BEDROCK STORIES: A CRITICAL GEOGRAPHY OF RADIUM AND URANIUM MINING IN THE SAHTU REGION, NORTHWEST TERRITORIES

by

© CARMELLA GRAY-COSGROVE

A thesis submitted to the

School of Graduate Studies

in partial fulfillment of the requirements for the degree of

Master of Arts

Department of Geography

Memorial University

St. John's, Newfoundland and Labrador

August 2015

Power and domination have to be produced, made up, composed. Asymmetries exist, yes, but where do they come from and what are they made of?

(Bruno Latour, 2005:64)

ABSTRACT

This thesis is aimed at answering two questions: how did uranium mining in the Sahtu region of the Northwest Territories contribute to the normalization of northern industrialization in the Canadian imagination? And, how is this historical normalization iterated in current policy decisions and negotiations around health and environmental assessments near radioactively contaminated sites in the Sahtu? Through a critical geography of visual representations and the discursive production of an industrial north, and employing visual methodologies, I unpack the rise of an industrial discourse surrounding Northern Canada in the twentieth century. Through an anti-colonial and de-colonizing theoretical framework I follow this discourse into current Sahtúot'ine (Sahtu Dene)-state negotiations around impact assessments of Port Radium and map the transactions of this controversy between the Délı̨nę First Nation and the Canadian government. In the first half of this thesis I examine how representations of uranium and the Sahtu have worked not only to paint the region as a *terra nullius*, but, more importantly, how these representations have worked to confine the Sahtu region within a discourse of industrial development. I conduct a close study of A.Y. Jackson's paintings of Port Radium and argue that the institutionalized dissemination of Port Radium minescapes has facilitated the emergence of a national discourse in Canada that privileges the interests of the mining industry, while marginalizing Sahtu Dene and 'non-scientific' knowledge systems and ways of being. In Chapter 3, I turn to a consideration of how these discourses are implicated in the ongoing controversy around the historical, environmental, and health legacies surrounding uranium mining in the Sahtu. I map the contours of the controversy around ionizing radiation and explore how scientific

knowledge claims have collided with Sahtúot'ine experience and claims to knowledge throughout negotiations over mine site remediation at Port Radium and redress for the health impacts of the mine. The focal point of this controversy is the competing knowledge claims about the health effects of radiation exposure at Port Radium: while many Sahtúot'ine, former residents and workers at the mine attest to a drastic increase in cancer and death rates after living and working at Port Radium, government and third party reports continually discount these claims with epidemiological and statistical evidence. Examining both the historical origins and the contemporary iterations of industrial colonialism in the Sahtu, this thesis uses images, maps, and policy documents to understand the processes that have oppressed Sahtúot'ine knowledge in industrial development and in Sahtúot'ine-state negotiations around environmental and health assessment over the past century.

ACKNOWLEDGEMENTS

First and foremost I must thank Morris and Bernice Neyelle for welcoming me into their home for three months; for their kindness, generosity, and wisdom; and for feeding me the most delicious fish I have ever eaten. To Morris, thank you for telling me stories that changed my life; for teaching me to fish and snare; and for building a wall-tent for me in the backyard. To Bernice for teaching me how to sew and bead and for being my Dene mother when I was so far from home. Mahsi-cho. I extend this thanks to the Délı̨nę First Nation for approving and supporting my research, and specifically to Paulina Roche, Orlena Modeste, Gloria Neyelle-Gaudet, Danny Gaudet, and Swanee Fink who made my time in Délı̨nę so wonderful and who guided me through the early phases of this project. Also, thank you to my youth-researchers who never ceased to surprise me with their insights, abilities, and creativity.

In St. John's, where the slogging happened, I am indebted to Arn Keeling who tirelessly believed I could finish this thesis despite the never-ending hurdles and who supported every aspect of this project as it traversed provinces, territories, and too many years. Thank you. Thanks are also owed to my committee: to Josh Lepawsky for being an inspired and wonderful teacher, for introducing me to the work of Bruno Latour, and for the editing of all and sundry; and to John Sandlos for support, encouragement, and insightful feedback. I must extend a special thank you to John O'Brian for showing me atomic art and for the seminar that started it all. Also to Allie Winton, my confidante in 2011-12, thank you for the well-timed gift of *A.Y. Jackson's Eldorado Sketches,* this was a turning point. I would also like to acknowledge the precious financial support provided

by the Department of Geography at Memorial University of Newfoundland, the Social Sciences and Humanities Research Council, the GNWT Education Culture and Employment program, and the Abandoned Mines Project.

This and all other undertakings would be impossible without my parents, Joyce and Stephen, whose love and insights, as well as passion for ideas, life, and art, are at the foundation of everything. Thank you. I must also thank John and Patrice for housing and feeding me along the way; Isaac for unending support; and Mary and Len for being my family on the East Coast. Lastly my greatest thanks are owed to David who has read every draft and who has been my sounding board at all hours and phases of jubilance and despair. My steadfast partner in adventure and creativity: may the next one be even better.

CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

AANDC – Aboriginal Affairs and Northern Development Canada

CDUT – Canada-Déline Uranium Table

DFN – Délı̨nę First Nation

DUT – Délı̨nę Uranium Team

ECE – Education Culture and Employment

GNWT – Government of the Northwest Territories

GSC – Geological Survey of Canada

HBC – Hudson's Bay Company

ICEC – Intergovernmental Committee on Environmental Contamination

IK – Indigenous Knowledge

INAC – Indian and Northern Affairs Canada

KFN – Kluane First Nation

NGC – National Gallery of Canada

NWT – Northwest Territories

SCESD – Standing Committee on Environment and Sustainable Development

TEK – Traditional Ecological Knowledge

TK – Traditional Knowledge

LIST OF APPENDICES

PREFACE

I lived in Délı̨nę for three months in the summer of 2011, a very short time in the long history of that place. I was shy and nervous as I waited in the small Northwright Airways terminal just down the road from the Yellowknife Airport. The other sixteen passengers waiting for the plane seemed to know one another. Parents and grandparents chatted loudly in a mix of *Sahtúot'ı̨nę*[1] and English, and herded small children hopping on the luggage scale and racing around the terminal, while teenagers in skinny jeans and hooded sweatshirts slouched over their iPhones and whispered inaudible teenaged thoughts to each other. I watched quietly, aware of my body and my language, aware that I was an outsider and a stranger. I was the only person on the flight who did not know every other person present and I was the only white person. The plane ride was turbulent; wind rattled window and wing. From the small plane I was high enough to see hundreds of lakes, scars left behind by glaciers, their pools of blue and white streaking across the muskeg—but low enough to know that, without the winter's ice, now melting, the only road across this land was a road for caribou and moose, a road for an ATV, or a road for a canoe and strong legs. But this was a route portaged for centuries by Dene people. In the nineteenth and twentieth centuries, this seemingly impassable plain was traversed by prospectors staking claims to rocks that would prove to be some of the richest radium and uranium deposits in the world; rocks that would fuel the acceleration of a national project to re-territorialize *Denendeh* (the Northwest Territories) as a Canadian resource colony.

[1] Throughout this thesis I will use the words Sahtúot'ı̨nę and 'Dene language' interchangeably to refer to the language spoken by the Sahtúot'ine, Bear Lake People—linguists often call this language 'North Slavey.' I will also use Sahtúot'ine and Sahtu Dene interchangeably to refer to the Great Bear Lake Dene from the Sahtu region.

Délı̨nę is home to the *Sahtúot'ine*, or Great Bear Lake People. It is a small community in the Sahtu[2], or Bear Lake, Region of *Denendeh*, the Northwest Territories (Figure 1).[3]

Figure 1. *Map locating Délı̨nę (Northwest Territories, Canada). Based on NWT map courtesy of Algkalv and Dr. Blofeld, Wikimedia Commons.*

[2] While the Sahtu region was not ratified as such until 1994, for ease of explanation I will employ this regional terminology throughout the historical portion of this thesis to describe the region around Great Bear Lake and extending north to the Beaufort Sea. It is important to note that 'the Sahtu region' did not exist prior to 1994, and the borders of Sahtu Dene traditional territory prior to the ratification of the Sahtu Dene and Metis Comprehensive Land-Claim Agreement would have been much less clearly defined than they are today.

[3] While I am aware of the complexity of the word 'community' (see Berkes, 2004; and Anderson, 1991) it is the term I have chosen to use in this thesis, primarily because this is the word used by the residents I spoke with in Délı̨nę when referring to their people and village. There was a sense of pride communicated with this word—a sense of not only living in a place, but also of being part of a group of people with a shared history. While words like village and town may be considered more precise and less homogenizing, these terms do not convey the sense of solidarity and healing which seemed to eclipse differences of opinion or conflicts between individuals or families.

An ice-road opens Délıné to Yellowknife from January to March and many people go south during these winter months leaving the population around 500 people.[4] The bright summer months bring an influx of visitors, researchers, as well as hunting and fishing tourists, and the population can spike as high as 700.

Figure 2. *The shoreline of Délınę, free of ice. Great Bear Lake, NWT (2011). Author's photograph.*

Over the past hundred years, the community has settled on the shore of Great Bear Lake (Figure 2) around the site of the former Fort Franklin fur trading post, but Sahtu Dene have lived on this land for time immemorial, moving around the lakes and rivers with the seasons, following the caribou, the trout, and the other animals that have provided

[4] According to Statistics Canada (2011), the official population of Délıné is 472 people. Residents that I spoke with cite the higher and fluctuating number that I have included here.

sustenance, clothing, and shelter. The name Délı̨nę translates from Sahtúot'ı̨nę, as "where the water flows"—west out of *Sahtu* (Great Bear Lake) to *Sahtúdé* (the Bear River), and then north up *Deh Cho* (the Mackenzie River) to the Beaufort Sea.

As the plane neared a huge lake, still partly covered in ice and snow, I could just make out a stand of houses on its shore. We touched down on the muddy landing strip and I went to meet Morris and Bernice, with whom I would be staying for the next three months. I did not know that this couple, who I greeted with shy handshakes and quips about turbulence and motion sickness, would open every door for my queries and questions, would critique and discuss my ideas, would guide me through their home, history, land, and community. We drove the 2km into town in their spotless, white Ford f-150, chatting about the weather—it was already early June but the ice was still jammed-up along the shoreline, preventing access to the lake and its fish.

The ice lingered around the docks, blockading boat and fisherman, until the end of the month; no one could remember it staying so late in the season. Two weeks after I arrived, as we sipped tea around the dinner table, I asked Morris about the ice. He told me old stories about Great Bear Lake, about fishing and hunting, and about his father. He told me stories most nights after that. In this way, into the wee hours of the morning, as the midnight sun slipped to its lowest point just below the horizon, I learned bits and pieces of a very different history of Délı̨nę than I had yet observed; a history that has allowed me to see the ubiquity of story in all accounts of the Sahtu region, and a history that has forced me to question my own notions about knowledge, colonialism, and power.

At the outset, this project was about *atomic art* and *industrial art*; art that iterates the knowledge of science. I preface this thesis with the *visual* stories that shaped my understanding of Délı̨nę prior to my time there—stories that paint a landscape at once mirroring and constituting, creating and upholding the dominant discourse about northern Canada. These visual stories fill the Canadian imagination. Producing, practising, and buttressing nationalistic truisms about land and nature, they are artefacts of an industrial north.

My interest in atomic art was piqued in 2009 when I met a multi-media artist who had constructed a tiny cloud chamber in her Gastown studio in Vancouver. This particular chamber was an airtight, glass box about 2'x2' containing supersaturated water vapour and a digital camera. When charged particles, which circulate invisibly in the air all around us, pass through a cloud chamber they force the particles from the supersaturated vapour, already on the verge of condensation, to coalesce—this process of ionization creates a puff, a tiny cloud, and a trail of mist showing the path of the charged particle. The process is similar to the ionization that produces auroras, or the northern lights. Around her cloud chamber, this artist had mounted photos of these small clouds, snapped at the moment of ionization, beside old silver-plate photographs from 1940s and 50s nuclear testing in the Nevada desert, obtained through the Nevada Site Nuclear Testing Archive. Her work dealt with visualizing radioactivity, with notions of 'the sublime' in nuclear imagery, and most importantly with creating a space to see the invisible—tracing imperceptible, charged particles through the atmosphere, unearthing archived photos and so on. In our brief conversations, I was intrigued to find that this artist had grown up in

Elliot Lake, a mining town in northern Ontario that supplied uranium ore to the American nuclear program beginning in the 1950s. The Serpent River First Nation and the town of Elliot Lake continue to struggle with the detrimental environmental and social legacies of uranium mining (Leddy, 2011). These connections between nuclear politics, visuality, uranium mining, and personal story became the terms of my subsequent research.

Equipped with this collision of nuclear ideas, and this young artist's personal connection to the story of the nuclear arms race and her interest in making 'the atomic' visual/visible, I began searching for other atomic art. The tumult of imagery that ensued includes Cornelia Hesse-Honegger's detailed illustrations of Chernobyl's "morphologically disturbed insects" (Hesse-Honegger, 1992, 1997, 2001; Raffles, 2010: 15-40); Isao Hashimoto's interactive map of the world's nuclear explosions entitled "1945-1998" (Hashimoto, 2003); Edward Burtynsky's epic photographs of Elliot Lake mine tailings (Pauli, 2003); George Yoshitake's documentary photographs of nuclear testing (Kuran, 2006); and a myriad of other visual artworks with atomic themes.

As I narrowed my search to Canadian artists, I landed on a unique set of paintings and sketches by Alexander Young Jackson (A.Y. Jackson), around which the first half of this thesis has taken shape. A prominent member of the Group of Seven, the renowned Canadian art collective, Jackson composed these works *en plein air* between 1938 and 1959 (Jackson, 1976; Larsen, 2003, 2009),[5] in the surrounds of a radium and uranium mine on Great Bear Lake in the Northwest Territories, called Port Radium. Operated by

[5]The National Gallery holds 27 pencil or ink sketches and 2 oil sketches from Jackson's visits to Port Radium. The Prince of Wales Northern Heritage centre holds 10 oil sketches, 1 painting, and 55 pencil or ink sketches, donated by Eldorado Mining and Refining (see W. J. Bennett, 1988). Additionally, many of Jackson's works are held in private collections.

Eldorado Mining and Refining Limited,[6] the Eldorado Mine at Port Radium began operations in 1932, just 250km east of Fort Franklin (now Délı̨nę), on the traditional territory of the Sahtúot'ine (Figure 3).[7]

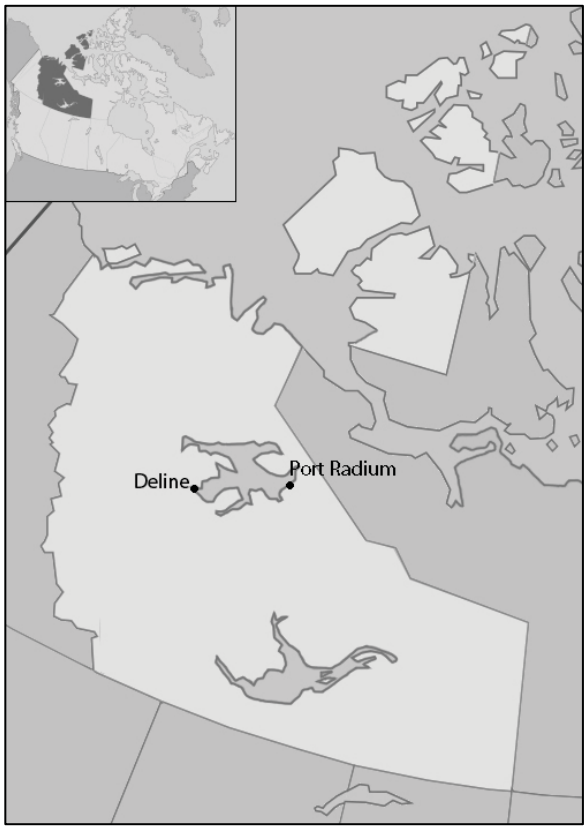

Figure 3. *Map locating Délı̨nę and Port Radium (Northwest Territories, Canada). Based on NWT map courtesy of Algkalv and Dr. Blofeld, Wikimedia Commons.*

[6] For the sake of clarity, I will use the name Eldorado, to refer to the company that owned the Port Radium Mine. However, when the mine first opened in 1932, the company was called Eldorado Gold Mines Limited. In 1944, the Canadian Government bought control of the company's shares and changed its name to Eldorado Mining and Refining. The mine is currently under the ownership of the Cameco Corporation. For a detailed history of Eldorado, see Robert Bothwell, 1984 and Délı̨nę Uranium Team, 2005.

[7] While the mine was built on the traditional territory of the Sahtúgot'ine, the Canadian government only ratified the Sahtúot'ine land-claim in 1994 with *Sahtu Dene and* Metis *Comprehensive Land Claim Agreement* (Government of Canada, 2009)—62 years after the Port Radium mine began its systematic exploitation and pollution of the region.

Ten years later the mine became an essential source of uranium for the United States' nuclear arms program and remained one of the top producers of uranium in the world until 1960 when the mine closed (Bothwell, 1984).[8]

It is remarkable that A.Y. Jackson, a Canadian landscape artist, would find himself so intimately involved in geological reconnaissance north of 60°, around Great Bear Lake—first in 1938 on an invitation from Gilbert Labine, the president of Eldorado Mining and Refining (Jackson, 1976: 125); in 1949 and 1950, with GSC surveyor Maurice Haycock, at the behest of Dr. Hugh Keenleyside, the Deputy Minister of the Department of Mines and Resources (Bennet, 1988: 1-2; Jackson, 1976: 154; Larsen, 2009: 194); again in 1951 with John Rennie, a painter and a mining engineer (Larsen, 2009: 194); and last, in 1959, just a year before the mine would close, on a second invitation from Labine (Mingay, 1977: 8). As I demonstrate in this thesis, the paintings, maps, sketches, reports, and representations of the Sahtu produced during this period were active in the normalization of industrial colonialism in Canada, the reverberations of which are still felt today.

With these colliding and complicated histories in mind, I ask the reader to consider this document as a metaphorical cloud chamber, an *aurora* of stories—from paintings, to oral histories, from geological maps to government reports. This is a space, not much smaller than the 2'x2' glass cube in the artist's studio, where, instead of charged particles, I offer charged narratives of a plural place; stories, art, and reports that collide, ionize, and interact. Beyond this metaphoric cloud chamber, these are important

[8] In 1964 Echo Bay Mines Limited leased the Port Radium mine site and continued to mine the area for silver and copper until 1981 (see E. A. Schiller, 1965: 39-44).

interactions and these are political interactions. In contemporary debates over such controversial issues as pipelines and mine re-development, long-term radioactive waste storage and redress for radioactive exposure, treaty negotiations and land-claims, as well as Sahtúot'ine autonomy and self-government, accounts of uranium and the Sahtu region represent competing claims to knowledge and vie for authority in Canadian policy. I approach these stories as artefacts in a complex network of interaction—conduits and participants in the geography and history of uranium mining in the Sahtu. Loaded with meaning and association these artefacts resonate in a complex of local and global discourses of nuclearity (Hecht, 2012), radiation (Mogren, 2002), war (Masco, 2006), colonialism (Leddy, 2007), northern industrialization (Keeling, 2010; Zaslow, 1988), and national imaginaries (Zemens, 1998). The particular set of artefacts I present here are integral to Sahtu Dene land-claims, 'Canadian identity,' current and future mining projects, and environmental remediation. In turn, these issues find themselves at the heart of families, history, land, and community; they are integral to the arduous process of healing from the deep wounds left by a savage colonization, and to guarding against the ongoing iterations of the Canadian colonial project.

CHAPTER 1

INTRODUCTION

BEDROCK STORIES

> The epidemiology feasibility study predicated [sic] that, due to the radiation doses calculated in the dose reconstruction, an excess of 1 or 2 cancer deaths would be expected among the 35 ore transport workers, in addition to 9 or 10 cancer deaths that would "normally" be expected in a similar, non-exposed group of 35 people.
>
> A full epidemiology study of former transport workers is not recommended for the following reasons: it would be difficult to establish an accurate baseline reference rate; the predicted number of excess cancer deaths due to radiation exposure is relatively small and; the small sample size (35) limits the likelihood of a statistically significant outcome.
>
> (Canada-Déline Uranium Table Final Report, 2005: 43)

Imagine that northern lake trout is the staple of your diet, that you were raised on the fish. At a young age you learned to net, filet, debone, cut, cook, smoke, and survive off trout. Your family relies on trout to stay healthy, you feed your children from the fish, your community thrives on the fatty, protein-rich meat. The frozen stores you prepare over the short summer months help you survive long, subarctic winters. At a cookout on a warm August afternoon, you fry the filets, serve them to your family and neighbours, you bite into the rosy flesh and you taste the freshness of a fish caught just hours earlier, you are confident in this food that has sustained your family and ancestors for millennia.

Now imagine the confidence is taken away. Imagine you are told that the lake you live on and fish from, the lake that your ancestors have lived on and fished from for thousands of years, has been contaminated by tailings from a radium and uranium mine. You begin to notice changes in the flesh of the trout, a certain pallour here, a dark spot there, occasionally a tumour. You begin discussing these changes with your friends and

family, other people have noticed the same spots and lesions. You also learn that your family who lived near that mine may have been contaminated—and finally, that the uranium ore your grandfathers and great uncles helped carry from the mine to a barge was refined and used in weapons that killed thousands of people and damaged hectares of land around the world. Years pass, scientists test the water in your hometown, take samples of trout meat, and report that there is no sign of contamination, that the fish is safe to eat—they tell you there is no new pallour, there are no dark spots, and there are no tumours.

Soon, your friends and family notice that the people in your community who worked at the uranium mine, or nearby, are getting sick. Many people are developing cancers, illnesses that have never been common in your community. Many people you know feel scared and guilty about their unwitting involvement in such a dangerous mining project. You take your concerns to your local government and the wheels of bureaucracy begin to turn. Your community comes together to demand a formal inquiry into the contamination and finally the federal government gets involved. The concerns are taken seriously, and the government funds a multi-million dollar inquiry into the situation.

When all is said and done, when the scientists have analyzed their data and the environmental consultants have summarized residents' testimonials, the overarching conclusion is that no correlation can be drawn between exposure to radioactive ore and the rise in cancer rates you have observed in your family and friends. In fact, the final report implies that it is impossible to determine whether increased rates of lung cancer in your community are caused by smoking cigarettes or by exposure to radiation. Further,

the report claims that the population sample is too small for any definitive causal conclusions or sufficiently informative findings.

The project is over, the reports are submitted, annual testing continues, but there is no immediate action taken to compensate your family and friends who are sure their relatives were killed by radium and uranium. Shaken by the whole experience and unsure what to think, you continue to fish and eat trout, but you avoid certain areas of the lake and you wonder what will happen if the latent tailings that still sit on the lake floor are disturbed. Regardless of the reports, the confidence you once felt as you ate the fish you knew would bring you health has turned to doubt. Your body's role in the ecosystem is no longer a safe one.

The trout I have described live in the waters of *Sahtu*, or Great Bear Lake, in the Northwest Territories. The radium and uranium mine that has threatened their habitat and the land of the Sahtúot'ine is called Port Radium, and the 14 or more men who died from lung, colon, and kidney cancer between 1940 and 1962 were Sahtúot'ine men who worked for that mine, and who settled near the Fort Franklin trading post, now the Charter Community of Délı̨nę. The number of deaths from diseases associated with radiation exposure in Dene women and children is not known, though the oral record indicates health impacts in these further marginalized demographics (Délı̨nę Uranium Team, 2005).

This work presents the results of research in historical and cultural geography about the actors that have set the stage for radioactive contamination in the Sahtu and the bodies that have absorbed it. More specifically, this thesis addresses the formulation and

perpetuation of a discourse of industrialism, radiation, and development in Northern Canada from 1900 to the present that has permeated Canadian perceptions of the Great Bear Lake region and Denendeh at large. Sherrill Grace (2001) has examined the ways in which *nordicity* has come to define a Canadian national imaginary—an imaginary that I argue is inextricably connected to a discourse of industrialism. I access the emergence of this discourse through artistic and geographical representations of Denendeh which allow insight into the ways in which the Northwest Territories has been drawn into nuclear history and is understood as a resource colony of Canada, constrained as a space for exploration, colonization, and industry. In turn, this discourse of industrialism, nuclearity, and development has given rise to complex epistemological conflicts as Sahtu Dene ways of knowing vie for a place in the colonial knowledge systems that have not only sought to oppress indigenous[9] knowledge across Canada since first contact, but which also shape governance and development strategies. In order to unpack the histories of uranium and the Sahtu and to challenge the dialectics inherent in these histories—north/south, Dene/white, colonizer/colonized—I turn my attention to the place at the heart of this story and follow uranium out of the bedrock of the Sahtu, fissioning through the twentieth century: through history and geology, art and print, imagination and story.

Following the Sahtu through art, science, and popular media in the twentieth century, I present scientific, visual, and storied enactments of the region and its mineral resources from 1938 to the present. I examine the various ways the Sahtu was translated

[9] While I avoid the terms "Indigenous" and "Aboriginal" in this thesis, terms that homogenize the diversity of first people on this continent, these terms are at times necessary to express the general scope of the Canadian colonial project. The term "indigenous knowledge" is used reluctantly and I examine the complexities of this category of knowledge throughout the thesis, particularly in Chapter 3. To avoid homogenization as much as possible I use the rather clumsy addendum 'Indigenous *peoples'* or 'Aboriginal *peoples.'*

onto canvas and map, and was disseminated as an industrial hinterland; as well as the methods and mediums of visual artists, geologists, and mining men that re-envisioned the region, allowing it to circulate in Canada and internationally. I propose that historical, southern Canadian representations of the Sahtu have acted as comprehensive claims to land and territory—claims that have systematically marginalized Sahtúot'ine ontologies and land rights. I approach these representations, not only as claims to a *Canadian* north, but also as stories and objects that have performed, inscribed, and sedimented "nordicity" (Grace, 2001), industrialism, and the Sahtu region as part of the Canadian nation. I trace the discursive route of uranium as it travels through networks of people and things, moving and shaping knowledge, normalizing the Sahtu as a nuclear space, first for industrialisation and development and more recently for environmental and health assessments as well as remediation.

I begin by outlining, in this introduction, the cast of characters and objects that constitute the substantive chapters of this thesis. I proceed to the methodological approach and theoretical framework that guide this study. I then examine colonial and Sahtúot'ine uranium-discovery-stories as a segue into the complex of historical representations that I collect in Chapter 2. The historical narrative progresses in a linear fashion from the early twentieth century to the present, tracing uranium through early mining activity and into current policy decisions.

1.1 HISTORICAL CONTEXT

I've been in Délıŋę for five days now. Today I walked over to ———'s office at the Land Corporation. After introductions and a tour by Morris and Swanee, a linguistic researcher in town for the summer, the four of us settled in for a long chat.

The Land Corporation is the hub of land claim and self-government negotiations for the Délıŋę First Nation [DFN], as well as more daily concerns of land-use planning and infrastructure. ——— is a member of the Sahtu Land and Water Board, the regional land-claim board in charge of regulating land and water use in the Sahtu, a region delineated through the Sahtu Dene and Métis Comprehensive Land Claim Agreement settled in 1994. As a liaison between the five communities in the Sahtu[10] and the federal government, his role is vital as Délıŋę negotiates the terms of self-government or the Délıŋę Got'ıŋę Government.

His office is big, crowded with books and papers; it sits adjacent to the Band Office, at the centre of town and looks out onto the main drag. As the conversation moved to Land Corp. business and Swanee's research, I examined a timeline scribbled in sharpie on a long strip of newsprint and pinned to one wall. Entitled "Stories as Policy," it sketched an uncomfortably divided history of the Sahtu region. While a categorization of events wasn't explicitly labeled, colonial encounters were time-marked above a red line—1825, arrival of Sir John Franklin; 1886, French missionary Émile Petitot arrives; 1921, Treaty 11 is signed, and so on—while important local time-marks were written

[10] Through the *Sahtu Dene and Metis Comprehensive Land Claim Agreement,* five discreet communities were established within the Sahtu: K'áhbamñtúé (Colville Lake), Délıŋę, Rádeyîlîkóé (Fort Good Hope), Tåegõhtî (Norman Wells), and Tulita (see Government of Canada, 2009).

below the red time-line. Early events had no date, but arrows indicated they occurred outside the time scale of the poster—for instance, ← the Great Flood and ←Yamoria walks the earth. More recent dates were marked within the timeframe of colonial history—1857, ɂehtsǝ́o (Prophet) Ayha is born; 1950, Caribou leave Délıǫ̨, etc.

Around the 1920s the poster was crowded with writing and featured an important overlap in 1929: above the red line was cited the first mineral claim in the area, staked by reputed prospector Gilbert Labine. Below, plotted on the same hatch-mark, Old Beyonnie shared his discovery of pitchblende with prospectors—the Dene elder was the first to note rare deposits of the very mineral Labine claimed three years later.

(Personal Field Notes, June 13, 2011)

The poster I have described in my field notes above is a contemporary example of the engrained, bifurcated history of colonialism and mineral discovery in the Sahtu, but it also highlights that there were important, and often violent, events in the Sahtu before, during, and after mining that complicate and compound the colonial encounter. Denendeh, or the Northwest Territories, has been the site of contentious resource extraction and land disputes since the early days of the fur trade. Colonial contact began in earnest in the Sahtu region as settlers moved north in the late eighteenth century. In 1799 the Northwest Company (NWC) opened the Bear Lake Post (Keith, 2001: 15, 62) in the place that would become Fort Franklin, a Hudson's Bay Company (HBC) outpost, in 1825 as Captain John Franklin began his Second Arctic Land Expedition (Bothwell, 1984: 13; Franklin, 1971: ii-iv). About 100km to the west of Fort Franklin, at the junction

of the Bear River and the Mackenzie River, was Fort Norman (now Tulita), an active HBC post from the early nineteenth century (Abel, 2005: 91). As exploration continued in the Northwest Territories in the nineteenth and twentieth centuries, the attention of the Canadian Government turned from the furs of the HBC to mineral resources. In 1899 and 1921 treaties 8 and 11 were signed, respectively, with First Nations from Northern British Columbia, Alberta, Saskatchewan and up the Mackenzie Valley past Great Bear Lake to the Beaufort Sea, with the intention to "extinguish" First Nations title to the Athabaska-Mackenzie region and its wealth of resources (Fumoleau, 1974: 19).

