A GLOBAL ENVIRONMENTAL HISTORY OF THE PORCUPINE GOLD RUSH, 1909-1929

“TREASURE HOUSE TO THE WORLD:” A GLOBAL ENVIRONMENTAL HISTORY OF THE PORCUPINE GOLD RUSH, 1909-1929

by

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LAY ABSTRACT

This dissertation argues that international forces shaped local environmental history in the gold mining district of Porcupine, northern Ontario, between 1909 and 1929. During these years, Canadian mining transformed from a relatively small extractive economy into a large-scale industrial one -- with a host of associated social and environmental consequences. The geological, climatic, and cultural characteristics of the Canadian Shield environment created significant challenges (including fires, floods, rock-falls, pollution, use conflicts, and disease) which required adaptation from the industry's stakeholders. People solved environmental problems by relying on support from transnational gold mining networks of investors, managers, prospectors, geologists, prospectors, miners, communities, and governments. As a result, Porcupine's environmental history was shaped by the convergent forces of its gold-bearing geology, an international context, and local Canadian history. Largely complete by 1929, the legacy of Porcupine's environmental history lives on in the power of Canada's international mining industry on modern extractive frontiers.

ABSTRACT

The discovery of gold at Porcupine Lake in 1909 brought a well-practiced era of ecological change to northern Ontario. By the early twentieth century gold rushes followed predictable patterns. Deforestation, soil depletion, water-shed modification, rapid immigration, transient populations, "get-rich-quick" ambitions, conflicts with Indigenous people, major fires, and hasty infrastructure development characterized multiple rushes in Africa, the Americas, and Australasia. In the aftermath of the nineteenth century mining booms, the 1909 Porcupine rush brought global gold mining knowledge and technology to northern Canada. At Porcupine, experiments in industrial extraction matured into a set of efficient methods for large-scale corporate extraction of low-grade gold. Although historians traditionally frame gold rushes as national or regional events, Porcupine shows how borders were permeable to people, objects, and ideas moving between mining zones to shape local environmental history.

Porcupine's gold-bearing landscape became a site of convergent historical forces between 1909 and 1929. The rush brought northern Ontario into an international community of mining frontiers at a moment of development in the province's northern hinterland. Local conditions (such as climate and geology) worked together with transnational networks to shape the land and its communities. Industrial mining also created problems including fires, droughts, and industrial disease. By 1929, Porcupine had become a major player in the global industrial mining industry. The Porcupine rush set the stage for twenty-first century dominance in international gold economy and laid the groundwork for Canada's modern relationship with nature.

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CONTENTS

LAY ABSTRACT III

ABSTRACT IV

ACKNOWLEDGEMENTS V

LIST OF FIGURES VIII

LIST OF TABLES IX

LIST OF ABBREVIATIONS X

INTRODUCTION:
A Global Environmental History of the 1909 Porcupine Gold Rush 1

CHAPTER 1:
"Promise of Reward to the Prospector:" An Environmental History of the Porcupine to 1910 21

CHAPTER 2:
Baptism by Fire: Mining Economies of Scale Before the Great War 82

CHAPTER 3:
Entrenched Industry: War and Water Power at Porcupine into the 1920s 142

CHAPTER 4:
Digging Up Disaster: Environmental Crises and Transnational Solutions in Ontario Mines during the Roaring Twenties 203

CONCLUSION:
Mining Stories, Conservation, and Fulfilling the Industrial Dream 270

BIBLIOGRAPHY 287

LIST OF FIGURES

FIGURE 1 “Map of ohe Porcupine Gold Fields” 3

FIGURE 2 “Arriving in Porcupine, 1909-1929” 9

FIGURE 3 “Key Map” 22

FIGURE 4 “Indian Hut and Potato Patch” 37

FIGURE 5 “Indians on Nighthawk Lake” 60

FIGURE 6 “Dome Gold Mine Plant after Porcupine Fire” 91

FIGURE “Graves of Victims of Great Forest Fire 1911” 102

FIGURE 8 “Mouth Of The West Dome Shaft” 103

FIGURE 9 “South Porcupine Station – Flood Time” 114

FIGURE 10 “Hollinger Mine - View from Survey Office Roof 275

FIGURE 11 “Dome Mine” 279

FIGURE 12 “Hollinger Mine - General View of Marcy Ball Mills” 280

FIGURE 13 “Hollinger Assay Office”. 283

LIST OF TABLES

TABLE 1 “Origin of the People by Subdistricts, Porcupine North & South”………97

LIST OF ABBREVIATIONS

T. & N. O.	Temiskaming and Northern Ontario Railway

STATEMENT OF ACADEMIC ACHIEVEMENT

Mica Amy Royer Jorgenson is the sole author of this dissertation.

Introduction: A Global Environmental History of the 1909 Porcupine Gold Rush

Standing beside Porcupine Lake in Timmins district, Northern Ontario, it is difficult to comprehend the magnitude of its geological and environmental history. As far as the eye can see in any direction, people modified this rolling muskeg landscape in search of gold. Over the course of a little more than a century, they broke open rocks, altered bodies of water, and cut down almost every tree. They built dusty rows of houses, and then built them again when forest fires levelled them. Three kilometres beneath the lakebed, people and machinery crawled through a honeycomb of tunnels and caverns. It is a landscape that has been worked over and over again as increasingly sophisticated technology and rising global markets made ever-smaller concentrations of gold profitable.

Compared against the vastness of geological time in which gold was formed and deposited in the Canadian Shield, the last century of gold mining at Porcupine Lake amounts to less than the blink of an eye. Transformation has always been part of history here. Environmental change, including anthropogenic environmental change, have worked and reworked the lakeshore's features continuously for eons. Plate movement, ice ages, fire, clearing, farming, hunting and gathering, erosion, and ecological succession ensured enormous physical changes. Yet the arrival of large-scale, low-grade, industrial extraction has multiplied human ability to manipulate the landscape.

The most dramatic period at Porcupine Lake were the first two decades of the industry's development (between 1909 and 1929) in the area roughly encompassed by the Tisdale, Whitney, Deloro, Shaw, and Mountjoy townships (figure 1). In these years, mines in the so-called "Porcupine district" went from a mere side attraction of the more famous Cobalt Silver Rush to a modern industrial mecca on par with the biggest gold mines on the planet: in 1928, as a result of Porcupine's success, Ontario Minister of Mines Charles McRae declared Canada "the mineral treasure house to [the] world."[1] Porcupine's history is one of turmoil punctuated by tentative moments of stability: forest fires, the First World War, floods, droughts, strikes, and industrial disease bookend years of steady work, community-building, scientific development, and profitability. Buoyed by the momentum of the 1909 find, Porcupine's stakeholders tumbled into corporate consolidation and ever-increasing scale, even as disaster regularly derailed its trajectory and shattered entrenched expectations for the land.

The Porcupine Gold Rush was not unique or special. The local, microcosmic story of this event runs parallel to much wider story of global gold mining in the early twentieth century. This was not the first time mining wrought massive environmental change on a frontier landscape, nor would it be the last. The Porcupine Gold Rush took place among many similar industrial stories following predictable and well-practiced trajectories in Latin America, the western United States, Australasia, Africa, and northern Canada. Although separated by time and geography, the mining landscapes of northern Ontario share many characteristics with mined landscapes all across the world. Many of the same people, technologies, and turning points defined its development. As a result, the relationship between people and their environment in separate mining zones reflect each other. The extreme nature of the changes caused many common problems and similar types of adaptations, negotiations, and failures on almost every goldfield in the world.

[1] "Canada Now the Mineral Treasure House to World," *Porcupine Advance*, 16 February 1928.

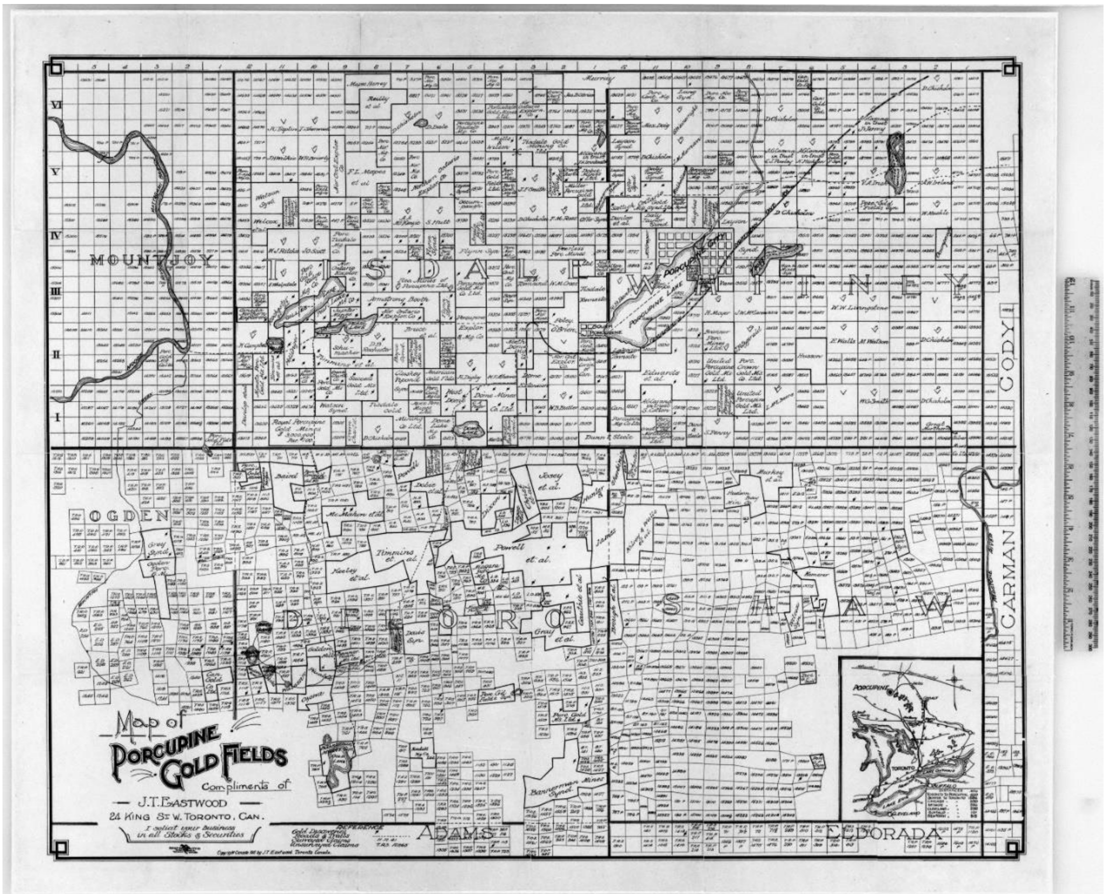

Figure 1 J.T. Eastwood, "Map of the Porcupine Gold Fields," MIKAN 4129363, CARTO 4981, 409 – Territorial Districts within Ontario under Federal or Provincial Control, Library and Archives Canada, Ottawa, Ontario, Canada.

Human struggles and successes with the land reverberated along human, corporate, and government mining networks between mining zones. To borrow the language of actor network theory, Porcupine and its fellow gold rushes became effects generated by a series of complex interactions between diverse human and non-human materials.[2] Porcupine's major players were conscious of their place in this network. Although working within a unique Ontario legal tradition, politicians wrote Ontario mining law with explicit reference to the experiences of international gold rush states.

[2] John Law, "Notes on the Theory of the Actor-Network: Ordering, Strategy, and Heterogeneity," *Systems Practice* 5, no. 4 (1992): 380.

International syndicates paid the first prospectors, many of whom had already tried their luck on other gold fields before arriving in Ontario. Geologists and engineers exchanged blueprints, scientific research, and expert knowledge across continents. This was not a passive one-way flow: incoming forces interacted with Porcupine nature in unpredictable ways.

The particular climatic, geological, and human characteristics of the Canadian Shield environment required adaptation from foreign people, ideologies, and technologies. As it interacted with other places, Porcupine became a single piece in an increasingly sophisticated transnational gold mining puzzle. This was (and continues to be) an interlocking system of interdependence, exchange, and feedback loops linking humans and nature across continents wherever gold is found. Porcupine existed at an intersection of the gold-bearing geology, international mining history, and Canadian industrialisation. By the late 1920s, Porcupine's place in this network had matured to the point that the industry's champions expressed self-confidence in the special value of Canadian mining expertise in the world. When the silicosis crisis struck the global industry, Porcupine stakeholders engaged as equal players in the transnational mining community, contributing scientific research and representatives to the League of Nations' 1930 International Conference on Silicosis in Johannesburg.[3]

Porcupine's place within an international mining context is key to understanding its human and environmental past. The molecular level of gold mining's penetration on

[3] "Silicosis: Records of the International Conference Held at Johannesburg 13-17 August 1930" International Labour Office (League of Nations): Studies and Reports Series F (Industrial Hygiene) No. 13 (London: P.S. King & Son, 1930); "International Conference on Silicosis," *The Labour Gazette*, 1930, 1040.

this landscape requires close attention to local detail. Rich minutia permeate the stacks of corporate correspondence, government legislation, miners' letters, geological reports, maps, and newspapers between 1909 and 1929. However, peeling back the layers of Porcupine's history reveals that its power does not lie in its exceptionality, but in its conformity with a long and well-practiced mining story. An environmental history of Porcupine implicates a much bigger transnational process. Tying transnational stories to local environmental ones shows how networks and relationships across time and space are concrete forces with the power to materially shape the past.

Mining in History

Visitors to the modern Timmins mining museum can view a Porcupine-made version of a classic middle-eastern-style arrastra: a simple animal-powered mill used to crush gold-bearing quartz in Mexico and California before prospectors applied it to Canadian Shield rock in 1909.[4] The arrastra is one of the earliest examples of the way that miners made material changes to the local landscape with tools collected from diverse locations and experiences. Designed and used internationally, it became the centre of physical change to Porcupine land: miners cleared and dug up the earth to get at quartz for the mill, disposed their waste rock in convenient depressions, and diverted local water ways to serve their operations. The arrastra embodies Porcupine's place within a larger transnational network of mining frontiers stretching across time and space. Although not always as simple or obvious as the arrastra, other objects, people, and ideas flowed

[4] It required two boulders (a larger base rock and a smaller grinding rock), a little water, and a mule. Michael Barnes, *Fortunes in the Ground: Cobalt, Porcupine & Kirkland Lake* (Erin: Boston Mills Press, 1986), 99, James Otto Peterson, "The Origins of Canadian Gold Mining: The Part Played by Labour in the Transition from Tool Production to Machine Production," (PhD Diss., University of Toronto, 1977), 150.

continuously along ever-widening transnational networks between Porcupine and the world to shape local environmental history. These relationships are represented visually in Figure 2 using historical geographical information systems software. Each line is linked to an object, person, or idea mentioned in the documentary evidence used for this dissertation.