As mining for radium and uranium began in the Sahtu in the 1930s, it was accompanied by a complex of colonial relations in Denendeh and was entangled with concurrent acts of violence, cultural oppression, and dispossession, as well as rapid change and emergent power dynamics in an area of great resource wealth. The fur trade, treaties 8 and 11, and mineral exploration in the Sahtu coincided with the widespread incursion of residential schooling in Denendeh (Dickerson, 1992:37-44), aggressive Roman Catholic and Anglican missions, flu and tuberculosis epidemics (see Helm, 2000:140-43; Department of Indian Affairs, 1928: 7; Blondin, 1997: 38-39), as well as the introduction of Euro-Canadian medical practices and hospitals (Mr. Paul Baton: Canada, 1998: [1150]). Between 1867 and 1920 residential schools swept through the Northwest Territories, with institutions in Aklavik, Inuvik, Fort Simpson, Fort McPherson, Fort Simpson, Fort Providence, Hay River, Yellowknife, and Fort Smith—as well as a federal school in Fort Franklin (Délı̨nę). As Dene people became ill from exposure to illnesses and influenzas introduced by *mola* (white people), many Dene families came to trading posts and industrializing hubs like Port Radium looking for

medical care as well as work, which was becoming necessary in order to earn a living in the rapidly changing region (Blondin, 1997). Many Dene children were put in residential schools and many Dene were hospitalized or institutionalized for illnesses previously unknown in the region—some of these people never returned to their communities, while others were never actually treated. As one report from the Department of Indian Affairs attests:

> The outstanding event of the past year [1928] was the epidemic of influenza which swept the basin of the MacKenzie river during the month of July[….] Accounts of the epidemic which have reached the department tell of whole settlements stricken at once, so that there were not enough well persons to care for the sick or bury the dead, of mission workers carrying on though suffering from the disease themselves, and in one or two cases, of isolated families or small settlements being completely wiped out.
> [….] The toll of death was heavy, and many widows and orphans are left.
> (Government of Canada, 1928: 7.)

In 1998, Paul Baton, then chief of Délı̨nę, spoke to the impact of Tuberculosis in Délı̨nę, in a Parliamentary hearing with the Standing Committee on Environment and Sustainable Development:

> Shortly after [the opening of the mine in 1930], one of the things that was well known was that people started being diagnosed with TB. A lot of them were sent out to the hospitals outside of the community. Some people just never went for any type of treatment. It was well known, and some of the people got treatment and some of them didn't. (Canada, 1998: [11:50])

Stories of families broken apart by residential schools and tuberculosis are commonplace in Délı̨nę, and the community continues to work toward healing from these detrimental experiences, which reverberate through the generations.

In the midst of all this colonial action in the north was the radium rush. To begin to sketch the basic storyline, cast, and setting in the history of radium and uranium mining in the Sahtu, as well as to begin to draw out the interwoven and contradictory threads of

this history, I present two divergent descriptions of the same moment in space and time—when a chunk of a rock interred in the outcrops and craggy cliffs around Great Bear Lake was removed from the bedrock, and came into the hands of a man who called it pitchblende and who understood its value in the context of the world economy.

The colonial, Euro-Canadian story of discovery and mining at Port Radium has been told countless times. Included in the anthology are newspaper and magazine articles in the *New York Times*, *Time Magazine, Life Magazine,* and *Popular Mechanics* as well as biographies and memoirs of infamous prospectors and bush pilots, all of which have glorified the momentous discovery of pitchblende (uraninite), the ore that contains radium and uranium, by prospector Gilbert Labine (for example Stoll, 1932; Canada at War, 1945; The Epic Story of Radium, 1938; Shaw, 1958; Camsell, 1954).

Among these publications is a noteworthy exposé in *Fortune* magazine entitled "The Great Radium Mystery" (February 1934), detailing Labine's discovery on Great Bear Lake and the global context of radium mining at Port Radium. This piece was not only widely disseminated (Mullen & Beard, 1985: 7), it also told a moving story that has become the ubiquitous account of pitchblende discovery in Northern Canada, eclipsing lesser-known and more nuanced tales. As *Fortune* tells it, in March of 1930, a bush plane deposited two prospectors, Gilbert Labine and Charles St. Paul, along with enough supplies to last them a few weeks, fifty miles south of Great Bear Lake on the Camsell River. "They ran into some Indians who dragged the toboggan and its half ton of supplies down the frozen river to an arm of the Lake and there left them" ("The Great Radium Mystery," 1934: 71). They were there for six weeks when St. Paul went snow blind and

Labine was left to scanning the hills alone for mineralization while his partner rested with poultices over his eyes.

> One day, rounding a long promontory that jutted out into the water, [Labine's] eyes lighted on a rock formation that shone dull red and yellow and black in the sunlight. That meant mineral; but what mineral? He went closer. Cutting through the rock was a clear vein of some black, vitreous-looking substance, tinged with green. Now what might that be? [….] In a while he remembered wandering through a museum, fourteen years earlier, and he visualized accurately the sample he had seen. Then he new; it made italics in his mind: "*Pitchblende!"* And pitchblende was the rare, rich ore from which came radium. To make sure, he broke off a sample and carried it back to camp. There, while St. Paul lay quiet in the dark tent, he poked silently through *The Prospector's Handbook,* terse, unornamented Bible of all treasure hunters. And that's what it was—pitchblende. Gilbert LaBine went home. ("The Great Radium Mystery," 1934: 71-73)

Labine did not stay home long, however. In 1932 his company, Eldorado Gold Mines Ltd., began operations near this site of his great discovery and opened the Port Radium mine (Figure 4). Over the next ten years Port Radium became the most profitable radium mine in the world (Bothwell, 1984). However, as the radium market declined during the depression, mining operations ground to a halt. In 1942 the mine reopened under a veil of wartime secrecy and nationalized in 1944—instead of radium, the government-owned mine had begun to produce uranium, supplying ore for nuclear arms testing and the Manhattan Project (Bothwell, 1984; Van Wyck, 2010).

While *Fortune* magazine may have been one of the first international publications to feature a story on Port Radium, the momentous industrial history of that place, its minerals, mining men, and rugged terrain has been told in many media over the past eighty years.

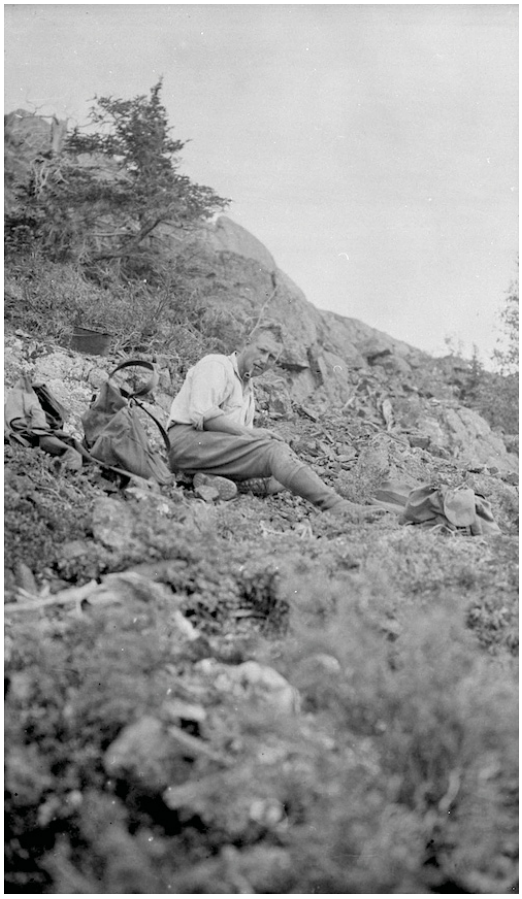

Figure 4. *Gilbert Labine on Silver outcrop, Great Bear Lake, N.W.T. (Aug,1931). Canada. Dept. of Mines and Technical Surveys, Library and Archives Canada, PA-014741. Accession no. 1965-040 NPC, item no. 6284, box 118.*

From the discovery of pitchblende, to the moment of nuclear fission over Hiroshima, to recent remediation efforts on Great Bear Lake, the story of radium and uranium from the bedrock of the Sahtu has been recounted by journalists, visual artists, filmmakers, and authors alike. Contemporary tellings have sought to highlight Dene histories and the colonial implications of the mine. These include an oral history book (Délı̨nę Uranium Team, 2005), a play (Clements, 2003), a photo essay (Del Tredici, 1987), and an opera (Salverson, *Shelter,* 2012), among a variety of academic and popular publications, films

and so on (see Van Wyck, 2010; Keeling and Sandlos, 2009; Nikiforuk, 1998a-h; Salverson, 2011; Blow 1999; Henningson, 2007; Isacsson, 1990).

Unlike the internationally disseminated account in *Fortune*, local histories of pitchblende discovery in Délınę feature a broader cast of characters, and depose Gilbert Labine, hitherto protagonist of this bedrock story. For instance, as the account given by the Délıṇę First Nation (DFN) attests, published in *If Only We Had Known: The History of Port Radium as told by the Sahtúot'ine,* a collection and synthesis of Sahtúot'ine oral histories relating to Port Radium:

> Grandfather Beyonnie and some other people left for Caribou Point by boat for a couple of months. It was getting dark when they got to the Port Radium area so they camped there for the night. There was a place where Beyonnie found different kinds of rocks so he broke a piece off to take with him. Beyonnie and the others were in Bay 66 when a white man met them.
>
> The white man asked Beyonnie to give him the rock and the white man gave Beyonnie something in return because in those days times were hard. The white man knew this rock was radium, but he said to Beyonnie "maybe it's nothing" and he told Beyonnie that he was just travelling through. The weather was good the next day so Beyonnie traveled to Caribou Point. The white man went back south. Later he came back and set claims in that area. Beyonnie didn't know the white man's name, but later on he found out that his name was Labine.
>
> The place Beyonnie and the white man made camp is called Beyonnie Bay. (Délıṇę Uranium Team, 2005)

Beyonnie was never justly recognized for his discovery of pitchblende, and the local testimony I heard countless times in Délıṇę was that he received only a few pounds of flour and a bag of groceries in exchange for his pitchblende sample (Field Notes, July 2010)—a measly reward compared to the millions in revenue facilitated by his find. *Fortune* magazine and *If Only We Had Known* present racialized and contrasting excerpts of pitchblende-discovery stories that diverge at almost every point. And while their similarities and differences are interesting to note, the quest here is to follow uranium from the Sahtu through story as it acts as a medium for encounters and interactions that

enacted an industrial discourse and perpetuated industrial colonialism. While the settler history of Port Radium enjoyed a wide readership, the latter history, the Dene account of pitchblende discovery, did not (until recently) travel south from Great Bear Lake. Not surprisingly, this instance in which settler knowledge about Port Radium is privileged over local Sahtúot'ine knowledge about the history of the mine does not stand alone. While these two discovery stories describe conflicting accounts of the genesis of industrial colonization in Denendeh, the inequities in their dissemination and in their perceived truth-value are reproduced in contemporary remediation and land-claim negotiations. If asymmetries in the perceived legitimacy of Sahtúot'ine knowledge exist, as I have suggested in setting the historical context for the controversies at the heart of this thesis, then the question to explore is, "where do [these asymmetries] come from and what are they made of?" (Latour, 2005: 64).

1.2 METHODS AND METHODOLOGY

THIS IS NOT ETHNOGRAPHY: BEING *MOLA* TALKING ABOUT URANIUM

Today I got up at seven and helped with odd jobs around camp: cutting wood, collecting pine boughs. Fileted and cut trout for drying later in the day—made a very foolish mistake stepping over a big pile of fish carcasses, a serious impropriety. Was scolded by an elder and felt very foolish. I know better than to do that. Elders have been calling me something like "mola neday," Morris says it means "the tall white girl." Other people have been calling me "?its'e," moose girl. I don't particularly like either nickname.

(Field Notes, July 26, 2011*:* Whiskey Jack Point, NWT)

As a *mola,* or white, researcher, the complications of writing about uranium contamination in a Sahtu Dene community abound. This thesis centres a settler perspective, not because I think this is a good way to research and write, but because this is the only perspective I can write from, and the only perspective I can critique. Edward Saïd's questions, "Who writes? For whom is this writing being done? In what circumstances?" (Saïd, 1982:1), have served as both a guide for critiquing representational practices and as a mnemonic for decolonizing my own research and writing. However, as Linda Tuhiwai-Smith has critiqued, "research adventures on indigenous lands" are inherently problematic (1999: 78) and there remains an inextricable and historic connection between research and imperialism. Being white and doing research in a Sahtúot'ine community is not comfortable. This discomfort is important to feel, important to understand, important to acknowledge in writing, and important to displace in order to make space for the colonial issues that underlie it. I reworked my methodological approach continually during my research with the ever-present goal of conducting an anti-colonial inquiry. The foremost difficulty I encountered working in Délı̨nę was that it proved impossible to conduct the rich ethnographic research I had set out to do, as an outsider and in the timeframe of a master's thesis, while cultivating the partnerships necessary for a deep ethnography that is invested in decolonizing research practices along every avenue of investigation. So this research is not grounded in ethnography. Regardless of my personal integrity, my friendships, my ethics approval, and my consent forms, my position in Délı̨nę remains that of an outsider and a *mola*. I do not have the knowledge, history, or language to tell certain stories or to write an account of Sahtúot'ine experiences with uranium mining. Indeed, as Absolon and Willett note,

"[t]he writing of Indigenous knowledge is a delicate topic. First there's the issue of which Indigenous knowledge should be put into text and which should not" (2005: 113)—a concern that was shared by many people I spoke with in Délı̨nę, particularly regarding elders' stories and the translation of those stories into English. The decision of how to share, tell, and understand Sahtúot'ine uranium stories is not mine to make, and so my methodology has taken shape largely as a negation: as *not ethnography.* Nonetheless, I rely on a mixed-methodological approach informed by ethnographic practices and applied to texts, documents, pictures, paintings, maps and so on, including transcribed interviews in the public domain. So, while stories from texts, retrieved during long hours in archives, libraries, and databases, and stories from people, imparted in conversations and workshops in Délı̨nę, form the raw materials of this project, these latter conversations were germinal and will not be treated as the *data* under analysis in this document. Instead, these stories from people have shaped my *approach* to research.

The Eldorado files at Library and Archives of Canada (LAC) were integral to this study, as were the A.Y. Jackson collection at the National Gallery of Canada (NGC) and the Eldorado Collection of A.Y. Jackson sketches at the Prince of Wales Northern Heritage Centre (PWNHC). A major limitation to my archival research was the sheer volume of information about the various phases of mining at the Port Radium mine-site. Due to the time constraints of this project and the extensive archival collection from Eldorado Ltd., the Canadian government, as well as the personal collections of myriad mine officials and visitors, it was necessary to limit my archival search to those records relating directly to A.Y. Jackson and the visual representations of the mine area. The archival documents pertaining to the Intergovernmental Committee on Environmental

Contamination (ICEC) reviewed in Chapter 3 were retrieved from the NWT Archives and made available to me by my supervisor, Dr. Arn Keeling.

Many of the visual documents I collected during archival research came with me to the NWT and informed the conversations I had with people in Délı̨nę. In organizing this latter part of my project, my goal was to explore, and sometimes initiate, interactions between documentary and local histories in order to bring them into conversation and to understand their divergences as well as the space they share. This experiment granted a reciprocal exchange: the documents I retrieved from archives, galleries, and libraries informed the conversations I had in Délı̨nę—in turn, those conversations helped me re-evaluate the texts that elicited them. This approach was loosely based on Douglas Harper's work on photo elicitation (2002) and the case studies in editor Sarah Pink's collection of essays *Visual Interventions: Applied visual anthropology* (2007). Harper and Pink both describe anthropological research that relies on participants' responses to and production of images. Framing these research methods is the *Visual Methodologies* work of Gillian Rose (2001), which provides a framework for critiquing visual materials and for understanding the work that images do in the world.

In the first month of my stay in Délı̨nę it became apparent that interviews were a controversial research method. In particular, my interest in uranium, mining, and land claims proved to be the most politically charged of topics as Délı̨nę was in the throes of negotiating remediation contracts with the territorial and federal governments as well as finalizing the Délı̨nę Self Government Agreement. Many of the Délı̨nę residents I spoke with were reticent to discuss related topics on the record, like uranium mining, remediation, or land claims. My hosts Morris and Bernice, as well as the DFN's

Environmental Liaison Officer, Orlena, offered much insight into the politics of interviews in Délı̨nę and the sensitivity around discussing politically charged issues—legacies of extractive research in the community over the past hundred years.

After many conversations about the history of interviewing in Délı̨nę and about my own discomfort with this form of knowledge acquisition I abandoned formal interviews in favour of community directed research and put myself in the service of the DFN. This approach was welcomed and I was assigned the development and implementation of a two-week youth workshop. With the help of Orlena, we developed the plans for a classroom-based program on uranium mining, oral history, and analysis of representations of the Sahtu. The workshop was part of a larger two-month youth employment program which included an "on the land" trek to Whiskey Jack Point; planning and organization for the Délı̨nę spiritual gathering; as well as administrative work around the Délı̨nę band office. The overall aim of the employment program was to facilitate knowledge exchange between youth and elders in the community. The program was based around an action-research model and was informed by an Indigenous research paradigm and methodology (Absolon, 2011; Brown & Strega, 2005; Kovach, 2009; Wilson, 2008). The workshop was part of an Education Culture and Employment (ECE) program, conducted and funded by the Délı̨nę First Nation (DFN) through a grant from the Government of the Northwest Territories (GNWT). This program provided the six youth researchers with a full-time wage for the duration of the project.

During the 2-week classroom sessions we discussed and displayed paintings, maps, and photographs from my archival research; we watched several films about Port Radium and read oral histories about the mine; and we worked on generating visual

representations of Délı̨nę that might voice issues not captured in archival documents and southern Canadian representations. We had several guest speakers from the community, including Danny Gaudet, chief negotiator for the Canada-Délı̨nę Uranium Table (CDUT) and for the Délı̨nę Self-Government Agreement; Morris Neyelle, an elder, photographer, and former miner at the Echo Bay silver mine—a mine that operated from 1962-1982 out of the Eldorado mine at Port Radium after its closure; Mandy Bayha, a young woman who visited Hiroshima with the Délı̨nę Uranium Team (DUT) to deliver a formal apology for the inadvertent involvement of the Sahtúot'ine in the production of uranium that led to the bombing of Japan; and Raymond Yakeleya, a Dene filmmaker who directed *Moving Forward Together,* a short documentary about Port Radium and the process of negotiating remediation at the mine site. During the last week of the workshop, we concluded by editing archival film footage as well as footage from our discussions into a short film (Appendix II), which was subsequently presented at an open house and reception on the last day of the workshop and distributed to the DFN Chief and Council and archived in the Délı̨nę Knowledge Centre. Orlena and I prepared the final report for the youth project (Appendix III), which was also distributed to the DFN Chief and Council. This workshop, the conversations and interactions I had around the politics of research, and my extensive exchanges with Morris Neyelle, have informed my critique of the representations and histories that emerged from my archival research. Additionally there have been many interviews published on film, radio, and in print-news; public hearings published by the Government of Canada; and oral historical documents published by the DFN, which I present as counterpoints to the southern Canadian artefacts that I critique.

I have respected the choice of workshop participants and presenters to be either directly identified or to remain anonymous as expressed through written and/or oral consent obtained before and after the workshop in Délı̨nę. The Interdisciplinary Committee on Ethics in Human Research (ICEHR) at Memorial University reviewed and approved the written consent forms for workshops and interviews, as well as the project proposal to conduct research with human subjects in the spring of 2011, prior to the beginning of all fieldwork activities involving workshops and interviews. ICEHR approval has been renewed annually since 2011. Further, the Délı̨nę First Nation and the Band Council approved my research activities and have received a preliminary report on my research findings, with a final report and presentation planned upon completion of this thesis.

Rather than providing the 'what' of this thesis, the work I did in Délı̨nę, my *not-ethnography,* has informed the *how* of this project: *How* do I talk about representation? *How* do I talk about uranium? *How* do I talk about the land? The result has been a methodology for analyzing representations of uranium and the Sahtu—a methodology that accounts for anti-colonial, anti-oppressive, and decolonizing practices in a semiotic critique of images, documents, discourse, and policy.

Anti-colonial scholars have critiqued the notion of indigeneity in Saïdian terms, as a concept that homogenizes diverse groups of people and constructs a pan-indigenous 'Other' (Tuhiwai-Smith, 1999). Linda Tuhiwai-Smith notes the importance of "representation" in constructing indigeneity as "it gives the impression of truth" (1999: 35). This impression of truth is poignant in twentieth-century representations of indigeneity in the Canadian north, which served to erase indigenous people altogether and

to open that space up to imperial expansion and industrial colonialism.

From my position as a white researcher and as a successor to citizenship in a country that persistently iterates its colonial beginnings, my overarching methodological goals are two-fold: first, to unpack *how* scientific and industrial knowledge and representations have shaped the dominant discourse of development about the Sahtu; and second, to suggest that a shift to a non-hierarchical and anti-colonial understanding of scientific and 'Traditional' knowledge could tangibly affect negotiations and political transactions between Sahtúot'ine and the Government of Canada.

First Nations' governments in Canada, activist movements, as well as Indigenous/indigen-*ist* scholars are actively fighting for the inclusion of the manifold Indigenous knowledge systems that have long been elided in Canada by industrial-capitalist interests—knowledge systems, as I discuss in Chapter 2, that are continually marginalized by the very 'democratic' systems and institutions that claim to include them (Nadasdy, 2005; Simpson, 2004; Tuhiwai-Smith, 1999). My methodological goals are aimed at contributing to the decolonization of an industrial discourse in the institutions and fields of study that often perpetuate it. This process is a small step toward changing the face of mining and remediation practices in the Sahtu, a process that could be extrapolated to mining mega-projects underway across the Canadian north and could contribute to the ongoing efforts toward Indigenous autonomy and self-determination.

1.3 THEORETICAL POSITION

> The driving question no longer is "how to find the truth?" but "how are objects handled in practice?" With this shift, the philosophy of knowledge acquires an *ethnographic* interest in knowledge practices. A new series of questions emerges.
>
> (Annemarie Mol, *Body Multiple,* 5)

Despite the significant limitations of this project, its research methods, and source materials, I have adopted a theoretical position on the basis of de-colonizing methodologies (see Methods and Methodologies). Using visual materials as a starting point, this thesis is framed by three key theoretical concepts. First, I propose the production of visual artefacts (paintings, maps, etc.) as a practice in the *'rationalization of sight'* (Latour, 1986); second, I frame the visual artefact as *'story,'* which is in turn understood as a *"material ordering practice"* (Cameron, 2011); lastly, I trace how the rationalization of sight and the ordering practices of story have facilitated the *"bureaucratization"* (Nadasdy, 2003) of Sahtúot'ine knowledge.

Rationalization of sight

Projected onto a shared geometry, a linear and two-dimensional world, and articulating a common industrialist message, artistic and scientific renderings of the Sahtu brought the region into the Canadian (and global) imagination as a space for mining and industry, a discursive legacy that lives on today. Bruno Latour defines "optical consistency" as a "rationalization of sight" and an integral force in the "relations between inscription procedures and cognition" (1986:7). An inscription like a map, for instance, proffers an

optical consistency or a stable perspective on a place. The map is imbued with the "rationalization of sight" that came with the scientific-revolution, the "logical recognition of internal invariances through all the transformations produced by changes in spatial location" (Ivins 1973:9, in Latour 1986:7). Map in hand,

> … you can go out of your way and come back with all the places you passed; these are all written in the same homogeneous language (longitude and latitude, geometry) that allows you to change scale, to make them presentable and to combine them at will. (Latour 1986:7)

Drawing on William Ivins' work, *On the Rationalization of Sight*, Latour describes optical consistency as a (positivist) tool for rendering space immutable and mobile—a way of seeing that can situate an object/place in a 'universal' geometry, to be transported and understood from all angles. In simpler terms, optical consistency in visual representation creates "a regular avenue through space" (Latour, 1986:7)—an organized matrix onto which an object or place can be projected. This consistency of sight declaims a spatiality that allows an object to be understood by anyone, anywhere (through drawing, writing, or mapping, for example). No matter the distance or angle from which an object in this geometry is viewed, "linear perspective" permits the transfer and translation of this object so it can be viewed and understood from any position (Latour, 1986:7).

As I will demonstrate in subsequent chapters, the inscription of the Sahtu region into a common geometry or a "linear perspective," through painting, mapping, writing and other media, has allowed a rationalization and standardization of the region while recapitulating it as an industrial space. This standardized, rationalized, and portable *vision* of the Sahtu is particularly important as images like maps, paintings, photographs, and even films integrate with verbal and written accounts of the region conveying a

consistently industrial message. As I position these visual renderings as storied or narrative objects—visual, written, mapped—I also suggest that the relationship between their stories and the networks of institutions within which they circulate has lent credence to scientific and southern Canadian knowledge systems while marginalizing the knowledge of the Sahtúot'ine.

Image as story—story as material ordering practice

From the rationalization of the Sahtu region through consistent spatial imaging and a standardized visual vocabulary, I propose that visual renderings of the Sahtu are integral to narrative, story, and speech act which, first, continually inform the ways in which the Sahtu is perceived in a "Canadian imagination" (Frye, 1971)—and second, give shape to an imagined Canadian identity or community (Anderson, 1983). Examining the discursive work that visual artefacts *do* allows an examination of how these artefacts have moved through networks, over time, and in different places to collectively uphold the Sahtu as a space for industry.

Materially, as artistic, storied, and scientific renderings of the Sahtu were produced and circulated throughout the twentieth century, their *optical consistency* allowed a rationalization and standardization of the Sahtu region. Produced alongside verbal narratives of the great mineral rush and the north as a "cornucopia overflowing with natural resources" (Walton 2007:142), visual renderings of the Sahtu became a part of the industrial narrative of that region. The perpetuation of industrialist renderings of the Sahtu by government departments, galleries, geological laboratories, and other national institutions has further served to bolster industrialist claims to knowledge. This

institutionalized support of an industrial vocabulary with which to speak about the Sahtu has produced a particular "regime of truth" (Foucault, 1979; Rose, 2001) in which the Sahtu Dene have been systematically erased—a discourse that excludes Sahtu Dene epistemology and ontology from southern Canadian narratives of the Sahtu.

In *Visual Methodologies,* Gillian Rose defines discourse as "…a group of statements which structure the way a thing is thought [….] a particular knowledge about the world which shapes how the world is understood and how things are done in it" (2001:136). Further, working from a Foucauldian understanding of discourse analysis, Rose posits that "intertexuality" is key to the perpetuation of a discourse, as images and texts combine with and depend on other images and texts to make meaning (2001: 136). Similarly, in her work on "Copper Stories" (2011), Emilie Cameron argues that "[t]he performance or inscription of stories over time and in different places contributes to the sedimentation of those same networks lending them a bit more coherency and sensibility" (Cameron, 2011: 180). She proposes that this coherency allows story to act, "not only as an imaginative practice through which we make sense of the world, but also a material ordering practice involving a diverse set of 'things'" (Cameron, 2011: 180). Cameron turns her focus from dominant Arctic stories and histories surrounding Samuel Hearne and the Bloody Falls massacre to trace the central Arctic instead *through* copper. Critiquing story as a "material ordering practice" and "as practice, performance, and network" (Cameron, 2011: 170), she focuses on copper to understand the assemblage of people and things interacting with the mineral and to unearth the material effects of these networks. By turning away from the dominant discourse, Cameron draws out the interactions and voices elided in these common narratives. In this way, she is able to

"account for some of the complexities and contradictions inherent in relations between various people, places, and things, and to challenge some of the binary notions that tend to structure understandings of the contemporary North," suggesting a more nuanced history of relations that blurs racialized lines and does not "fetishize" Inuit voices (as, for example, inherently "traditional") (Cameron, 2011: 188).

In order to understand the complex set of interactions around mineral development in Délı̨nę since the early twentieth century, and to wade through the incongruous historical accounts, conflicting ontologies, and disharmonious knowledge systems at play in a place that was, and continues to be, aggressively colonized, it is important to understand these interactions and histories as discursive tools for shaping "how the world is understood and how things are done in it" (Rose, 2001: 136). As Cameron demonstrates, it is by tracing these interactions, by unpacking networks of stories, and by drawing all narrative threads to the surface that it becomes possible to understand and even to challenge the dominant discourse.

Bureaucratization of Sahtúot'ine knowledge

In her seminal works on the intersections of story, "nature," and "culture" in Yukon, Julie Cruikshank (1998; 2005) critiques the appropriation of orally narrated accounts at a time when "indigenous knowledge continues to be presented as an object for science rather than as a system of knowledge that could inform science" (Cruikshank, 1998: 50). In Aboriginal-state transactions, indigenous knowledge is often used as supplementary to Euro-Canadian evidence and is translated into data for this use. Cruikshank is concerned with the proliferating use and integration of oral narratives into

Euro-Canadian bureaucratic or scientific knowledge systems, despite the incompatibility of these knowledge systems. She argues that using story as a "reified product" ignores the vital and rich social histories and embodied relationships of orally narrated accounts (Cruikshank, 1998: 41). This reified product is often categorized as TK, TEK, or IK, acronyms that emphasize 'tradition' in the local knowledge of indigenous people and imply stasis and anachronism of knowledge. This collection, classification, and management of indigenous knowledge effectively embeds and obscures the everyday and embodied practices of complex local knowledge systems in an objectivist paradigm.

Paul Nadasdy (2003) works closely from Cruikshank's critiques. In his research on power, knowledge, and the relationship between the Kluane First Nation (KFN) and the state, Nadasdy argues that "First Nations peoples have had to adopt Euro-Canadian political institutions as a prerequisite for even engaging with Euro-Canadian lawyers and politicians in a dialogue about land claims" (Nadasdy, 2003: 248). In order for members of the KFN to engage in negotiations with representatives of the federal and territorial governments they "have had to build a bureaucratic infrastructure modelled on and linked to that of the government" (Nadasdy, 2003: 248), effectively translating beliefs, values, and practices into a language that can be understood in a bureaucratic context (Nadasdy, 2003: 223). In the context of the Délı̨nę First Nation (DFN), this argument can be extended from land claim negotiations to health and environmental assessments, to mine-site remediation, and to research for the Canada-Délı̨nę Uranium Table. Entire bureaucratic systems have been set up within the community, simply to address the concerns of the Sahtúot'ine in a format that is compatible with the methods and knowledge systems of Government of the Northwest Territories (GNWT) and the federal

government. This process has resulted in the bureaucratization of Sahtúot'ine knowledge by its confinement in Canadian policy, to the language and office spaces of Canadian governance systems—its removal from the land and language in which it is so deeply rooted.

1.4 THESIS STRUCTURE

Working from Latour's *rationalization of sight* (Latour, 1986), this thesis begins with a visual focus in the context of scientific and artistic representations of the Sahtu region. I critique visual, narrative, and scientific artefacts as *story* and in turn as *"material ordering practice"* (Cameron, 2011) unpacking the production and perpetuation of an industrial Sahtu. Chapter 3 examines the fallout and reproduction of these discursive practices in contemporary environmental and health assessment processes which have required the *"bureaucratization"* (Nadasdy, 2003) of Sahtúot'ine knowledge.

The substantive chapters of this thesis (2 and 3) are written as standalone papers, yet are conceptually linked by their critique of an industrialist discourse around uranium mining and the Sahtu—first as it emerged in the early twentieth century, and recently as this discourse was iterated in health and environmental assessments of uranium mining on Great Bear Lake. I begin Chapter 2 with an account of Port Radium given by Maurice Haycock—a geologist for Eldorado and a landscape painter. Haycock was also a great friend of A.Y. Jackson, a renowned Canadian landscape painter, who visited the Sahtu five times from 1938-1959. Chapter 2 is a close study of Jackson's paintings, as well as his role at Port Radium and on the Canadian art scene, and an examination of geological and popular-media images of the region that appeared concomitant with Jackson's work. I

argue, first, that the institutionalized dissemination of Port Radium minescapes, including Jackson's paintings and other images and texts I will explore, facilitated the emergence of a national discourse in Canada that privileged the interests of the mining industry, while marginalizing Sahtu Dene and 'non-scientific' knowledge systems and ways of being.

Second, by asking how objects or minescapes enact the Sahtu I unpack the practices that have allowed southern Canadian representations to view and constitute an industrial understanding of uranium and the region. Categorized by their objectivity and empirical accuracy—their adherence to the scientific ethos of a 'Nation' steeped in mores of the Enlightenment—the set of objects I explore enact a singular, industrialist reality. They purport a treasure-laden *Canadian* North engrained in contemporary discourses of prosperity and development in Canada; a Sahtu region that can and should be exploited for the resources interred in its rocks.

In response to conceptualizations of mining, environment, and health borne out of twentieth-century *minescapes* of the Sahtu, and to illustrate the networks in which these stories continue to interact and compete for claims to knowledge, in Chapter 3 I examine the bureaucratization of uranium from 1995 to the present. During my stay in Délı̨nę I had the opportunity to work with six young adults on an "Education and Cultural Employment" (ECE) project about uranium and story-telling (see Methodology for details of this project). The project examined the intersections and incongruities of representations of the Sahtu. This chapter is punctuated by accounts of uranium from sources like oral histories and interviews—many of which emerged from the ECE project—as well as field notes from my time Délı̨nę. While these accounts can be understood simply as counter-stories to a dominant discourse around northern

development, I examine the lived and embodied ways in which a non-industrial discourse of uranium and the Sahtu interacts with dominant, southern-Canadian stories.

Finally, by homing in on the final report of the Canada-Délı̨nę-Uranium Table (CDUT), its attending documents, and the oral testimonies of Dene people who were affected by the Port Radium mine, I examine the divergent accounts of what uranium is, what contamination does, and how people, bodies, and land interact/react to uranium mining. The CDUT was a collaborative, seven-year process undertaken by the DFN and the federal government to assess the health and environmental impact of the mine. Through traditional knowledge, health, and environmental studies, as well as historical research, the CDUT aimed to evaluate the multi-faceted effects of the mine on the Sahtúot'ine and the Sahtu region, and to offer recommendations for remediation and healing. I critique the ways in which the CDUT iterates the colonial and industrialist discourse around mining in Denendeh, continually reproducing the Sahtu as an industrial space—a space for further mineral exploration and as a space for remediation in the aftermath of uranium mining. I situate the CDUT in the context of "co-management discourse" (Nadasdy 2005), TEK, and Dene "life projects" (Feit et al., 2004). As Sahtúot'ine, mining-industry, and Canadian government interests collide in Délı̨nę, negotiating mine development, remediation, and the ongoing assessment of contamination, it is absolutely necessary to question the scientific and industrial discourse that defines the use and value of land and resources.

1.5 CO-AUTHORSHIP STATEMENT

This thesis has been completed in partial fulfillment of the requirements for the degree of the Master of Arts in Geography at Memorial University in Newfoundland. This research was supported by a SSHRC Joseph-Armand Bombardier Canada Graduate Scholarship and by a SSHRC grant obtained by Dr. Arn Keeling and Dr. John Sandlos, "Abandoned Mines in Northern Canada." I (Carmella Gray-Cosgrove, MA candidate) designed the research proposal, conducted fieldwork in Délı̨nę, and collected archival documents under the guidance of Dr. Keeling. Dr. Keeling contributed all archival material relating to the Intergovernmental Committee on Environmental Contamination in Chapter 3. I drafted the manuscript thesis, while Dr. Arn Keeling, Dr. Josh Lepawsky, and Dr. John Sandlos provided feedback in accordance with their role as supervisory committee members.

1.6 BIBLIOGRAPHY

Abel, Kerry. (2005). *Drum Songs: Glimpses of Dene History.* Montreal: Mcgill-Queen's University Press.

Absolon, Kathy, & Willett, Cam. (2005). Putting ourselves forward: Location in Aboriginal research. In L. Brown & S. Strega (Eds.), *Research and resistance*: 97-126. Toronto: Scholar's Press.

Absolon, Kathleen E. (2011). *Kaandosswin: how we come to know*. Halifax: Fernwood Pub.

Anderson, Benedict. (1983). *Imagined communities: reflections on the origin and spread of nationalism*. London: Verso.

Bennett, W. J. (1988). *The Eldorado Collection of A.Y. Jackson Sketches*. Eldorado Nuclear.

Berkes, Fikret. (2004). Rethinking community-based conservation. Conservation biology, 18(3): 621-630.

Blondin, George. (1997). *Yamoria the Lawmaker: stories of the Dene.* Edmonton: NeWest Press.
Blow, Peter. (1999) *Village of Widows.* [52 min., video] Toronto: Lindum Films.

Bothwell, Robert. (1984). *Eldorado*. Toronto: U of T Press.

Brown, Leslie A., & Strega, Susan (Eds.). (2005). *Research as resistance: critical, indigenous, and anti-oppressive approaches*. Toronto: Canadian Scholars' Press.

Canada. Parliament. House of Commons. (1998). Standing Committee on Environment and Sustainable Development. *Evidence*. 36th Parliament, 1st Session, 1997-1999. Available at: http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=E&DocId=1038878&File=0#top; [Feb. 12, 2013].

Canada at War: Northwest Territories: Radium City. (1945, August 20). *Time Magazine*.

Canada-Deline Uranium Table. (2005). Canada-Deline Uranium Table Final Report: Concerning health and environmental issues related to the Port Radium mine. Ottawa: Ministry of Indian Affairs and Northern Development.

Cameron, Emilie. (2011). Copper Stories: Imaginative Geographies and Material Orderings of the Central Canadian Arctic. In A. Baldwin, L. Cameron, & A. Kobayashi (Eds.), *Rethinking the Great White North: Race, Nature, and the Historical Geographies of Whiteness in Canada*. Vancouver: UBC Press.

Camsell, Charles. (1954). *Son of the North.* Toronto: Ryerson Press.

Clements, Marie H. (2003). *Burning vision*. Vancouver: Talonbooks.

Déljne Uranium Team. (2005). *If only we had known: the history of Port Radium as told by the Sahtuot'ine*. Déljne, NWT: Déljne Uranium Team.
Dickerson, M. O. (1992). *Whose North?: political change, political development, and self-government in the Northwest Territories*. Vancouver: UBC Press.

The Epic Story of Radium. (1938, December). *Popular Mechanics*, 888–889.

Feit, Harvey, Blaser, Mario, & McRae, Glenn. (2004). *In the way of development: indigenous peoples, life projects, and globalization*. London, Eng.; New York, N.Y.; New York: Zed Books in association with International Development Research Centre; Distributed exclusively in the USA by Palgrave Macmillan.

Foucault, Michel. (1979). *Discipline and Punish: The Birth of the Prison.* Harmondsworth: Penguin.

Franklin, John. (1971). *Narrative of a Second Expedition to the Shores of the Polar Sea.* Edmonton: M.G. Hurtig.

Frye, Northrop. (1971). *The bush garden; essays on the Canadian imagination*. Toronto: Anansi.

Fumoleau, R. (1974). *As long as this land shall last: a history of Treaty 8 and Treaty 11, 1870-1939*. Toronto: McClelland and Stewart.
Government of Canada. (1928). *Annual report of the Department of Indian Affairs for the year ended March 31 1928*. Ottawa.

Government of Canada; Aboriginal Affairs and Northern Development Canada. (2009). Sahtu Dene and Metis Comprehensive Land Claim Agreement [agreement].

Grace, Sherrill. (2001) *Canada and the Idea of North.* Montreal: McGill-Queen's University Press.

The Great Radium Mystery. (1934, February). *Fortune*, 9(2), 70–75, 100, 102, 104–a, 105–106, 109.

Harper, Douglas. (2002). "Talking about pictures: a case for photo elicitation." *Visual Studies* 17, no. 1: 13-26.

Hashimoto, Isao. (2003). *1945-1998*.

Hecht, Gabrielle. (2012). *Being nuclear: Africans and the global uranium trade*. Cambridge, Mass: MIT Press.

Helm, June. (2000). *The people of Denendeh : ethnohistory of the Indians of Canada's Northwest Territories*. Montreal: McGill-Queen's University Press.

Henningson, D. (2007). *Somba Ke: The Money Place*. Urgent Service Films, Ltd.

Hesse-Honegger, Cornelia. (1992). *After Chernobyl*. Exhibition catalogue. Baden, Schweiz: Bundesamt für Kultur [Bern] im Verlag Lars Müller.

Hesse-Honegger, Cornelia. (1997). *The Future's Mirror*. Exhibition catalogue. Newcastle upon Tyne: Locus.

Hesse-Honegger, Cornelia. (2001). Heteroptera: the beautiful and the other, or images of a mutating world. Zurich [Switzerland]: Scalo.

Isacsson, Magnus. (1990). *Uranium.* [47 min. DVD] National Film Board of Canada.

Ivins, William M. (1973) On the Rationalization of Sight. New York : Plenem Press.

Jackson, A. Y. (1976). A painter's country: the autobiography of A.Y. Jackson. Toronto: Clarke, Irwin.

Keeling, Arn & Sandlos, John. (2009). Environmental Justice Goes Underground? Historical Notes from Canada' Northern Mining Frontier. *Environmental Justics*, *2*(3), 117–125.

Keeling, Arn. (2010). "Born in an atomic test tube": landscapes of cyclonic development at Uranium City, Saskatchewan. *The Canadian Geographer / Le Géographe Canadien*, *54*(2), 228–252.

Keith, Lloyd. (2001). *North of Athabasca: Slave Lake and Mackenzie River documents of the North West Company, 1800-1821* (Vol. 6). Montreal: MQUP.

Kovach, Margaret. (2009). *Indigenous methodologies: characteristics, conversations and contexts*. Toronto; Buffalo: University of Toronto Press.

Kuran, Peter. (2006). *How to photograph an atomic bomb*. Santa Clarita, Ca.: VCE.

Larsen, Wayne. (2009). *A.Y. Jackson: the life of a landscape painter*. Toronto: Dundurn Press.

Larsen, Wayne & Jackson, A. Y. (2003). *A.Y. Jackson: a love for the land* (Vol. 21). Montréal, Quebec: Dundurn Group.

Latour, Bruno. (1986). "Visualization and cognition." *Knowledge and society*, (6): 1-40.

Latour, Bruno. (2005). *Reassembling the social: an introduction to actor-network-theory*. Oxford: Oxford University Press.

Leddy, Lianne C. (2011). *Cold War colonialism: The Serpent River First Nation and uranium mining, 1953-1988*. ProQuest, UMI Dissertations Publishing, Wilfrid Laurier University (Canada).

Masco, J. (2006). *The nuclear borderlands : the Manhattan Project in post-Cold War New Mexico*. Princeton, N.J.: Princeton University Press.

Mingay, Jane. (1977) "Interview with Dr. Maurice Haycock" *Mingay Historical Project – The Artists.* National Archives of Canada, RG 134.

Mogren, E. W. (2002). *Warm sands : uranium mill tailings policy in the atomic West*. Albuquerque: University of New Mexico Press.

Mol, Annemarie. (2002). *The body multiple: ontology in medical practice*. Durham: Duke University Press.

Mullen, C., & Beard, P. (1985). *Fortune's America : the visual achievements of Fortune magazine : 1930-1965*. [Norwich]: University of East Anglia Library.

Nadasdy, Paul. (2003). *Hunters and bureaucrats: power, knowledge, and aboriginal state relations in the Southwest Yukon*. Vancouver: UBC Press.

Nadasdy, Paul. (2005). The Anti-Politics of TEK: The Institutionalization of Co-Management Discourse and Practice. *Anthropologica*, *47*(2), 215–232.

Nikiforuk, Andrew. (1998a, March 14). Cancer killed 14 uranium workers: Echoes of the Atomic Age. *Calgary Herald (Alberta, Canada)*, A1/Front.

Nikiforuk, Andrew. (1998b, March 14). Echoes of the Atomic Age: Uranium haunts a northern village. *Calgary Herald (Alberta, Canada)*, A4.

Nikiforuk, Andrew. (1998c, March 20). Ottawa to probe uranium-linked cancers. *Calgary Herald (Alberta, Canada)*, A3.

Nikiforuk, Andrew. (1998d, March 25). Natives demand response to workers' radiation deaths. *Calgary Herald (Alberta, Canada)*, A16.

Nikiforuk, Andrew. (1998e, April 12). "Money rock" took high toll: Ottawa kept uranium mine's peril secret. *Calgary Herald (Alberta, Canada)*, A9.

Nikiforuk, Andrew. (1998f, April 12). Uranium mine left deadly legacy. *Calgary Herald (Alberta, Canada)*, A1/Front.

Nikiforuk, Andrew. (1998g, May 30). Ottawa agrees to discuss Great Bear radiation question. *Calgary Herald (Alberta, Canada)*, A15.

Nikiforuk, Andrew. (1998h, June 10). Dene may skip talks over radiation: Committee head cites insults by government. *Calgary Herald (Alberta, Canada)*, A3.

Pauli, Lori et al. (2003). *Manufactured landscapes: the photographs of Edward Burtynsky*. Ottawa: National Gallery of Canada in association with Yale University Press.

Pink, Sarah (ed.). (2002). *Visual interventions : applied visual anthropology*. New York; Oxford: Berghahn Books.

Raffles, Hugh. (2010). *Insectopedia*. New York: Pantheon Books.

Rose, Gillian. (2001).*Visual Methodologies: An Introduction to the Interpretation of Visual Materials.* London: Sage Publications.

Said, Edward W. (1982). Opponents, Audiences, Constituencies, and Community. *Critical Inquiry*, *9*(1), 1–26.

Salverson, Julie. (2011). They Never Told us These Things. *Maissoneuve: A Quarterly of Arts, Opinion & Ideas*, (40).

Salverson, Julie. (2012) *Shelter.*

Schiller, E. A. (1965). *Mineral industry of the Northwest Territories, 1964*. Ottawa: Department of Mines and Technical Surveys.

Shaw, Margaret Mason. (1958). *Canadian Portaits: Tyrell, Camsell, Cross, LaBine Geologists and Prospectors.* Toronto: Clarke, Irwin & Company Limited.

Simpson, Leanne R. (2004). Anticolonial Strategies for the Recovery and Maintenance of Indigenous Knowledge. *The American Indian Quarterly*, *28*(3), 373–384.

Statistics Canada. (2011) *Historical Census Population Counts, by Community and Region: Northwest Territories, Census Years 1981-2011.* Retrieved July 17, 2013 from NWT Bureau of Statistics: http://www.statsnwt.ca/census/2011/index.html

Stoll, Bert. (1932, May 29). Miners Ready to Fly into Radium Eldorado. *The New York Times*, p. XX14.

del Tredici, Robert. *At Work in the Fields of the Bomb*. Vancouver: Douglas and McIntyre, 1987.

Tuhiwai-Smith, Linda T. (1999). *Decolonizing methodologies: research and indigenous peoples*. Dunedin, N.Z: Zed Books.

Van Wyck, Peter C. (2010). *The highway of the atom*. Montreal: McGill-Queen's University Press.

Walton, Paul H. (2007) The Group of Seven and Northern Development. In *Beyond Wilderness: The Group of Seven, Canadian Identity and Contemporary Art*. eds. John O'Brian and Peter White. Montreal: McGill-Queen's University Press.

Wilson, Shawn. (2008). *Research is ceremony: indigenous research methods*. Halifax, NS: Fernwood Publishing.

Zaslow, M. (1988). *The northward expansion of Canada, 1914-1967*. Toronto: McClelland and Stewart.

Zemans, J. (1998). Envisioning nation: nationhood, identity and the Sampson-Matthews silkscreen project: the wartime prints. *Journal of Canadian Art History*, *19*(1), 6.

CHAPTER 2

THE ART OF SEEING URANIUM: MINING, IMPERIALISM, AND VISION IN ELDORADO 1930-1962

ABSTRACT

In the foreground of an A.Y. Jackson painting entitled "Radium Mine" (1938), a craggy outcrop slopes down into the pale blues and greys of Great Bear Lake in the Northwest Territories—just hidden from view is the head frame of a radium and uranium mine that produced ore for the American nuclear arms program in the 1940s and 50s. While the story of uranium mining in the Northwest Territories has largely receded into the archives of Canadian history, it remains part of everyday life for the Sahtúot'ine, or Bear Lake People, who live in Délı̨nę—many of whom have been actively demanding redress and environmental remediation since the 1980s as they grapple with the environmental and health legacies of the mine. With a specific focus on the Port Radium works of A.Y. Jackson, I examine how representations of uranium and the Sahtu have worked not only to paint the region as a *terra nullius*, but, more importantly, how these representations have worked to confine the Sahtu region within a discourse of industrial development. Using visual materials as a starting point I propose an anti-colonial critique of Port Radium minescapes and explore the impact of their institutionalized dissemination. Through an examination of the visual artefact as story, which is in turn understood as a *"material ordering practice"* (Cameron, 2011), I unpack how visuality and artefacts drew the North into the Canadian imaginary and facilitated the emergence of a national, industrialist discourse that privileges the interests of the mining industry.

2.1 AN INTERVIEW WITH MAURICE HAYCOCK

JPM – *You were telling me about the ore bodies. You started that.*

MH – *Oh yes. Well, my first trip to the Eldorado mine at Port Radium was in '49 […] I went in to collect some samples to find out actually how the uranium occurred in the ores there because I was involved in microscopic work in the ores to determine the opaque minerals. [….]*

[….]

MH – *Then we went on to Great Bear Lake. That was my first visit to Port Radium. I've forgotten how long I was there. I don't think I was there very long but Bill Bennett, when we started up there, said, "there's an old friend of yours up there."*

I said, "Who's that."

"Oh," he said, "A.Y. Jackson."

"Oh," I said, "is he up there?"

I said, "Yes, he came in."

So on Sundays we'd go out painting, you know.

JPM – *How did you know A.Y. Jackson?*

MH – *Oh I met A.Y. Jackson in 1927 first. I'd painted with him many years when I was here before then, around anywhere from Quebec to lower Quebec, eastern townships and Algoma and so on.*

JPM – *Did Eldorado sponsor him? How did he end up there? Do you know what the arrangement was there?*

MH – *Oh I guess Bill Bennett asked him to come in. Yes I think he sponsored him. Oh yes, sure. Oh yes, I think so to do some things, you know.*

In those days you didn't commission to do things but what you did was make it possible then you had your choice of paintings. Of course, we usually gave our sponsors a choice of several including what we gave them, instead of buying them, naturally, I mean, they'd put us up and taken us up and everything and make it possible, made the whole trip possible. It was very generous of them. It was nice to be able to reciprocate a little bit. So I think probably he gave them to them. Oh I'm pretty sure he did.

JPM – *Well, they have some.*

MH – *I know they do but they bought some, too. But I think he gave them some. At any rate, that part of it I don't know anything about. It's a delight to go up there and paint, anyway. It's beautiful country to paint in September, of course, the colour and everything.*

[….]

Then again in 1959 -- we knew the [Port Radium] mine was going to close -- the thing was to get a good collection underground and also we had one other purpose. A method had come out and we had developed a crude instrument there at the lab to determine the temperature formation of the different minerals, if we could isolate them. We new that the uranium had been deposited at a certain period in the mineralization. If we could follow somehow in these rather complex vein systems, if we could follow these little veinlets or portions of it which coincide with that temperature formation, we could probably give some clue as to where to find new

ore bodies of uranium which were very spotty and even extensive diamond drilling sometimes missed good ore bodies.

[….]

Well, Jackson came along that same year, too. We had two trips to the Barren Lands that year. [….]

Now meantime, of course, Sundays and holidays and any time we could get off we'd go painting around Port Radium. I remember that -- let me see, what did he call that? I painted an old cache up on posts up at Cross Fault Lake a couple of miles from Port Radium. It was the one that Franz Johnston painted earlier, in 1939. It was still there. And of course there was a tremendous bunch of birch, well, mostly birch-- flaming colours -- and Alec used to call it my Arctic forest fire. Arctic forest fire. He wasn't very complimentary about that. And I can't say, looking back at it, I blame him. I still have it.

(Mingay Historical Project – The Artists. Interview with Maurice Haycock, August 16, 1977: 1-9)

2.2 INTRODUCTION

In southern Canada[11] the circulation of stories about radium, uranium, and the Sahtu has accelerated since Gilbert Labine's discovery of the ore containing these minerals, pitchblende, in the region in 1930. I trace this acceleration as far back as A.Y. Jackson, one of Canada's foremost painters of the twentieth century, and to his first sorties around Great Bear Lake, which began in 1938. Contrary to prevailing commentaries on Jackson's paintings, which position his work within a school of art involved in shaping Canada as a nation embodied by its vast and empty northern wilderness (Hill, 1994; Silcox, 2003), I propose that his contributions to the formulation of a discourse of industrialism around northern Canada can be seen in his Port Radium works and in their interactions with geographical artefacts and national institutions. Beyond the discursive production of Canada as wilderness, the Sahtu region, among the other northern territories, was actively enacted during the mid-twentieth century as a resource colony and as a space for industrial development. As the Sahtu region was opened to industrialization in the early twentieth century with new transportation technology and aerial prospecting, industrial interests met with Dene perceptions of the land. Liza Piper has argued that,

> In this meeting, scientific knowledge and authority, as extensions of industrial capitalist desire, prevailed, and the industrial transformation ultimately carried the imprint of how scientists especially, and to a lesser extent other outside interests (namely, businesspeople, sojourning workers, and the state), imagined the natural world. (2009:8)

While Jackson was by no means an instigator of industrial colonialism in the Canadian north, his paintings of the Sahtu were intimately involved in the process of subarctic industrialization, and continue to circulate among a set of images and histories that have

[11] A region known as the Canadian "ecumene" or in Cole Harris' terms, the 'archipelago' of settlements stretching the approximately 6000 east-west kilometres along Canada's southern border (Harris, 2001).

collectively aided in the transformation and normalization of resource extraction in the region. As uranium from the Sahtu wove through painting, cartography, and print media, spinning an arctic and atomic mythology, the mineral as well as the land that held it were ordered and confined to a discourse of industrialism. A.Y. Jackson's painting trips to the Port Radium Mine in the Northwest Territories (NWT), sponsored by Eldorado Mining and Refining, were not only entwined with industrial development in the Sahtu, but also with the history and methods of the natural sciences in Canada (see Berger, 1983; Jordanova and Roy, 1979; Klonk, 1996). Jackson's companions on these trips were miners and geologists who moonlighted as landscape artists or dabbled in the connoisseurship of Canadian art. These men, in their geological and artistic forays, were engaged in mediating the sub-Arctic, performing the region as an industrial hinterland.

This chapter is a case-study-analysis of some of the artefacts that enacted and re-territorialized the Sahtu region[12] as a 'resource colony' of Canada in the twentieth century (Coates, 1985). Examining visual artefacts and tracing their circulation, I examine how artefacts have storied uranium and the Sahtu—where story is not only an imaginative practice to understand the world but also a "material ordering practice" (Cameron, 2011:180). To begin, I examine the "optical consistency" (Latour, 1990:8) of A.Y. Jackson's Bear Lake paintings and concomitant scientific and popular representations of this landscape; as well as the collaborative, discursive power of artefacts and scientific knowledge. I set the stage for this discussion with *Radium Trail 1934,* an early

[12] The traditional territory of the Sahtúgot'ine was only delineated on a map and named the 'Sahtu region' in 1994, when *the Sahtu Dene and Metis Comprehensive Land Claim Agreement* was settled, long after A.Y. Jackson et al. were traveling in the area. However anachronistically, for the sake of clarity and consistency, I will use 'the Sahtu region' or 'the Great Bear Lake region' to refer to the area of land which was, until 1994, variously delineated and named for different groups of people and different purposes.

journalistic map of northwestern Canada drawn by Richard Edes Harrison, a map, and attending article that offered an industrialist foundation for popular perceptions of the Great Bear Lake region. I then examine the production of industrial images, or *minescapes*, their accumulation of meaning, and their subsequent circulation as "immutable mobiles"—artefacts that fix knowledge rendering it mobile and combinable with other objects and knowledge (Latour, 1986; 1987; 1990). Over the past hundred years, A.Y. Jackson's Port Radium works and contemporaneous geological translations of the Sahtu have circulated in southern Canada, making the region knowable (to anyone, anywhere), all the while combining with other objects and knowledge, accruing and making meaning. While popular critiques of A.Y. Jackson, his contemporaries, and fellow members of the Group of Seven have posited this new school of Canadian art as integral to constructing the Canadian landscape as a great and empty wilderness, this chapter seeks to re-examine Jackson as an artist who was deeply invested in painting the industrial development of Canada's northern frontier. Since 1938 his *minescapes* have been complicit in confining the Sahtu to a geometry that renders it immutable and mobile—through representations that circulate and combine in galleries and museums—producing a region, in the dominant discourse, that is affixed to an industrial paradigm.

While renderings of the Sahtu such as paintings, maps, and ore samples may seem static, even 'objective,' as they have combined and moved through "centres of calculation" (Latour, 1987:215), like galleries, government offices, or atomic test sites, in these movements, the meaning they carry has been 'transformed, translated, distorted, and modified' (Latour, 2005:39) and they have contributed to the emergence of an exclusionary discourse that elides the Sahtúot'ine. In this transformative process, the

National Gallery of Canada (NGC), Eldorado Mining and Refining, the Geological Survey of Canada (GSC), and other national organizations can be understood as *institutional-mediators* of Jackson's paintings. The NGC, for example, modified Jackson's works, displaying his minescapes in carefully designed exhibitions, accompanied by prescriptive curatorial texts. The assertions of these texts were iterated in newspaper articles, reviews and so on. Collectively involved in the dissemination, the fission perhaps, of a discourse that naturalized mining around Great Bear Lake, this aggregation of objects, despite having receded, in some cases to the shadows of archive and museum storage, has been crucial to the proliferation of a discourse of development and industrialism now independent of the paintings, maps, and inscriptions at its root, that has come to define the Sahtu.

Despite their decisive contribution to the normalization of resource extraction in the NWT, the artefacts (paintings, maps, letters, newspaper articles, advertisements etc.) at the heart of this thesis are now invisibly, yet indelibly, written into the confinement of the Sahtu to an industrial paradigm—to a discourse of nationalism, nordicity, industry, and uranium. As many of these artefacts have faded into various archives, their agency, their nuanced and complex interrelationships, and their integral role in colonizing and shaping perceptions of the Sahtu region, have likewise been forgotten, leaving behind a discourse whose beginnings must be actively re-membered if space is to be made for anti-colonial narratives.

And so the task is clear: to understand these artefacts not merely as works of art, or representations of a place, but as objects that make, practice, enact, and uphold meaning; objects loaded with the realities of their production and circulation; objects that

enact 'reality in practice' (Mol, 2002); and objects that mediate, "transform, translate, distort, and modify the meaning or the elements they are supposed to carry" (Latour, 2005: 39). Latour has argued that objects are *mediators*, they have agency in networks of interaction; they can change, affect, transform, and otherwise alter meaning. To track the flow of some of the objects that have shaped the dominant discourse around the Sahtu, to track the interactions and collisions of these objects with other objects and people, is to "inspect and decompose the contents of social forces" (Latour, 2005: 252). In this way, the power-play of objects, people, and institutions is newly visible. Once the flow of these objects is "opened up, flattened down, and cut down to size in a place where formats, structures, globalization, and totalities circulate inside tiny conduits" (Latour 2005: 252), then action is possible—action that, in this case might allow the re-imagination of an industrialist vocabulary that has tacitly opened the Sahtu to the prolific exploitation of its subterrane. With the dynamics of vision and meaning-making in mind, this chapter grapples with the discourse of industrialism, development, and modernity that has positioned the Sahtu in anachronism—as a region that only began to 'develop' with the imposition of southern Canadian industry, a region made 'valuable' by the 'discovery' of its rocks. To draw out the networks, interactions, objects, institutions, and other agents that have collectively produced and upheld this paradigm is essential to de-colonization and for the assertion of Sahtúot'ine self determination.[13]

[13] It is important to note that the anti-colonial goal of this thesis is not to understand Sahtúot'ine life-ways, rather to suggest that the decolonization and dismantling of settler society must begin with an acknowledgement of the diverse ways-of-being of the many different peoples whose traditional lands have been subsumed by the Canadian nation-state.

2.3 GEOLOGY AND THE VISUAL ARTS: A NOTE ON DISCIPLINARY BOUNDARIES

Suzanne Zeller has called geology one of the "inventory sciences," which, in Victorian Canada, undertook "systematic surveys of the land and its resources with the ultimate goal of assessing its material potential" (Zeller, 1987: 269)—the inventory sciences sought to catalogue, depict, order, and organize the land. As Bruce Braun (2000) has argued, in early-nineteenth-century-Canada an "emerging discourse of geology" (Braun, 2000: 13) brought the land into focus in new ways, namely through its reterritorialization on a vertical axis, allowing understanding and mapping of the subterrane, or what Braun dubs, "vertical territory." In the wake of this Victorian schematization of the Canadian landscape, A.Y. Jackson's collaborations with Eldorado Mining and Refining, prospectors like Gilbert Labine, and geologists like Maurice Haycock, were among Canada's first distinctly *artistic* permutations of the longstanding relationship between artistic practices and scientific inquiry. While the inventory sciences sought to draw, sketch, and *re-present* facets of the land for scientific investigation, Jackson's Port Radium works mediate scientific or industrial facets of the land for aesthetic and national consumption.