Partly as a product of such exchanges, the Porcupine shared characteristics with similar mining events both before and after 1909. Gold rushes tend to occur far from urban centres during times of economic growth, when individuals and corporations are more risk-tolerant and open to new opportunities.[5] Prospectors are usually migrant male members of a neo-European culture sharing specific ideas about their relationship to nature.[6] Discoveries trigger media excitement, speculation booms, migration, expropriation of land and resources, environmental change, and infrastructure development. From the beginning, most mines are haunted by the spectre of resource exhaustion, which eventually ends all extractive ventures. This basic chronology played

[5] The California Rush in 1848, Australian Rush in 1851, British Columbia Rush in 1858, and Otago Rush in 1861 all came at times of relative political stability and economic expansion. Exceptions include the Klondike Gold Rush (1896) which historians often attribute to miners' desperation to escape economic depression and industrial malaise at a time when gold promised relative stability, freedom, and adventure. Kathryn Morse, *The Nature of Gold: An Environmental History of the Klondike Gold Rush* (University of Washington Press: Seattle and London, 2003): 17.

[6] Several historians have made arguments about the mobility of environmental and legal ideology between settler states. Thomas Dunlap describes the exchange of environmental ideas between British colonies and successor states. He argues that the "neo-Europes" inherited notions about nature protection from Britain. He argues that this knowledge exchange was neither a one-off nor one-way, but was part of a continuous international flow of environmental ideology largely invisible to historians. Thomas Dunlap, *Nature and the English Diaspora: Environment in the United States, Canada, Australia, and New Zealand* (Cambridge: Cambridge University Press, 1999). Stuart Banner argues that prospectors, settlers, and governments arrived on frontiers with shared ideological baggage derived from British understandings of ownership and rights, and then adapted these ideas based on local circumstances. Stuart Banner, *Possessing the Pacific: Land, Settlers, and Indigenous People from Australia to Alaska* (Cambridge, Harvard University Press, 2007), 5.

out fully at Porcupine: a brief prospecting period based on surface gold quickly gave way to syndicate-funded development, expansion underground, community building, large-scale environmental change, and, eventually, closure. Porcupine's place at the mature end of the tumultuous nineteenth century gold rushes make it a useful case study for understanding how gold rushes influenced local environmental histories elsewhere.

Mining historiography has traditionally served separate celebratory *nationalist* mythologies. According to these stories, gold rushes and gold mining provided the unique and essential cultural, political, and economic conditions for independent state-building in Australia, Canada, New Zealand, South Africa, and the United States.[7] In the well-worn gold rush narrative, an enterprising independent prospector in the remote wilderness stumbles on his riches through a combination of good fortune, entrepreneurial spirit, and backwoods acumen. His discovery facilitates the extension of the state into the frontier, bringing law, infrastructure, and civilization. Eventually, morally ambiguous mining camps reform into stable economies (usually agricultural), leaving a legacy of hardy and enterprising spirit among citizens. Mining and prospector myths are parts of larger "frontier" theses popularized by Frederick Jackson Turner in the United States.[8] Although the frontier proved less compelling as an explanation for state formation and identity in Canada, mining played a central role in resource-focused economic and

[7] These narratives are most well-developed in Australia and the United States. For Australia, see Geoffrey Blainey, *The Rush That Never Ended: A History of Australian Mining* (Parkville: Melbourne University Press, 1963). For the United States see: Rodman Paul, *Mining Frontiers of the Far West 1848-1880* (New York: Holt, Rhinehart, and Winston, 1964).

[8] Turner argued that the availability of "empty" land in the American west encouraged the formation of a liberal democratic society which rejected established institutions and celebrated individualism. Frederick Jackson Turner, *The Significance of the Frontier in American History*, (Henry Holt and Company: New York, 1920), chapter 1.

political theories of scholars like Harold Innis and Donald Creighton.[9] Mining companies still use the entrepreneurial prospector narrative to represent their work to the world, even though the act of extraction has changed significantly over the past hundred years. The relative invisibility of industrial mining to mining's distant consumers have granted this gold rush narrative lasting power in the western imagination.

Since the environmental movement and the emergence of environmental history in the 1980s, some historians have turned the old celebratory mining myths upside down. These historians argue that if the mining industry granted the state a hardy and enterprising spirit, it also left a legacy of exploitation, destruction, and short-sighted profit-seeking. In the hands of this new generation of historians, mining stories became inward looking criticisms of the nation and its dysfunctional relationship to nature.[10] The industry has an easy appeal as a metaphor for humanity's deteriorating relationship with the planet as a whole: precious metals replace themselves only after eons, so our reliance on them is inherently unsustainable. With the arrival of the Anthropocene as a new geological epoch, mining provides a useful window for understanding the roots of our present crisis. While environmental historians reject the celebratory tone of the older

[9] Michael Cross, ed. *The Frontier Thesis and the Canadas* (Toronto: Copp Clark, 1970). Innis argues that Canada's dependence on primary resources (including gold) shaped its economic, social, and political history. Harold Innis, *The Fur Trade in Canada* (Toronto and Buffalo: University of Toronto Press, 1956). Creighton emphasized the importance of water routes in determining the organization of the Canadian state. Donald Creighton, *The Commercial Empire of the St. Lawrence, 1760-1850* (Toronto: Ryerson, 1937). Kerry Abel provides a useful analysis of frontier theory in the context of the Porcupine/Timmins region in *Changing Places: History, Community, and Identity in Northeastern Ontario* (Kingston: McGill-Queens University press, 2006), 400.

[10] With a few important exceptions, two of the most notable being George Fetherling, *The Gold Crusades: A Social History of Gold Rushes, 1849-1929,* revised edition, (Toronto: University of Toronto Press, 1997) and John McNeill and George Vrtis, *Mining North America: An Environmental History Since 1522* (Vancouver: UBC Press, 2017).

narrative, they maintain its internally-focused, state-based infrastructure. Mining communities become microcosms of larger environmental stories, but their connections to each other, especially across oceans, remain underemphasized.

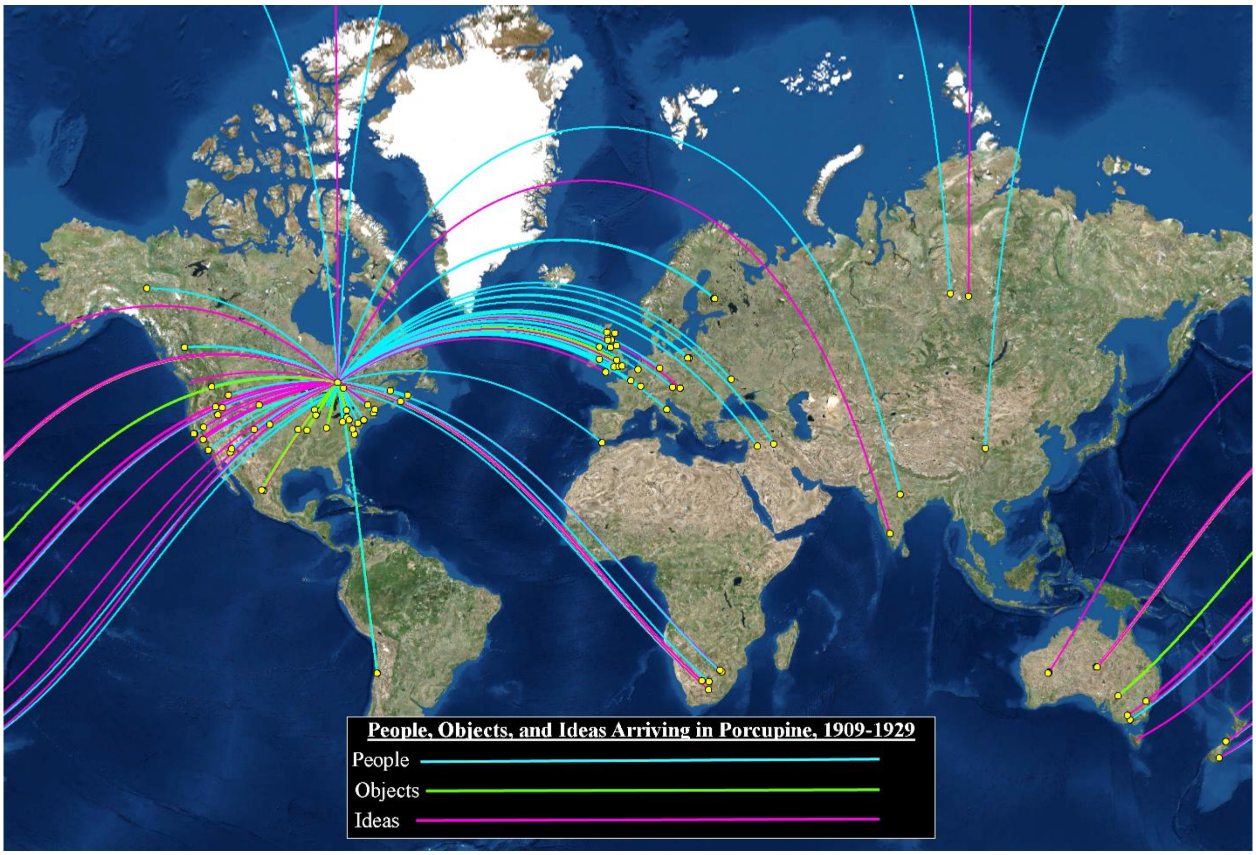

Figure 2 "People, Objects, and Ideas Arriving in Porcupine, 1909-1929," Map created by author with the support of the Sherman Centre for Digital Scholarship, McMaster University, 2017. Full colour map and data available on scholars portal at: https://doi.org/10.5683/SP/26CE5W.

A scattered collection of mining histories chronicle transnational exchange between mining states.[11] They tell a story of technological and legal exchange, migration,

[11] In the 1960s, New Zealand historian Phillip Ross May produced a series of books and articles tracing the origins of gold rush terminology and technology back to their (largely Californian) sources in addition to writing what is widely accepted to be the foundational texts on New Zealand gold rush history. May, Phillip Ross. *On the Motherlode* (Christchurch: University of Canterbury Press, 1971); May, Phillip Ross. *Origins of Hydraulic Mining in California* (Oakland: The Holmes Book Company, 1970); May, Phillip Ross. *The West Coast Gold Rushes* (Christchurch: Pegasus Press, 1962). Poet and novelist George Fetherling's *The Gold Crusades* treats the international gold rushes as an "expression of the British imperial experience and

and ideology between mining zones. Few mining frontiers developed independently, and although usually in-ward focused, scholars have noticed the heavy borrowing of labour, technology, and law between states on matters related of extraction. The trajectory of the historiography starts in colonial Latin America, where a blend of old and new-world miners used a fusion of ideology and technology to extract gold in sixteenth century Mexico, Peru, and Colombia.[12] The Californian gold rush of 1848 extended this early hunt for El Dorado into the formative frontier history of the United States, where it would achieve popular status as an agent of state-building, liberalism, and development among the British colonies and successor states.

After 1848, a domino-like succession of gold rushes touched off in Australia, British Columbia, New Zealand, South Africa, Alaska, and Northern Ontario. Gold in the

nineteenth century liberalism." Introduction to the revised edition, Fetherling, *The Gold Crusades,* I. Ian Tyrell's 1999 *True Gardens of the Gods* traced the exchange of environmental ideas between the United States and Australia in the aftermath of the gold rushes. Tyrell, Ian. *True Gardens of the Gods: Californian-Australian Environmental Reform 1860-1930*. Berkeley: University of California Press, 1999. In 2010, in their introduction to a special edition of the *Australian Economic History Review* called "A World in Search of Gold," Keir Reeves, Lionel Frost, and Charles Fahey called for more transnational histories of mining. Kier Reeves, et. al., "Integrating the Historiography of the Nineteenth-Century Gold Rushes," *Australian Economic History Review* 50 (2)(2010): 111-128. Since then, a flurry of Australian research has answered the call. In 2010 Simon Chapple wrote a doctoral dissertation describing the influence of California gold rush land law on comparable Australian legal regimes. Simon Chapple, "Law and Society Across the Pacific: Nevada County, California, 1849-1860 and Gympie, Queensland, 1867-1880," (PhD diss., University of New South Wales, 2010). In a 2013 article, economic historian Warwick Frost argued that gold rush immigrants established an exploitative relationship to the environment which persists to this day. Frost, "The Environmental Impacts of the Victorian Gold Rushes," 78. In their 2015 examination of tailings regulation in Australia, Susan Lawrence and Peter Davis draw direct parallels between the Australian experience and similar experiences in California and New Zealand. Susan Lawrence and Peter Davis, "The Sludge Question: The Regulation of Mine Tailings in Nineteenth-Century Victoria," *Environment and History* 20 (2014), 385-404.

[12] Heidi Scott, "Taking the Enlightenment Underground: Mining Spaces and Cartographic Representation in the Late Colonial Andes," *Journal of Latin American Geography* 14 (3)(October 2015), 7-34. David Studnicki-Gizbert and David Schechter, "The Environmental Dynamics of a Colonial Fuel Rush: Silver Mining and Deforestation in New Spain, 1522 to 1810," *Environmental History* 15 (1) (January 2010), 94-119. Lorena Campuzano Duque, "From Mazamorreros to Illegal Miners: The Ecology of Gold in the Colombian Andes, 1850–1952," (PhD Diss., Binghampton University, 2019).

nineteenth century had universal value in the gold standard and mining existed under shared cultural, legal, and social regimes in these states.[13] In California, Australia, and British Columbia, a 1785 British Crown Ordinance stated that the monarchy owned any precious metals found on public land.[14] This Ordinance was found lacking on all three frontiers, especially in the aftermath of American anti-monarchism and frontier liberalism in California. Instead, miners made up their own rules in line with the structures and traditions they knew from English common law and knowledge of South American silver and Wisconsin lead mines.[15] Although the details of gold mining law varied from place to place, all possessed some form of claim law dictating the number of claims a miner could own, its dimensions, and conditions for maintaining and transferring title.[16]

Even though Ontario did not yet possess mineral lands on the same scale as the nineteenth-century gold rush frontiers, the province's politicians were paying attention from an early date. Although they could bring chaos, gold rushes were also desirable stimulants for frontier economies and tight colonial budgets. Hoping to attract and encourage prospectors in 1864, the Ontario cabinet did away with royalties and set the outright price of ownership of mineral-bearing land at two dollars per acre.[17] In doing so, legislators made explicit reference to the international mining context. According to Thomas Gibson, who worked for the Ontario Bureau of Mines from 1880 until 1941, "the

[13] Morse, *The Nature of Gold,* 17-39.
[14] Chapple, "Law and Society Across the Pacific," 59.
[15] John Phillip Reid, *Law for the Elephant: Property and Social Behaviour on the Overland Trail* (San Marino: The Huntington Library, 1980); Paul, *Mining Frontiers of the Far West,* 23.
[16] Paul, *Mining Frontiers of the Far West,* 23.
[17] H.V. Nelles, *The Politics of Development: Forests, Mines, and Hydro-Electric Power in Ontario 1849-1941* (2nd ed.) (McGill-Queens University press: Montreal and Kingston, 2005), 20-21.