As art historian Svetlana Alpers notes, a comparison between the representational practices of the disparate fields of art and science, exerts a two-way force: on the one hand lending scientific credence and authority to the work of art, while simultaneously luring science out of the ivory tower (Alpers, 1998: 403). Hearkening back to the works summarized in the preface to this thesis, it would seem that the relationship between art and science endures in contemporary atomic art—the cloud chamber, for instance, became an art installation only after a long stint in the laboratory; likewise, Hesse-

Honegger's insects iterate traditional biological illustration (Hesse-Honegger, 1992); Hashimoto's maps play with cartographic media (Hashimoto, 2003); Burtynsky's landscape photos are on the cutting edge of industrial documentation (Pauli et al., 2003); and Yoshitake's prints were born out of American nuclear arms testing (Kuran, 2006). Since it is science that imagined an industrial and a nuclear world, it seems reasonable that the art of representing that world continues to flirt with scientific knowledge. With the benefit of hindsight, I propose that A.Y. Jackson's Port Radium landscapes be classified as *proto*-atomic artworks—industrial *minescapes* at the vanguard of the atomic studies listed above. Positioned as a voice in the dialogue between art and science, the Port Radium minescapes and the relationship between Jackson and his crew of mining men take on new life.

In their scientific context, and in the context of the Victorian inventory sciences, Jackson's paintings can be read as the *landscape renderings* of a space enacted by the industrial discourse of geologists like James Mackintosh Bell, Charles Camsell, and Maurice Haycock—or mining men like Gilbert Labine and institutions like the Geological Survey of Canada (GSC) or Eldorado Mining. Jackson's Eldorado collection is not just an essential folio in Canadian art history, it is also a fundamental player in the interdisciplinary *mediation,* ordering, and imagination of the Sahtu and in the perpetuation of a Canadian industrialist discourse.

In 1934, just two years after the Port Radium mine opened, journalistic cartographer Richard Edes Harrison published his first map in *Fortune* ("The Great Radium Mystery," 1934: 72; Figure 5)—a global business magazine, owned by Time Inc. and the same magazine that publishes the famed, annual "Fortune 500," a list ranking

America's largest corporations. With a circulation of 90,000 at the time (Mullen & Beard, 1985: 7), Harrison's map, "The Radium Trail, 1934," accompanied an exposé on "The Great Radium Mystery" which profiled Port Radium and the world radium market. Harrison's map shows the transportation route between Edmonton and Echo Bay, the site of the Port Radium mine. The map traces the physical route of uranium from north to south, while contributing, as an object enacting uranium, to the storying of the element in an international imagination. Each town along the route is defined, not by its traditional name, inhabitants, or history, but by its minerals and the form of transportation needed to move these minerals to southern Canada (steamship, airplane, railroad). Harrison was widely recognized in the years following this publication as a revolutionary wartime cartographer who challenged the format and perspective of traditional cartography (Barney, 2012; Schulten, 1998). His vividly illustrated maps appealed to American audiences and, as visual rhetoric scholar Timothy Barney notes, Harrison "helped broaden the geographic imagination and allowed America to 'look at the world' in a new way" (Barney, 2012: 400). Infused with frontier fantasies of the Wild West and the gold rush, "Radium Trail," one of the first widely disseminated images of the Great Bear Lake region, certainly accomplished these two feats. Pan-Aboriginal iconography frames the drawing which describes an empire expanding into the desolate north—"country so bare and vast and empty that nothing inhabits it except a few Indians, a few bears, a few wolves and caribou," as the attending article explains ("Great Radium Mystery," 1934: 71). Great Bear Lake looms large at the top of the map, a radiant treasure chest in the hinterland, a beacon of wealth and prosperity for any prospector brave enough to follow the radium trail.

Figure 5. *Richard Edes Harrison, The Radium Trail, 1934. Courtesy of Dr. Peter van Wyck.*

It is essential to note that on the page preceding Harrison's map, and also illustrating the "Great Radium Mystery," is a painting of the Northwest Territories' Barren Lands by A.Y. Jackson ("Great Radium Mystery," 1934: 70)—this publication was the international debut of Jackson's northern works, a debut in which the region was featured as a latent industrial and economic treasure trove, and the first in a series of connections between Jackson's work, geology, pitchblende, economics, and industry. Jackson's

painting magnifies a local point on Harrison's "Radium Trail"—a map that at once distances Great Bear Lake from southern Canada by describing its remoteness, the long duration of travel to the hinterland, while simultaneously bringing the region closer to the south, mapping 'modern' transportation routes.

In 1938, four years after the publication of Harrison's map, Winston Norman, a columnist for *The Globe and Mail,* undertook a two-month trek "Down North," as he called it. Norman travelled from Edmonton to Port Radium and then southeast to Toronto, stopping along the way and reporting to the newspaper weekly. His letters are filled with nationalistic sentimentality, propounding the stark beauty of the north and the struggle of life in the hinterland. In the concluding epistle of the 'Down North' series, Norman put into words the industrial sentiment evoked by Jackson's painting, articulating the necessity of mining to the northern scene—albeit with a flourish of hyperbole contrary to the subtlety of Jackson's work:

> To Toronto, the new developments "down north" mean another opportunity for us to take part in making the wilderness useful [….]
> To Canada, it means the chance for East-West amity now so sorely needed; perhaps a new empire bigger than Europe, all within Canada and the British Empire. [….]
> To the world it will mean the chance to watch Canada […] fighting Nature on a frontier so that its own citizens need not fight one another in the sort of economic cannibalism that is levelling much of the human race to a new Dark Age.
> It means all that—when and if […] we can get over the outworn romantic bunk about the North country—land of husky dogs, fierce wolves, Mountie-and-villain fiction stuff; land of eternal snow, missions, silent Indians and lone trappers. That's all still there, but with it, to win, we've got to do mining or we can't support a population […] and if we relax in the battle for even a short time, the wilderness will take it all back from us and write Failure in the snow. (Norman, Aug 23, 1938:1)

To Norman, the north represented a wilderness waiting to be harnessed, a frontier on which Canadians needed to conquer Nature, and a resource colony that would bend to the will of a new and powerful Canadian Empire; and like Harrison's map at the outset of this

chapter, Norman's depiction of "down north" very literally connected the Arctic to the Canadian ecumene; by inverting his preposition, Norman brought north down south. His views, touted weekly by *The Globe and Mail* for two-months, often in the front pages, perpetuated the notions of a 'wild' north and an industrial future that were, by 1938, proliferating in the dominant Canadian discourse. As the ad for Norman's column reads, "his illuminating descriptions of life and labor […] describe the opening of a great new treasure chest of minerals" (Display Ad 24, No Title, 1938:23)—a treasure chest which cast its golden sheen over Great Bear Lake. Popular representations of the mine like Norman's column and Richard Edes Harrison's map embody a spatiality consistent throughout many Port Radium *minescapes,* which collectively describe the Sahtu region as a space where the wilderness of northern landscape meets 'urban,' southern Canadian demand.

These minescapes enact a region that is 'uncivilized' while simultaneously entrenched in the industrial processes at the heart of 'modernity.' As geologist James Mackintosh Bell described almost thirty years before Harrison's publication in *Fortune*,

> Throughout the Dominion of Canada still lie immense tracts of country where the white man has never been, and where the few wandering savages who there make their home are still as wild and uncivilized as in the days of Columbus. The day is not far distant when much of this great region will support a thriving population, but the arctic part of it must remain, for climatological reasons, as it is now, a great northern wilderness, a home fit only for savages, and a refuge for caribou, musk-oxen, and other northern animals. (Bell, 1901: 249)

The discursive production of a wilderness/industry dichotomy has served to marginalize the Sahtúot'ine—most recently in decision and policy-making processes around mining and resource development on their land. As such, paintings, maps, and ore samples are implicated in the ongoing naturalization of mining, the persistent re-imagination of *rocks*

as resources, and the ongoing marginalization of anti-industrial ontologies. Projecting Edward Said's (2003) "imaginative geography" to the north rather than the east, these inscriptions can be understood as objects that have served to legitimate and perpetuate the industrialist vocabulary that has come to define the Sahtu and the Canadian north in the dominant Canadian discourse. These objects, and their dissemination in popular Canadian media, have systematically enacted the region as a topic of 'learning, discovery, and practice,' while shaping the 'dreams, images, and vocabularies' of *nordicity*[14] available to anyone who tries to talk about the region North of 60° (Said, 2003: 73).

2.4 PAINTING A NATION: A.Y. JACKSON AND A GILDED NORTH

> They entered a very plain house, for the door was only of silver, and the ceilings were only of gold [….]
>
> The old man received the strangers on his sofa, which was stuffed with humming-birds' feathers, and ordered his servants to present them with liqueurs in diamond goblets; after which he satisfied their curiosity in the following terms:
>
> "[….] The kingdom we now inhabit is the ancient country of the Incas, who quitted it very imprudently to conquer another part of the world, and were at length destroyed by the Spaniards [….who] have had a confused notion of this country, and have called it *El Dorado* [….]
>
> (Voltaire, *Candide,* 1918: 81-82)
>
> This devoted band called itself the Eldorado Exploring Expedition, and I believe they were sworn to secrecy. Their talk, however, was the talk of sordid buccaneers: it was reckless without hardihood, greedy without audacity, and cruel without courage; there was not an atom of foresight or of serious intention in the whole batch of them, and they did not seem aware these things are wanted for the work of the world. To tear treasure out of the bowels of the land was their desire, with no more moral purpose at the back of it than there is in burglars breaking into a safe.
>
> (Conrad, *Heart of Darkness,* 1971: 31)

[14] For a more detailed critique of nordicity and the mythology of the Canadian north see Shelagh Grant, 1998; Sherrill Grace, 2001.

The mythical city of El dorado, Spanish for 'the golden one,' has lived in the imperial imagination as the ultimate discovery of wealth for hundreds of years. From Milton (1962: 276), to Voltaire (1918: 81), to Conrad (1971: 31), and Poe (1966: 767), in literature alone this city of gold has a long legacy—and so this history is written into Gilbert Labine's mining and refining company, Eldorado, which, through its name, carries the lasting colonial fantasy of discovering inimitable wealth in the far reaches of the earth. After Labine found pitchblende in 1930 (detailed in the introduction to this thesis), Eldorado began mining operations on Great Bear Lake in 1931, sparking the "Great Bear radium rush" which brought hundreds of prospectors to the region and lasted through 1932 (Bothwell, 1984:34). Between 1932 and 1940 Eldorado expanded, with ore outputs rising and staff and operations growing (Bothwell, 1984: 39). The company began a transportation subsidiary to reduce the costs of moving supplies and ore, and to increase profits (Bothwell, 1984: 64-65). Throughout the 1930s, as Bothwell notes, Eldorado brought publicity to the far north with articles appearing in *Time, Travel,* the *New York Times,* the *London Times,* the *Sunday Times, Maclean's* magazine, and *Saturday Night,* (Bothwell, 1984: 48), among other publications like *Fortune* magazine (“The Great Radium Mystery,” 1934), *Popular Mechanics* (“The Epic Story of Radium,” 1938), and many local and national Canadian newspapers. Among the long list of visitors during this decade was A.Y. Jackson, whose art works must be viewed, not only in the context of Canadian landscape art, but also in the context of the industrial boom in the north.

Understanding A.Y. Jackson's sketches of the Sahtu in their milieu of development and alongside contemporaneous industrial/scientific images of the region, as I have proposed, does not eclipse the importance of Jackson's role in the Canadian art

scene. On the contrary, it is his position not only as a celebrated member of the Group of Seven, but also as a resident painter at Eldorado that makes Jackson's paintings and sketches of the Sahtu integral to this story. So I begin with an outline of this painter's dyadic role at Port Radium in order to understand the context in which he saw and painted the Sahtu region and the "optical consistency" (Latour, 1990: 8) of scientific, industrial, and artistic representations of the Sahtu. I examine *the work that Jackson's paintings do,* not only as artistic representations of Canadian 'wilderness,' but also as a buttress for an industrial/scientific discourse.

The archival record suggests that in the early 20th century in Canada, landscape painters, surveyors, prospectors, and bush pilots were a close-knit community of Canadian trekkers (see Mingay, 1977; and Jackson, 1976). In his 1941 documentary film, *Canadian Landscape,* which follows Jackson's northern painting ventures, writer and director Radford Crawley articulates the relationship between painter and bushwhacker, highlighting the unclear boundary separating artist and explorer. In one of many shots *en situ*, Jackson dons a black beret (artist), while paddling along a serene river and portaging through the reds and yellows of an autumn forest (explorer). Crawley's narrator, in his Mid-Atlantic Hollywood drawl, informs the viewer that Jackson "belongs in the open with the landscapes he paints," his studio work is only a small part of his art:

> In October [Jackson] packs his brushes, paints, and birch sketching panels, and heads north. He looks more like a bushman than a painter, but the best country lies many miles from settlement, and the artist must be able to wield a paddle as well as a brush. (Crawley, 1941 [4:40-5:40])

As Svetlana Alpers notes, in the history of landscape painting, the nineteenth century saw painters freeing themselves from the studio to take to "the real landscape outside," a move

that "… posits the world as the alternative to the studio—the painter went out to do *empirical studies* and came in to compose." (Alpers, 1998: 412; my emphasis). “More like a bushman than a painter,” conducting “empirical studies” in the wilds around Great Bear Lake, Jackson was not only a member of the Group of Seven, he was part of an “old boys club” of new-world explorers, armed with tools as diverse as chisel and easel, paddle and paintbrush, embarking on what historian Morris Zaslow (1988) has referred to as the “Northward Expansion of Canada” (see also Jessup, 1998).

Jackson's close friendship with Maurice Haycock, a geologist employed by Eldorado and a landscape painter, elucidates this entangled relationship between artist, explorer, and scientist. At Port Radium, Haycock straddled the fine line separating these disciplines—his geological sample was also his artistic subject and when he was not doing "microscopic work in the ores" (Mingay, 1977: 1), he was moonlighting as a landscape painter around Great Bear Lake. In a 1977 interview, Haycock attested to this disciplinary crossover, detailing his geological work, his friendship with Jackson, and his involvement with the community of mining men at Port Radium. In 1959, for example, knowing the mine was going to close and in a last attempt to find new and lucrative ore bodies, Eldorado hired Haycock to "get a good collection [of ore samples] underground" (Mingay, 1977: 8-9). While he was not working with the ores, Haycock spent much time painting with Jackson. Haycock said:

> We knew that the uranium had been deposited at a certain period in the mineralization. If we could follow […] these little veinlets or portions of it […] we could probably give some clue as to where to find new ore bodies of uranium [….]
>
> Now meantime, of course, Sundays and holidays and any time we could get off we’d go painting around Port Radium. (Mingay, 1977: 8-9)

Throughout the interview, Haycock's "we" refers indiscriminately to either Haycock and geologists, or Haycock and Jackson (Figure 6). The two artists spent many weeks painting together in the wilds around Great Bear Lake and Haycock spoke of their adventures in the backcountry with excitement.

> Don Ferris flew us in […] and we looked around a bit, looked around Dismal Lake and finally Jackson said, "Well, I think that's about as good a place as any." [….]
>
> It was lovely. The wind blew almost incessantly but the country was simply magnificent — big glacial rafted boulders with lichen all over them and caribou all around. Oh it was simply gorgeous. And Alec [Jackson] used to say, "You know, I think the wind just goes up and wherever it is circles around a bit and then takes a dead line on this lake." (Mingay, 1977: 5-6)

Figure 6. *"A.Y. Jackson and Dr. Maurice Haycock on an early spring outing south of Ottawa," Gilliat Eaton Fonds, 1960, Ontario. Photograph by Gilliat Eaton, Library and Archives Canada, archival reference no. R12438-2153-2-E, item number 745, online MIKAN no. 4316697.*

When they were not in the bush, Jackson and Haycock were active members of the small community at Port Radium. The two were held in high esteem by eminent figures at the mine including the founding president of Eldorado, Gilbert Labine (1927-1946), his successor, W.J. Bennett (1946-1958), and Dr. Hugh Keenleyside, who served as both Commissioner of the Northwest Territories (1947-1950) and Deputy Minister of the Department of Mines and Resources (1947-1949) (These relationships are detailed in Bennett, 1988; Jackson, 1976; and Mingay, 1977). Indeed, Jackson's relationships with these prominent men were such that his trips to the region were fully funded by Eldorado (Mingay, 1977: 3-4). In *The Eldorado Collection of A.Y. Jackson Sketches* (1988), published by Eldorado Nuclear, then president of the company, W.J. Bennett attests to Jackson's involvement at Port Radium observing that, during his visits,

> […] A.Y. became very much a member of that small and closely-knit community. He was a very modest man with simple tastes and a great gift for friendship. [….]
>
> He made regular visits to the school where he gave the pupils lessons in sketching. He also did this for the wives at the mine who had formed an art club. (Bennett, 1988: 11)

So, while Jackson's purpose in the Great Bear Lake region was to sketch and paint the "…exciting country … with its moss and lichen and small plants turning red and orange" (Jackson, 1976: 154), he was also deeply involved in the daily life of the mining town as a teacher, friend, and community member. As one E.B. Spice attested in 1955, "While at Great Bear Lake I heard Dr. Jackson lecture on art [….] I had been interested in painting but his address so intrigued me I began to paint" (Arnott, 1955: 19).

It comes as no surprise that, as a friend of prospectors, geologists, and mining men; as a beneficiary, even, of the wealth and northward mobility provided by Eldorado; and as an active member of the community at Port Radium, Jackson's mores were aligned

with those of his friends and community, and that those mores were reflected in his paintings. As the artist noted in an interview, "When I am making a sketch, I try to emphasize the things I want, and ignore the things I don't want" (Crawley, 1941 [8:40]).

> The final canvas, if there is ever to be one, will not be judged by its likeness to the scene which inspired it. Just imitating nature was never the artist's intention. Whether you take nature itself or the perfect replica by photography, either one remains the same starting point. From this starting point, a painter must select and create his own interpretation of the scene. (Crawley, 1941 [9:53-10:16])

In his Port Radium works, the things Jackson tried to "emphasize" and the things he tried to "ignore" resulted in representations that acted as a medium for the industrialist reality of his colleagues and friends—men who were deeply invested in mines and resources. As his fellow Group member Arthur Lismer averred in the exhibition catalogue for a retrospective showing of Jackson's work at the Art Gallery of Toronto and the National Gallery of Canada (1953 and 1954),

> Another side to the expressive personality of A.Y. Jackson is his ability to integrate his interests and to absorb the interests of others, whether they are loggers, miners, students of all ages, Eskimos or dwellers in cities. (Art Gallery of Toronto, 1953)

While it is hard to imagine that Jackson could integrate his interests with the interests of "Eskimos" let alone the Sahtúot'ine at a time of rampant colonial expansion and outright racism, Lismer's observations were otherwise astute. Not only did Jackson live and work alongside mining-industry proponents, the artist and the mining-man at Eldorado looked at the region with a shared vision—their 'interpretation of the scene' saw rocks, not only as part of a northern wild, but also as resources.

So, while Jackson may have looked at Great Bear Lake as an artist, he looked alongside geologists and miners engaged in their own process of selecting, creating, and interpreting. The lens through which Jackson saw this space was already an industrialist

one—his friendships, funding, and geological affiliations made it so. As a critic of landscape might argue, what Jackson saw in the rolling hills and glittering waters of Great Bear Lake was "already artifice in the moment of its beholding, long before it [became] the subject of pictorial representation" (Mitchell, 2002: 140).

As I will show in the subsequent pages, Jackson's Port Radium canvases attest to an industrialist vision and gave the mining industry a voice in Canadian landscape art. Reflected in other disciplines and media, this voice seeped into the galleries and cities of southern Canada, and indeed into the Canadian imagination.

> The eastern shore of MacTavish bay is rugged and mountainous. The cliffs often rise 1000 feet almost perpendicularly from the water's edge. The rocks are a series of basic eruptives [….] All these rocks weather to beautiful shades of purple, red, and brown, and the reflections of the coloured precipitous cliffs in the clear northern waters, with the brilliant arctic sunlight, were singularly beautiful. [….] the scenery would delight the eye of any connoisseur of the beautiful. (Bell, 1901: 256)

In a report on his lengthy explorations of Great Bear Lake for the GSC, geologist James Mackintosh Bell reflected that "the scenery would delight the eye of any connoisseur of the beautiful" (1901: 256). For A.Y. Jackson, it did just this. However, bushwhacking and sketching landscapes through the lakes and muskeg around Port Radium was only one side of his job. Just as Haycock was involved doubly as geologist and artist, Jackson's life outside Port Radium was not that of a 'bushman.' In his southern Canadian sphere of studios, galleries, and museums, Jackson was a founding member of the Group of Seven and an integral figure in an emerging art movement.

Group of Seven artists have been celebrated for almost a century, with accolades from institutions with "'national' mandates" (Jessup, 1998: 203) like the National Gallery of Canada, the Art Gallery of Toronto, and the National Museum of Canada. The Group

has been touted with creating a Canadian school of art and with shaping popular perceptions of the Canadian landscape; feats that helped to paint Canada into a nation.[15] As a central figure in the Group, and regardless of his intentions while painting the landscapes that have brought him such fame, A.Y. Jackson is implicated in the effects of this national art movement, which has been popularized as nothing short of an artistic revolution, and more recently, decried for complicity in the Canadian colonial project (Bordo, 1997).

The Group of Seven wrote a foreword to the catalogue for their first exhibition in 1920, held at what is now called the Art Gallery of Ontario, but was at the time the Art Museum of Toronto. The foreword served as a mandate describing their shared goals as artists, their vision for Canadian art, and the ways in which viewers of their art ought to respond to their, then avant-garde, landscapes. In the view of the Group, "an Art must grow and flower in the land before the country will be a real home for its people" (Art Museum of Toronto, 1920: foreword), and their landscapes reflect this desire to capture and create a unique Canadian-ness. They continue to assert that any "intelligent" viewer of their work "will welcome and support any form of Art expression that sincerely interprets the spirit of a nation's growth" (Art Museum of Toronto 1920: foreword). The sentiments expressed in the Group's foreword imply, among other things, that the people of Canada were newcomers, not the nations of people for whom this land was already a very "real home." "Its people" were those settlers for whom home and meaning had not

[15] The National Gallery of Canada has been active in perpetuating the truism that the Group of Seven created a 'Canadian school of art.' Their 1995 retrospective exhibition "The Group of Seven: Art for a Nation" was rife with this credo (see Hill, 1995), which has been challenged by Art Historian Lynda Jessup. Her 1998 article *Prospectors, Bushwackers, Painters,* opens with an unpublished excerpt from A.Y. Jackson's journal, dated 1910. With dramatic vehemence, Jackson writes: "As far as Canadian Art concerns me, it can go to ---. There never will be a school of Canadian art." (Jessup, 1998:193).

yet been made—for whom Canada needed to be held together and to grow as a nation. As Ernest Renan has argued, "the essence of a nation is that all individuals have many things in common, and also that they have forgotten many things" (Renan, 1970:45)—while the Group was concerned with capturing and creating a common and uniquely Canadian landscape, they were likewise involved in the forgetting, indeed the active erasure, of Aboriginal peoples. Jackson's sketches of life and land around Great Bear Lake were, and continue to be, part of this forgetting, part of this nation-building project. His northern contributions to an "Art for a Nation" (Hill, 1995), as the Group's work was later termed[16], worked to pull the Sahtu south, draw it into the "imagined community" of Canada, "*imagined,* because the members of even the smallest nation will never know most of their fellow-members, meet them, or even hear of them, yet in the minds of each lives the image of their communion" (Anderson, 1983: 6). This image of communion was exactly the goal expressed by the Group of Seven: their manifesto articulated the need to let art "grow and flower" in order to cultivate Canada as a "real home for its people" (Art Museum of Toronto 1920: foreword)—if this home was to be prosperous, it needed its northern resources for economic stability and so drew the Great Bear Lake region, as well as other northern territories, into a Canadian discourse of north as empty; north as wild; north as colonized; north as industrial; north as treasure chest; north as Canada.

However, there is no room in this *nation* for *First* Nations and A.Y. Jackson's north, his Great Bear Lake, his radium mine, and his many sketches and paintings of his travels around the Sahtu region, actively exclude the lives of the Sahtúot'ine, who were

[16] This phrase is the title of an all-encompassing retrospective show of Group of Seven works produced from 1920-1930, held at the National Gallery in 1995 (Hill, 1995), and which toured Canada from February 17 – December 1, 1996.

not only deeply connected to the land brought into focus in Jackson's work, but with the mine at the foundations of his paintings. Not only was Port Radium located on Sahtúot'ine land, polluting the Sahtu with toxic waste, but the lives of many Sahtúot'ine had begun to actively involve, if not revolve around, the mine site, as a place for trade, for employment, and for medical services (Blondin, 1990; Délıne Uranium Team, 2005). Yet the Sahtúot'ine—because they complicate the simplicity of a virgin and pristine north; because they disrupt the ease of settling an *empty* territory; and because they obfuscate a gilded landscape pregnant with mineral wealth—were excluded from Jackson's Port Radium, were erased from the land on which they had lived for millennia. As Jackson has noted "a painter must select and create his own interpretation of the scene" (Crawley, 1941 [10:14])—this selection has, in turn, helped to shape the discursive production of north, to validate the regimes of truth (Foucault, 1979; Rose, 2001) around the Sahtu, and to consolidate the hierarchy of knowledge about the region.

The colonial implications of Jackson and the Group of Seven do not stop at their works, which actively represent an uninhabited Canadian north, and in Jackson's Port Radium works, and industrial Sahtu. Indeed, once composed, the meaning-making process of these paintings only accelerated as they found their way into galleries across the nation and overseas. The venues for the dissemination of Group of Seven paintings include international galleries like the Tate Gallery in London, with *A Century of Canadian Art,* 1938; and shows like the British Empire Exhibition in Wembley London, 1924—a colonial exhibition showcasing the art, trades, landscapes (cultural and "natural") in the British colonies (Cook et al., 1924). As the official guide to the Wembley Exhibition claims, the Canadian portion was

> […] staged on a national rather than a provincial basis. The country as a whole is presented to the view. How vast a country—a continent in extent! Certainly full expression has been given to each aspect of Canadian national life, and the wealth of detail is often astonishing. The natural resources and the potentialities of these huge tracts of "new" country almost stagger the imagination. (Cook et al. 1924: 43)

The colonial tone of the exhibition is apparent in every phrase—with claims to presenting the country of Canada as a *whole*, a vast yet homogenous nation—to expressing *each aspect* of Canadian national life (undoubtedly excluding or at best misrepresenting entire nations of aboriginal people)—and finally highlighting the economic *potentialities* of Canadian resources for England. While Jackson's Port Radium works were produced after both the Wembley and the Tate shows, and cannot be critiqued as directly involved in either of these colonial moments, his inclusion in international, colonialist exhibitions sets the tone for the work that his paintings continued to do in subsequent years, and indeed the work that they continue to do today.

While Jackson has been cited renouncing the idea of a Canadian school of art (Jessup, 1998: 193), he has also been praised for his role as a founding father of this very school. His paintings, circulating widely, have taken on a life of their own, and his reputation has grown accordingly. As Governor General Vincent Massey commented in an address at a 1953 exhibition of Jackson's work at the Art Gallery of Toronto,

> [Jackson's paintings] have the breath of Canada in them and are treasured wherever they are owned [….] [Y]ou will recall he was one of four to form that group of artists which, during a spirited chapter in the history of Canadian art, taught Canadians to perceive the peculiar beauty of their own country. Alex Jackson is not only a great Canadian painter, he is a great Canadian, a legendary figure in the Canadian scene. (Jackson, 1976: xi)

However, much has changed since Massey's address, particularly as visual methodologies scholars have critiqued the role of "visual culture" in legitimizing unequal power relations (Rose, 2001); and anticolonial scholars have complicated such reverence for the Group of Seven, as expressed by Massey, by highlighting the homogenization and exclusion

necessary to the construction of a unifying *Canadian* art (Jessup, 1998; Bordo, 1997). The Group of Seven has been criticized for painting Canada as a sublime '*terra nullius'* (a land belonging to no one) and "a pristine, edenic expanse" (Bordo, 1997: 25)—notions intrinsic to the colonial imaginary. Art historians, environmental historians, and anticolonial scholars alike have argued that such depictions played a vital part in moulding the now ubiquitous idea of a Canadian "wild" (see Nash, 1982; Jasen, 1995; Bordo, 1997; Jessup, 1998 & 2002). By emptying Canada of people, the 'wilderness ideal' justified colonial expansion—after all, if a land is unpeopled, it cannot object to imperial domination. Structuring an imagined divide between 'nature' and 'culture,' 'primitive' and 'civilized,' 'north' and 'south,' this ideological wilderness contributed to the dispossession of the many Indigenous peoples of the vast territory we now call Canada (see Jessup, 1998; Dawn, 2006; McKay, 2011; and O'Brian and White (eds.), 2007.)