Californian discoveries in 1848, those of Australia in 1851, and of British Columbia in 1858, were fresh in the minds of the legislators" when it came to new 1864 mining law.[18]

As the nineteenth century progressed, the application of mining law on the global gold frontiers proved uneven and difficult. Miners struggled regularly with monopolisation, conflicts over resources (especially water), claim jumping, speculation, and violence.[19] As the world neared the end of the century, industrial techniques like quartz milling and hydraulic mining emerged on the gold fields as a way of adapting to the disappearance of alluvial (surface) gold and the need to look for lower concentrations or greater depths to make a profit.[20] Large scale extraction had large-scale environmental consequences: Increasing scale exacerbated tensions between land-users as miners pushed the limits of their environments.[21] Regulators struggled to keep up with the human and environmental consequences.[22]

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[18] Thomas Gibson, *The Mining Laws of Ontario and the Department of Mines,* (Toronto: Kings Printer, 1933), *9.*

[19] See, for example, Robert Kelley's classic account of hydraulic mining versus agriculture in the Sacramento valley. Robert L. Kelley, *Gold Vs. Grain: The Hydraulic Mining Controversy in California's Sacramento Valley: A Chapter in the Decline of the Concept of Laissez Faire* (Arthur H Clark Company: Glendale, 1959).

[20] Paul, *Mining Frontiers of the Far West 1848*-1880, 20-21. These new methods led to a resurgence in the stagnating California industry in the 1860s. May, *On the Motherlode*, 18-19; 30-32.

[21] Some historians of California have argued that miners' transience encouraged an attitude of indifference to ever more obvious environmental damage. Raymond Dasmann, "Environmental Changes Before and After the Gold Rush," in *A Golden State: Mining and Economic Development in Gold Rush* California Richard Orsi and James Rawls eds. (Berkeley: University of California Press, 1999), 105. Others see the environmental destruction associated with the rush as part of a broader lack of concern for conservation, emphasis on efficiency, faith in capitalism, and the idea that the exploitation of gold overrode concerns about damage. Andrew Isenberg, *Mining California: An Ecological History* (New York: Hill and Wang, 2005), 16.

[22] In New Zealand, the 1861 Otago gold rush saw the early adoption of industrial technology including water-wheels, flumes, and hydraulic nozzles. According to Otago historian Erik Olsen, "by 1865, 535 miles of water races existed at Topeka" and there were 510 more miles at Dunstan. Erik Olsen, *A History of Otego* (Ann Arbour: Michigan, 1984), 64-65. Regulation based on Californian and Australian examples (which sought to encourage free enterprise and remove barriers to exploitation) quickly proved inadequate for regulating this new type of gold mining. Terry Hearn, "Mining the Quarry," in *Environmental Histories*

Although Porcupine gold still lay hidden under northern muskeg in the late nineteenth century, Ontario was not immune to the industrial problems of the age. It was during these years that Richie's Canadian Copper Company made a significant profit while paying virtually nothing back to Ontario and leaving behind a toxic mess in Sudbury.[23] The Mowat government responded to the disaster by reversing its earlier policy of encouragement toward mining. Prospectors faced higher prices per acre for mineral bearing land and the re-introduction of a royalty scheme for precious metals.[24] Such centralised control sharply contrasted notions of free and unrestricted enterprise lauded in California, Australia, and British Columbia. Attitudes had changed. Growing anti-American sentiment and an awareness of the failures of mining regulations elsewhere encouraged Ontario to forge its own path in conscious avoidance of others' mistakes.[25]

The depression of the 1890s saw significant slowdown and disillusionment in mining economies all over the world. Even in places where accidents of geography produced large, dependable hard rock deposits, uncertainty reigned. Witwaterstrand's predictable "reef" formation allowed for rapid take-over by industrial developers, but environmental conditions and tensions with farmers, pastoralists, and migrant labour plagued the industry.[26] In the Klondike, exuberance over new discoveries was tarnished by food shortages and legal difficulties exacerbated by the gold field's severe winters and

of New Zealand, Eric Pawson and Tom Brooking, eds. (Oxford University press, Melbourne, 2002), 84-85. Similar problems occurred in California. Kelley, *Gold Vs. Grain*.

[23] Nelles, *The Politics of Development*, 25.

[24] Nelles, *The Politics of Development.* 27.

[25] Nelles, *The Politics of Development*, 29.

[26] Alan Patrick Cartwright, *The Gold Miners* (Purnell, 1962), 8. Using oxcarts, companies brought in a considerable amount of heavy equipment, especially stamp mills, within the first few months of discovery. Much of the money and equipment came from the diamond mines. Cartwright, *The Gold Miners*, 57, 78.

isolation.[27] Industrial mining had promised efficiency and an end to the unpredictability that plagued the volatile rushes.[28] Over fifty years of experimenting on multiple gold rush frontiers failed to create stability. The failure and decline of prominent gold fields in California, Australia, and British Columbia combined with several wildcat speculation busts created pessimism and disillusionment in parts of the industry despite the excitement provoked by new finds.

The return of economically favourable conditions after the turn of the century saw a return of prospectors to the remote frontiers of the British colonies and successor states. In northern Ontario, the construction of the Temiskaming and Northern Ontario Railway (T. & N. O.) beginning in 1902 led to silver discoveries and the Cobalt silver rush in 1903. As the railway pushed further north, prospectors and Indigenous guides discovered gold in quartz formations near Porcupine Lake, initiating a gold rush in 1909. The Porcupine Gold Rush marked a turning point in the province's history recognised by Ontario historians. Popular writers celebrate the discovery and development of Porcupine as part of a broader progressive trajectory of northern development through the perspective of white, male settler culture.[29]

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[27] Fetherling, *The Gold Crusades*, 124-125, Morse, *The Nature of Gold*, 138-141.

[28] Timothy LeCain, *Mass Destruction: The Men and Giant Mines that Wired America and Scarred the Planet* (New Brunswick: Rutgers University Press: 2009), 20; Kent Curtis, *Gambling on Ore: The Nature of Metal Mining in the United States* (Boulder: University of Colorado Press, 2013), 16.

[29] See, for example, L. Carson Brown, *The Golden Porcupine,* 2nd ed., (Ontario Department of Mines, 1968), Philip Smith, *Harvest from the Rock : A History of Mining in Ontario* (Macmillan of Canada, 1986); Barnes, *Fortunes in the Ground*; and *100 Years : Ontario Bureau of Mines* (Ministry of Northern Development and Mines, 1991) as well as Charles P. Girdwood, Lawrence Jones, and George Lonn, *The Big Dome : Over Seventy Years of Gold Mining in Canada* (Cybergraphics Co., 1983), and Gerald E. Boyce, *Eldorado: Ontario's First Gold Rush* (Natural Heritage/Natural History, 1992). The major exception is local Member of Parliament Charlie Angus, who has written several books on social inequality and tumultuous labour history at Porcupine. See *We lived a Life and Then Some* (Between the Lines, 1996),

Critical scholarly research examines geological and economic publications related to the physical deposition of gold in the ground and its operations within the market economy.[30] For example, historian of technology Dianne Newell wrote in *Technology on the Frontier* that mining contributed to Canada's role as "a supplier of staple commodities" in the tradition of Innis' staples thesis.[31] She focuses especially on the way transnational technology was adapted to function in a northern climate, and argues that putting a Canadian twist on imported machinery was the key to the industry's success.[32] Critical scholarship also addresses gender and class in northern Ontario during the mining period. Peter Vasiliadis' cultural history dissertation explores the history of interethnic competition and labour in the camp and argues that corporate pursuit of profit agitated existing divisions between members of the mining community. Nancy Forestell's research examines gender, work, and community in Timmins for the period between 1909 and 1950.[33] Other research by historians like H.V. Nelles and Jean Manore places the Porcupine Gold Rush in the wider context of colonialism, power, and politics in early

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Industrial Cathedrals of the North (Between the Lines, 1999), and *Mirrors of Stone: Fragments from the Porcupine Frontier* (Between the Lines, 2001).

[30] For example: Bateman, R, and Ontario Geological Survey. *The Timmins-Porcupine Gold Camp, Northern Ontario: The Anatomy of an Archaean Greenstone Belt and Its Gold Mineralization.* Sudbury: Ontario Geological Survey, 2005; David Groves, Richard Goldfarb, and Craig Hart, "Gold Deposits in Metamorphic Belts: Overview of Current Understanding, Outstanding Problems, Future Research, and Exploration Significance," *Economic Geology* 98(1)(1 January 2003): 1-29; J.A.Fyon, A.H. Green and the Geological Survey of Canada, *Geology and Ore Deposits of the Timmins District, Ontario* (1991).

[31] Dianne Newell, *Technology on the Frontier: Mining in Old Ontario* (Vancouver: University of British Columbia Press, 1986), 7.

[32] Newell, *Technology on the Frontier*, 141.

[33] Peter Vasiliadis, "Dangerous Truth: Dangerous Truth: Interethnic Competition in a Northeastern Ontario Goldmining Center," (PhD Diss., Simon Fraser University, 1984); Nancy Forestell, "All That Glitters is Not Gold: The Gendered Dimensions of Work, Family, and Community Life in the Northern Ontario Goldmining Town of Timmins, 1909-1950," (PhD Diss., University of Toronto, 1993).

twentieth century Ontario.[34] Although environmental and transnational forces permeate these accounts, they tend to be secondary to explanations of the technological, social, cultural, and political contributions of Porcupine mining to local, provincial, or national history.

Porcupine, Industrial Mining, and the World

As Porcupine embarked on a new gold rush experiment, miners, mining companies, and legislators could look back on the nineteenth century world and see enormous potential profits, dangerous social and legal pitfalls, and a few clear lessons for its own development. The Canadian Shield offered unique environmental barriers to efficient exploitation of the new deposit. The larger problem remained that precious metals are finite, and without new discoveries industry would die.[35] Even as they pulled back the muskeg to expose massive veins of gold-bearing rock, prospectors, miners, investors, geologists, and legislators all understood these facts and attempted to mitigate them.

At first glance, Porcupine's extraordinarily long life appears to testify the miners' success. Here is a gold rush that defied the classic boom/bust cycle. Porcupine is North America's longest continually operating gold mine – in 2018, Goldcorp still pulls profits from its open pit on the site of the original 1909 find.[36] Porcupine's exceptional longevity

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[34] Nelles, *The Politics of Development*; Jean L. Manore, *Cross-Currents: Hydroelectricity and the Engineering of Northern Ontario* (Wildfred Laurier University Press, 1999).
[35] As Thomas Gibson wrote in his statistical review for the 1918 Annual Report of the Bureau of Mines, "Gold and silver mines are not like farms, and cannot be worked for ever, or even for many years. There must be a constant succession of new properties to take the place of those being exhausted, otherwise the industry will languish." *Twenty-Seventh Annual Report of the Ontario Bureau of Mines 1918* (Toronto: King's Printer, 1918), 5.
[36] "Porcupine Project," Goldcorp Inc., accessed 1 April 2018, https://www.goldcorp.com/English/portfolio/operations/porcupine/default.aspx.

is partly a product of geology and partly a product of human history. The deposits went deeper and contained more gold than any of the first discoverers could have imagined. The rush also had good historical timing: in the early twentieth century, northern Canada was on the cusp of industrial transformation and increasingly connected to the global market economy.[37] Fifty years of mining experiments around the world offered the intellectual, technological, and economic tools required to make Porcupine mining successful. Almost the entire story of industrial mining ingenuity lay ahead of the industry when gold was discovered in 1909, including a host of techniques for extracting ever more finely distributed fragments of hard rock gold.

While the town never went bust in the spectacular way of some of its contemporaries, it has experienced a longer, slower, more uneven kind of decline. Gold at Porcupine never ran out because the industry adapted to the changing requirements of geology and environment, and because it could draw on powerful corporate, government, and human transnational networks to do so. However, the industry's control over the whole process remained tenuous. The continued life of the industry was only assured through enormous sacrifices on behalf of miners, managers, investors, First Nations, and community members. As they industrialised the mining companies could never fully shed the inherent risk and uncertainty of their business. They could only forestall, not eliminate, environmental and geological limits of their activities on the land.

Porcupine became a birthplace and a testing ground for modern relationships with the environment in Canada and in the mining community broadly. The modern Canadian

[37] Liza Piper, *The Industrial Transformation of Subarctic Canada* (Vancouver: UBC Press, 2009): 1-12.

mining industry still bears Porcupine's mark. The power of transnational capital, science, labour, technology, and communication has become even more central to the industry in the present. Canada's reputation as a leader in these areas is rooted in its mining past and the growth of the industry in northern Ontario. Since the 1980s, Canada has earned a dubious modern reputation as both a centre of international mining and a regular perpetrator of environmental injustice in developing states, especially Africa and Latin America. At the time of writing, a coalition of Indigenous Maya Q'eqchi' women are suing Canadian-owned Hudbay minerals in Ontario's supreme court for human rights violations and Barrick Gold's Pascua-Lama operation is still undergoing a prefeasibility following a $16 million dollar fine levelled by the Chilean government after civilians complained about environmental damage.[38] Canada's influence in these areas travels along a combination of newly formed and old well-worn networks, many established and strengthened on the shores of Porcupine Lake between 1909 and 1929.

In keeping with the central premise that both local circumstances and international themes determined the environmental history of the Porcupine, the body of the dissertation weaves together an international with a local gold rush story. Chapter One starts by setting the geological and human stage for the gold rush using the earliest

[38] Ashifa Kassam, "Guatemalan women take on Canada's mining giants over 'horrific human rights abuses,'" *The Guardian*, 13 December 2017, (accessed 5 January 2017), https://www.theguardian.com/world/2017/dec/13/guatemala-canada-Indigenous-right-canadian-mining-company; "Barrick Third Quarter2017 Results," 25 October 2017 (Accessed 5 January 2018), http://www.barrick.com/investors/news/news-details/2017/Barrick-Reports-Third-Quarter-2017-Results/default.aspx; "Chile Fines Barrick Gold 16m for Pascua-Lama mine," BBC News, 24 May 2013 (Accessed 5 January 2017), http://www.bbc.com/news/world-latin-america-22663432. For a detailed analysis of Canadian mining and its dubious reputation in Africa see Paula Butler, *Colonial Extractions: Race and Canadian Mining in Contemporary Africa* (Toronto: University of Toronto Press, 2015).

surveys of the area conducted by the Ontario Bureau of Mines. The second half of the chapter tells the story of the gold rush in its earliest years, from 1909 until the end of 1910, as participants forged the first connections between Porcupine and an international mining context. It focuses on the first scientific, media, and corporate networks which informed geological knowledge, brought over the first prospectors, and spread investment capital around the mining zones.

Just as industrial mining was picking up at Porcupine, the town was devastated in 1911 by a massive bushfire. Chapter Two deals with the local and transnational reach of this transformative disaster. Although fire cycles were a well-known and well-documented characteristic of Porcupine ecology, 1911 took the mining community (and the world) by surprise. Part of a broader North American fire phenomenon between 1910 and 1911, it facilitated the consolidation of power in the hands of a few well-financed companies at the expense of smaller operations who could not afford to re-build.

Chapter Three examines the entrenchment of the industry through the First World War. As Porcupine miners shed blood on European soil, the industry back home became tangled in demoralizing projects of nationalism and home-front production. Northern Ontario's failure as an agricultural frontier, its continued dependence on the urban south, and a lack of war-time mining labour caused growth, industrialization, and production to slow even though exploration and technological advance continued. When the armistice finally arrived in Europe, the industry expanded rapidly, only to find itself confronted with new limits. There was not enough labour or water to power the mines, and the continued viability of the industry depended on its ability to transfer some of the costs of production to marginalized people, including Mattagami First Nation and ethnic workers.

Chapter Four deals with the mining industry as it boomed through the roaring twenties. Yet environmental problems bubbled under the surface including persisting problems with the cold shield climate, fires, tailings disposal, and industrial disease. Two major disasters brought the 1920s to a close and exposed the invisible costs of industrial expansion. The 1928 Hollinger Fire shocked the global mining industry and transformed safety practices in hard rock mines internationally. Then the silicosis crisis, already wrecking havoc in Australia, South Africa, and the United States, arrived on Canadian soil. Faced with dying miners and increasing compensation costs, the Ontario government and the mining industry joined a growing international conversation about how to manage the disease.

In the end, the continuation of industrial mining at Porcupine relied on an interdependent, multinational web of people, knowledge, and objects which intersected on Ontario's landscape between 1909 and 1929. By 1930, corporations already perceived the potential public-relations payoff of tracing their lineage to the famous and oft-romanticised California, Australia, British Columbia, New Zealand, South Africa, and Klondike gold rushes. Even as they promoted the Porcupine as the progeny of these romanticised rushes, they scrambled to deal with a new series of major industrial crises. The Conclusion reflects on conservation and multiple-use conflicts in Porcupine in the context of the industry's emerging self-confidence on the world stage.

Chapter 1: "Promise of Reward to the Prospector:" An Environmental History of the Porcupine to 1910

Ten years before the 1909 Porcupine Gold Rush, Bureau of Mines surveyor William Arthur Parks walked the portage between Mattagami River and Night Hawk Lake, meters from millions of dollars worth of gold. He photographed rocky outcrops on Porcupine Lake but, ironically, his final report would contain no significant discussion of mineral wealth. With the benefit of hindsight, popular historians seize on one casual comment ("I regard the region south of the trail to Porcupine Lake as giving promise of reward to the prospector") as a prophetic vision of the area's golden future.[1] Actually, Parks regarded northern Ontario as giving promise of reward to just about everyone. A product of true turn-of-the-century optimism about the productive potential of Canadian nature, Parks envisioned any number of potential futures for the region he covered: agricultural hinterland, lumber mecca, massive peat farm, or hydroelectric producer. Before 1909, nothing distinguished the future Porcupine gold camp from anywhere else in northern Ontario.[2] Parks' "promise of reward" merely reflected his overwhelming certainty that this vast shield landscape was destined to be a valuable economic hinterland one way or another.

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[1] William Arthur Parks, "Niven's Base Line 1899," *Report of the Bureau of Mines* 1900 (Toronto: Queen's Printer, 1900), 141.

[2] As Jocelyn Thorpe argues in *Temagami's Tangled Wild*, northern Ontario possessed multiple meanings for different people at different times. However, some visions came to dominate the imaginative and physical landscape more than others, in line with social and racial structures in Canadian society. Jocelyn Thorpe, *Temagami's Tangled Wild: Race, Gender, and the Making of Canadian Nature,* (Vancouver: UBC Press, 2011).

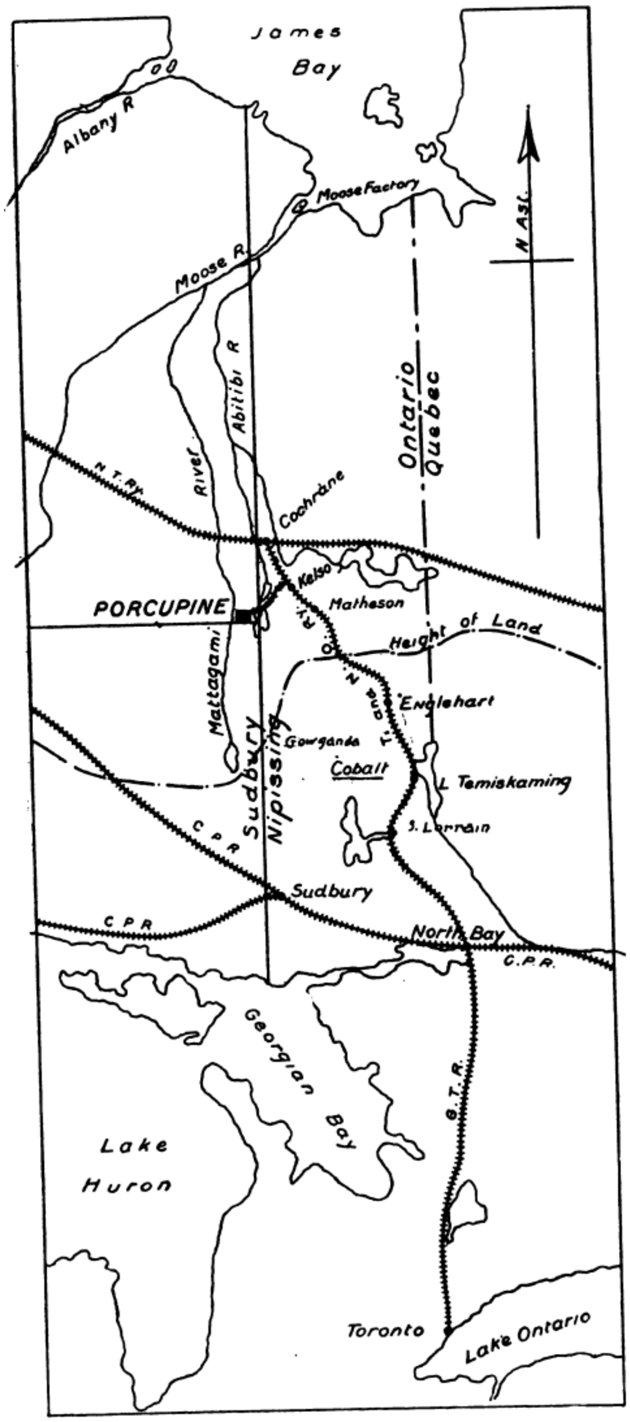

Figure 3 Map showing Porcupine's location in relation to Toronto. "Key Map," The Davis Handbook of the Porcupine Gold District, (New York: 1911), 10.

Parks' utter faith in the productive potential of northern Ontario turned out to be well placed, even if he failed to see the gold right under his feet. A favourable global industrial investment climate, government boosterism, and surface gold produced the 1909 rush. Pursuing dreams of agricultural rather than mineral greatness, the provincial government had begun pushing the T. & N. O. into its nascent industrial hinterland in 1902. As workers ripped up moss and broke up the shield rocks for track, they found deposits of precious metals left where centuries of geological and environmental change had placed them. Over fifty years of well publicised rushes in the United States, Australia, British Columbia, New Zealand, South Africa, and the Klondike had established precedents for what would come next.[3] With the market economy slowly recovering after its turn-of-the-century slump, professional prospectors -- many of them migrants from other goldfields -- began mobilising capital, governments established mining regulations, and new internationally-funded companies imported the latest extraction science and technology to turn shield rock into profits.[4] Established international mining journals which had made a business of following global gold strikes - including the American *Engineering and Mining Journal* and the *Canadian Mining Journal* – jumped to action. Only a few months after the discovery, Porcupine could be found advertised as an investment opportunity in their columns.

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[3] As George Fetherling argues, by 1909 the Porcupine prospectors "worked against a backdrop of what by then was a familiar set of circumstances" considering the long history of gold rushes which had taken place around the world up to that point. George Fetherling, *The Gold Crusades: A Social History of Gold Rushes, 1849-1929* (Toronto: University of Toronto press, 1997), 165.

[4] Fetherling locates the rise of scientific prospecting in northern Ontario's early mineral rushes. "Generations of prospectors had been quick to disguise their past to accept distinctions like forty-niners and sourdough, which suggested amateur status. Now the trend was reversed. Humble prospectors often made brief appearances at mining schools." Fetherling, *The Gold Crusades*, 171.

Rather than a neat linear trajectory from fortuitous mineral discovery to national industrial hinterland, the history of Porcupine quickly became a messy tangle caught between the triple forces of government optimism, local material and cultural geographies, and international mining markets. Parks' alternative destinies for the northland, particularly as agricultural frontier, refused to go away, and would return to haunt the mining community on a regular basis. Aside from a few spectacular surface deposits, most of the gold existed in complicated low-grade deposits under a landscape in constant flux: Insect and fire cycles, vegetative succession, variable precipitation, severe seasonal shifts, and pre-existing human hunting, trapping, gathering, agriculture, route-making, and other activities shaped the landscape according to their own priorities and in ways not always conducive to mining. In terms of overall human use and occupation of the area around Porcupine Lake, a century of mining remains a tiny blip in a long trajectory of environmental change. More broadly, the early twentieth century was an awkward time for a global mining industry caught halfway between frontier individualism and big-time corporatism. While transnational technologies, capital, and migration sometimes enabled extraction, their transmission could be uneven, unpredictable, disappointing, and slow, especially when confronted with the unique conditions of Canadian Shield ecology. The messy convergence of history at Porcupine Lake facilitated the establishment of the mining industry by 1910, but not without difficulty, conflict, and misunderstanding between humans and nature.

Geologic and Human History in Anishnaabek Homelands to 1900

Despite the massive amount of professional scientific effort aimed at the Porcupine since 1909, the exact details of the location and extent of gold deposits in Northern Ontario still remain largely unknown. Even the most up-to-date information on the Ontario Ministry of Northern Development and Mines website compares finding precious metals to looking for "a needle in a haystack" because the deposits are tiny pockets of wealth distributed in unpredictable patterns within a vast and varied body of the Canadian Shield.[5] Nevertheless, geologists now know that collisions within Canadian Shield rock between 4.5 and 540 million years ago provided the necessary conditions for gold deposition. These collisions caused cracks or other spaces within host rocks.[6] Gold atoms floating in liquid magma pushed into these spaces and hardened, often within crystalline structures such as quartz and feldspar.[7]

Over the next few million years, cycles of erosion, sedimentation, and tectonic shifts changed the shape and locations of hardened gold. The Canadian shield contains some of the oldest rocks on earth. Unlike in British Columbia and the Klondike, where the mountains are comparatively young and the gold freshly exposed to the forces of wind and water, much of the gold in Ontario was long ago broken apart and widely dispersed by time and nature. Ice finally retreated fully from Northern Ontario between 8,000 and

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[5] "Metallic Minerals," Ontario Ministry of Northern Development and Mines, (25 May 2012) http://www.mndm.gov.on.ca/en/mines-and-minerals/geoscience/metallic-minerals (Accessed 08/08/2016).
[6] A.C. Colvine, ed., *The Geology of Gold in Ontario, Ontario Geological Survey Miscellaneous Paper 110* (Ministry of Northern Development and Mines, 1983), 3.
[7] C.J. Hodgson "Preliminary Report on a Computer File of Gold Deposits of the Abitibi Belt, Ontario," in A.C. Colvine, ed., *The Geology of Gold in Ontario, Ontario Geological Survey Miscellaneous Paper 110* (Ministry of Northern Development and Mines, 1983), 32.

9,000 years ago leaving behind a complex network of lakes and rivers.[8] Some gold deposits remained protected within polished-down outcroppings, but others were swept away and re-deposited wherever water and the topography took them.

Humans followed the ice as it retreated north over a mixed landscape of low, wet muskeg and higher, glacially eroded shield-rock. In general, the soil is thin and acidic (except where the Northern Ontario clay belt covers part of the region), and the summers cool. Berry crops thrived, and the entire shield is subject to regular regenerative forest fires, which early residents used to initiate new cycles of vegetative growth.[9] The landscape changed dramatically over time. Aside from regular fires, the non-human environment underwent other major transitions: For example, historians and geographers note the increased abundance of white pine over time. They also trace fluctuations in the range and extent of Ontario grasslands (possibly because of Indigenous modification).[10]

A full description of Porcupine's human and environmental history since the retreat of the glaciers lies beyond the scope of this study. Several Algonquin-speaking groups and possibly Cree occupied the Porcupine mining region before the first Europeans arrived.[11] The modern Mattagami, Matachewan, Abitibi and Flying Post First Nations, which currently occupy the Porcupine mining area, descended from these people. Highly mobile, northern Indigenous communities harvested resources according to seasonal availability.[12] Pre-colonial population estimates are difficult because European disease

[8] Donald Smith, *Aboriginal Ontario: Historical Perspectives on the First Nations* (Toronto: Dundurn Press, 1994), 4.
[9] Smith, *Aboriginal Ontario*, 4, 14.
[10] Smith, *Aboriginal Ontario*, 15.
[11] Smith, *Aboriginal Ontario*, 276.
[12] Smith, *Aboriginal Ontario*, 280.

reached Indigenous communities ahead of face-to-face contact, drastically reducing numbers while leaving few oral or written accounts.[13]

Fur traders arrived at Porcupine Lake by the middle of the seventeenth century. In the immediate vicinity of future mine site, tensions with English traders led the French to establish a series of posts in the area, on Nighthawk Lake in 1673 and Lake Timiskaming in 1679.[14] Local people called Nighthawk Lake and the Frederick House River (which flows out of it) Piscoutagamy or Puscoutagamy.[15] After the fall of New France, Scottish-American traders became the new competition for the Hudson's Bay Company, creating favourable trading conditions for Indigenous trappers through the late 1700s and early 1800s. Sometimes competition turned violent: Competing trappers burned the post at Frederick House Lake to the ground in 1813, killing the manager, several labourers, and Indigenous allies.[16] The fur trade caused a steady depletion of furs and big game after 1800 so that by the mid-nineteenth century, many communities had shifted to reliance on fish, small game, and trade goods.[17]

In 1905, Treaty Number Nine legally removed Indigenous title from 210,000 square miles of Ontario (about two thirds of the province's total area) encompassing the entire drainage basin for Hudson and James Bay. The last of Ontario's numbered treaties, Treaty Nine originated from Indigenous requests for support from the headwaters of the

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[13] Smith, *Aboriginal Ontario*, 281.
[14] Smith, *Aboriginal Ontario*, 282.
[15] Elaine Allan Mitchell, *Fort Temiskaming and the Fur Trade* (Toronto: University of Toronto Press, 1977), 8.
[16] Smith, *Aboriginal Ontario,* 293. This study primarily addresses settler relationships with land, so settler place names have been retained throughout for clarity.
[17] Depletion was ameliorated somewhat by conservation efforts following the Hudson's Bay Company monopoly in 1821. Smith, *Aboriginal Ontario,* 302; 307; Smith, *Aboriginal Ontario,* 317.