Painting nature as Native and culture as Euro-Canadian, the wilderness paradigm upheld a dichotomy that allowed the 'civilized' Canadian south to look north; to define, idealize, and categorize its 'primitive' parts. From the conventions of Victorian landscape painting emerged an artistic interest in confining the Canadian terrain to the picturesque aesthetics of the English countryside (Osborne, 1988). However, the perception of Canada's "Virgin north" as a great and mythological wilderness evaded such circumscription in early Canadian landscape painting—instead, "The great North and its living whiteness, its loneliness and replenishment" (Harris, 1926: 85-86) became a part of a Canadian "ideology of distinctiveness," a wilderness that in its *difference* to the English picturesque, was central to the "iconography of Canadian landscape" (Osborne, 1988: 172; see also Grant, 1989). Indeed, art historian Jonathan Bordo has placed the wilderness

myth "at the very foundation of North American community" (Bordo, 1997: 29). At a retrospective exhibition of the Group's work in Vancouver in 2001, curators Melanie O'Brian and Ian Thom emphasized the importance of this wilderness ideal to the Canadian psyche:

> The mythology built up around the Canadian wilderness by the members of the Group ran parallel with developments in literature, poetry and politics that sought to identify Canada with the North and a nationalism based on the land. The identification with the land has been one reason, amongst others, for their continued popularity and success. (O'Brian & Thom, 2001: 27)

Bordo posits that the wilderness ideal, bolstered by artists like the Group of Seven, institutionalized by state organizations, and reflected, as O'Brian and Thom have suggested, in the literature, poetry, and politics of Canada, served to 'empty out' the Canadian north and erase the presence of Indigenous people.[17] The landscapes of the Group of Seven capture the "visual moment where the fifth day of creation converges with deep ecology" (Bordo, 1997: 17). Devoid of humans, the land created by these canvases is always already Canada—a land that does not, and cannot, resist imperialism and colonization. Bordo has poignantly described the "*terra nullius* of wilderness" as "a covenant of the land that finds itself endlessly repeated in representational practices" (Bordo, 1997: 29). He situates landscape pictures among these representations "as devices of colonial legitimation" (Bordo, 1997: 29). By practicing or enacting a terra nullius and circulating in the galleries and cities of southern Canada, Group of Seven works were complicit in the discursive production of an unpeopled Canadian hinterland.

[17] It is essential to note that the language of erasure often credits nationalist agendas with tangibly erasing the presence of Indigenous peoples. However, despite attempts to "empty out" the north, Indigenous Nations are actively working to reclaim territory and rights lost since European contact.

Furthering the colonial and marginalizing implications of this wild and empty landscape, visual studies scholar, Lynda Jessup proposes that the Group's unpeopled and primitive Canada were the product of an elitist, *urban* imagination that emerged from the Ontario middle-class (Jessup, 2002). The social-construction of a Canadian hinterland found its roots in the turn of the nineteenth century, which saw increased tourism to the so-called countryside and a movement "back to nature" as Canadian urban centres became more densely populated and industrialized (Altmeyer, 1976).

> As early as 1894, a Canadian journalist observed it to be "one of the characteristics of modern times" that, as the competition in all aspects of life becomes keener, people "seek recreation and restoration in a closer approach to nature than can be found in the busy street or crowded mart." (Altmeyer, 1976:23—quoting Thomas W. Gibson, "Algonquin National Park," *Canadian Magazine*, III (Sept. 1894): 543)

The notion of going "*back* to nature" for a reprieve from "modern times" denotes a divide between urban and rural life that was not only geographical but also temporal: a holiday in the country could transport the overworked city-dweller far from the hustle of urban life *and* to a simpler time in the past. Jessup posits that Group of Seven landscapes continued this glorification of rural simplicity. The Group's northern Canadian landscapes echoed the urban/rural dichotomy and painted the north in a veneer of anachronism (as simple or primitive), while simultaneously upholding the urban Canadian centre as *the modern*. The wilderness ideal, the tourist landscape, and the British-Canadian tropes, which appealed to the 'modern,' city dwelling, Anglo-Canadian and worked to define Canadianism, not only erased Indigenous peoples, but marginalized French-Canadians, the lower class, rural populations, and anyone outside the urban centre. The discursive production of a pan-Canadian nature, landscape, and wilderness—a singular national

vocabulary defined by the values of a select few, spoke only for the urban "march of progress," and left everyone else at the margins (Jessup, 1998: 204).

Finally, like Bordo, Jessup contends that this modernist interpretation of the Canadian landscape, its set of representative tropes, was upheld and reinforced through the Group's association with nationalist institutions. However, she pushes the hegemonic argument further with the regionalist assertion that these institutions were not simply privileging a general 'settler' perspective, rather they were "instrumental in legitimating the cultural authority of this *regional [Ontario] identity* on a national scale" (Jessup, 1998: 203; my emphasis).

> [Jackson] also frequently drew the celebrated view of Echo Bay [at Port Radium] with its rugged shore line, showing the various early mining installations, log boom, all topped by the flimsy-looking mill-head that one can scarcely credit with being a major source of the world's most lethal product—from pitchblende came radium, then came uranium, then came the atom bomb, all within seven years from the time A.Y. climbed up and down the steep road and "took" the toylike contraption from varying heights.
>
> (Naomi Jackson Groves, 1990: 35)

Aggrandizing a wild, stark, and stoic Canadian territory, Jackson's Port Radium works retain the aesthetic tropes of the Group of Seven critiqued thus far. However, Jackson's mined landscapes present a new industrial dimension to the Group's problematic Canadian wild. While Jackson's paintings fit into Bordo's category of "landscape pictures as devices of colonial legitimation" (Bordo, 1997: 29) and are often in keeping with the cultural hierarchy proposed by Jessup, his Port Radium scenes are unique in their depiction of industrial action in the very unpeopled wilderness rejected by anticolonial critics. Jackson's Great Bear Lake is a "treasure-laden wilderness" (Walton, 1990: 174), as Vincent Massey might have called it—a wilderness at the peak of industrial

development, churning out radium and uranium ore. Painting an industrialist and capitalist facet of the modernist British-Canadian agenda in a hitherto *virgin* north, Jackson's images complicate both the wilderness ideal, put forth by Bordo, and the anachronistic tropes proposed by Jessup. He does not depict Great Bear Lake as an unpeopled terra nullius, rather his minescapes enact 'development' in the very hinterland that, as Jessup argues, an Ontario-regionalist-discourse shaped as a place from the past (Jessup, 1998:203). Jackson's *minescapes* present a new phase in a Canadian national imagination, a phase of industrialism at the margins, a phase "Beyond Wilderness" (O'Brian and White (eds.), 2007).

Art historian Paul Walton has described industrial Canadian landscape art of this era as a celebration of the industrial boom in the north at the turn-of-the-century, as Canada began a rapid changeover from an agricultural to an industrial nation (Walton, 1990 & 2007). Walton cites contemporary works by other Group of Seven artists such as *A Northern Silver Mine* (1930) by Franklin Carmichael and *Copper Mining Town, Ontario* (1924) by Arthur Lismer, which are thematically consistent with Jackson's Port Radium scenes. While Walton and other critics acknowledge these paintings as representations of Canada's "Great Transformation" (Walton, 2007: 141; Donegan, 2007), I propose that beyond simply *celebrating* industrialization, Jackson's minescapes were active in the discursive *production* of Canada and 'north' as industrial spaces. Enacting the ideals of the mining industry, these images were complicit in *producing and upholding* an industrialist vocabulary with which to talk about Great Bear Lake. In Edward Said's terms, these paintings are to the Sahtu region as stylized costumes are to characters in a play, "a set of representative figures or tropes" (Said, 2003: 71). 'Industrialization,' 'The

Great Transformation,' and 'uranium' were not inherent to the Sahtu, rather these feature were enacted through a set of representational practices that mobilized an industrial vocabulary. As I have argued above, the elements that Jackson painted in his minescapes were "already artifice at the moment of beholding" (Mitchell, 2002: 14) and his paintings served simply as a medium for an industrial vision of the Sahtu. Nonetheless, as Port Radium was enacted pictorially the region became *immutably* industrial and *mobile*. In *cycles of accumulation* that amassed knowledge of the Sahtu to *centres of calculation* (Latour, 1987: chapter 6), the Port Radium scenes were combined with the wild hinterland and the terra nullius of other Jackson and Group of Seven paintings on gallery walls, as well as with scientific and economic data in newspapers and magazines. Port Radium was disseminated not as a violently industrial project but as a benign facet of the land.

Read in this light, Jackson's Port Radium paintings describe the minesite *as* wild-hinterland, uranium-extraction *as* landscape. They naturalize industry as part of the northern scene. Note, for example, the lighting in Jackson's "Radium Mine, Great Bear Lake, 1938" (Figure 7)—head frame, muskeg, and outcrop blush in the indiscriminate gold of the setting sun; oil tanks and snow glimmer the same bright white; utility pole and jack pine stand in shadow, side-by-side in the Canadian north.

Figure 7. *A.Y. Jackson, Radium Mine, Great Bear Lake, 1938. Oil on wood, 26.5 x 34.2 cm National Gallery of Canada, Ottawa. Photo © NGC. Courtesy of the estate of Naomi Jackson*

Further, as Jackson's niece Naomi Jackson Groves observed, his sketches of Port Radium were often "topped by the flimsy-looking mill-head that one can scarcely credit with being a major source of the world's most lethal product" (Groves, 1990: 35). Veiled in a golden sheen, the "toylike" mine on this canvas is not complicit in the displacement of the Sahtu Dene or in the rapid industrialization of the Sahtu. Rather, head frame *is* outcrop; oil tank *is* snow; utility pole *is* jack pine. A viewer would not be remiss in thinking that this Port Radium is a facet of the land, 'nature,' glowing on the shores of a shimmering lake—or that this Port Radium *is* Eldorado, "the gilded one" (OED, 2010).

Infused with wealth, the Eldorado minesite found itself again in gilt and tranquil hues in Jackson's "Radium Mine, 1938"[18] (Figure 8). From a higher vantage than "Radium Mine, Great Bear Lake, 1938" (above), the viewer can no longer see the mine head frame. Instead toy-sized buildings in the middle right of the painting, made small by rolling hills and epic lake, puff their warmth from tiny chimneys. As the *Globe and Mail* reported a few years later, in 1950,

> Today there are numerous recreational facilities in Port Radium and it has a child population of 30, with a nice school. People who go up to the mine now plan to settle down and make their home in this place near the Arctic circle. "There is an excellent system of steam heat, and general comfort," [A.Y.] Jackson reported. (McCarthy, *The Globe and Mail*, 1950: 10)

Figure 8. *A.Y. Jackson, Radium Mine (1938). Courtesy of Wikimedia Commons. Oil on canvas, 71.1 x 91.4 cm.*

[18] "Radium Mine" (1938) sold at auction in November of 2012 for $643,500 CDN (Heffel, online auction catalogue).

The "comfort" that Jackson communicated in the *Globe and Mail* is also a feature of his painting—the viewer can imagine the mining man sitting down to dinner in his cozy cabin; warm and full in the waning northern light. A year after this visit to Port Radium, "Radium Mine" (1938) was exhibited at *the Sixty-seventh Annual Exhibition of the Ontario Society of Artists* along with "Arctic Lake" (1939) also composed on Great Bear Lake (Art Gallery of Toronto, 1939).

From October to November of 1953, "Radium Mine, Great Bear Lake" (1938) hung in the Art Gallery of Toronto as part of an exhibition entitled *A.Y. Jackson: Paintings 1902*-1953 (Art Gallery of Toronto, 1939), which moved to the National Gallery of Canada where it was displayed from December to January of 1954. Other Port Radium works in this exhibit included "South from Great Bear Lake" (1939), "Sunshine and Fog, Eldorado Mines" (1949), "Echo Bay, Great Bear Lake" (1945), and "Eldorado Mines, Labine Point" (1938) (Art Gallery of Toronto, 1953: 25-30). Beyond the reach of these paintings in galleries, as Lismer notes in the exhibition catalogue,

> [Jackson] finds himself addressing a school assembly in a remote corner of Canada, talking about art and sketching, to a group of young scientists in Uranium mines, or to farmers on the extensive western ranges. They understand each other's language, and his paintings of their environment provide a convincing manifestation of what an artist does with *their* landscape. (Art Gallery of Toronto, 1953: 8)

Indeed, even as Jackson addressed schools, miners, and farmers, his paintings and stories were also featured in popular magazines (Jackson, 1927a, 1927b, 1958; "The Great Radium Mystery," 1934; Reid, 1942; Wilson, 1954; Allen, 1958; etc.), newspapers ("Famous Artist," 1938; Arnott, 1955; Magner, 1960), and on film (Crawley, 1941).

For example, in November 1954, as the retrospective exhibit discussed above toured through art galleries around Canada, "Radium Mine, Great Bear Lake" (1938) was reproduced in an issue of Maclean's magazine dedicated to various "Reports on the North," including maps, geological reports, and personal accounts of Canada's northern development. Most notably, the issue included "A Gallery of Northern Painting" (Wilson, 1954: 24-27)—a spread featuring colour reproductions of northern works by Lawren Harris, Frederick Varley, and A.Y. Jackson, Frederick Banting. The first of these three had been members of the Group of Seven, which had by this point dissolved as a formal group and was touted in this exposé as "the dominant influence" in painting the north, "the great school of artists which, in the Twenties, determined to paint the hinterland" (Wilson, 1954: 24). Alongside Jackson's "Radium Mine" is his painting "Barren Land" (1950), a short write-up on the Port Radium mine, and a brief description of his painting practices and travels in the north.

Jackson's and the Group's paintings had reached even further than national galleries and publications during the second world war when Jackson began the Sampson-Matthews Silkscreen Project, which, through a collaboration between the National Gallery of Canada and the Sampson-Matthews studio reproduced Canadian paintings for distribution to Canadian military bases at home and abroad (Zemens, 1998). The program continued after the war distributing Canadian art to schools and for private sale. Indeed,

> A whole generation of Canadians who grew up following the Second World War learned of the Group almost entirely from reproductive silkscreen prints that seemed to hang in every school library, bank and doctor's waiting room in the country. (Reid, 1989: 23)

From Harrison's "Radium Trail," to Jackson's paintings, to Norman's "New Frontier," and Canadian print-media endorsements, Port Radium has been enacted as an industrial minescape, a facet of the land, a peaceful, familial community, and a treasure-chest to support the Canadian economy since its inception in the 1930s. As I suggested in the introduction to this chapter, the various enactments of the Sahtu by artist and scientist alike were *optically consistent.* That is, these images were projected onto a stable geometry and with a shared vision that served to render the Sahtu immutable yet mobile—universally comprehensible, singularly industrial, and available to anyone, anywhere. Jackson's Port Radium works are most confounding when the landscape productions of both of artist and mining-man are understood in tandem: Jackson sitting on knoll or muskeg, donning a black beret, wielding pencil and brush, and sketching the Sahtu, as he described it, "with its moss and lichen and small plants turning red and orange" (Crawley, 1941; Jackson, 1976)—his colleagues and friends at Eldorado, meanwhile, mapping very different facets of the land, digging deep below moss and lichen, to extract high grade radium and uranium ores. While Jackson's works were (and continue to be) displayed in national galleries and museums—inculcating viewers into an "iconography of nationhood" (Osborne, 1988) defined by the wild north and its "bottomless Horn of Plenty" (Altmeyer, 1976:27)—the maps, samples, and surveys produced by mining men travelled south to laboratories and government departments strategizing the indiscriminate exploitation of this very landscape.

Despite the reverence for the landscape expressed in Jackson's works, they were nonetheless complicit in colonial expansion and reliant on an industrial program that dismantled the very “wilderness” they depict. It is through this duplicity that A.Y.

Jackson's representations of the Sahtu can be understood, not simply as representations *of* a place*,* but as stories enacting a discourse about that place which worked toward the normalization of industrial development in the north while erasing *Sahtúot'ine*, the Bear Lake people, from popular, southern Canadian perceptions of the region.

2.5 BIBLIOGRAPHY

Allen, R. T. (1958, October 11). The Memories of a Great Canadian Painter. *Maclean's*, *71*(21), 18–19; 77–80.

Alpers, Svetlana. (1998). The studio, the laboratory, and the vexations of art. In Caroline A. Jones, Peter Galison, and Amy E. Slaton (Eds.), *Picturing science, producing art*. New York: Routledge.

Altmeyer, George. (1976). Three ideas of nature in Canada, 1893-1914. *Journal of Canadian Studies/Revue d'Études Canadiennes*, *11*(3).

Arnott, W. M. (1955, July 28). Art School In Perfect Gatineau Setting. *Ottawa Citizen*, p. 19. Ottawa.

Art Gallery of Toronto. (1939). *Sixty-seventh Annual Exhibition, Ontario Society of Artists* [Exhibition Catalogue]. Toronto, Ontario.

Art Gallery of Toronto. (1953). *A.Y. Jackson: Paintings 1902-1953* [Exhibition Catalogue]. Toronto, Ontario.

Art Museum of Toronto. (1920). *Group of 7: Catalogue, Exhibition of Paintings, May 7-May 27, 1920*. Toronto.

Barney, Timothy. (2012). Richard Edes Harrison and the Cartographic Perspective of Modern Internationalism. *Rhetoric & Public Affairs*, *15*(3): 397–433.

Bell, James Mackintosh. (1901). "Explorations in the Great Bear Lake Region." *The Geographical Journal.* 18(Sept. 3):249-60.

Bennett, W. J. (1988). *The Eldorado Collection of A.Y. Jackson Sketches*. Eldorado Nuclear.

Berger, Carl. (1983). *Science, God and nature in Victorian Canada* (Vol. 1982). Toronto: University of Toronto Press.

Blondin, George. (1990). *When the world was new: stories of the Sahtú Dene*. Yellowknife, N.W.T: Outcrop, the Northern Publisher.

Bordo, Jonathan. (1997). The *Terra Nullius* of Wilderness—Colonialist Landscape Art (Canada & Australia) and the So-Called Claim to American Exception. *International Journal of Canadian Studies.* 15(Spring). 13-36

Bothwell, Robert. (1984). *Eldorado*. Toronto: U of T Press.

Braun, Bruce. (2000). Producing vertical territory: geology and governmentality in late Victorian Canada. *Ecumene*, *7*(1), 7–46.

Cameron, Emilie. (2011). Copper Stories: Imaginative Geographies and Material Orderings of the Central Canadian Arctic. In A. Baldwin, L. Cameron, & A. Kobayashi (Eds.), *Rethinking the Great White North: Race, Nature, and the Historical Geographies of Whiteness in Canada*. Vancouver: UBC Press.

Carmichael, F. (1930). A Northern Silver Mine.

Coates, Ken. (1985). Canada's Colonies: A History of the Yukon and the Northwest Territories. Toronto: Lorimer.

Conrad, J. (1971). *Heart of Darkness*. (R. Kimbrough, Ed.) (2nd ed.). New York: Norton.

Cook, M. G., Fox, F., & Mathew, A. (1924). *The British Empire Exhibition 1924: official guide*.

Crawley, R. (1941). *Canadian Landscape*. National Film Board of Canada.

Dawn, Leslie Allan. (2006) National Visions, National Blindness: Canadian Art and Identities in the 1920s. Vancouver: UBC Press.

Délįne Uranium Team. (2005). *If only we had known: the history of Port Radium as told by the Sahtuot'ine*. Délįne, NWT: Délįne Uranium Team.

Display Ad 24, No Title. (1938). *The Globe and Mail (1936-Current)*, p. 23. Toronto, Ont., Canada, Toronto, Ont.

Donegan, Rosemary. (2007). Modernism and the Industrial Imagination: Copper Cliff and the Sudbury Basin. In *Beyond Wilderness: The Group of Seven, Canadian Identity, and Contemporary Art*. eds. John O'Brian and Peter WhiteMontreal: McGill-Queen's University Press: 145–152.

"Eldorado." (2010). *Oxford Dictionary of English.* Oxford University Press.

The Epic Story of Radium. (1938, December). *Popular Mechanics*, 888–889.

Famous Artist to Paint at Great Bear Lake, New Country to Art World. (1938, August 15). *The Lewiston Daily Sun*, p. 4. Lewiston, ME.

Foucault, Michel. (1979). *Discipline and Punish: The Birth of the Prison.* Harmondsworth: Penguin.

Grant, S. D. (1989). Myths of the North in the Canadian Ethos. *The Northern Review*, *3*(4), 15–41.

Groves, Naomi Jackson. (1990). *Works by A.Y. Jackson from the 1930s*. Ottawa: Carleton University Press.

The Great Radium Mystery. (1934, February). *Fortune*, 9(2), 70–75, 100, 102, 104–a, 105–106, 109.

Harris, L. (1926). Revelation of art in Canada: a history. *The Canadian Theosophist*, *7*(5), 85–88.

Hashimoto, Isao. (2003). *1945-1998*.

Hesse-Honegger, Cornelia. (1992). *After Chernobyl*. Exhibition catalogue. Baden, Schweiz: Bundesamt für Kultur [Bern] im Verlag Lars Müller.

Hill, Charles C. (1995) *The Group of Seven; Art for a Nation.* Toronto Art Gallery of Ontario, Montreal Museum of Fine Arts, National Gallery of Canada, and Vancouver Art Gallery. Ottawa: National Gallery of Canada.

Jackson, A. Y. (1927a, December 15). Rescuing our Tottering Totems. *Maclean's*, *40*(24), 23, 37.

Jackson, A. Y. (1927b, December). Up North. *The Canadian Forum*, *8*(87), 478–480.

Jackson, A. Y. (1958, October 11). The Memories of a Great Canadian Painter. *Maclean's*, *71*(21), 18–19, 77–80+.

Jackson, A. Y. (1976). A painter's country: the autobiography of A.Y. Jackson. Toronto: Clarke, Irwin.

Jackson, A. Y. (1938a). Radium Mine, Great Bear Lake.

Jackson, A.Y. (1938b). Radium Mine.

Jackson, A.Y. (1938c). Eldorado Mines, Labine Point.

Jackson, A. Y. (1939a). Arctic Lake.

Jackson, A. Y. (1939b). South from Great Bear Lake.

Jackson, A.Y. (1945). Echo Bay, Great Bear Lake.

Jackson, A.Y. (1949). Sunshine and Fog, Eldorado Mines.

Jackson, A.Y. (1950). Barren Land.

Jasen, P. J. (1995). Wild things: nature, culture, and tourism in Ontario, 1790-1914. Toronto: University of Toronto Press.

Jessup, Lynda. (1998). Prospectors, Bushwackers, Painters; Antimodernism and the Group of Seven. *International Journal of Canadian Studies*. 17(Spring): 203-214.

Jessup, Lynda. (2002). The Group of Seven and the Tourist Landscape in Western Canada, or the More Things Change. *Journal of Canadian Studies*, *37*(1): 144-179.

Jordanova, Ludmilla J., Porter, Roy, & British Society for the History of Science. (1979). *Images of the Earth: Essays in the history of the environmental sciences*. Chalfont St. Giles: British Society for the History of Science.

Klonk, C., & Paul Mellon Centre for Studies in British Art. (1996). *Science and the perception of nature: British landscape art in the late eighteenth and early nineteenth centuries*. New Haven: Published for the Paul Mellon Centre for Studies in British Art by Yale University Press.

Kuran, Peter. (2006). *How to photograph an atomic bomb*. Santa Clarita, Ca.: VCE.

Latour, Bruno. (1986). "Visualization and cognition." *Knowledge and society*, (6): 1-40.

Latour, Bruno. (1987). *Science in action : how to follow scientists and engineers through society*. Cambridge, Mass.: Harvard University Press.

Latour, Bruno. (1990) "Drawing Things Together," in *Representations in Scientific* Practice*,* ed. Mike Lynch and Steve Woolgar. Cambridge, Mass.: MIT Press: 19-68.

Latour, Bruno. (2005). *Reassembling the social: an introduction to actor-network-theory*. Oxford: Oxford University Press.

Lismer, A. (1924). *Copper Mining Town* [Oil on canvas].

Magner, B. (1960, August 27). The artist who captured Canada. *The Globe and Mail (1936-Current)*, p. 5. Toronto, Ont.

McCarthy, P. (1950). A. Y. Jackson Is Home From Trip to Badlands. *The Globe and Mail (1936-Current)*, p. 10. Toronto, Ont., Canada, Toronto, Ont.

McKay, Marylin Jean. (2011) Picturing the Land: Narrating Territories in Canadian Landscape Art, 1500-1950. Montreal: McGill-Queen's University Press.

Mingay, Jane. (1977) "Interview with Dr. Maurice Haycock" *Mingay Historical Project– The Artists.* National Archives of Canada, RG 134.

Mitchell, W. J. T. (2002). *Landscape and Power, Second Edition*. University of Chicago Press.

Mol, Annemarie. (2002). *The body multiple: ontology in medical practice*. Durham: Duke University Press.

Mullen, C., & Beard, P. (1985). *Fortune's America : the visual achievements of Fortune magazine : 1930-1965*. [Norwich]: University of East Anglia Library.

Nash, Roderic. (1982) *Wilderness and the American Mind,* 3rd ed. New Haven: Yale University Press.

Norman, Winston. (1938). Down North. *The Globe and Mail (1936-Current)*, p. 1. Toronto, Ont., Canada, Toronto, Ont.

O'Brian, John, & White, P (eds.). (2007). *Beyond wilderness: the Group of Seven, Canadian identity and contemporary art*. Montreal: McGill-Queen's University Press.
Osborne, B. (1988). The iconography of nationhood in Canadian art. In D. Cosgrove & S. Daniels (Eds.), *The Iconography of Landscape: Essays on the symbolicrepresentation, design and use of past environment.* Cambridge: Cambridge University Press: 162–178.

O'Brian, Melanie & Ian Thom. (2001). *Vancouver Collects.* Vancouver: Vancouver Art Gallery.

Osborne, B. (1988). The iconography of nationhood in Canadian art. In D. Cosgrove & S. Daniels (Eds.), *The Iconography of Landscape: Essays on the symbolicrepresentation, design and use of past environment.* Cambridge: Cambridge University Press: 162–178.

Pauli, Lori et al. (2003). *Manufactured landscapes: the photographs of Edward Burtynsky*. Ottawa: National Gallery of Canada in association with Yale University Press.

Poe, Edgar Allen. (1966). Eldorado. In *Complete Stories and Poems of Edgar Allen Poe* (p. 767). Garden City, N.Y.: Doubleday.

Reid, J. (1942). A.Y. Jackson, Landscape Painter-at-Large: His Brush Interprets Canada's Vastness. *Saturday Night*, (April 18). *57*(32), 4–5.

Reid, Dennis. (1989). *The Group of Seven: Selected Watercolours, Drawing and Prints from the Art Gallery of Ontario* (Toronto: Art Gallery of Ontario).

Renan, Ernest. (1970). What is a Nation? In W. G. Hutchison (Trans.), *The poetry of the Celtic races: and other studies* (pp. 42–55). Port Washington, N.Y: Kennikat Press.

Rose, Gillian. (2001).*Visual Methodologies: An Introduction to the Interpretation of Visual Materials.* London: Sage Publications.

Said, Edward. (2003). *Orientalism*. New York: Vintage Books.

Schulten, S. (1998). Richard Edes Harrison and the Challenge to American Cartography. *Imago Mundi*, *50*(1): 174–188.

Silcox, D. P. (2003). *The Group of Seven and Tom Thomson: Tom Thomson, Lawren Harris, J.E.H. MacDonald ... [et al.]*. Toronto, Ont.: Firefly Books.

Voltaire. (1918). *Candide*. New York: Boni and Liveright.

Walton, Paul H. (1990). "The Group of Seven and Northern Development." *RACAR-Revue D'Art Canadienne-Canadian Art Review.* 17(2): 171-179.

Wilson, R. Y. (1954, November 15). A Gallery of Northern Painting: Four Famous Canadian Artists and a Gifted Amateur Pain the Canadian North in All its Moods from the Bustling Alaska Highway to the High Arctic. *Maclean's*, *67*(22), 24–27.

Zaslow, Morris. (1988) *The Northward Expansion of Canada*, *1914-1967*. Toronto: McClelland and Stewart.

Zeller, Suzanne. (1987). *Inventing Canada: early Victorian science and the idea of a transcontinental nation*. Toronto: University of Toronto Press.

Zemans, Joyce. (1998). Envisioning nation: nationhood, identity and the Sampson-Matthews silkscreen project: the wartime prints. *Journal of Canadian Art History*, *19*(1), 6-51.

CHAPTER 3

MAPPING THE CONTROVERSY: IONIZING RADIATION AND COLONIALISM IN SAHTÚOT'INE-STATE RELATIONS

Abstract

How did radiation exposure become a matter of concern for the people of Délı̨nę and later for the Canadian government? This chapter maps the controversy around the effects of ionizing radiation in Délı̨nę, Northwest Territories from the 1980s to the present day. Over this period, data-driven, scientific claims to knowledge have collided with Sahtúot'ine experience and claims to knowledge. The focal point of this controversy is the competing knowledge claims about the health effects of radiation exposure at Port Radium: while many Sahtúot'ine, former residents and workers at the mine attest to a drastic increase in cancer and death rates after living and working at Port Radium, government and third party reports continually discount these claims with epidemiological and statistical evidence. I follow this controversy from the first demands for redress by the Délı̨nę First Nation (DFN) in the 1980s; to the meetings of the Intergovernmental Committee on Environmental Contaminants; to a parliamentary hearing with the Standing Committee on Environment and Sustainable Development; and finally to the environmental and health assessments of the Canada-Déline Uranium Table (CDUT), a seven-year collaborative assessment process between the federal government of Canada and the DFN. The processes leading up to and including the CDUT are invested in the bureaucratization of Sahtúot'ine knowledge—its confinement in Canadian policy, to the language and office spaces of Canadian governance systems and its removal from the land and language in which it is so deeply rooted.

When objects have receded into the background for good, it is always possible—but more difficult—to bring them back to light by using archives, documents, memoirs, museum collections, etc., to artificially produce, through historians' accounts, the state of crisis in which machines, devices, and implements were born.

(Latour, 2005: 81)

It is not at all a stretch to think of the opening up of Sahtu Dene to uranium mining for weapons production in WWII as a crisis. Indeed, one could argue that situation was a crisis par excellence.

(Josh Lepawsky, email correspondence: July 2, 2013)

2.1 WORKSHOP TRANSCRIPT: MORRIS NEYELLE

I went there in 1978. They […] wanted to train Dene people to become miners. There's no jobs so… I went. [….] About ten of us went. When we got to Port Radium [….] they each gave us a little book, [….] they said, read it and sign it and give it back to us. And we didn't understand it so we didn't even read it, just signed it.

—Here. [Imitates handing the book over to someone]

Gave it back.

It's to cover themselves, to protect themselves. And when I got there they asked me to go work underground, so I went down that shaft, down that radium mine, 800 feet down. Right under the lake about 800 feet and then how many miles under the lake [gestures forward]. And just water pouring in. A cave, like a tunnel, about this size, from here to there [spreading his arms wide], it's dark, with this little light on [gestures to his forehead] and about a foot of water [gestures to the ground]. We went through the water. And it's scary. It's right under the lake and there's water just pouring down. Me and this guy from the south, he was […] training me. He's an aboriginal from one of the reserves, and he was just coughing, spitting, like he's sick. Has cancer or something.

I said,

—How come?

He said,

—I've been working here about twenty years, and ever since I've been sick. It has to do with this mine or something. But they never did tell me why.