Albany, Missinaibi, and Abitibi Rivers where livelihoods had been most affected by the decline of the fur trade.[18] Indian Affairs and the Department of Crown Lands were happy to oblige, as they saw Indian title as a barrier to industry and development.[19] Specifically, proponents argued that the extension of the T. & N. O. railway north of the height of land (and associated resource exploration in the region) required legal cessation.[20] By that time, a 1903 silver rush to Cobalt, lying just within the northern edge of Robinson Treaty lands, had already suggested the possibility of further mineral wealth on the shield. As part of Treaty Nine, Indian Affairs allocated reserves to First Nations, including reserves for Matachewan, Mattagami, Abitibi, and Flying Post First Nations, which currently hold the nearest reserves to the modern mining community. The reserves tended to occupy the land around Hudson's Bay Company forts, and thus were relatively distant from Porcupine Lake itself.[21] As a result, by 1909 there were no colonial legal or title barriers to prospectors and developers taking ownership over gold-bearing land at Porcupine Lake. Practically speaking however, Indigenous people continued to live and work the areas claimed by miners. Treaty commissioners recorded Indigenous settlements in and around the site of modern-day Timmins during their trip through the area in 1906, and described a winter settlement on Nighthawk Lake maintained for purposes of winter fur trapping.[22] As following chapters demonstrate, communities continued to live on and

[18] John Long, *Treaty No. 9: Making The Agreement to Share the Land in Far Northern Ontario in 1905* (McGill-Queens University Press: Montreal & Kingston, 2010), 36.
[19] Long, *Treaty No. 9*, 3.
[20] Long, *Treaty No. 9*, 54.
[21] Long, *Treaty No. 9*, 11.
[22] Long, *Treaty No. 9*, 84; 454n3.

manage the land throughout the entire mining period, a practice that continues through negotiations with governments and mining companies in the present.[23]

The numbered treaties relate closely to mining and environmental history in Canada, and this connection is worth exploring in the context of settler-Indigenous relationships at Porcupine. The first treaty in Canada (the 1850 Robinson Treaty) stemmed directly from land use conflicts between miners and Indigenous people on Lake Superior. In 1845, in response to prospectors' increasing demands for access and regulation, the Crown Lands Department issued regulations for exploring, claiming, and developing land.[24] Local people objected to mining in their territory and wrote letters of complaint to the department of Indian Affairs. These efforts elicited little response, and Metis and Ojibwa communities attacked the Quebec Mining Company at Mica Bay in November of 1849.[25] In 1905, these were the kinds of conflicts the government hoped to avoid by signing Treaty Nine. Furthermore, the Robinson Treaties set precedents for colonial understanding of northern Ontario including the idea, expressed by Robinson himself, that the land was "barren and sterile" and would "never be settled except in a few locales by mining companies."[26] Thus Treaty Nine failed to deal effectively with usage

[23] Goldcorp, the operator working in Timmins/Porcupine in 2017, has formal agreements dating to 2014 with Mattagami, Wahgoshig, Matachewan, and Flying Post First Nations. Goldcorp, "Responsible Mining," 2016 Sustainability Report, http://csr.goldcorp.com/2016/communities/stakeholder-engagement (Accessed 15 November 2017).
[24] Robert Surtees, "Treaty Research Report: The Robinson Treaties (1850)" (Treaties and Historical Research Centre, Indian and Northern Affairs Canada, 1986): https://www.aadnc-aandc.gc.ca/eng/1100100028974/1100100028976 (accessed 9 August 2016). This was the first time a treaty had occurred in response to resource development as opposed to settler desires for homesteads. James Morrison, "The Robinson Treaties of 1850: A Case Study," (prepared for the Royal Commission on Aboriginal Peoples, Treaty and Land Research Section, 1996), 7.
[25] Surtees, "The Robinson Treaties (1850)."
[26] Long, *Treaty No. 9*, 27-28; 83.

rights off reserve, because commissioners assumed the land was too big and too empty for conflicts over any resource besides (possibly) minerals. Although mineral rights were not explicitly mentioned in Treaty Nine, Ontario's third commissioner, Daniel George MacMartin, was described as a "mining expert" and precious metals formed an important part of its *raison d'être*.[27] The Robinson Treaty and Treaty Nine functioned to alienate Indigenous people from natural resources on their traditional territories, but the emphasis in both cases was specifically on ensuring the colonial government's control of precious metals. Colonialism and the numbered treaty process explain how governments, settlers, and mining companies could own and manage Porcupine landscapes without consent from First Nations people after 1905. The crown legally owned the land, and had power to dispose of resource rights as it pleased.

The Ontario Bureau of Mines Surveys, Ecological Change, and the Agricultural Dream 1899-1909

Between 1899 and 1909, the landscape transitioned from a portage route, agricultural and hunting/gathering zone to a location of small-scale mining influenced by international trends in gold extraction. Ontario Bureau of Mines employees regularly traveled through the Porcupine and recorded these changes in the Bureau's annual reports.[28] Fire and insect cycles, seasonal Indigenous land use, animal activity, and

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[27] Long, *Treaty No. 9*, 67.

[28] The Mining Act of 1891 created the Ontario Bureau of Mines "to aid in promoting the mining interests of the province." It worked under the Department of crown lands under director Archibald Blue. The Geological Branch of the new Bureau engaged in summer field work "in any areas which it may be thought advisable [by the Provincial Geologist] to explore" and was explicitly "for the benefit of the public." The area east of the Mattagami River and North of Niven's base line first fell into this category in 1899. An exploration party usually included a head (Parks in 1899) and three assistants chosen from university students in geology or mining engineering, paid and provisioned by the Bureau. Thomas Gibson, *The Mining Laws of Ontario and the Department of Mines* (King's Printer: Toronto, 1933), 111.

fluctuating water levels suggest significant change over time in Porcupine ecology even before the arrival of miners. As participants in broader culture which saw northern wilderness as land waiting to be transformed by a modern industrial regime, Bureau surveyors actively sought signs from the landscape as to its destiny. Their observations overwhelmingly led them to envision Porcupine as a future agricultural frontier, an alternative destiny which would prove hard to shake from future human perceptions of the land.

In 1899, William Arthur Parks became the first Ontario Bureau of Mines employee to walk over and document the future mine sites.[29] Parks arrived at Porcupine Lake in the spring, so winter runoff rendered the shallow lakes like Nighthawk and Red Willow muddy. He described inlet and outlet streams as tortuously winding and variable, with banks consisting of clay, swamp, timber, and shrubs. Rocky exposures surrounded Porcupine Lake and the Porcupine River more abundantly than other waterways, giving Parks a hint of underlying geological formations (but no indications of precious metals). Parks also noted the scars of recent fires in multiple locations, a theme that was repeated by those who came later.[30]

Parks travelled on existing canoe and portage routes, describing the landscape as he went.[31] He benefitted from the work of fur traders and First Nations people who

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[29] He returned in 1900 to add further details.
[30] It is impossible to know if these were natural or human-caused, but were most likely a combination of both. William Arthur Parks, "The Nipissing-Algoma Boundary," *Ontario Bureau of Mines Volume VIII First Part* (Toronto: Warwick Bro's and Rutter, 1899), 176; 177; 179; 181.
[31] That Parks used these pre-existing routes is evidenced by the fact that he refers in all cases to "finding" the portage, rather than cutting one himself. Waterways possessed the highest occurrences of exposed bedrock and were therefore useful routes for preliminary explorations like Parks' survey. Later prospectors and surveyors would use a grid pattern in the most promising areas.

maintained canoe routes for their own purposes and whose presence permeates his narrative. Around the Frederick House River Parks noted that "several…small lakes are scattered over this region, all of which are connected by trails giving evidence of their use as hunting grounds," and described an abundance of otter, fisher, and beaver signs.[32] Near Frederick House Lake, Parks described a small lake with clear water and plentiful fish which "seems to be a fishing ground for the Indians of the region, as many drying places were noticed on its shores."[33] Where routes were not maintained, travelling became difficult: At one point Parks described deadfall so thick as to be "almost impassable."[34] Parks also relied heavily on First Nations knowledge of places beyond his ability to explore: "I did not consider it advisable to follow [the river] farther," he wrote after encountering a series of rapids, "Indians however go through this way to the headwaters of the Riviere Blanche, and thence to Lake Temiscaming. I was also informed that a portage leaves this river somewhere near the first falls and connects with a route to the Matachewan waters."[35] First Nations people knew, monitored, and managed the landscape Parks travelled in 1899.

In 1903 a second Bureau expedition led by George Kay (and accompanied by agricultural expert Tennyson Jarvis) returned to the ground originally covered by Parks in 1899. In the intervening years, the land had changed: When Kay arrived at the portage between the Mattagami River and Porcupine Lake he found it in a state of

[32] Parks, "The Nipissing-Algoma Boundary," 178.
[33] Parks, "The Nipissing-Algoma Boundary,"179.
[34] Parks, "The Nipissing-Algoma Boundary," 178.
[35] Parks, "The Nipissing-Algoma Boundary," 181.

disrepair.[36] Kay also recorded recently-flooded landscapes: “Submerged camping grounds and drowned trees over areas of many acres indicated that the season had been one of more than ordinary rainfall.”[37] Additionally, 1903 seems to have been a bad year for larch sawflies, which thinned the canopy and left the woods more open to sunlight. Originally native to Europe, larch sawflies first arrived in Canada in the late nineteenth century (they were identified first in Quebec in 1882). The species lays its eggs at the base of new shoots and young larvae strip branches of their foliage, inhibiting growth and weakening healthy trees. In the summer they drop to the ground to form cocoons and transform into pupae which emerge the following spring. Through the early twentieth century larch sawflies chewed their way across Canada’s forests in a series of population explosions and collapses.[38] Jarvis’ visit coincided with one such event as it swept through Porcupine. He wrote “nearly all of the larch or tamarac trees in this northern country have been destroyed by the larvae of [the larch sawfly].”[39] Dropped larvae coated the Porcupine River, the shores of Nighthawk Lake, and were “found in masses” in the vegetation.[40] There were other changes too: the portage trail between the Mattagami River and Porcupine Lake had become overgrown. Kay described the area as “wooded with spruce, balsam, birch and polar; the soil is gravelly sand,” “rocky undulating country,” with evidence of moose and beaver in local lakes and streams and plenty of pickerel and pike

[36] George Kay, “The Abitibi Region,” in *Thirteenth Report of the Ontario Bureau of Mines 1904* (Toronto: King’s Printer, 1904), 105.
[37] Kay, “The Abitibi Region,” 107.
[38] “Larch Sawfly,” Government of Canada, last modified 4 August 2015, https://tidcf.nrcan.gc.ca/en/insects/factsheet/7907.
[39] Kay, “The Abitibi Region,” 128.
[40] Kay, “The Abitibi Region,” 128.

in Porcupine Lake.[41] Biting flies plagued the party: Jarvis devoted two full pages to descriptions of flies (he only used half a page for all other forms of wildlife).[42]

Kay reported much more First Nations activity in 1903 than Parks did in 1899, perhaps because he arrived in the fall when people actively travelled through the area.[43] He noted that he might have met more "Indians" in the woods, except that "they never hunt during the summer months when flies and mosquitoes are out, but congregate at the forts where they can protect themselves to some extent from the insects by building smudges."[44] He reported that "Indians were camped on a small island in Night Hawk Lake," and found "potatoes, squashes and onions, which had been planted by the Indians, were in thriving condition" nearby.[45] Kay also noticed huts erected on a bluff over-looking Nighthawk and, closer to Fort Matachewan, he described a place known as McDougall's clearing, which contained a furnished house and garden plus "some Indian Wigwams and a small patch of cleared ground."[46] Like Parks, Kay replied on Indigenous knowledge to fill in gaps of his report. For example, he noted that Indigenous people told him "that the Redstone takes its rise in a large muskeg several miles to the west."[47]

James McMillan led a third Bureau expedition into Porcupine (with his own agricultural expert Archibald Henderson) in 1905. McMillan expressed more geological

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[41] Kay, "The Abitibi Region," 105.
[42] Kay, "The Abitibi Region," 127
[43] He wrote: The Indian hunting season extends from about the middle of September to about the middle of June. The Indians were just coming home from their winter's hunt the day we landed at Fort Mattagami on 21st June. Kay, "The Abitibi Region," 127.
[44] Kay, "The Abitibi Region," 127.
[45] Kay, "The Abitibi Region," 107.
[46] Kay, "The Abitibi Region," 110.
[47] Kay, "The Abitibi Region," 107.

imagination than his predecessors: he envisioned the landscape backwards to the retreat of the glaciers when it was "a plain, in all probability once the bed of a glacial-dammed lake."[48] When the ice and the water retreated it left sharp ridges, piles of glacial till, and depressions filled with water, which became the area's myriad of lakes. As the land drained, it created the slightly younger v-shaped eroded valleys. McMillan speculated that "some depressed tracks" had once been the "beds of shallow lakes…now filled with peat and moss to a depth of 4 to 12 feet."[49] After setting the geological context, McMillan recorded his modern impressions: the larch-fly attacks described by Kay in 1903 had severely impacted the land. As the weakened tamarac blew down, it had been replaced by a thick growth of alder: "The killing of the tamarack has left the woods rather open to the sunlight, and a thick growth of alder has sprung up among the more or less scattered spruce."[50]