So I went into this tunnel and there was this little ladder […] [gestures about a foot across with his hands], this string, the rope, and then, little pieces of stick across, it's a long ladder, waaay up and really high. Climbed that and go on top and there's a vein of silver […] and you drill it. You drill all day. Thirty holes. Thirty holes, then put a stick,

about a foot long—dynamite. Tie it up together, ten of them in one hole. Three-hundred dynamites. And then about 3 o'clock you have to light it. So 3 o'clock comes, we connect it all and 3 o'clock, exactly 3 o'clock, [emulates striking a match, the sizzling noise of the wick] smoke [laughing incredulously]. We have to climb down the ladder and get in the tunnel and start. You have to get out of there before […] before four minutes. We start climbing down really fast, go down the tunnel walking, walking, we didn't go very far then [makes the sound of a loud explosion, bracing his arms, hands clenched into fists] [….] there's rocks falling down in the tunnel. And this, the noise from it, it travels through the tunnel eh, and it hits you just like this [strikes his fist hard against his open palm, makes the sound of the explosion again] even though it's far away. Scared by the whole thing [….] all around you.

But they never did tell you the danger you were facing. The only thing I heard was that … because the main shaft is the one that you shouldn't use, cause that's where all this dust comes from and radioactive waste comes through there. And they would blast the veins and then, next day, we'd go there and use this machine [emulating claws dragging with his hands] to get all these ores, and there's just dust, we didn't even use masks. [….]

The thing I know about uranium, about radioactive waste, it's that there's no safe level of radiation. That's what scientists say, even the amount on that landing across [Bennett Field]. I'll never go there again. It affects your cells. You go there, and even though it looks safe, you go there and there's rays coming from this ore [….] you can't see it. [….] it goes through you and it affects your blood cells. It's low-level radiation. It affects your blood cells and it injures your blood cells [….] and that's what causes tumours and cancer.

(Morris Neyelle, workshop transcript: July 19, 2011)

3.2 INTRODUCTION

In the first chapter of this thesis I attempted to retrace the fission of uranium from the bedrock of the early twentieth century into a discourse of industrial development that has proliferated and constituted the dominant discourse around mining in Canada in general, and specifically, the dominant discourse around uranium in the Sahtu. I have tried to re-construct some of the networks of people, places, and things that helped to sediment an epistemological framework of industrial colonialism in the first half of the twentieth-century in northern Canada—shaping the ways in which Canadians imagine the north, and the Sahtu in particular. I have argued that visual renderings of the Sahtu can be understood as artefacts, narrative, and story. It is now a matter of bringing these artefacts into the present, of understanding how, when objects themselves have receded into archives and museums, their discursive legacy lives on in policy decisions, lived experiences, and the vocabulary of everyday life. In the fallout of early twentieth century radium and uranium mining, the health and environmental effects of ionizing radiation in the Sahtu came into focus in the 1980s and onwards. This chapter begins from the basic question, how did radiation exposure become a "matter of concern" (Latour, 2004; Myers, 1982) and indeed a “crisis" (Gilday, 2000), for the people of Délı̨nę and later for the Canadian government? I map the contours of a controversy around ionizing radiation from the 1980s to the present day, as data-driven, scientific claims to knowledge have collided with Sahtúot’ine experience and claims to knowledge throughout negotiations over mine site remediation at Port Radium and redress for the health impacts of the mine. The focal point of this controversy is the competing knowledge claims about the health effects of radiation exposure at Port Radium: while many Sahtúot'ine, former residents

and workers at the mine attest to a drastic increase in cancer and death rates after living and working at Port Radium, government and third party reports continually discount these claims with epidemiological and statistical evidence. From 1998-2005 Sahtúot'ine observations of increased cancer rates in the wake of uranium mining at Port Radium were documented in research conducted by the DFN through the Canada Déline Uranium Table (CDUT), a collaborative, seven-year project undertaken by the DFN and the federal government to assess the health and environmental impacts of the mine. However, as this chapter aims to demonstrate, the conflicting knowledge systems at work in the CDUT investigation led to a final report that elides Sahtúot'ine knowledge and research conducted by the Délı̨nę Uranium Team (DUT). First, by confining Sahtúot'ine knowledge to comprehensible and translatable categories like Traditional Knowledge (TK), Traditional Ecological Knowledge (TEK), oral history, and Indigenous knowledge (IK); second, by incorporating and synthesizing this knowledge as supplementary data within Euro-Canadian systems of statistical and scientific analysis; and third, by accepting this knowledge-integration as an advancement in the empowerment and inclusion of First Nations in Canadian policy-making processes, the CDUT process erased-by-incorporation the very knowledge it aimed to include.

As Morris Neyelle described his experiences mining silver at Port Radium (excerpted above), under the management of Echo Bay Mines (1964-1982) in a workshop session in Délı̨nę in 2011, he spoke vividly, not only of his life, but of his parents' lives, mining, the CDUT, hunting, education, and an array of other subjects. Morris was one of a series of speakers at workshop sessions I conducted with a group of six youth researchers, as well as Orlena Modeste, then the Environmental Liaison Coordinator

between Indian and Northern Affairs Canada (INAC) and the Délı̨nę First Nation (DFN). These sessions were held in a house in Délı̨nę that had been repurposed for community activities and which we had decorated with large-scale reproductions of A.Y. Jackson prints, maps, and archival photographs that featured the parents, grandparents, and great-grandparents of the youth researchers. While I detail these workshops in the conclusion of this thesis (as well as in the methodology section of the introduction), I offer Morris' testimony here as a segue from the early days of mining at Port Radium into the second half of the twentieth century, to the liminal period before information about radiation had reached Délı̨nę in full, before the scope of the damage at Port Radium came to light in the 1980s when the Sahtúot'ine began to organize around unanswered questions about radioactive waste on their land.

The first phase of industrial colonialism in the Sahtu, from 1900-1982, saw surveying and prospecting; radium, uranium and silver mining at Port Radium; oil drilling at Norman Wells; and the construction of the Canol Road. This period laid the groundwork not only for resource extraction in the region but also for what Liza Piper (2009) refers to as the "assimilation" of the subarctic into a paradigm of industrial development in policy decisions and in the national imagination, while simultaneously eliding Sahtúot'ine knowledge and world-views. All mining operations at Port Radium ended in 1982, nearly a decade after the Berger Inquiry waylaid natural gas exploitation in the Mackenzie Valley and the Sahtu region with a ten-year moratorium on the construction of a Mackenzie Valley pipeline (Berger, 1977). As indigenous resistance accelerated through the 1970s and 80s, and Dene, Inuit, and Métis land rights came into focus, this activism and new land claims processes sparked changing approaches to

industrial development (Sabin, 1995; Angell and Parkins, 2011). While in the Canadian imaginary, the Sahtu region is still discursively confined to its status as a resource-rich hinterland, recently Sahtúot'ine demands for autonomy coupled with the legal obligations of the federal government to settle land claims and negotiate self-government have complicated previously straightforward resource exploitation. However, as Blaser et al. argue, while indigenous autonomy is essential to empowerment and self-determination, it is still a facet of the colonial system—an idea that can only exist in, and only came to exist because of, the epistemological context of settler Canada (Blaser et al., 2010: 7). In other words, the anti-colonial is a condition of the colonial. This same argument can be extended to the CDUT, land-claim agreements, treaties, and so on—projects aimed at indigenous empowerment that are essential to reconciliation, but are simultaneously contingent on a dominant settler knowledge system and the colonial context (Nadasdy, 2012). Further, in dealing with issues like environmental remediation, resource management, or climate change research, Sahtúot'ine knowledge is severed from its situational context—teller, place, time, and purpose. Subsumed as "data" within a scientific knowledge system, assimilated into bureaucratic processes as TK (or the even more telling homonym, TEK), Sahtúot'ine knowledge can only ever supplement dominant knowledge systems in policy and co-management processes (Cruikshank 1998; Nadasdy 2003; Simpson 2004).

In her seminal works on the intersections of story, "nature," and "culture" in Yukon, Julie Cruikshank (1998; 2005) critiques the appropriation of orally narrated accounts at a time when "indigenous knowledge continues to be presented as an object for science rather than as a system of knowledge that could inform science" (Cruikshank,

1998: 50). In her analysis of indigenous knowledge, storytelling, natural resources co-management, and self-government in *The Social Life of Stories* (1998), Cruikshank argues that growing interest in these areas of investigation often leads to the treatment of orally narrated accounts as collectible texts and to their subsequent reduction to sources of data (Cruikshank, 1998: 40). While any translation of the world (whether scientific or narrative) is necessarily a reduction, this argument critiques the appropriateness of translating a story to a data point. Cruikshank's work is particularly concerned with the malleability of stories—their ability to shape-shift, to move through time and space, and to conform to the circumstances and relationships in which they are told. She examines these characteristics of stories as the factors that define the incompatibility of storytelling and indigenous knowledge with Euro-Canadian bureaucratic and scientific knowledge systems, despite the proliferating use and integration of oral narratives into these very systems. Using story as a "reified product" (Cruikshank, 1998: 41) ignores the vital and rich social histories and embodied relationships of orally narrated accounts—accounts that Cruikshank proposes might be understood instead as "the equipment for living" (Cruikshank, 1998: 41) in order to emphasize the *process* of their production rather than the *product* itself. If the *act* of narration is indeed *act*ive, then it cannot be fully understood when collected, transcribed, coded, or read; translated from a nuanced story to a convenient category and acronym, like TEK, TK, or IK; “depicted as static, timeless, and hermetically sealed” (Cruikshank, 2005: 10). Reformatting an indigenous or local knowledge system as TEK, Cruikshank argues, can give the impression that it is "essentially uncomplicated, that acquiring it is primarily a technocratic classification exercise, and that managers are the ones best equipped to identify the appropriate

parameters and categories" (Cruikshank, 1998: 53). Finally, in *Do Glaciers Listen?* Cruikshank examines the linguistic, epistemological, and social interactions with and around glaciers in the Saint Elias Mountains, a space where Tlingit, settler, and scientific knowledge systems constantly collide. She asserts that "local knowledge is never crudely encapsulated in closed traditions, but is produced during human encounters" (Cruikshank, 2005: 4)—in other words, tradition is an anachronistic concept with which to describe evolving and complex system of local knowledge. Not only does TK imply stasis and anachronism of knowledge, the collection, classification, and management of indigenous knowledge effectively embeds and obscures the everyday and embodied practices of complex local knowledge systems in an objectivist paradigm.

Elsewhere, the incorporation of Indigenous knowledge in science and policy have been criticised for iterating a colonial agenda. Such applications have sought to legitimate TK as an addendum to scientific fact, to use TK as "a resource for baseline data in areas where Western scientific data is lacking" (Simpson, 2004: 374) or to quantify TK to bolster or refute industrial aims (Simpson, 2004; Turner, 2000; Berkes, 1999a, 1999b). Scholars examining participatory development strategies in other parts of the world have critiqued international development and conservation policies for theoretical and practical shortcomings in dealing with indigenous knowledge and its integration into a scientific paradigm (Cooke and Kothari 2001; Escobar, 1991). The treatment of Sahtúot'ine knowledge in Canadian policy is no exception to this trend. In the Canadian territories, researchers have examined the colonial implications of community-based participatory studies and development strategies (Caine, Salomons, and Simmons 2007; Cruikshank, 1998); the colonial consequences of wildlife co-management strategies (Nadasdy, 2005);

and the way in which probabilistic modelling for the CDUT "reproduces *colonial* configurations of in/visibility so as to keep evidence of wasted life from becoming a political liability" (Stanley, 2014: 18). I will build on these critiques to further elucidate the colonial consequences of environmental and health impact assessments of mining and of mine remediation as these collaborative processes evolved before, during, and after the CDUT. In observing the integration of Sahtúot'ine knowledge *into* the predominantly scientific and statistical assessment of the environmental and health impacts of the Port Radium mine, then, it is important to return to Edward Said's questions posed at the outset of this thesis: "Who writes? For whom is this writing being done? In what circumstances?" (Said, 1982:1)—and by extension, what does knowledge integration *mean* in Aboriginal/state relations in Canada?

Despite recent efforts by federal and territorial governments to include Sahtúot'ine in decision-making processes after their epistemological elision during the uranium-mining boom, in the context of state governance this very *inclusion* has confined Sahtúot'ine knowledge to a format compatible with bureaucratic processes, iterating or reproducing the colonial dynamics of the early twentieth century. In order to participate in processes like resource co-management, land claims and so on, indigenous peoples must bureaucratize into First *Nations* to engage in dialogue with other bureaucrats, government officials, researchers, and scientists (Nadasdy, 2003: 5). DFN participation in CDUT negotiations required the fluency of DFN officials and other Sahtúot'ine participants in the managerial language of industrial development and environmental remediation, as well as the attending scientific discourses of epidemiology, statistical analysis, and so on. Yet, over the course of the CDUT, a project that lasted seven years, government

representatives, scientific experts, and environmental consultants were not expected to obtain any level of fluency in the epistemological systems of the Sahtúot'ine, let alone any degree of fluency in the Dene language. To begin to see the direction of the flows of knowledge in transactions around the CDUT in the Sahtu between the DFN and the government of Canada, is to begin to see the direction of flows of power. As Actor Network Theory scholars have proposed, power is "produced, made up, composed" (Latour 2005:64); it is the *effect* of networks of agents—objects, people, and things—working together in the right circumstances. John Law has argued that a text, a person, or a device alone will be ignored, will be snubbed or will rust, respectively—but together, and given the right circumstances, this network of "mobile, durable, yet tractable agents" will be more difficult to ignore (Law, 1986:34). Further, working from a Foucauldian understanding of discourse analysis, Gillian Rose posits that "intertexuality" is key to the perpetuation of a discourse, as images and texts combine with and depend on other images and texts to make meaning (2001: 136). Working from the intermingling of texts, people, and devices in a period of rampant colonialism in the Sahtu, outlined in the previous chapter, and given Law's actor-network conception of power as an *effect* of a network of agents working together, this chapter considers the fallout of an early-twentieth century industrial discourse by mapping the controversy around radiation exposure and mine remediation, tracing interactions and flows of knowledge between the Délı̨nę First Nation, the GNWT, and the government of Canada.

Since the cessation of mining operations in the Sahtu in 1982, the industrialist discourse outlined in the previous chapter has not only remained the common lexicon for discussions about land-use and development in the region, it has gained the "authority and

associated rights to analyze or translate those very linguistic forms that have been marginalized" (Cruikshank 1998:49). As such, the "rules of the game" (Nadasdy 2003:5)—the language and formalities of government and industry in Canada—have required Sahtúot'ine to conform to the institutions that make decisions about land and land-use, and have circumscribed Sahtúot'ine knowledge to categories like TK or 'oral history.' It is essential to note that problematizing the integration of indigenous knowledge into processes aimed at indigenous empowerment does not discount the importance of anticolonial action toward indigenous autonomy and self-determination, nor does it undermine the productive ways in which community action can accelerate through projects like the CDUT or processes like self-government, and effectively subvert the colonial dynamics that inhere in such projects. Rather, I propose that understanding knowledge integration as part of a colonial system allows a framework for observing the flow and translation of indigenous knowledge through government bureaucracies and scientific inquiries—a framework for seeing what is lost and marginalized in contemporary negotiations as the DFN, among many First Nations across Canada, fight for autonomy in the Canadian system.

I begin with a timeline of the first interactions between First Nations activists/actors and the Intergovernmental Committee on Environmental Contamination (ICEC)—a committee formed in 1982 by the relevant departments of the GNWT and the Government of Canada to address Sahtúot'ine and Tłı̨chǫ concerns about radioactive contamination at two abandoned mine sites in the NWT: Port Radium and Rayrock. Moving to the 1990s, I offer a close reading of the transcript of a meeting between a group of representatives from Délı̨nę who assembled the preliminary demands for

community redress and the Standing Committee on Environment and Sustainable Development in the House of Commons (SCESD), to whom the Délı̨nę delegation brought these demands. Last, I examine how the CDUT process iterated the discursive production of the Sahtu as an industrial space in new ways: as a space for collaborative environmental assessment, for so-called government partnerships, and for remediation in the aftermath of mining.

3.3 THE INTERGOVERNMENTAL COMMITTEE ON ENVIRONMENTAL CONTAMINANTS

In 1982, shortly after Morris Neyelle worked at Echo Bay, the mine site closed for good as silver prices dropped. That same year the Native Women's Association (NWA) of the NWT commissioned a study of uranium mining at Port Radium through the Canadian Arctic Resources Committee (CARC) to investigate concerns about possible health effects of tailings around the Port Radium mine. The CARC study was the first of many investigations into the health impacts of mine tailings at Port Radium over the subsequent decade and provided the NWA of the NWT with a summary history of the mine, the extent and effects of mine-related pollutants, and evidence that further research into the impacts of pollution was needed (Myers, 1982:1). The report concluded that, with so little knowledge about the impact of radioactive mine waste on the environment, "[t]he critical radionuclides involved, dispersal mechanisms, potential exposure pathways and susceptible population groups, and long-term regional impacts must be identified to ensure sound environmental planning and management" (Myers, 1982: 21). In response to that report, the Honourable George Braden, then Minister for Justice and Public Services

in the GNWT, mandated an inquiry into the health and environmental effects of uranium mining in the territory and formed the Intergovernmental Committee on Environmental Contaminants (ICEC)—a committee comprised of members of the various government agencies with "legislative mandates for the control of contaminant impacts on human health or the environment" (NWT Archives, G-1993-006 box 19 file 13 408 005; Canada, 1985: 1).[19] The ICEC met periodically over the subsequent five years and commissioned two major studies into the health and environmental effects of uranium mining at Port Radium and at Rayrock, an abandoned uranium mine near the community of Fort Rae (now Behchokò) (Hatfield Consultants, 1985; Kalin, 1984). Collectively, the two studies located tailings dumping grounds, assessed water quality in various lakes around the mine including Great Bear Lake, measured uptake of radionuclides and heavy metals in fish caught near contaminated water, and calculated concentrations of radionuclides and heavy metals in solid waste in surrounding areas (Hatfield Consultants, 1985; Kalin, 1984). Based on these studies, the ICEC recommended reclamation and monitoring of specific areas, further analysis of groundwater, and further sampling of fish from Great Bear Lake (Canada, 1985: 7).

In addition to these two main investigations, the ICEC also commissioned a preliminary analysis of mortality rates and cancer rates associated with uranium mining in the NWT. While the two studies outlined above assessed environmental damage at Port Radium and Rayrock independently—evaluating the contamination at the two sites separately—this

[19] Members of the committee were: M. Hewitt (GNWT, Justice and Public Services); E. Paquin (GNWT, Renewable Resources); J. Fitzpatrick (Health and Welfare Canada); D. Sutherland(Department of Energy/Environmental Protection Services); R. Soniassey (Department of Indian Affairs and Northern Development); B. Wong (Department of Fisheries and Oceans).

third study *amalgamated* the affected populations across a study area comprised of six communities: five were located along the Marian River system, just north of Yellowknife, NWT, with populations exposed to radioactive and heavy metals pollution from the Rayrock mine, while the sixth, Fort Franklin (now Délı̨nę), was the only community near Port Radium with a concentrated population of people exposed to radioactive and heavy metals pollution from that mine (Morrison and Mathias, 1985: 1). Researchers used census data to inform statistical conclusions about mortality and cancer rates, and second, they used a questionnaire to inform conclusions about the current health status of individuals in the study area (Morrison and Mathias, 1985: 3). It is important to note that the population under statistical comparison and comprising the "exposed group" consisted of *both* Dene people exposed at Rayrock and Dene people exposed at Port Radium, some 400km south of Rayrock. The Rayrock mine was operational from 1957-59 (Silke, 2009), Port Radium was active from 1932-1982 (Bothwell, 1984). The two markedly different groups amalgamated in this study worked at mines operated by different companies, at different times in history, and for different periods of time. Workers at these two mine sites handled ores with different concentrations of radioactive elements, and were exposed to radioactive tailings of different concentrations that were disposed of in different ways. The statistical analysis resulting from the conflation of these two differently exposed groups and the comparison of their collective mortality and cancer rates to the mortality and cancer rates of the overall Dene population of the NWT, led to the conclusion that "there is no evidence from either the overall mortality data or from the cancer deaths data the [sic] there is any increased risk of death from all causes or death due to cancer in the communities of the Marion [sic] River system or Fort Franklin"

(Morrison & Mathias, 1985: 3). The second part of this study consisted of a questionnaire focussed largely on the smoking habits of participants, which concluded: "the high prevalence of smoking and its duration may account for the observation of the Dene that the rates of cancer have increased in their communities" (Morrison & Mathias, 1985: 5). I would like to draw particular attention to this latter conclusion, which, despite limited evidence derived from a questionnaire and a lack of in-depth research into the epidemiology of smoking-related cancers in Dene mine workers and their families, is echoed by all investigations into the health effects of the Port Radium mine, from media reports to the final report of the CDUT and narratives of community members. This conclusion is a pivotal statement in the genealogy of this conflict as cancer from radiation exposure can be easily mapped onto cancer caused by smoking despite methodological difficulties in determining an actual cause of cancer. Shannon Cram has critiqued causality, certainty, and radiation exposure, examining “how layers of certainty and uncertainty structure medical decisions, legal action, procedure, and daily life in the nuclear complex” (2011: 243; see also Murphy, 2006). Reports from the ICEC mark the beginnings of conflicting narratives around causality and exposure at Port Radium, a controversy that is mapped continually through the remainder of this thesis. Further, the focus of this study on occupational exposure ignores the exposure of women and children, an exclusion that is present in all studies of Sahtúot'ine cancer rates conducted since the 1980s.

These three studies (Hatfield Consultants, 1985; Kalin, 1984; Morrison and Mathias, 1985) formed the basis for overall ICEC conclusions and recommendations, and were the foci of ICEC meetings as well as communication between the various

government departments involved with the committee. A close-reading of the reports and correspondence contained in the official record of committee proceedings housed in the NWT Archives demonstrates very high levels of involvement of government departments like INAC, GNWT Department of Renewable Resources, and the federal Department of Health and Welfare, for example, as well as the high frequency of interaction between these departments and the ICEC. Similarly high levels of involvement and high frequency of interaction can be seen in members of the ICEC as well as non-ICEC members affiliated with involved government departments. What is most striking and most important about the ICEC records are the low levels of involvement of the Dene Nation, Fort Franklin, and Rae-Edzo; the leaders of these First Nations organizations, S. Kakfwi, George Blondin, and Joe Rabesca, respectively; as well as the NWA of the NWT and its representative, Sue Enge. Indeed, the ICEC record documents only one or two interactions each between these eight Dene leaders/organizations and the ICEC and its members and affiliates over the course of the three years the committee was active.

It is notable, as we travel along the timeline of this controversy, that in 1988, just a few years after Port Radium-related activism began to gain momentum outside the community of Délı̨nę, Eldorado Nuclear Limited merged with Saskatchewan Mining Development Corporation and formed the private corporation Canadian Mining and Energy Company (CAMECO) (Van Wyck, 2010: 10). Because Eldorado had been a Crown corporation, under the new private ownership of CAMECO the company's records were archived in Library and Archives Canada (LAC), where they remain subject to the provisions of

access-to-information and privacy (ATIP) legislation. The new status of these documents has resulted in very restricted access and the labour-intensive process of requesting each file for research to be approved or denied by an ATIP officer (Van Wyck, 2010: 9-10). Despite these new restrictions on research, in 1990 Magnus Issacson directed the film *Uranium,* which documents the Canadian nuclear industry, its down-winders and its disproportionate impacts on indigenous communities. The film highlights Port Radium and Délı̨nę among these locales and relies on oral testimonials as its main source of historical evidence. The same year Délı̨nę elder George Blondin published *When the World was New* (1990), a collection of traditional Sahtúot'ine stories as well as more contemporary stories about Port Radium. In 1993, the various communities in the Sahtu signed the Sahtu Dene and Metis Comprehensive Land Claim Agreement. The negotiation of the Land Claim resulted in research documenting the presence of 1.7 million tonnes of radioactive tailings around the Port Radium mine site and in Great Bear Lake (Gilday, 2000: 11).

In 1998, as concerns about radiation exposure continued to accelerate in Délı̨nę and as these concerns were increasingly corroborated by research and particularly by oral historical evidence (Blondin, 1990; Issacson, 1990), efforts by Sahtúot'ine activists to demand redress for radiation exposure and environmental damage around Port Radium rose to their zenith in Délı̨nę. In March of that year, investigative journalist Andrew Nikiforuk broke the story of radioactive contamination at Port Radium in the *Calgary Herald*. Highlighting the concerns expressed by many Sahtúot'ine with regard to health and the environment alongside the shocking concealment of the effects of radiation exposure by Eldorado and later by the Canadian government, Nikiforuk's story spread

through Canadian newspapers. Over the next five months the *Herald* published eight articles following Nikiforuk's investigation and the progress of the DFN as concerned community members in Délı̨nę assembled formal demands for the federal government. The Herald's investigation found that "18 of 26 Dene men who worked as mine laborers succumbed to cancers and lung diseases in the past 30 years. The *Herald* also found that the Canadian and U.S. governments actively knew of the dangers of gamma radiation, radon and radioactive dust as early as 1932 but never informed white miners or Indian laborers" (Nikiforuk, 1998: A16).

Thirty-six years after the cessation of uranium mining at Port Radium in 1962, and sixteen years after the closure of the silver mine at Echo Bay in 1982, Nikiforuk's investigation into contamination around Great Bear Lake signals the moment when the concerns of the DFN, about illnesses and deaths in the community, were finally broadcast on a national scale, disseminated along the Canadian ecumene, far from the northern territories. In June of 1998, a delegation from Délı̨nę followed Nikiforuk's story south from the industrial hinterland of Great Bear Lake, as it was painted in the early twentieth century, to Canada's *central* government: a journey of over five-thousand kilometres.

Organized demands by the Sahtúot'ine for a formal investigation into the environmental and health impacts of mining activities associated with the Port Radium mine, including ore transport, tailings disposal, and exposure to radioactive materials, began with a document assembled by members of the DFN entitled, "They Never Told Us These Things: A Record and Analysis of the Deadly and Continuing Impacts of Radium and Uranium Mining on the Sahtu Dene of Great Bear Lake" (Déline Uranium Committee, 1998). This document along with a 14-point action plan was presented by a

delegation from Délı̨nę, first on June 10, 1998 in a closed-doors meeting with federal Ministers Jane Stewart, Department of Indian and Northern Affairs; Ralph Goodale, Department of Natural Resources; and Allan Rock, Department of Health (CDUT, 2005: 6)—and in a hearing with the House of Commons Standing Committee on Environment and Sustainable Development (SCESD) the following day, June 11, 1998 (Canada, 1998).

However, even before the SCESD meeting, in the planning phases, in the assembly of the action plan, and in the writing of the "Record and Analysis" of the impacts of uranium, members of the DFN had to set up an infrastructure to effectively mobilize their concerns within a Euro-Canadian bureaucracy. They had to hire lawyers, who, as Cindy Kenny-Gilday, a member of the DFN delegation to parliament, noted, "[were…] a great deal of help in putting our story together in a form the Government of Canada can understand" (Canada, 1998: [11:25]); they had to record, transcribe, and translate their oral history into writing, in English; and they had to organize their demands to adhere to the knowledge system and language deemed legitimate by the federal government. As one of the two lawyers working for the DFN in CDUT negotiations, Andrew Orkin, noted, the translation of Sahtúot'ine knowledge into a written document, into a format that conforms to the needs of federal bureaucracy, is inherently problematic and repeatedly complicated by the shifting needs of government:

> […] the government says, 'the aboriginal people always bring us oral history, we can't believe oral history.' Then when you bring them written history, they say, 'we can't believe this written down because we know Paul Baton [a Délı̨nę elder] can't write, so it can't be the truth. We want the oral words.' That's a terrible thing to do. And that's what they're doing to us now. (Blow, 1999: [29:25 - 29:49])

This problem of knowledge translation was further reflected in the bureaucratic processes the Délı̨nę delegation encountered as it pressed its claims before the House of Commons SCESD, an encounter I analyse in the following section.

3.4 TIME, KNOWLEDGE, AND BUREAUCRACY: DÉLĮNĘ IS IN THE HOUSE

> **Murray Klippenstein (Adviser, Dene Community of Délı̨nę):** [….] Although it is very wonderful to hear the ministers yesterday express sympathy and support, I can only say that it is necessary to note that at the same time as the ministers were meeting, a backgrounder on behalf of the federal government was handed out […] to the media during and after the meeting. It said, among other things, that "Studies of the Port Radium site in 1981, 1984, 1985, 1994, and 1995 indicated no significant environmental or health risks." This would be very encouraging to the community, if it were true.
>
> (Canada, 1998: [12:25])

When Murray Klippenstein, one of two lawyers who worked for Délı̨nę during the CDUT process, stood alongside the DUT in their meeting with the Standing Committee on Environment and Sustainable Development (SCESD) in the House of Commons, he not only drew attention to the backhanded way in which the federal government attempted to undercut Délı̨nę delegates' testimonies by citing de-contextualized scientific studies, he also drew attention to an essential question in Canadian governance strategies: in Aboriginal/State relations, is there a way to negotiate between competing claims to knowledge and competing claims to truth? In this particular case, is there a way to negotiate in a controversy where Indigenous knowledge claims disrupt the foundations of Euro-Canadian epistemology? While I make no attempt to answer these questions, I examine how these competing claims to knowledge and truth manifested themselves in a parliamentary hearing in Ottawa as well as in the final report of the CDUT, and how this

discursive power play worked to translate, integrate, and thereby oppress Sahtúot'ine knowledge.

When the Délıné delegation finally did meet with government ministers and later with the SCESD "*in televised session* at 11:18 o'clock a.m. […] in Room 253-D, Centre Block, the Chair, Charles Caccia, presiding" (Canada, 1998; italics in original), they were required to further translate their beliefs, history, values, practices, and their very spoken language into a bureaucratic format. The difficulties with this translation or interpretation are apparent in the transcript of that meeting. This section offers a close reading of the Parliamentary Hearing on June 11, 1998 in order to illustrate the collision of knowledge systems as Délıné delegates circumscribe their long history and their deep losses to the temporal, physical, and epistemological confines of "Room 253-D," and government bureaucrats try to listen to oral testimonies and acknowledge loss without stepping outside the epistemological framework and tight time constraints of the House.

The hearing transcript begins with a discussion of unrelated scheduling issues. While the delegation from Délıné waits, having flown across the country to present a case that is vital to their community's health and survival, the chairman begins:

> **The Chairman (Mr. Charles Caccia):** Good morning and welcome to the committee.
>
> This could be the last meeting before we adjourn for the summer. For that reason, before we welcome and hear from our witnesses and friends today, I would like to bring a matter of some importance to your attention, which came by way of a letter to my office this morning [….]
>
> Apparently at the present in Canada we have fragmented information on various aspects of our biodiversity. It is over there in academia, it is over there in some departments, and it is over there in certain interested museums. (Canada, 1998: [11:16])

The committee discusses the logistics of putting forth recommendations on the issue of fragmented information regarding Canadian biodiversity, when and how to "meet with

the people of the Museum of Nature" (Canada, 1998: [The Chairman, 11:16]), if they will indeed have time for such a meeting (Canada, 1998: [Mr. Bill Gilmour, 11:20]), and how they ought to organize their schedule in September to accommodate these matters of fragmented information on biodiversity (Canada, 1998: [Mr. Gnar Knutson, 11:20]). This discussion endures for nearly ten minutes until Mrs. Karen Kraft Sloan articulates the awkwardness of the situation:

> I'm very concerned about having a discussion about committee business while we have witnesses waiting here. (Canada, 1998: [11:20-11:25])

From the outset then, despite using ten minutes for subjects unrelated to the issue at hand, time is at the forefront of discussion—a theme that continues throughout the meeting whenever a member of the SCESD speaks, with few exceptions.

At 11:25a.m., ten minutes into the meeting, The Chairman finally welcomes the Délı̨nę delegation, or the witnesses, and Ms. Cindy Kenny Gilday ("Chair, Délı̨nę Uranium Committee, Dene Community of Délı̨nę") introduces the Délı̨nę delegates. The first and most tangible hurdle of this meeting, as Gilday points out, is the interpretation of Sahtúot'ine language into English:

> We have a second-language situation. I am sorry, because there's no translator available, and we have to use one of our delegates to make translation here. It's not fair to Gina, but she will provide that help. (Canada, 1998: [11:25])

Immediately the Délı̨nę delegation is at a disadvantage: despite having what Nadasdy terms "linguistic competence" (Nadasdy, 2003: 6) in issues around environmental contamination, the balance of power in Room 253-D lies with the members of the Standing Committee on Environment and Sustainable Development, whose "habitus," as Nadasdy calls it, working from Bourdieu's linguistic theory, "arising from their middle-

class Euro-North American upbringing, is more compatible with the forms and formalities of the state-sanctioned official discourse" (Nadasdy, 2003:6). Beyond the issues arising in any translation, Nadasdy argues that fluency in the social and linguistic conventions of *official discourses* like those of wildlife management or property law—and in this case, I add sustainable development, natural resources, and environmental contamination—requires years of training (Nadasdy, 2003: 5). As Gilday points out, without a translator trained to interpret Sahtúot'ine into English, or into the official discourse of the SCESD, in this meeting, in Room 253-D, linguistic authority, and with it epistemological authority, lies with the SCESD.

The first speaker is Mr. Paul Baton (Community Delegate, Dene Community of Délı̨nę). He speaks Sahtúot'ine and Ms. Gina Bayha (Community Delegate, Dene Community of Délı̨nę) interprets his words in English, in a format and vocabulary compatible with the needs of the SCESD, to the best of her ability. Through Bayha's translation, Baton begins by describing the increase of deaths from cancer in his community since the Port Radium mine and outlining the traditional Dene way of life—"that our land, water, wildlife, and all the natural elements around us in our environment are very important to us" (Canada, 1998: [11:30]). He speaks for five minutes and is interrupted by Gilday who explains to the committee:

> I just want to say please be patient, because in the traditional way of making a presentation on such a serious issue, it would take an hour of continuous speaking. So with this sort of translation thing, it's very difficult for him to stop in the middle of an important point to be translated. This is going to be ongoing. We'll just keep going back and forth. Okay? (Canada, 1998: [11:35])

Paul Baton speaks eloquently, through the interpreter, for another twenty-five minutes (Figure 9). His narrated account of his life and the land he lives on traces the impacts of

Treaty 11, the difficulty of negotiating and signing the treaty in 1921 when very few Dene spoke English and many were concerned about how the treaty might affect their access to their own land. He moves to an overview of the opening of the Port Radium mine in the 1930s and how Dene people continued to live their traditional lifestyle while also working for the mine:

> We lived at Port Radium there for a long time. Back then, I can remember that there were a lot of elders. Back then, the people used to live long lives. Even though they were very old, they were still very healthy, and they travelled long distances and continued all their subsistence harvesting activities for themselves and their families. I can remember that even though they were very old, they also had their health, and they continued to carry out all the activities for their own survival. (Canada, 1998: [11:45])

Figure 9. *Still photograph of Paul Baton speaking to the Standing Committee on Environment and Sustainable Development, from the Peter Blow's film, Village of Widows (1999). Courtesy of the Délınę Knowledge Centre.*

Baton covers topics essential to underscoring not only the environmental and health impacts of mining but also the colonial implications of industrial development in the

Sahtu. From the rise in diseases like tuberculosis, to the impact of Euro-Canadian healthcare and Dene people's distrust of hospitals in centres like Yellowknife—from which many Dene never returned—Baton provides the colonial context of radium and uranium mining.

> Over the last 25 years we have heard of nothing but cancer among our people. The majority of our people who have died have died of cancer. We the Dene now know that it is related to the exposure to uranium. We feel that our animals, our caribou, our fish, our water and our environment are contaminated, and it may be affecting us in turn, because we are consumers of these elements.
> I was one of the ore carriers who worked in the ore transportation from the Port Radium site. There was no machinery back then, so all the transportation was done by arm.
>
> During those years there were a lot of people who worked at the Port Radium site and along all the major transportation stop-off sites along Great Bear Lake and along the Mackenzie River down to Tulita and onwards. There were a lot of Dene who worked in assisting with this transportation.
>
> As for the people who worked in mining and transportation and those who were boat captains and who worked on the boat decks, all of those are dead. Even the non-aboriginal people who participated are not with us any more. This is what happened, and that's why we're telling you our story. (Canada, 1998: [11:50-11:55])

Paul Baton's testimony indicates the confident understanding among elders, who lived at Port Radium and remember a time before the mine, that there is a link between cancer rates and radiation exposure—that Sahtúot'ine lived longer, healthier lives before contact, before industrial colonialism, and before radiation exposure. While this knowledge is essential to understanding the conflict at hand and is, in my understanding, incontestable, my goal here is not to adjudicate the veracity or factual truth of specific claims about health and environmental contamination. Rather, I focus on the ways in which this knowledge has been insidiously integrated into the scientifically oriented modality of Canadian policy and erased through the CDUT process, beginning with the very *hear*ing designed to validate Sahtúot'ine concerns in government.

The hearing grows increasingly tense as the SCESD members assert their concerns about the time limitations of the session, and the members of the Délı̨nę delegation try to parse the extremity of their crisis into the tightening constraints of the House. As the meeting proceeds, and the Délı̨nę delegates have the chance to speak, the number of references to time restrictions by committee representatives and eventually by the Délı̨nę delegates themselves, also increases:

> "Are we going to have the time to do all these things?" (Mr. Bill Gilmour [11:20])
>
> "But I leave that up to everybody, depending on their schedule and time." (Mr. Bill Gilmour [11:20])
>
> "[…] we might be interrupted around 12:30 or so by bells for a vote." [The Chairman 11:25]
>
> "In the interest of time […]" [Ms. Gilday 12:00]
>
> "Perhaps without delay we should start [questions] with Mr. Gilmour […]" [The Chairman 12:10]
>
> "What about the time?" [Mr. Bill Gilmour 12:10]
>
> "I realize that we don't have a lot of time" [Mrs. Kraft Sloan 12:10]
>
> "Initially I thought we had two hours, which is why we took so much time at the beginning." [Ms. Gilday 12:10]
>
> "Could you perhaps keep your statements fairly short?" [The Chairman, 12:10]
>
> "Thank you very much for your time" [Mr. Joe Blondin Jr. (Community Delegate, Dene Community of Délı̨nę) 12:15]
>
> "Considering the keen interest of members in the room, their desire to pose questions and the limited time […]" [The Chairman 12:25]
>
> "[…] we will attempt to make the best use of time." [The Chairman 12:30]
>
> "Okay, very briefly. I'll keep it short because of time." [Mr. Bill Gilmour 12:30]
>
> "I'll keep it short so we can move around." [Mr. Bill Gilmour 12:30]
>
> "Everybody will appreciate the brevity." [The Chairman 12:30]
>
> "We are still available to you until the bell starts ringing." [The Chairman 12:45]
>
> "As we perhaps have just a few minutes […]" [Ms. Gilday 12:55]

> "Now I'd like the elder to make a statement, because I know the time is up." [Ms. Gilday 13:00]
>
> "The bells are ringing. As you know, they are calling us for a vote, so we will now have to adjourn." [The Chairman 13:00].
>
> [The Chairman interjects three times during the course of these interactions, trying to move the session to questions—he tries first at 12:00, then at 12:10, and is successful at 12:25.]

What do these repeated references to time constraints say? How should they be read? Are they decontextualized? In total, the transcript of the two-hour long hearing contains twenty-one direct references to time,[20] and seventeen indirect references to time,[21] all of which relate to meeting proceedings. When Cindy Gilday interjects at the outset of the meeting, during Paul Baton's opening remarks, she draws specific attention to "the traditional way of making a presentation," and to the "hour of continuous speaking" it would take to properly communicate the extent of such a serious issue (Canada, 1998: [11:35]) and perhaps to begin to communicate the epistemological context of Sahtúot'ine relationships with the land and its attending biota. I read her interjection as a request for compromise, a motion for flexibility, an explanation that this format, the constant interruptions due to the needs of translation, the lack of understanding of Sahtúot'ine ways of life and history, and the limited time, make it difficult for Mr. Baton to speak to the issues at hand as he would outside the bureaucratic context. But there is little room in a hearing like this one for flexibility. As Nadasdy argues, "[…] within the context of

[20] I define a direct reference to time as an instance in which the word "time" is used or in which a number of minutes or a clock-time are cited to refer to the progression of meeting proceedings.
[21] I define an indirect reference to time as an instance in which nouns, verbs, or adverbs associated with the idea of time are used (ex. brevity, catch-up, wrap-up, interrupt, delay, quickly); as well as an instance in which the end of the meeting or the bell that signals the end of the meeting are referenced.

contemporary bureaucratic wildlife management and land claims negotiations, decisions/concessions simply *cannot* be based on anything other than Euro-North American assumptions about land and animals" (Nadasdy, 2003: 8)—though in this case the negotiations are around radioactive contamination.

It is true that the Committee *is* on a tight schedule, its members *do not* speak Sahtúot'ine, there *will* be a vote around 12:30, and there *are* television broadcasters recording for the Cable Public Affairs Channel. Given these parameters, there is no choice for Sahtúot'ine delegates but to present their case within the guidelines set by the Canadian government. The vocal emphasis by committee members of the lack of time is simply a tautological reminder that adherence to the conventions of the committee is unavoidable. The result of these strictures is a muting of Sahtúot'ine story and testimony in keeping with the standards of colonialism—marginalizing and silencing Sahtúot'ine voices. Except in this iteration, it is disempowerment in the guise of fair hearing; a disempowerment that Ms. Gilday and the other delegates forcefully resisted in their articulate and persistent testimonies. It is important to return to Mr. Klippenstein's statement quoted at the very beginning of this section, in which he points out the hypocrisy of a "backgrounder" distributed on behalf of the federal government to the media during the June 10th meeting between ministers and the Délı̨nę delegation (Canada, 1998: [12:25]); a document that was handed out again in a press release after that meeting. This document, which claimed that studies of the mine site indicated "no significant environmental or health risks" (Canada, 1998: [12:25]), palpably undermined the Sahtúot'ine, their knowledge, and their right to demand third-party environmental assessment. It did this in the very interaction designed to address these concerns. It is

important to note that the 1984 and 1985 studies referenced in the “backgrounder” are the same studies conducted by the ICEC outlined earlier in this chapter—studies with questionable methods conducted without community involvement.

While this meeting did, in the end, open the doors for a collaborative assessment of the environmental and health impacts of uranium mining, it did so within a bureaucratic paradigm that reiterated colonial dynamics of paternalism and oppression. For Sahtúot’ine activists to pursue recourse for damages to their land and community at all, not only did they have to participate in English and through interpretation, they also had to adhere to the formalities of bureaucratic language, to the censures of government committee meetings, and, despite waiting ten minutes at the outset of their meeting while the SCESD organized their schedules for a possible meeting with the Museum of Nature and the “biodiversity people,” the Délı̨nę delegation had to do all of this on the clock.

3.5 THE CANADA-DELINE URANIUM TABLE

Despite its epistemological shortcomings, the parliamentary hearing with the SCESD was a catalyst for action in Délı̨nę. After presenting their case to parliamentary ministers and then again to the SCESD, the Délı̨nę delegates and other community members formed the Délı̨nę Uranium Team (DUT). In August of 1999, after a one-year delay in negotiations with the federal government due to conflicts over Canada's three draft papers or "First Thoughts Papers"—designed to establish the guidelines of a potential partnership project with the DFN—the federal government established a Band Council Resolution (BCR 003-99). The BCR mandated a joint process with Canada focussing on "(1) clean-up and

containment of the Port Radium site; (2) health and environmental studies and long-term monitoring; and (3) compensation" (CDUT 2005: 6; see also, Contaminants and Remediation Directorate 2005: 1-7). In October of the same year, the Canada-Déline Uranium Table (CDUT) was formed. The committee contributing to the CDUT was made up of representatives and advisors from Délı̨nę, Health Canada, and Natural Resources Canada (the federal departments acting on behalf of Indian and Northern Affairs Canada (INAC) (Contaminants and Remediation Directorate 2005: 1-7).

The first project of the CDUT was to assemble a preliminary list of questions that would guide discussions with consultants, experts, and members of the community. These questions were compiled into a comprehensive list called the "77 Questions." During meetings to compose this list and in subsequent consultations mapping the scope of research, it became apparent that the prevailing concerns in the community were around the potential risks to human health due to radiation exposure (CDUT 2005:6). By 2001 the CDUT had completed a detailed, 3-year Action Plan (CDUT, 2002), which delineated the studies and activities that would "provide the information necessary to enable Délı̨nę and the federal government to make informed decisions about the long-term management of the Port Radium mine site and any ongoing community health requirements relating to the mine site (past or present)" (CDUT 2005: 7). The section of the Action Plan pertaining to the “Role of Traditional Knowledge” in CDUT research provides early insights into the incongruity of TK/TEK and the Euro-Canadian bureaucratic context. The document describes TK as an overarching form of knowledge that “is based on both personal experiences and learning that comes from sharing experiences with others or is passed on from one generation to another” (CDUT, 2002: 15). However, the report

quickly establishes that the knowledge of some people is more valid and relevant than the knowledge of other people—"[p]eople who have made their living from the land over many years are generally the best sources of TK because they have the greatest range of observations about the environment over space, time, and circumstances" (CDUT, 2002: 15). Despite being "unrecorded or uninstrumented" (CDUT, 2002: 15) this type of knowledge is valid because such observations are "of a kind and frequency that field scientists or other observers rarely if ever can equal, and […] cannot be obtained any other way" (CDUT, 2002: 15). Sahtúot'ine knowledge is validated in this definition based on the lifestyle of the knowledge holder and the frequency of their experience relative to that of a field scientist.

Further, as a subset of TK, the Action Plan describes the three types of TEK that will be useful in the CDUT: "factual knowledge about the environment," "factual knowledge about past and current use of the environment," and "values about the environment and people" (CDUT, 2002: 15). The rhetoric of these categorizations is steeped in the mores of a Euro-Canadian knowledge system and legitimates Sahtúot'ine knowledge through its incorporation into this system. This rhetoric validates Sahtúot'ine knowledge as a system that uses "facts," "empirical observations," and "observed phenomena" (CDUT, 2002: 15). However, the Action Plan further decrees: "TEK cannot tell us about the actual medical hazard posed by any particular contaminant," "TEK cannot perceive or measure the hazard in any way," and "TK must be carefully grounded in time and space …[to] ensure authenticity and verifiability of information" (CDUT, 2002: 15-16). Valid, yet invalid; empirical, yet unable to "perceive or measure," factual, yet in need of "quality assurance and control to the greatest degree possible" (CDUT,

2002: 15-16), throughout the CDUT documents, TK and TEK are contested, contradictory, and complicated forms of knowledge that are at once exploited for insight into unrecorded history and experiential environmental data while simultaneously discounted for their embeddedness in an epistemological system that is at odds with Euro-Canadian ways of knowing. So, in CDUT research, what processes operated to remove *certain* narratives from the construction of facts around radiation exposure? What processes permitted or necessitated the elision of Sahtúot'ine knowledge from the process of 'finding facts' about Port Radium? These questions will guide further discussion of these problems inherent in the integration of Sahtúot'ine knowledge in the fact-making processes of the CDUT.

The research undertaken by the CDUT can be divided into four main categories: (1) TK research; (2) archival research and data collection; (3) human health studies and community healing; and (4) environmental studies (CDUT, 2005). From 2002-2005 the research goals outlined in the CDUT Action Plan were carried out, producing thirty-one studies and attending reports: one each by AXYS Environmental Consulting, Intertec Management Ltd., KAVIK-AXYS Inc. and Northern Environmental Consulting and Analysis Ltd.; nine by SENES Consultants Ltd.; and eighteen by the DUT (CDUT, 2005). I note the number of reports to highlight that the Délı̨nę Uranium Team conducted over half of the studies completed in the CDUT process and to segue into an illustration of the ways in which DUT findings were elided in the final report of the project, in particular by the research of SENES Consultants and Intertec Management Ltd.

In 2004 after many of the Action Plan points were put into effect, the “Fact Finder Report” (Intertec, 2004), a third-party study, was commissioned by the CDUT to “find answers to certain questions of interest to the two parties associated with the operation of the Port Radium mine from 1931 to 1960” (Intertec 2004: 1). Intertec Management consultants list seven types of information used in their research and rank these sources based on the “Credibility of information resources” (Intertec, 2004: 9). In this ranking “Original records and reports” are first, followed by “Academic, scientific and engineering reports,” while “Déline Uranium Team research,” mostly consisting of oral histories, is ranked fifth, just above “Special interest and advocacy resources” and “Media Reports” (Intertec, 2004: 9-10). This hierarchy demonstrates that, despite claims that the CDUT was a “collaborative” process, the knowledge of one of the participating groups—the Délıne Uranium Team—was devalued from the outset. Yet, as the Final Report of the CDUT describes, a major contribution of the "TK projects" carried out during the project was to supply information that could supplement human health and environmental studies. “In particular, information about employment and land use during the mining period was critical in the reconstruction of historical radiation exposures and was unavailable through other sources" (CDUT, 2005: ii). This begs the question: if DUT research is ranked so low, how does it gain the authority to form the basis of dose reconstruction, the main controversy of the CDUT investigation? I argue that it is only through the translation of oral histories into written accounts and then into data, followed by the projection of this data onto probabilistic modelling, that DUT research gains the authority already accorded to “Original records and reports” and “Academic, scientific and engineering reports”—the latter of which rely heavily on data derived from oral

histories, which are corroborated as authoritative by scientific methodologies. This incremental translation of oral testimony to data point to "scientific report," a process that integrates Sahtúot'ine knowledge into a scientific format, is a crucial part of the process by which Sahtúot'ine knowledge was elided and marginalized in CDUT research.

During the CDUT oral history project, the DUT collected over 130 interviews with Délı̨nę community members regarding their experiences and involvement with uranium mining at Port Radium. These interviews were collected from previous research or were recorded specifically for the CDUT, and were then transcribed and translated into English (CDUT, 2005: 11):

> The oral histories underwent three different analyses. The first focused on factors relevant to the dose reconstruction study (e.g. lifestyle, diet, exposure to contaminants), the second analysis focused on the identification of general themes, and the third analysis focused on the psychological and social impacts of mining activities. (CDUT 2005: 34)

One of the major community-driven projects over the course of the CDUT was the translation, transcription, and compilation of some of these testimonies into an oral history book entitled *If Only We had Known: The History of Port Radium as told by the Sahtúot'ine* (Délı̨nę Uranium Team, 2005). The book provides excerpts and synopses of some of the oral histories collected over the course of the CDUT. Collectively these histories describe the exposure of many Sahtúot'ine and Dene families at Port Radium and substantiate a rise in cancer deaths in Dene living and working near the mine. As Rosie Dolphus attests:

> [M]y husband went across to the head of Bear River to work transporting ore bags … After the men finished working each day they were always covered with brown dust. They would remove their clothing outside …. He must have been sick for a while before they found out that he had cancer. The cancer was around his neck and they used chemotherapy on him. For three years I took good care of my husband …. he passed away." (Rosie Dolphus, DUT, 2005: 71)

Figure 10. *The Radium Gilbert, used to transport radium and uranium ore across Great Bear Lake, was left in Délınę until 2005 when it was moved as part of the CDUT remediation plan. Photo courtesy of the Délınę Knowledge Centre.*

Almost all of the sixty-four interviews excerpted in this book make reference to the exposure of families and children to ore in sacks, dust from broken ore sacks along the transportation route, or dust from these sacks brought into Dene workers' homes. Many of these testimonies also reference personal or familial experiences with cancer.

As Marie Kenny recounts:

> My husband worked piling and hauling logs … he also hauled ore bags … When the ore bags tore open you could see the spillage on the barge. They just swept it into the water … Sometimes kids would play around the worksite. My son Jonas sometimes played on the ore bags" (DUT, 2005: 79)

Similarly, Bella Bekale, whose family lived near Port Radium and whose husband worked on the barges transporting ore attests that "We enjoyed living there. We weren't aware of any danger …. After we moved back to Rae Lakes my son Mike died of cancer in his leg" (DUT, 2005: 56). While Jane Quitte recalled her own experiences with uranium ore sacks as a child:

> We saw ore bags lying around all over. Sometimes when the sun was shining brightly we lay on the ore bags and rested. We didn't know the danger we faced. (DUT, 2005: 108)

Evidence like these testimonies is provided throughout DUT interviews, and demonstrates that, in addition to the occupational exposure of men working as ore carriers, women and children were exposed to radioactive contaminants, and Dene workers were further exposed to dust brought into their homes, which were often erected on flats where ore sacks had been piled (Stanley, 2014: 6). However, as Anna Stanley (2014) has demonstrated, "the CDUT mandate hinged, in analytical terms, on a probabilistic risk modelling exercise conducted by SCENES [sic] Ltd on behalf of the government that was subsequently reduced, for methodological reasons justified by SCENES [sic], to a modelling of *occupational* cancer" (Stanley, 2014: 10). This means that the SENES study, on which many CDUT conclusions and recommendations were based, only looked at the exposure of ore carriers, and further, it only looked at exposure while these men were at work. It did not include environmental exposure away from the worksite (CDUT, 2005: 38; Stanley, 2014:10). The preliminary SENES study determined that "ore transport workers had the highest levels of radiation exposure" while "Family members of these workers, who may have lived in proximity to Port Radium or transportation route sites, would have received very low incremental doses" (CDUT, 2005: 40). As such, SENES only conducted risk modelling for "35 Déline Dene ore transport workers" (CDUT, 2005: 40). That is, SENES excluded cancer cases in women whose husbands "came back from work [with] their clothing … covered with powder from ore bags" (DUT, 2005: 105) and in children who may have "played on the ore bags" (DUT, 2005: 79) or who "lay on the ore bags and rested" (DUT, 2005: 108). What

Stanley describes as the "dubious methodological choices that framed the modelling exercise" (Stanley, 2014: 11) are embodied in these omissions and further, in SENES' exclusion of bone cancer as well as to the inclusion of leukemia in risk modelling. These were problematic choices because, Stanley argues, though bone cancer is a rare form of cancer, it is common among ore carriers (Stanley, 2014: 11) and despite there being no reported cases of leukemia among ore carriers from Port Radium there was one case reported in a Dene child, which could not be included in the study since the modelling was restricted to occupational exposure (Stanley, 2014: 10). As Stanley concludes, the probabilistic risk modelling conducted by SENES consultants for the CDUT "generated a knowledge about Dene ore carrier cancer death in which the actual deaths and actual harm from exposure to ionizing radiation, were denied measure" (Stanley, 2014: 11). Further, while the Final Report acknowledges that statistical research into cancer rates in Délı̨nę is flawed due to "gaps in the cancer registry prior to 1990" (CDUT, 2005: 30; 42) and that "a full epidemiology of former ore transport workers is not recommended ... [because] it would be difficult to establish an accurate baseline reference rate" (CDUT, 2005: 43), it nonetheless concludes that "the predicted number of excess cancer deaths due to radiation exposure is relatively small" (CDUT, 2005: 43).

In this way, non-occupational exposure and the women and children whose experiences are detailed in the oral histories from DUT research excerpted above, were written into the margins by the methodology of SENES' risk modelling, despite evidence that women and children were exposed to ore dust and were in contact with ore sacks. As these accounts were legitimated as sources of data by SENES and Intertec, among other consulting companies, and were deployed as vital supplementary evidence for scientific

investigations in the statistical and scientific assessments carried out through the CDUT, not only was the richness and complexity of these stories elided, many of the very simple facts they communicated, such as the legacy of radiation exposure in women and children, were excluded through the process of knowledge integration. In other words, the methodological choice to restrict this statistical model to a dose reconstruction of occupational exposure selectively legitimated some oral historical evidence while discounting evidence that women and children were also exposed and that working men were further exposed away from the work site.[22]

This form of "knowledge-integration" has been analyzed by anti-colonial scholars across disciplines (Simpson 2004; Nadasdy 2003), and as Paul Nadasdy notes, processes of knowledge-integration are often accepted as a viable route to representing and addressing First Nations interests in policy around resource and land-use. However, as I have argued, such treatments of indigenous knowledge "take for granted existing power-relations, focusing on the incorporation of First Nations cultural elements into existing Euro-Canadian institutional contexts, without ever questioning the appropriateness of such a project in the first place" (Nadasdy 2003:10). The data derived from traditional knowledge and oral history in CDUT research was used to supplement the existing strategies of state bureaucracies (ex. scientific and statistical methods). The integration of this "data" into statistical analysis and probabilistic modelling effectively constrained the beliefs, values, and practices of the Sahtúot'ine to the forms and formalities of state

[22] While my critique is focussed on the erasure of local knowledge about health and environmental risks posed to all Sahtúot'ine people living near Port Radium, it is essential to acknowledge the further disproportionate erasure of indigenous women's bodies in the bureaucratization of knowledge around radiation exposure (see Cook, 1980 and Hoover et al., 2012 for further analysis of environmental contamination and indigenous women's health).

sanctioned decision-making processes. Further, the integration of traditional knowledge into statistical analysis and probabilistic modelling removed power from the hands of Sahtúot'ine by bureaucratizing knowledge while concentrating power in administrative centres, both within First Nations' governments and in territorial, provincial, and federal governments. I propose that, just as Nadasdy (2005) questions the assumptions that underlie co-management, or co-operative resource management, it is essential to question these same assumptions as they undergird the collaborative integration of Sahtúot'ine oral history and TK into the CDUT and its final report and recommendations.

It is assumed that the integration of traditional knowledge with resource management is a positive, knowledge-building advancement in policy-making; that employing local knowledge in resource management creates "more centralized systems of state management" (Nadasdy, 2005: 216); and finally, that incorporating TK into resource management empowers the individuals—the elders and hunters—that hold this knowledge, and their communities (Nadasdy, 2005: 215-216). Nadasdy asserts that the incorporation of indigenous knowledge in co-management strategies constrains the ways in which it is possible to think about and talk about resources and further, rather than empowering aboriginal people, co-management "leads almost automatically to the bureaucratization of the people and communities who participate [….] serving to extend state power into the very communities that it is supposedly empowering" (Nadasdy, 2005: 216).

In addition to the insidious ways in which the CDUT worked to bureaucratize Sahtúot'ine knowledge, the project also materially devalued, and in some instances discounted, this very knowledge. For example, "reporting only the facts" (Intertec, 2004:

6-7), the project's *Fact Finder* states that in CDUT research, "individual pieces of information were sometimes encountered which suggested some 'fact' that might appear contrary to information obtained elsewhere [….] This issue arose with the greatest frequency in the oral history documents that were produced by the Déline Uranium Team" (Intertec, 2004: 6). As the Fact Finder assembled information from oral histories and other sources lacking "benchmarks" (Intertec, 2004, 7), the authors warn that it "contains interpolations and judgements and may present what looks like a more accurate picture than may really be the case" (Intertec, 2004: 7). This fact-oriented report is focused on separating out accounts that may be flawed from events and exposure that "really" happened—a problematic and positivist approach to a complex historical reconfiguration where the written record is lacking. "Reporting only the facts" means that many important oral historical accounts are not accounted for in the truth-claims presented in CDUT reports.

Since the publication of the CDUT final report in 2005, the project has been considered a model for federal collaboration with First Nations in impact assessment and remediation, most recently in community planning and workshops around the remediation plan for the Giant Mine in Yellowknife, NWT (Yellowknives Dene First Nation, 2011: 7-9). Over the course of CDUT research, the project employed thirty-two Délı̨nę community members (CDUT, 2003: iii) and remediation work continues to employ many men in the community (Field Notes, 2011). Including fees paid to third party consultants, total expenditures of the CDUT were $6,787,430 (CDUT 2005:8). Despite the complicated epistemological questions inherent in the project, the careful translation of Sahtúot'ine knowledge into the bureaucratically accepted format of TK, and the

manoeuvring of this knowledge into a scientific research paradigm, the federal government touts the CDUT as exemplary in its economic and educational benefits to the community of Délı̨nę for its incorporation of TK and scientific methodologies in impact assessment and remediation (CDUT, 2005; Government of Canada AANDC, 2009; 2010).