Human characters did not feature strongly in McMillan's description of the geologic past. Although the Cobalt silver rush was in full swing a few hundred kilometers to the south in 1905, Porcupine remained a landscape largely shaped and managed by fur traders and Indigenous people. In his accompanying report, Henderson attributed changing waterways and increasing beaver numbers to beaver legislation. In 1899, Parks had reported beaver overhunted.[51] Four years later the animals had rebounded. In 1903, Kay crossed the portage between Jarvis and Porcupine Lakes, and noted that the stream

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[48] James McMillan, "Explorations in Abitibi," *Report of the Bureau of Mines 1905 Vol. XIV Part I* (Toronto: L.K. Cameron, 1905), 185.
[49] McMillan, "Explorations in Abitibi,"185.
[50] McMillan, "Explorations in Abitibi,"189.
[51] Parks, "The Nipissing-Algoma Boundary," 193.

was sluggish "due to the fact that beaver are at present operating there, and by their dams are raising the water."[52] Jarvis first traced this activity to human intervention: "thanks to the wise legislation in the protection of the beaver, this animal is becoming more numerous and the danger of its extermination has been warded off for some time...fresh beaver dams were very common."[53] In 1905, McMillan noted on one of the tributaries of the Porcupine River "a beaver dam 5 feet in height was seen and in fact on nearly every stream beaver cuttings and work are plentiful."[54] Henderson reiterated Jarvis' sentiment that "the increase in the number of beaver in this region" could be traced to "wise protective legislation."[55]

First Nations continued to exert a noticeable agricultural presence on the land in 1905. Henderson took photos of an "Indian hut and potato patch" on the west shore of Frederick House Lake (see figure 4).[56] They also fished extensively, using techniques adapted to the northern rivers. "The larger rivers and lakes of the region are very muddy," he explained, "and for this reason the fishermen must use other means than trolling these waters." Trolling involved dragging a baited line behind a boat and worked poorly if fish could not see the lures through murky water. The solution was nets, which allowed "the Indians" to "catch large numbers of pike, pickerel, whitefish, and, in some localities, sturgeon. In the smaller, clearer lakes and rivers, "pike and pickerel are readily caught with a troll."[57]

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[52] Kay, "The Abitibi Region," 105.
[53] Kay , "the Abitibi Region," 127.
[54] McMillan, "Explorations in the Abitibi," 192.
[55] McMillan, "Explorations in the Abitibi," 242.
[56] McMillan, "Explorations in the Abitibi," 239.
[57] McMillan, "Explorations in the Abitibi," 243.

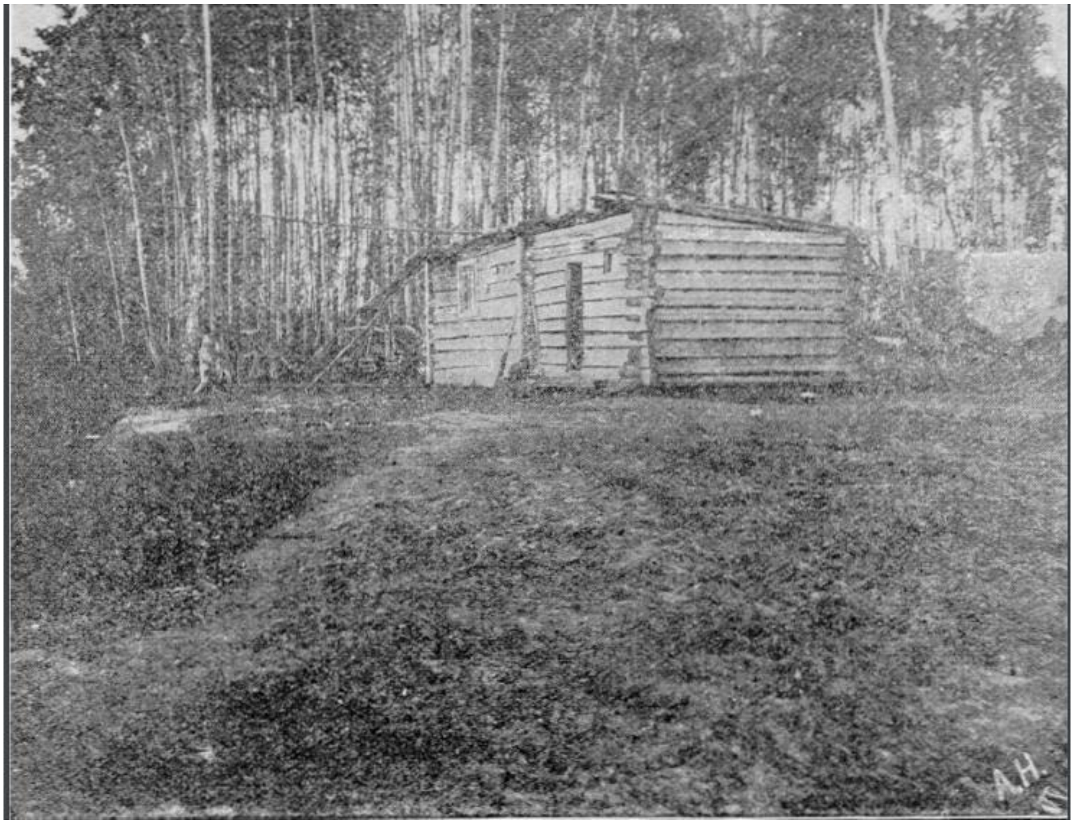

Figure 4 "Indian Hut and Potato Patch West shore of Frederick House Lake," Report of the Bureau of Mines 1905, Vol. XIV Part I (Toronto: L.K. Cameron, 1905), 239.

In 1906, H.L. Kerr was the last Bureau geologist to visit before the gold rush. Agricultural expert Henderson (the same man who had accompanied McMillan) accompanied him. Kerr's reports largely follow the same pattern as McMillan's: He started by reaching for the distant past ("at one time a great lake dammed in the north by the retreating ice" resulting in a series of small lakes now filled with muskeg).[58] First Nations people appear in many of the same places as they did in McMillan's report, particularly on the shores of Nighthawk Lake, and furnished Kerr with supplementary

[58] Kerr, "Exploration in Mattagami Valley," *Report of the Bureau of Mines 1906 Vol XV Part* 1 (Toronto: L.K. Cameron, King's Printer, 1906), 131.

knowledge for his report. Henderson took soil samples from an "Indian Garden" on Lake Kamisokotaia, which he later used as evidence for the region's agricultural viability.[59] Kerr suggested that, even if the beaver were doing well under conservation measures, other fur bearers were in decline. Excepting Parks' note on declining beaver populations, explorers had generally reported good game conditions, with plenty of fox, otter, and bear. However, in 1906, Kerr described conversation with "several Indians" who claimed that "game is not so plentiful as it used to be." He later spoke with HBC employees who complained that "furs brought into the fort are becoming less in number each year."[60]

Ultimately, Bureau surveyors had not gone into the bush to record human and environmental change, but to fulfil the mandate of the Bureau of Mines to work for the benefit of the public by finding and recording potential economic resources. They filtered their actions and their words through this lens as they sought signs of the landscape's potential future use. They were looking for "value." Overwhelmingly, the conclusion they arrived at based on their observations was that Porcupine would be an excellent agricultural space. For example, Parks wrote that "the rock is barren," but luckily "this region will be a valuable addition to Ontario's agricultural lands."[61] Kerr opined in 1906 that "the chief value of the district is in its agricultural possibilities."[62] Eventually, "railways will connect this part of Ontario with the rest of the country [and] its splendid agricultural possibilities and the various other resources...[will]...combine to make the

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[59] Kerr, "Exploration in Mattagami Valley," 151.
[60] Kerr, "Exploration in Mattagami Valley," 131.
[61] Parks, "The Nipissing-Algoma Boundary," 193; McMillan, "Explorations in Abitibi," 243.
[62] Kerr, "Exploration in Mattagami Valley," 27.

future of this part of the Clay Belt particularly promising."[63] The Bureau's vision of the North as an agricultural land is also evidenced by its decision to send agricultural experts along with every party, whose job it was specifically to assess the quality of soil and potential for farming.

In the context of western settlement in the United States and a neighbouring settler frontier (at comparable latitudes) on the Canadian prairies, the agricultural dream made perfect sense. The approval of the T.&N.O. in 1902 stemmed largely from this agricultural vision for the north's future.[64] Settlement in the north was part of what Canadian historian David Wood calls a period of "brash optimism" about the productive potential of the land, science and technology, and the inherent connectivity between settlement, egalitarianism, and democracy. In Ontario, rich agricultural land became increasingly scarce in the last half of the twentieth century.[65] Hopeful speculators, boosters, and farmers looked further afield for free productive land, and their hopes focussed on the province's "Great Clay Belt," which promised the possibility for the opening of a new northern frontier. In addition to subsidizing railways like the T. & N. O., the Ontario government built colonisation roads, published pamphlets, reserved homesteads for veterans, established immigration bureaus, and built experimental farms as part of a program of agricultural development on the clay belt.[66]

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[63] Kerr, "Explorations in Mattagami Valley," 135.
[64] H.V. Nelles, *The Politics of Development: Forests Mine & Hyrdo-Electric Power, 1849-1941*, second edition (Montreal & Kingston: McGill-Queens University Press, 2005), 118.
[65] David Wood, *Places of Last Resort: The Expansion of the Farm Frontier into the Boreal Forest in Canada, c. 1910-1940* (McGill-Queens University Press: Kingston, 2006), 10, 13.
[66] Wood, *Places of Last Resort*, 35. Nelles, *The Politics of Development*, 53.

Bureau of Mines surveyors were part of this vision, even as they recognised that there were inconvenient environmental barriers to be overcome in the pursuit of a northern agricultural hinterland, including muskeg and a short growing season. Muskeg, they argued, could easily be turned to the purposes of the state. The wettest land would "yield a large supply of peat," and the rest "when drained will be available as farming land in the areas in which the soil is suitable."[67] The cold climate was self-resolving: "When the country is cleared, the mean summer temperature will be considerably higher."[68] Evidence was drawn from the prairies: "there is no reason why land, situated in the same latitude as some of the most prosperous parts of the great west, should not some time in the future -prove equally productive and support a large population."[69] Economic and technological development could easily overcome environmental constraints.

This is not to say that surveyors dismissed the possibility of non-agricultural futures. Parks reported "immense quantities" or timber available, despite recent fires in the region. He also listed off waterfalls with potential for water power.[70] In his 1906 description of the economic possibilities Kerr remarked on "the soil," "forests," "peat beds," "water power," "minerals," and "game." Although the soil meant that "the chief value of the country is in its agricultural possibilities," the "forest wealth may in time prove to be of no inconsiderable value."[71] The peat beds, although usually seen as a disadvantage, would "eventually prove of enormous value" because of their cheapness as

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[67] McMillan, "Explorations in Abitibi,"138
[68] Kerr, "Exploration in Mattagami Valley," 27.
[69] Kerr, "Exploration in Mattagami Valley," 135.
[70] Parks, "Niven's Base Line 1899," 142.
[71] Kerr, "Exploration in Mattagami Valley," 127, 128

a source of fuel.[72] Waterfalls suitable for power were plentiful, and "we may reasonably expect to see, in the not very distant future, large pulp mills and plants for the preparation of the products of the great peat beds for the market as well as other industries in this northland, in which case these water powers will prove of great value."[73] The only category Kerr was pessimistic about was game, which seemed thin. With such abundant potential products suitable for integration into southern industrial economies, northern Ontario's future as a location of *mineral* extraction was far from certain at the turn of the century.

Mine Ecology: Industrial Extraction meets the Porcupine Environment, 1909-1910.

The discovery of precious metals in northern Ontario brought new perceptions of about the future of the land. Dialogue around northern development became increasingly focused on preparing the land for an industrial mining future. As mining interests arrived in Porcupine from around the world in response to the news of silver and gold, they brought capital, migration, technology, law, and expectations with them. They formed new ties between Porcupine and a transnational community of mining zones while attempting to avoid the mistakes and replicate the successes of other extractive frontiers. Physical environmental change to local geography, especially to local waterways, resulted. The early years of transforming Porcupine into a mining hinterland were marked by negotiation between these international forces and the conditions of the local

[72] Kerr wrote: ("Peat may be prepared for the market at such a figure as to have a slight advantage over coal." Kerr, "Exploration in Mattagami Valley," 128.
[73] Kerr, "Exploration in Mattagami Valley," 128-129.

environment. The two did not always mesh neatly, and the first years of development are marked by experimentation and difficulty.

The first hints of Porcupine's industrial mining future came during the 1903 Cobalt silver rush, two hundred kilometers south of the modern mines. Porcupine developed in the shadow of Cobalt, only to emerge as an industrial mining mecca in its own right by 1910. Migration, international capital, and imported mining technology shaped both the Cobalt silver rush and the early years of Porcupine prospecting. These transnational influences escalated in conjunction with the intensification of mining into 1910, bringing about the first conflicts between industrial mining and Porcupine nature.

As the T.&N.O. pushed into the shield in 1903, construction workers had noticed pink cobalt blooms in the rocks. Both prospectors and geologists knew that cobalt was associated with silver deposits a the time few people willing to put in the time and capital in a region seen as "unproven" and "risky" in terms of its mineral potential.[74] Those who eventually staked claims and searched for precious metals in the area depended heavily on the Ontario Department of Mines surveys (like those produced by Parks, Kerr, and McMillan) plus small-scale investors willing to risk a little money for grubstake.[75] Old timer John Patrick Murphy describes these men as having read "tattered volumes" of the California rush, where they had learned to bite into rocks to test for precious metals among other tricks.[76] Eventually, the samples they produced came to the attention of men

[74] Michael Barnes, *Fortunes in the Ground: Cobalt, Porcupine & Kirkland Lake* (Erin: The Boston Mills Press, 1986), 15.
[75] Grubstake refers to money prospectors used to buy food, lodging, and equipment for exploring. Barnes, *Fortunes in the Ground*, 15-16.
[76] John P. Murphy, *Yankee Takeover at Cobalt!* (Highway Book Shop, 1977), 6.

with knowledge and means to build a modern mine – Noah Timmins, a shopkeeper at Mattawa, T.W. Gibson of the Ontario Department of Mines, and Willet Miller, a professor of geology at Queen's.[77] Miller knew that the surface showings indicated deeper deposits, accessible only by (expensive) underground shafts. Timmins agreed to finance a project, and northern Ontario's first metal rush was on.