This chapter has been focused around two aims: first I have attempted to map how radiation exposure became a "matter of concern" and second, I have offered a critique of the selective incorporation of TK in the human health and environmental assessment processes associated with the CDUT. These aims are connected in that the controversy around radiation exposure depended critically on Sahtúot'ine activism and knowledge, while the CDUT assessment processes worked to simultaneously integrate and neutralize the moral, ethical, political, and empirical claims that this knowledge entailed. From the first study commissioned by the NWA of the NWT in 1982 to assess the legitimacy of concerns around radiation exposure in the NWT, to the preliminary research conducted by the ICEC, this controversy has spanned over thirty years. Subsequent research associated with the CDUT has been regarded as exemplary as the federal government and the DFN conducted their collaborative, seven-year investigation. Nonetheless, the bureaucratization of Sahtúot'ine knowledge exemplified in the hearing of the Canadian government's Standing Committee on Environment and Sustainable Development, and the processes of knowledge integration employed in the CDUT have demonstrated some of the ways in which Sahtúot'ine knowledge has been effectively confined and reduced to a format compatible with Euro-Canadian governance strategies and knowledge systems

throughout this controversy. The proceedings outlined in this chapter demonstrate the discursive legacy of the objects and artefacts outlined in Chapter 1, which, I have argued, laid the groundwork for the discourse of development, and now remediation, that has structured transactions between the DFN and the federal government. Despite claims of collaborative research and an increased focus on TK, the controversy around ionizing radiation and the knowledge integration practices of the CDUT demonstrate the ongoing and iterative colonialism in current, and lauded, Sahtúot'ine-State relations.

3.5 BIBLIOGRAPHY

Angell, A. C., & Parkins, J. R. (2011). Resource development and aboriginal culture in the Canadian north. *Polar Record*, *47*(240), 67-79.

Berger, Thomas. (1977). *Northern Frontier, Northern Homeland.* Ottawa: Ministry of Supply and Services Canada.

Berkes, Fikret. (1999a). Sacred Ecology: Traditional Ecological Knowledge and Resource Management (Philadelphia: Taylor and Francis).

Berkes, Fikret. (1999b). Learning to Design Resilient Resource Management: Indigenous Systems in the Canadian Arctic. In Fikret Berkes and Carl Folke (eds.), *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. (Cambridge: Cambridge University Press), 98 – 128.

Blaser, Mario (2012). Ontology and indigeneity: on the political ontology of heterogeneous assemblages. *Cultural Geographies*. http://doi.org/10.1177/1474474012462534

Blaser, Mario, Ravi De Costa, Deborah McGregor, & William D. Coleman. (2010). *Indigenous peoples and autonomy: insights for a global age*. Vancouver: UBC Press.
Blondin, George. (1990). *When the world was new: stories of the Sahtú Dene*. Yellowknife, N.W.T: Outcrop, the Northern Publisher.

Blow, Peter. (1999) *Village of Widows.* [52 min., video] Toronto: Lindum Films.
Caine, K. J., Salomons, M. J., & Simmons, D. (2007). Partnerships for Social Change in the Canadian North: Revisiting the Insider–Outsider Dialectic. *Development and Change*, *38*(3), 447–471.

Canada. (1985). *Status Report of the Intergovernmental Committee on Environmental Contaminants*. Yellowknife, N.W.T.

Canada. Parliament. House of Commons. (1998). Standing Committee on Environment and Sustainable Development. *Evidence*. 36th Parliament, 1st Session, 1997-1999. Available at: http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=E&DocId=1038878&File=0#top; [Feb. 12, 2013].

Canada-Deline Uranium Table. (2002). Action Plan. Ottawa: Ministry of Indian Affairs and Northern Development.

Canada-Deline Uranium Table. (2005). Canada-Deline Uranium Table Final Report: Concerning health and environmental issues related to the Port Radium mine. Ottawa: Ministry of Indian Affairs and Northern Development.

Cook, Katsi. (1980). A Native American Response. In H. B. Holmes, B. B. Hoskins, & M. Gross (Eds.), *Birth Control and Controlling Birth: Women-Centered Perspectives*. Clifton, N.J.: Humana Press: 251-258.

Cooke, B., and Kothari, eds. (2001). *Participation: The New Tyranny?* New York: Zed books.

Contaminants and Remediation Directorate, The Canada-Déline Uranium Team, & SENES Consultants Limited. (2005). *Port Radium Mine Remediation Plan* (p. 100). Indian and Northern Affairs Canada.

Cram, Shannon. (2011). Escaping S-102: Waste, Illness, and the Politics of Not Knowing. *The International Journal of Science in Society*, *2*(1), 243–252.

Cruiksank, Julie. (1998). *The social life of stories: narrative and knowledge in the Yukon Territory*. Lincoln: University of Nebraska Press.

Cruiksank, Julie. (2005). *Do Glaciers Listen? Local Knowledge, Colonial Encounters and Social Imagination.* Vancouver: UBC Press and Seattle: University of Washington Press.

Délı̨nę Uranium Committee. (1998). They Never Told Us These Things: A Record and Analysis of the Deadly and Continuing Impacts of Radium and Uranium Mining on the Sahtu Dene of Great Bear Lake. Délı̨nę: Délı̨nę First Nation.

Déljne Uranium Team. (2005). *If only we had known: the history of Port Radium as told by the Sahtuot'ine*. Déljne, NWT: Déljne Uranium Team.

Escobar, A. (1991). Anthropology and the Development Encounter: The Making and Marketing of Development Anthropology. *American Ethnologist*, *18*(4), 658–682.

Gilday, Cindy K. (2000). A Village of Widows. In *Peace, Justice and Freedom: Human Rights Challenges for the New Mllennium* (pp. 107–119). University of Alberta Press.

Hoover, E., Cook, K., Plain, R., Sanchez, K., Waghiyi, V., Miller, P., … Carpenter, D. O. (2012). Indigenous Peoples of North America: Environmental Exposures and Reproductive Justice. *Environmental Health Perspectives*, *120*(12), 1645–1649.

Latour, Bruno. (2004). Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry*, *30*(2), 225–248.

Government of Canada; Aboriginal Affairs and Northern Development Canada, Contaminants and Remediation Directorate. (2009). What's Happening in the Sahtú? [contact information; promotional material; reference material]. Retrieved April 24, 2015, from http://www.aadnc-aandc.gc.ca/eng/1100100023181/1100100023186

Government of Canada; Aboriginal Affairs and Northern Development Canada, Contaminants and Remediation Directorate. (2010). What's Happening in the Sahtu? 2009 in Review [contact information; promotional material; reference material]. Retrieved April 24, 2015, from https://www.aadnc-aandc.gc.ca/eng/1100100023174/1100100023179

Hatfield Consultants Ltd. (1985). *An Evaluation of Environmental Conditions Associated with Abandoned Uranium Mines at Rayrock and Echo Bay*. Science Institute of NWT.

Kalin, M. (1984). Port Radium NWT, An Evaluation of the Environmental Effects of the Uranium and Silver Tailings. University of Toronto Institute for Environmental Studies.

Intergovernmental Committee on Environmental Contaminants. (1985) Library and Archives Canada, G-1993-006 box 19 file 13 408 005.

Intertec Management Limited. (2004). *Port Radium* Fact Finder *Report*. Ottawa: Natural Resources Canada and the Déline Dene Band.

Isacsson, Magnus. (1990). *Uranium*. [47 min. DVD] National Film Board of Canada.

Law, John. (1986). On power and its tactics: a view from the sociology of science. *The Sociological Review*, *34*(1), 1–38.

Morrison, B., Mathias, R.G. (1985). "Investigation into the Health Effects of the Rayrock and Port Radium Uranium Mines on the Dene of the Marion River System Fort Franklin." Department of Health Care and Epidemiology. University of British Columbia.

Murphy, Michelle. (2006). *Sick Building Syndrome and the Problem of Uncertainty : Environmental Politics, Technoscience, and Women Workers*. Durham, NC, USA: Duke University Press.

Myers, Heather. (1982). *Uranium mining in Port Radium, N.W.T.: Old wastes, new concerns*. Ottawa: Canadian Arctic Resources Committee.

Nadasdy, Paul. (2003). *Hunters and bureaucrats: power, knowledge, and aboriginal-state relations in the Southwest Yukon*. Vancouver: UBC Press.

Nadasdy, Paul. (2005). The Anti-Politics of TEK: The Institutionalization of Co-Management Discourse and Practice. *Anthropologica*, *47*(2), 215–232.

Nadasdy, Paul. (2012). Boundaries among Kin: Sovereignty, the Modern Treaty Process, and the Rise of Ethno-Territorial Nationalism among Yukon First Nations. *Comparative Studies in Society and History*, *54*(3), 499–532.

Nikiforuk, Andrew. (1998, March 25). Natives demand response to workers' radiation deaths. *Calgary Herald (Alberta, Canada)*, A16.

Sabin, P. (1995). Voices from the Hydrocarbon Frontier: Canada's Mackenzie Valley Pipeline Inquiry (1974-1977). *Environmental History Review*, *19*(1), 17-48.

Silke, Ryan. (2009). "The Operational History of Mines in the Northwest Territories, Canada" Self Published.

Simpson, L. R. (2004). Anticolonial Strategies for the Recovery and Maintenance of Indigenous Knowledge. *The American Indian Quarterly*, *28*(3), 373–384.

Stanley, Anna. (2014). "Citizenship and the production of landscape and knowledge in Canadian nuclear fuel waste management." Canadian Geographer. 52(1): 64-82.

Turner, Nancy, Marianne Boelscher Ignace, and Ronald Ignace. (2000). Traditional Ecological Knowledge and the Wisdom of Aboriginal Peoples in British Columbia, *Ecological Applications* 10(5), 1275 – 87.

Van Wyck, Peter C. (2010). *The highway of the atom*. Montreal: McGill-Queen's University Press.

Yellowknives Dene First Nation. (2011). *From Despair to Wisdom: Perpetual Care and the Future of the Giant Mine, a Report on a Community Workshop* (Community Workshop Report: Perpetual Care of Giant Mine) (p. 65). Dettah, NWT: Alternatives North.

THESIS CONCLUSIONS

When I was in Délı̨nę in 2011 the band office was the hub of activity. It was the place to swing by if you wanted to find someone, if you wanted to know what was happening that week, or if you wanted a job. Orlena, the Environmental Liaison between Indian and Northern Affairs Canada (INAC) and the Délı̨nę First Nation (DFN), was the person to see if you needed work—remediation is an industry and Orlena was in charge of the hiring. The Government of the Northwest Territories has since discontinued the position of Environmental Liaison in Délı̨nę, but at the time the role was integral to the ongoing remediation work at Port Radium and surrounding contaminated sites.

Figure 11. *Pouring concrete to cap a mine opening, Port Radium, 2007. Published in Indian and Northern Affairs Canada, "How has the Port Radium Remediation Project made the site safer for people, animals, and the environment?" Winter 2009. Photo courtesy of the Délı̨nę Knowledge Centre.*

Orlena was also my main contact in the Band Office and together we applied for, and received, funding from the GNWT Education Culture and Employment program to

conduct a research and oral history project with six youth researchers entitled "Picturing the Mines: Stories from Somba'ke."[23] Over the course of those workshops, in which my role was mainly as facilitator and organizer, Morris Neyelle shared his experiences mining silver at Echo Bay (the former Port Radium mine); Danny Gaudet spoke about his role as Chief Negotiator during the CDUT; Raymond Yakolaya discussed making a film about the CDUT; and Mandy Bayha spoke to her experience travelling to Japan with the Délı̨nę Uranium Team (DUT) to deliver an apology on behalf of the community of Délı̨nę to the Hibakusha, survivors of the bombings of Hiroshima and Nagasaki. In my time in Délı̨nę I also spoke with many men who had been employed over the years doing environmental remediation along the uranium transportation route, from Port Radium, to Echo Bay, Bennett Field, and Sawmill Bay. There was even remediation work in Délı̨nę, disassembling the Radium Gilbert, one of the barges used to transport ore, in 2005 and driving its radioactive bits along the winter road to Yellowknife for proper disposal. My point here is that, long after its closure, the Port Radium mine remains indelibly written into the lives of many people in Délı̨nę—not only due to its lasting health and environmental effects, but also by dint of the industrialist system into which the Sahtu has been assimilated.

As a whole, this thesis is an exercise in understanding how the Sahtu region of the Northwest Territories has come to be conceived over the past century as an industrial space, a nuclear space, a radioactive space, a contaminated space, and recently as a space for remediation. Despite the thematic differences between the two substantive chapters of

[23] In English, Somba'ke translates to "the money place," it is the Sahtúot'ine name for Port Radium, and also the Dene language term for Yellowknife, capital of the NWT.

this thesis, they both seek to understand how industrial colonialism has worked to oppress Sahtúot'ine knowledge first through the discursive assimilation of the Canadian North into a paradigm of industrial development and recently through the iteration of industrial colonialism in health and environmental assessments in the Sahtu.

Scholarship around industrial development in the Northwest Territories has examined the colonial implications of community-based participatory studies and development strategies (Caine, Salomons, and Simmons 2007; Cruikshank, 1998); the colonial consequences of wildlife co-management strategies (Nadasdy, 2005); and the way in which probabilistic modelling for the CDUT "reproduces *colonial* configurations of in/visibility" (Stanley, 2014: 18). This thesis has contributed to this work by further examining the colonial consequences of environmental and health impact assessments of mining and of mine remediation in Délı̨nę and the Sahtu from the 1980s to 2005. Further, this thesis has contributed to scholarship about northern resource development in attempting to link the historical assimilation of the Sahtu into an industrial paradigm to contemporary iterations of industrial colonialism in the North.

Working with visual and anti-colonial methodologies I have attempted to follow uranium as it has moved through art, story, and policy over the past century. The salience of these representations is not merely historical: in November 2012, Canadian newspapers reported on the emergence of A.Y. Jackson's painting, "Radium Mine" (1938), from the private collection of Gilbert Labine. The painting went to auction and, fleetingly, popular news sources grazed the surface of the subterranean history I have begun to unpack here. In Chapter 2, focusing on the period between the 1930s and 60s, I used Jackson's Port Radium works as a vehicle to understanding not only the proliferation of images, stories,

and paintings representing the radium and uranium industry in the Sahtu, but also the proliferation of a discourse of development that has come to shape Southern Canadian perceptions of the Sahtu region as well as local, Sahtúot'ine interactions with a nuclear landscape. I have traced the translation of uranium out of the bedrock and onto canvas and map alike in what Bruno Latour has called the *rationalization of sight*. Further I have argued that these artefacts or stories have served as "material ordering practice" (Cameron, 2011), discursively confining and organizing the Sahtu in an industrial paradigm. The perpetuation of industrialist renderings of the Sahtu by government departments, galleries, geological laboratories, and other national institutions has further served to bolster industrialist claims to knowledge. The institutionalized support of an industrial vocabulary with which to speak about the Sahtu has produced a particular "regime of truth" (Foucault, 1979; Rose, 2001) in which the Sahtu Dene have been systematically erased from Southern Canadian representations of their land. I have sought to understand the networks and actors involved in the making of an industrial, nuclear north.

The discourse of development and industrialization borne out of twentieth-century industrial colonialism in the Sahtu and its attending, prolific visual representations gave rise to an enduring way to understand and talk about the land. Chapter 3 of this thesis began to trace some of the ways in which this discourse has been reproduced in Sahtúot'ine-state transactions and debates around the environmental and health assessments of radium and uranium mining in the Sahtu. I have mapped this controversy from the first demands by the DFN for redress in the 1980s, to the Intergovernmental Committee on Environmental Contaminants, the Parliamentary Standing Committee on

Environment and Sustainable Development hearing with the Délı̨nę Uranium Team, and finally to the CDUT assessments. As the controversy unfolded, Sahtúot'ine knowledge was continually oppressed by the very State institutions and processes that aimed to include it. The reduction of Sahtúot'ine knowledge to categories like TK, its incorporation as data into scientific analysis, its legitimation through these translations, and the palpable exclusion of oral historical evidence in the methodological choices of CDUT probabilistic modelling underscore the ongoing colonial practices written into Canadian negotiations with the DFN.

Contamination from the Port Radium mine remains a major source of concern in the Sahtu and its role as a catalyst in the rapid assimilation of the region into Canadian life and nationhood is written into the collective memory of the region. Hundreds-of-thousands of tonnes of radioactive tailings remain on the floor of Great Bear Lake. While disease and contamination are serious effects of colonial violence, the assimilative effects of industrialization are also worthy of careful consideration. If remediation can mitigate the environmental and health impacts of Port Radium, what process can mitigate the forceful assimilation of the Sahtu into Canada and the oppression of Sahtúot'ine knowledge in current environmental and health assessments? What process can alleviate the ongoing colonialism intrinsic to Sahtúot'ine-state relations? While this thesis has aimed to highlight the processes by which industrial colonization took shape in the Sahtu and was iterated through the environmental and health assessments culminating in the CDUT, it has not offered any solutions to these questions—these answers will undoubtedly come from Sahtúot'ine activism and communities in the Sahtu.

Remediation at contaminated sites associated with the Port Radium mine was deemed complete by AANDC in 2012. In conversations with people doing remediation work in Délı̨nę in 2011, however, it was clear that despite remediation, complete reclamation of the land and erasure of the mine's scars will never be complete. As Dennis Kenny attested in an interview:

> Well at the beginning, I wasn't there before, and people were telling me that it used to be a real mess in that area. Piles and piles and piles of debris, pipes, tin cans […] I didn't realize that miners who were working there were camping any place, and they had no respect for the land and they were probably just eating from the can and then cooking and putting pots and throwing tin cans around, cause what we found were tin cans lying all over the area. It was pretty sad, like how they treated the land. [….] And absolutely didn't have […] respect for the land. That area is a really beautiful country and it's sad to see what they did to it. We had to end up cleaning up that area. And Sawmill Bay is like that too, Echo Bay mine was like that too. All the mines on that side of the Port Radium. It's quite a mess there. (Interview with Dennis Kenny, June 21, 2011)

Beyond environmental remediation, the health and psychological impacts of the mine are slow to heal. Uranium mining in the region was wrapped up in the process of northern colonization that brought residential and federal schools to the Sahtu along with Euro-Canadian health care and diseases, as well as the racialized dynamics that inhere in these institutions and processes. The annual Spiritual Gathering in Délı̨nę, which I was privileged to attend in August of 2011, is focussed around healing and coping with these, and other, struggles. People from all over the Sahtu come on chartered flights or small motor boats up the Bear River to convene in the house once inhabited by Délı̨nę's foremost spiritual leader and prophet, the Prophet Ayha. The gathering lasts for four days during which time people feast, pray, listen, talk, drum dance, and play traditional games. Though the events are largely conducted in Sahtúot'ine, my impression from translations and conversations in English was that a focus of the Spiritual Gathering is healing from

colonialism and the violent abuses of settler society. While industrial colonialism persists in the Sahtu and in Southern Canada, many people in Délı̨nę are actively involved in the fight against assimilation and oppression of Sahtúot'ine knowledge in negotiations with the state and in daily life. While the efforts of this thesis have been to understand the origins and iterations of industrial colonialism in the Sahtu through a close analysis of images and documents, community-lead work and activism in Délı̨nę are paving the way for reconciliation beyond remediation.

BIBLIOGRAPHY

Caine, K. J., Salomons, M. J., & Simmons, D. (2007). Partnerships for Social Change in the Canadian North: Revisiting the Insider–Outsider Dialectic. *Development and Change*, *38*(3), 447–471.

Cameron, Emilie. (2011). Copper Stories: Imaginative Geographies and Material Orderings of the Central Canadian Arctic. In A. Baldwin, L. Cameron, & A. Kobayashi (Eds.), *Rethinking the Great White North: Race, Nature, and the Historical Geographies of Whiteness in Canada*. Vancouver: UBC Press.

Cruiksank, Julie. (1998). *The social life of stories: narrative and knowledge in the Yukon Territory*. Lincoln: University of Nebraska Press.

Foucault, Michel. (1979). *Discipline and Punish: The Birth of the Prison.* Harmondsworth: Penguin.

Nadasdy, Paul. (2003). *Hunters and bureaucrats: power, knowledge, and aboriginal-state relations in the Southwest Yukon*. Vancouver: UBC Press.

Nadasdy, Paul. (2005). The Anti-Politics of TEK: The Institutionalization of Co-Management Discourse and Practice. *Anthropologica*, *47*(2), 215–232.

Rose, Gillian. (2001).*Visual Methodologies: An Introduction to the Interpretation of Visual Materials.* London: Sage Publications.

Stanley, Anna. “Citizenship and the production of landscape and knowledge in Canadian nuclear fuel waste management.” Canadian Geographer. 52(1): 64-82.

APPENDICES

Appendix I: Working List of A.Y. Jackson's Port Radium Sketches and Paintings

TITLE	DATE	MEDIUM	SIZE	LOCATION	VALUE
Great Bear Lake	06-Sep-38	Graphite on wove paper	22.5x30.2cm	NGC	
Great Bear Lake	11-Oct-38	Graphite on wove paper	22.5x30.3cm	NGC	
Contact Lake, near Great Bear Lake	1938	Graphite and green pencil on wover paper	22.9x30.2cm	NGC	
Minehead, Great Bear Lake	06-Sep-38	Graphite on wove paper	22.5x30.2cm	NGC	
Radium Mine, Great Bear Lake	1938	Oil on wood	26.5x34.2cm	NGC	
Mountains, Great Bear Lake	1938	Graphite and green pencil on wover paper	22.9x30.2cm	NGC	
Eldorado Mine, Great Bear Lake	1938	Graphite on wove paper	22.9x27.5cm	NGC	
Pre-Cambrian Hills	1938	Oil on wood	26.5x34.1cm	NGC	
Eldorado Mines, LaBine Point	1938	Oil on wood	26.4x34.1cm	NGC	
Eldorado Mine	1938	Graphite on wove paper	22.8x30.3cm	NGC	
Eldorado Mine	1938	Graphite on wove paper	22.5x30.3cm	NGC	
Landscape	1938	Graphite on wove paper	22.8x30.3cm	NGC	
Poplars, Port Radium	1938	Graphite on wove paper	22.8x30.3cm	NGC	
Landscape and Aerial View of Lakes	11-Oct-38	Graphite on wove paper	22.5x30.3cm	NGC	
Oil Tanks, Eldorado	1938	Graphite on wove paper	22.8x30.3cm	NGC	
Eldorado	1938	Graphite on wove paper	22.8x30.2cm	NGC	
Eldorado	23-Sep-38	Graphite on wove paper	22.8x30.3cm	NGC	
Tree, Northwest Territories	1938	Graphite on wove paper	14.6x11.4cm	NGC	
Port Radium, Great Bear Lake	1949	Graphite on wove paper	22x30cm	NGC	
Stairs, Port Radium	1949	Graphite on wove paper	22x30cm	NGC	
McDonough Lake	1949	Graphite on wove paper	22x30cm	NGC	
Port Radium	17-Sep-49	Graphite on wove paper	22x30cm	NGC	
Great Bear Lake	16-Sep-50	Graphite on wove paper	22.7x30.5cm	NGC	
Cobalt Island, Great Bear Lake	13-Sep-50	Graphite on wove paper	22.7x29.8cm	NGC	
Great Bear River	19-Sep-50	Graphite on wove paper	22.3x29.3cm	NGC	
Great Bear River	19-Sep-50	Graphite on wove paper	14.5x22.7cm	NGC	
Cobalt Island	1950	Oil on wood	26.4x34.3	NGC	
Indian Camp, Great Bear River	1950	Graphite on wove paper	22.7x30.5cm	NGC	
Pool and Dead Trees	1950	Graphite on wove paper	22.7x30.5cm	NGC	
Great Bear River (Two Views)	1950	Graphite on wove paper	30.3x22.8cm	NGC	
Fallen Spruce Trunk	1950	Graphite on wove paper	22.7x29.8cm	NGC	
Franklin, Great Bear Lake	10-Sep-51	Graphite on wove paper	22.8x30.4cm	NGC	
Franklin, Great Bear Lake	1951	Graphite on wove paper	22.8x30cm	NGC	
Coppermine (Detail View)	1951	Graphite on wove paper	22.8x30.3cm	NGC	
Cameron Bay	1951	Graphite on wove paper	22.7x30.3cm	NGC	
Fish Rack, Franklin, Great Bear Lake	1951	Graphite on wove paper	22.8x30.4cm	NGC	
Lake Rouvière	1959	Graphite on wove paper	22.5x29cm	NGC	

Lake Rouviere	1959	Graphite with black chalk and	22.5x29cm	NGC	
Fort Franklin, Great Bear Lake	1959	Blue ballpoint pen on wove paper	22.9x30.3cm	NGC	
Entrance to Great Bear River	1959	Graphite on wove paper	22.9x29.5cm	NGC	
Entrance to Great Bear River	1959	Graphite on wove paper	14.5x22.7cm	NGC	
Tent Encampment	1959	Graphite on wove paper	22.9x29.3cm	NGC	
Stream and Trees	1959	Graphite with blue ballpoint on wove paper	22.4x29cm	NGC	
Port Radium	1959	Graphite with blue ballpoint on wove paper	20.2x25.3cm	NGC	
Rock Samples and Caribou Antlers	1959	Graphite on wove paper	22.8x26.7cm	NGC	
Boat on the Shore, Fort Franklin	1959	Graphite on wove paper	22.9x30.3cm	NGC	
Radium Mine	1938	Oil on canvas	71.1x91.4cm	Private	$643,500 CDN
Great Bear Lake		Oil on canvas	81.3x101.6cm	Private	$431,250CDN
Morning, Great Bear Lake		Oil on canvas	71.1x91.4cm	Private	$409,500CDN
Eldorado, Great Bear Lake	1938	Oil on board	26.7x34.3cm	Private	$35,100CDN
Great Bear Lake Near Port Radium	1949	Oil on canvas	64.1x81.9cm	Private	$141,600CDN
The Radium Gilbert at Sawmill Bay, Great I	1949	Oil on panel	26.7x34.3cm	Private	$17,250CDN
Eldorado Mine		Oil on panel	26.7x34.3cm	Private	$29,250CDN
Deese Bay, Great Bear Lake	1938	Guache on board	76.2x101.6cm	Private	$43,875CDN
Great Bear Lake	1938	Oil on panel	26.7x34.3cm	Private	
Northern Landscape, Great Bear Lake	1938	Oil on canvas	82.4x102.1cm	Unknown	
Eldorado Mine on Echo Bay	1938			McMichael Canadian Collectio	
Wilderness, Deese Bay	1938			Unknown	
Hills at Great Bear Lake	1953			Unknown	
West Bay Fault	unknown	Oil on canvas	unknown	GNWT	
Labine Point, NT	unknown	Field sketch in oil	unknown	GNWT	
Labine Point, NT	unknown	Oil on canvas	unknown	GNWT	
Between Yellowknife and Great Bear Lake,	unknown	Oil on canvas	unknown	GNWT	
Untitled [west side of West Bay Fault]	1949	Oil on canvas	unknown	PWNHC	
Great Bear Lake	1960	Oil on canvas	unknown	PWNHC	
Eldorado Headframe (sketch #1)	1949	Oil on board	unknown	PWNHC	
West Bay Fault (sketch #3)	1949	Oil on board	unknown	PWNHC	
Barren Lands (sketch #4)	1950	Oil on board	unknown	PWNHC	
Hills (sketch #5)	1950	Oil on board	unknown	PWNHC	
Hills (sketch #6)	1950	Oil on board	unknown	PWNHC	
Hunter Bay (sketch #7)	1951	Oil on board	unknown	PWNHC	
Dease Inlet (sketch #8)	1951	Oil on board	unknown	PWNHC	
Bear River (sketch #9)	1951	Oil on board	unknown	PWNHC	

NGC: National Gallery of Canada
GNWT: Government of the Northwest Territories
PWNHC: Prince of Wales Northern Heritage Centre

Appendix II: Picturing the Mines: Stories from Somba'ke, a short film by the Délı̨nę Youth Cultural Projects Program

*This film is not available in the online version of this thesis due to ethics restrictions regarding its distribution.

Appendix III: Youth Cultural Projects Final Report

YOUTH CULTURAL PROJECTS
Picturing the Mines: Stories from Somba K'e

Coordinator: Orlena Modeste
Researcher: Carmella Gray-Cosgrove
Research Trainees: Kenny Kenny**,** Napoleon Kenny**,** Doris Sewi**,** Rebecca Sewi**,** Blake Takazo**,** Charmaine Takazo
Funded by: Education, Culture, and Employment (GNWT), Memorial University of Newfoundland

SUMMARY OF RESEARCH

The history of Port Radium has been told in many different ways in communities across Canada, the US, and in Japan.

Maps, pictures, movies, paintings, geological surveys, scientific studies, local research and oral history give different versions of a story rooted in the history of the Sahtu.

YOUTH PROJECT GOALS:

The goals of this three-week educational program, which ran from July 11-29th, were:

- to understand the **different ways** the history of Port Radium has been told
- to **critically analyze** different versions of this story. **What** is included and excluded from these different stories? **Why**?
- to **create representations** of this story that include **local knowledge, archival information, and scientific data**
- to become familiar with telling stories through different media, including **painting, filmmaking, comic strips, and narration**.

In particular, the students discussed

- artworks **by A.Y. Jackson**, who is an internationally famous painter. His sketches and paintings of Port Radium and Fort Franklin were done in the 1930s-1950s

- **archival photographs** of the mine and surrounding areas

- community and final reports from the **Canada Délįnę Uranium Team**
- the Port Radium oral history project book ***If Only We Had Known***
- Port Radium **documentaries**: *Uranium* (1990) and *Somba K'e* (1999)
- **stories** about mine activity written by George Blondin in his book *When the World Was New*
- **historical maps** of ore deposits by the Geological Survey of Canada
- **photographs** of the nuclear fuel chain by nuclear activist, Robert del Tredici

The students discussed how these different representations affect how people in Délįnę, Canada, and around the world understand uranium mining and the Sahtu region.

SKILLS DEVELOPMENT

Skills development was a major focus of this workshop. Student researchers learned:

- the basics of **audio-recording** and **transcribing**
- the basics of **video recording** and **video-editing technology**
- they became familiar with **acrylic painting**

We had three guest-speakers talk about history, community development, mining, and telling stories using different media.

- **Morris Neyelle** talked about **painting, photography**, and the importance of **telling stories** through different mediums to keep history **moving forward with younger generations.**

- **Danny Gaudet** discussed self-government, current industrial development, the Canada Dél̨nę Uranium Table, and **the importance of youth involvement** in these processes.

- Filmmaker, **Raymond Yakolaya** discussed **filmmaking** as a medium for **telling stories**, the importance of **youth education** and technology in **moving traditional knowledge forward** with the next generation.

PROJECT RESULTS

With the knowledge and skills outlined above, student researchers assisted in producing **a short film about the history of Port Radium** (included with this report).

They also made **paintings** that showed parts of the landscape they thought were important to life in Dél̨nę.

Finally, they made a **comic-strip** version of the Port Radium prophecy written by George Blondin.

Student work will be displayed for the public in the old Basic Awareness building tomorrow, Friday August 19th at 5:00. Refreshments will be served. Please come!