From the beginning, Cobalt was a transnational event. Popular historian of the northern Ontario mineral rushes Michael Barnes dismisses American involvement in the Cobalt rush as "the old story of a large pool of capital south of the border which knew no international boundary," but American investment in Cobalt was more than just monetary.[78] According to the *New York Times,* Californian placer miners, copper miners from Arizona and Senora, gold diggers from British Columbia and the Yukon, and diamond diggers from Africa all came to Cobalt.[79] There is also evidence that New Zealand expertise had a hand in Cobalt mining development: the Otago School of Mines boasted several graduates working at the Cobalt camp.[80]

Barnes describes this first mining community as a "town planner's nightmare," and blames the transient nature of miners with little interest in settling down: "Building construction, after all, delayed the serious business of mining."[81] Streets followed claim boundaries, rather than the contours of the land. In 1905 Cobalt had over 6000 residents,

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[77] Barnes, *Fortunes in the Ground*, 17.
[78] Barnes, *Fortunes in the Ground*, 32.
[79] "New Eldorado in a Northern Ontario Wilderness: How the Mishap of a Burly Blacksmith Revealed the Wonderful Mineral Wealth of the Cobalt District," *New York Times* 27 May 1906.
[80] "Otago School of Mines Annual Report," *Otago Daily Times,* 14 May 1910, 5
[81] Barnes, *Fortunes in the Ground,* 28.

by 1911, 10,000.[82] By 1907, stamp mills were used to break down ore and “nine such plants graced the skyline close to town. According to Barnes, “the place was no beauty spot.”[83] Development was so heavy that it was difficult to access the lake.[84] There were no sewage or sanitary arrangements, and the water quickly became polluted. Cobalt was regularly plagued by small-pox and diphtheria – it boasted the largest typhoid epidemic in Ontario history in 1907 (it lasted six years). Uncontaminated water had to be packed in for drinking.[85] The hasty construction also added to the devastation caused by fires, which destroyed the town in 1906 and 1911.[86]

By 1909, Cobalt was an industrial mining city. Labour historian Peter Vasiliadis notes that the nature of the location of precious metals in the rocks meant that mining camps in Ontario’s north needed big capital. In his work on ethnicity in the Ontario mining camps, Vasiliadis notes that “the Cobalt owners were forced to subordinate to a capitalist stock system which pressed for maximization of profits, introduction of professional managers and increased efficiency."[87] Indeed, industrial mining quickly took a toll on miners’ bodies: More than 100 men had been killed in the Cobalt mines by 1912, and uncountable others died or became debilitated by industrial diseases.[88]

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[82] Mike Macbeth, *Silver Threads Among the Gold: The Rags to Riches Saga of a Man and His Mines* (Tans-Canada Press: Toronto, 1987), 17.
[83] Barnes, *Fortunes in the Ground*, 36.
[84] Barnes, *Fortunes in the Ground*, 36.
[85] Macbeth, *Silver Threads Among the Gold*, 18.
[86] Macbeth, *Silver Threads Among the Gold*, 18.
[87] Peter Vasiliadis, *Dangerous Truth : Interethnic Competition in a Northeastern Ontario Goldmining Center*, Immigrant Communities & Ethnic Minorities in the United States & Canada. (New York: AMS Press, 1989).
[88] Macbeth, *Silver Threads Among the Gold*, 19.

Industrialisation interests Vasiliadis because one of the ways that mining companies increased efficiency and profit was to hire foreign workers, but the large scale of environmental intervention encouraged by competitive corporate capital also had environmental implications. In their quest for dominance, Nipissing Mine used one of the largest unskilled labour force ever seen in the north (100 men) to cut miles of trenches, used hydraulic monitors to jet water over the exposed rock to expose all surface veins, and built an overhead tramway across Cobalt Lake.[89] Because the cost of shipping was so high, mine owners preferred to process ore using flotation plants and cyanides on-site.[90] The Cobalt Hydraulic Power Company dammed Ragged Chutes, Hound Chutes Fountain Falls, and the Mattabechewan to power the mines, bringing down power prices by more than two thirds while significantly altering the function of the watershed.[91]

Barnes called the resulting landscape "barren and scarred," and the primary evidence describes destruction and loss in addition to success and riches.[92]An anecdote from a New Zealand paper gives a sense of the environmental change experienced at Cobalt. It told the story of a melancholy sport hunter sitting on the verandah of the Cobalt Hotel: "I spent a holiday shooting through these woods and fishing in these lakes a few years ago," he laments. An interviewer asks "these woods?" Looking around, "there was scarcely a tree in sight, only a rolling barrenness of cleared land that certainly would not have paid any farmer to clear it, so stony was it all." "Yes," the melancholy man

[89] Barnes, *Fortunes in the Ground,* 44, 63.
[90] Barnes, *Fortunes in the Ground,* 44
[91] Barnes, *Fortunes in the Ground,* 61.
[92] Barnes, *Fortunes in the Ground,* 44.

confirms, "but just think of it! If I had scraped the rocks instead of scrambling over them after fur and feathers, I might have hit on a million-dollar vein of pure silver!"[93]

Cobalt money, knowledge, and men went on to play central roles at Porcupine: As Peter Fancy writes of Cobalt entrepreneur Noah Timmins, "the money he had won from mining silver at the LaRose in Cobalt has given him his chance to play for gold."[94] Porcupine was close and the geology familiar. Local prospectors knew what signs to look for, and they knew how to survive in the northern bush. Experience at Cobalt promised that, once found, valuable land would be bought up by capitalists (both Canadian and international). According to the Ontario Bureau of Mines' Annual report, discoverers of Porcupine gold had actually been looking for extensions of the Cobalt silver finds.[95] Understanding Porcupine geology was facilitated by the knowledge already gathered at Cobalt: "the geology of the whole region is similar to that of Cobalt. Any person having a good knowledge of the geology of the Cobalt area has little difficulty in mapping other areas in this region."[96] Many of the prospectors venturing out from Cobalt did so because they had been pushed out of the rapidly corporatized world of the silver mines.

As they ventured out from the Cobalt camp, prospectors used visual signs to asses the presence of precious metals. As modern surveys of the Porcupine region have concluded, "almost all of the major producing and past-producing deposits from which most of the gold ore in the area was obtained were found by surface prospecting in the

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[93] "Cobalt: Where Streets are Lined with Silver," *Star,* 19 March 1910, 1.
[94] Peter Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915*, (Highway Book Shop: Cobalt, 1993), 1.
[95] *Nineteenth Annual Report of the Bureau of Mines, 1910 Vol XIX, Part I* (Toronto: L.K. Cameron, Kings Printer, 1910), 9.
[96] Willet Miller "The Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming (Cobalt and Adjacent Areas)," fourth addition, *Report of the Bureau of Mines XIX, Part II* (Toronto: Kings Printers, 1913): xi.

first 10 years of major exploration (1905-1914)."[97] Visual assessment remains a primary method of identifying minerals in the field right up to the present, although many prospectors added new scientific techniques to their toolkits after the First World War. The Bureau of Mines recommended prospectors look for "streaky" appearing rocks. Deposits on the surface would occur in streaky rock that looked oxidised and rusty. Under ground, gold-bearing rock had grey or green streaks.[98] Only after a prospector identified ore as valuable based on these visible signs would they send samples to professional assayers for testing.

Early claim staking came about because of Porcupine's place within a broader context of turn-of-the-century extraction, at Cobalt and around the world. E.O. Taylor of Toronto recorded the first claim in the Porcupine region (just south of the big deposits) on 20 December 1906, and prospectors recorded further claims in July of 1907 and 1908 around Nighthawk Lake.[99] One of these later claims belonged to prospector Reuben D'Aigle. A native of New Brunswick, D'Aigle had participated in the Klondike gold rush in 1898 where he had prospected successfully on the Koyukuk River. After working out his claim, he heard news of the Cobalt silver rush. He left for Ontario immediately, but arrived too late to join the silver boom. Realising that he needed a better understanding of

[97] Non-visible indicators would not shape prospector behaviour until much later in the twentieth century and the development of aerial prospecting with powerful radar. C.J. Hodgson "Preliminary Report on a Computer File of Gold Deposits of the Abitibi Belt, Ontario," in A.C. Colvine, ed., *The Geology of Gold in Ontario,* Ontario Geological Survey Miscellaneous Paper 110 (Ministry of Northern Development and Mines, 1983), 11.
[98] *Twentieth Annual Report of the Ontario Bureau of Mines,, 1911, Vol XX, Part II* "Special Report on the Porcupine," (Toronto King's Printer, 1911), 22.
[99] *Eighteenth Annual Report of the Bureau of Mines, 1909 Vol. XVIII, Part I* (Toronto: L.K. Cameron, King's Printer, 1909), 52-53.

Ontario geology, he left the north and took a course in minerals at Queen's Mining and Agricultural School in Kingston. At Queen's he encountered the Bureau of Mines reports describing Porcupine.[100] Supported by money from his Klondike finds, he paddled in to Porcupine Lake, staked claims, and did some digging and blasting. Unfortunately for him, D'Aigle's claim did not prove profitable enough and he left it to lapse before the 1909 prospecting year.[101]

Eventually, the combination of local prospecting with big (international) capital paid off. In 1909, two men, George Bannerman and Tom Geddes of Haileybury, found surface gold sufficient to convince them of the region's mineral worth and formed a company funded by Scottish investors to explore it.[102] A party led by Jack Wilson of Haileybury also entered Porcupine in 1909 with the help of Indigenous guide Tom Fox.[103] They were backed by Chicago businessmen W.S. Edwards and T.N. Jamieson. The Wilson party found a dome of white quartz, dug trenches around the base, and discovered a large vein of gold. Their find became the Dome Mining Company. When news of the Wilson strike got back to Wilson's hometown, more prospectors headed into the bush, including Benny Hollinger, Alex Gillies, Clary Dixon, and Tom Middleton, who would stake the claims later bought out by the Hollinger Mining Company.[104] Sandy McIntyre and Hans Buttner, a Scot and a German, were right behind and staked two claims on Pearl

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[100] Barnes, *Fortunes in the Ground,* 87.
[101] Barnes, *Fortunes in the Ground,* 88.
[102] Barnes, *Fortunes in the Ground*, 89.
[103] Given Wilson's dependence on Tom Fox's assistance, other prospectors may similarly have depended on Indigenous people to access the Porcupine in 1909. "Tom Fox – Hired by First Porcupine Prospecting Group," *Porcupine Advance* 13 May 1926.
[104] Ironically, the Hollinger claims were right on top of the lapse D'Angle claims. Barnes, *Fortunes in the Ground,* 92.

Lake.[105] They later formed the McIntyre Mining Company.[106] Dome, Hollinger, and McIntyre mines became the "big three" which dominated Porcupine mining for the next century.

As they had with gold mines around the world, prospectors made Porcupine's deposits productive by first dividing them up according to the laws and conventions of private property. Ontario already possessed a clear set of rules for staking mineral claims inspired by the mid-nineteenth century gold rushes and shaped by subsequent developments at home and abroad.[107] In 1909, the first discoveries at Porcupine would be conducted under a centralised system which separated surface from subsurface rights, left default ownership of minerals to the crown, and imposed royalties.[108] After news of the first discoveries became widely known in September of 1909, "a few thousand claims were staked" according to the Ontario Bureau of Mines.[109]

Claim-stakers hoped to create a speculation boom in which excitement about the finds would create skyrocketing prices. Although the boom failed to manifest as quickly as most people hoped, some properties changed hands "at fairly large figures."[110] The remoteness of the country and the existence of several mining busts within recent investor memory may have made capitalists nervous or unable to invest in unproven properties.

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[105] Barnes, *Fortunes in the Ground*, 93.
[106] Dome, Hollinger, and McIntyre became "the big three" that dominated Porcupine mining. These were not the only claims staked at Porcupine in 1909, but other prospectors did not experience the same fantastic successes as those associated with the Dome, Hollinger, and McIntyre mines, and thus have not been well recorded by documentary evidence.
[107] By 1909, Ontario claim law had come full circle from more permissive development-focused regulation inspired by the California and Australia gold rushes to more restrictive laws aimed at capturing some of the returns of mining for the people of Ontario. See Nelles, *The Politics of Development*, 20-23.
[108] Nelles, *The Politics of Development*, 30.
[109] *Nineteenth Annual Report of the Bureau of Mines 1910*, 92.
[110] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 92.

After a slow start, on 16 October 1909, the American voice of the global mining industry, the *Engineering and Mining Journal* reported on the Porcupine discoveries.[111] By November, the journal reported that claims were going for about $1000 each.[112]

Although the first prospectors left few primary records of their impressions of the landscape, there is some indication that they felt a sense of admiration and wonder when confronted with Porcupine's gold deposits. Existing accounts suggest that this wonder mixed thoroughly with economic interest: A desire to sell shares to distant readers of print media likely motivated hyperbolic prose as much as genuine admiration. The account of Benny Hollinger's discovery is a good example. Alex Gillies described the find with real appreciation: "the quartz where [Benny Hollinger] had taken off the moss looked as though someone had dripped a candle along it, but instead of wax it was gold."[113] Later, on another find, Jack Wilson telegraphed his partner to describe a deposit so beautiful it was "beyond description."[114] Later, Wilson was quoted by an Australian paper as saying of the Porcupine deposits "it is the most wonderful thing I have seen, and I have been in every big gold camp that there is."[115] However the beauty of deposits was tightly bound up with their financial worth. These men took sincere joy from watching human beings render the landscape profitable. As one visitor to the Porcupine explained, "the fatigue of a thousand-mile journey…was immediately forgotten upon my arrival at this wonderful place…energy and enterprise are personified here. I have watched with wonder and

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[111] "Toronto," *Engineering and Mining Journal,* 16 October, 1909, 797.
[112] "Toronto," *Engineering and Mining Journal,* 27 November 1909, 1087.
[113] Fancy, *Temiskaming Treasure Trails Vol. 4 1907-1909*, 172.
[114] Fancy, *Temiskaming Treasure Trails Vol. 4 1907-1909*, 173
[115] "The Stampede to Porcupine Gold Fields," *The Northern Miner,* 29 April 1910.

amazement the progress that has been made within the past week."[116] Appreciation of Porcupine nature was rooted in the spectacular ability of human beings to render it productive space.

Yet Porcupine did not give up its precious natural wonders easily. Northern Ontario's seasonal variability caused the first environmental problems for the budding mining economy. The discovery occurred in the late summer, meaning that staking and shaft-sinking occurred in the cold, snowy winter months.[117] This immediately stalled staking and exploitation of the land. As the *Mining and Engineering Journal* lamented in November of 1909, "as the majority of the smaller lakes in this section are now frozen over, it is a very difficult matter to get into the country."[118] The weather ensured that experienced northern men had an advantage. As Barnes writes, "men who were tough enough to range the bush in all weather had no qualms about hanging on to a prospect in a proved camp" over the winter.[119] Once Timmins and the Dome Mining Company pushed roads into the region in 1910, seasonal transport patterns would reverse: Easy sleighing made winter the best time for transport because in the spring and summer the muskeg softened. Deep spring and summer mud quickly made overland transport impossible.

Compared to the wholesale re-arrangement of the environment which would take place later in Porcupine's history, the environmental impacts of early mining were relatively slow and light. As prospectors moved through the bush, they ripped up moss, dug trenches, and otherwise rearranged features of the landscape in search of signs of

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[116] Harold Palmer Davis, *The Davis Handbook of the Porcupine Gold District,* (New York: 1911), 17.
[117] *Nineteenth Annual Report of the Bureau of Mines, 1910,* 9.
[118] Untitled, 13 November 1909, *Mining and Engineering Journal*, 995.
[119] Barnes, *Fortunes in the Ground,* 28.

precious metal. For example, when Gillies and Hollinger were exploring their future claim, Gillies describes himself cutting a marking post, while Hollinger pulled up moss to look at the rock beneath.[120] If explorations failed to turn up anything interesting, Porcupine prospectors left tools and trenches in the bush. According to Barnes, "prospectors commonly found evidence that others had visited an area before them. Such things as adits, or horizontal tunnels, trenches, pits, and even blasting following a vein were usual relics in the gold country."[121] Indeed, when Gillies and Hollinger arrived at D'Aigle's old site, they found his rusted tools there.[122]

Once prospectors confirmed the presence of mineral wealth, they set about stripping the "overburden" from the land to follow the vein, entailing a physical redistribution of the soil and, if any were nearby, altering local waterways. The Dome property provides the best example of this process. According to Barnes, "the Dome property was first worked as an open pit." Miners dug up the "golden staircase" until it petered out at 150 feet, before they turned to hard rock mining.[123] The process of open-pit mining involved the removal of soil and its deposition elsewhere, creating holes and piles of rock and topsoil on the land that had not been there before. Without the benefit of industrial equipment, these changes remained relatively contained to the areas immediately around major high-grade strikes.

The scale of equipment for processing ore remained modest in the early years due to the lack of cheap transport for industrial equipment. As the Ontario Bureau of Mines

[120] Barnes, *Fortunes in the Ground,* 92.
[121] Barnes, *Fortunes in the Ground,* 92.
[122] Barnes, *Fortunes in the Ground,* 92.
[123] Barnes, *Fortunes in the Ground,* 101.

observed, even though "a large number of claims were staked during the fall and winter...very little actual mining work has been done in the camp."[124] Early miners nevertheless came up with ways for processing ore on a large scale. A flat table of rock found in the bush near Timmins showed signs of being used as an arrastre, a tool originating in the middle-east and used regularly in Mexico and Southern California to grind down gold-bearing ore. Chunks of rock containing gold would be crushed against the table by heavier rocks until the material was fine enough for processing.[125]

The evidence suggests that prospectors could make significant environmental change even with the most rudimentary tools. Father Charles Paradis (prospector and ordained member of the Oblate Congregation of the Roman Catholic Church) accidentally drained the southern tip of the Frederick House Lake in the fall of 1909 to mine the embankment near the lake's exit. In a 1911 *Canadian Mining Journal* article called "The Destruction of Valuable Water Power on the Frederick House River, near Porcupine" Assistant Geologist C.W. Knight speculated that the incident had been part of Paradis' plan to drain the land for agriculture: "Father Paradis is reported to have made the statement that the clay belt of Northern Ontario should be drained, not dammed, and that the present drainage system might be likened to a man suffering from pneumonia," Knight wrote. Paradis had been digging at the embankment next to the waterfall when the lake began to flow into his excavation. Following Paradis' shallow channel, water flowing out of the lake rapidly widened and eroded its banks, washing away the soil and

[124] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 120.
[125] Barnes, *Fortunes in the Ground,* 99. James Otto Peterson, "The Origins of Canadian Gold Mining: The Part Played by Labour in the Transition from Tool Production to Machine Production," (PhD Diss., University of Toronto, 1977), 150.

undermining trees on either side.[126] Knight, who explored the area with provincial geologist W.C. Millar, expressed concern about the severity of change on the waterway. Frederick House Lake's water dropped eighteen feet and Night Hawk Lake three feet. The modification left behind "a sand and clay flat with the pinched river winding through," impassable by boat.[127] Knight took photographs of the destruction and compared what he saw to Parks' Bureau of Mines reports of the same waterway. He speculated that Frederick House Lake might eventually disappear as a result of erosion. Yet he also speculated that "it may be that future generations of prosaic farmers, long after the Porcupine is a dead one, may bless the worthy friar for draining areas of what might otherwise have remained...swamp land." Knight thus expressed hope that today's environmental damage might be tomorrow's boon, and in doing so circled neatly back to pre-1909 notions of the north as agricultural land (a destiny it would supposedly fulfil when mining was finished).[128]

Measuring Change in the Ontario Bureau of Mines' 1909 Survey

Three years after the last Bureau of Mines surveyor had been through the Porcupine in 1906, Bureau geologist James Bartlett got off the train at mile 228.5 (now a flag station named "Red Pine Lakes") to record his impressions of the new mining camp. How did the first description of Porcupine-as-mining-camp compare to pre-1909 reports? Already the convenience of the train meant that his trip to Porcupine was clearly of a different character than that of Parks, McMillian, and Kerr. After getting off the train however, the

[126] C.W. Knight, "The Destruction of Valuable Water Power on the Frederick House River, near Porcupine" *The Canadian Mining Journal*, 1 February 1911, 91-92.
[127] Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915*, 39
[128] Knight, "The Destruction of Valuable Water Power," 91-92.

route remained unchanged since Parks' time. The canoe route from the flag station to the Porcupine was about sixty miles, and Bartlett called it "for the most part easy travelling."[129] A "fifty chain" (approximately one kilometre) portage from the rail line allowed Bartlett to put his boat in the water in a small lake which drained into the Frederick House River, and then follow Frederick House River to Nighthawk Lake. On the western shore of Nighthawk Lake he entered the Porcupine River, which led to Porcupine Lake. The winding nature of the Porcupine River necessitated two short portages overland (three chains and eight chains, or around 60 metres and 160 metres). Bartlett spent eight days in the vicinity, describing the discoveries.[130]

Like his pre-rush predecessors, Bartlett described a low-lying, level plain without obvious signs of hidden wealth. Before the gold rush, this had meant vague speculations about the "promise of reward to the prospector." After 1909, hidden rocks became a major intelligence problem. Bartlett called Porcupine "largely swamp-covered, with occasional outcrops of rock," and as "drift-covered, comparatively little being rock."[131] He talked about the rock as "much altered," (in the geological sense) and observed the presence of quartz veins and quartz schist.[132] What this meant, in plain terms, was that he found the ground difficult to read. Aside from the quartz, there were no recognisable signs that could tell him about the underlying geology. In the south he observed some higher country and more exposed rock, which only helped a little.[133] The *Engineering and*

[129] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 11.
[130] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 11.
[131] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 11.
[132] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 11.
[133] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 12.

Mining Journal echoed Bartlett's frustrations in 1910, stating that "a good deal of territory is covered with drift, which makes prospecting difficult."[134] Without being able to look at the bare rock, it was hard to know where to dig or how to invest. "Ninety percent of the staking now being done in low-lying country without rock-outcropping," noted the *Journal*, so it "cannot show any indications to warrant location under the Mining Act."[135] Over the course of the mining period, the Bureau depended on excavations by mining companies in order to get a look at the rock, or to provide geological information on their properties conducted by private geologists and engineers.

Bartlett promised a Bureau map by July or early August of 1910 covering the land and mineralogy of the townships of Tisdale, Whitney, Shaw, and Deloro. Geologists (and the Bureau) were under considerable pressure to make sense of the geology quickly so that it could be efficiently exploited. But even where they could get a look under the muskeg, the rock was confusing and complicated because it had been so broken up and re-arranged during glaciation.[136] Eventually, Bureau geologists turned to similar formations elsewhere in the world as points of comparison. For example, W.G. Millar, linked Precambrian rock in Scotland and similar deposits in Ontario. Millar found several points of comparison, and touted the usefulness of international examples: "it is of great value to workers here to have an opportunity of visiting areas of rock of like age in other countries, especially where they have been studied and mapped in detail."[137] Others

[134] Thomas Gibson, "Ontario," in *The Engineering and Mining Journal* 8 January 1910, 125.
[135] Gibson, "Ontario," 125.
[136] According to Barnes, "Cyril Knight made the first map of the Hollinger property and at that time found it difficult to draw boundaries between the intrusive porphyry and the basic lavas." Barnes, *Fortunes in the Ground,* 99.
[137] *Twentieth Report of the Bureau of Mines 1911,* 260.

would turn to similar quartz-feldspar and aplite dikes found in the Black Hills, South Dakota, Forty-Mile Creek in Alaska, and research by Louis DeLaunay (who studied Africa, Asia, and other gold-producing nations around the world).[138] When maps did appear, international presses quickly snatched them up. For example, by 1911, the New York-based publication *Davis Handbook to the Porcupine Gold Fields* included detailed maps of the entire region, including lakes, claim boundaries, and the ore bodies of major properties.

One of the biggest changes between Kerr's 1906 report and Bartlett's in 1910 is the absence of Indigenous people. Of course, Indigenous people still lived and worked the land throughout the early years of the gold rush despite their omission from Bartlett's descripton. Photographs from the Bureau's annual reports show whole families living near the mining zone at Nighthawk Lake (see figure 5). There are also documentary details related to individuals who interacted directly with the industry. Tom Fox occupied the Porcupine Lake area throughout its industrial transformation. Alex Kelso encountered Fox in 1906, clearing a water route with an axe at Frederick House Lake.[139] Fox later served as a guide for Jack Wilson's prospecting party.[140] Other evidence provides further hints about Fox's relationship with newcomers in 1909. A letter written by prospector Jack Campbell, Campbell describes a long list of supplies Wilson sent to Porcupine Lake in the spring of 1909 – "two canoes, two sleeping tents and a grub 'cache' tent...blankets,

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[138] A.G. Burrows, "The Porcupine Gold Area," *Report of the Bureau of Mines 1911* (Part II) (Toronto: King's Printer, 1911), 20.
[139] "Alex Kelso Discoverer of Alexo Nikel Mine and Pioneer of the North" (n.d.), File 3, MG 30 E 219, Earnest F. Pullen Fonds, Library and Archives Canada, Ottawa, Ontario, Canada, 3.
[140] "Fox, Tom – Hired by First Porcupine Prospecting Group," *Porcupine Advance,* 13 May 1926.

cooking utensils, fly nets, axes, shovels, picks, saw, compasses, packsacks, tumplines, [and] provisions." Wilson had Campbell (and three other men) "put the stuff in [to Porcupine] by toboggans and dogs." The men left their supplies in the bush near their claims with a guard "to protect [it] from the old Indian Chief Tom Fox."[141] This evidence suggests Fox was well known and perhaps feared by local prospectors. Relationships between Indigenous people and newcomers was distrustful. Years after Treaty Nine had supposedly cleared title, Fox exerted control over the land, and he remained near Porcupine until his death in 1926.[142]

Also differently than his Bureau predecessors, Bartlett took no soil samples and provided no comment on timber growth or wildlife.[143] Constrained by time and resources, the body of his report recorded the activities of white prospectors. Although not explicitly environmental, descriptions of development suggest some noticeable changes. There were five claims under development by the newcomers: Robert Bruce, W.H. Reamsbottom, A.E. Way (known as the Bannerman claim), W.H. Davidson, and F.C. Remington (the Wilson property). The Robert Bruce claim had stripped about twenty-five feet of earth from a series of parallel quartz veins which contained visible gold "in grains and leaf-like forms." The Bannerman claim had stripped away earth "at intervals for about three chains [60 metres]." Their trenches were about two feet wide. Davidson had done little stripping, impairing Bartlett's full view of the quartz. The Wilson property was by far the most

[141] Jack Campbell, "The Treasure Chests of Canada Located in Northern Ontario. Found by Greenhorn Prospectors and financed by Greenhorn Businessmen," (n.d.) File 1-22 Campbell, Jack, Letter Describing Discovery of Porcupine Mining Area, Vol. 1., MG 30 W.S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[142] "Fox, Tom – Hired by First Porcupine Prospecting Group," *Porcupine Advance,* 13 May 1926.
[143] He did briefly describe local possibilities for water power. Burrows, "The Porcupine," *1911*, 32-33.

developed. They had found a new vein only a few days before Bartlett's arrival (the largest yet). Although work had not yet commenced, the vein was visible for 120 metres and was about 40 metres wide. The gold existed here in nuggets "scattered through the quarts [sic] in a space of about an inch and a half square to cover a twenty-five cent piece." In general, Bartlett stated that estimates about the total ore could not yet be made, since "no sinking has been done and very little trenching." A more careful examination would have to wait until "the snow leaves the ground in the spring of 1910." In addition to the mine sites, he observed three embryonic townships on the shores of Porcupine Lake in 1909.[144]

Emerging Industry and the Rich Man's Game, 1910-1911.

With more pens and paper on the ground in 1909, Bartlett's brief depiction was not the only post-rush description of the Porcupine. Other accounts similarly focused on development progress, leaving environmental change to be inferred. The *Engineering and Mining Journal* indicated that the arrival of big money by the end of 1909 meant changes in the bush: "several well known people have lately taken up large interests in the new Porcupine goldfields and have already sent men and supplies to develop their holdings." McArthur and Co. from Scotland had taken over the Way and Griffith claims, and planned to sink four shafts to 200 feet. In January of 1910, the *Journal* claimed that "there are about 50 people starting to build stores and stopping places at the northeast end of

[144] On the maps: *Nineteenth Annual Report of the Bureau of Mines, 1910*, 12. On the new towns: *Nineteenth Annual Report of the Bureau of Mines, 1910*, 120.

Porcupine lake."[145] The land had become a busy place pocked with big holes and piles of rock, and filled with new roads, building, and people.

Figure 5 "Indians on Nighthawk Lake," Twentieth Annual Report of the Bureau of Mines, 1911, Vol XX, part II, The Porcupine Gold Area (Toronto: Kings Printer, 1911), 9.

The assembly of an industrial mining community continued through the winter and into 1910, impeded by seasonal fluctuations and Porcupine's relative isolation. After the freeze-up in 1909, Timmins and a crew of twenty-five men got off the train at mile 220 west with two teams of horses and three tons of supplies (including equipment brought in

[145] "Porcupine Lake Region, Ontario," *The Engineering and Mining Journal* 22 January 1910, 209.

from Cobalt).[146] By January, Timmins' crew had hacked in a road using horse teams to plow through the snow. After a false start on a direct route from the rail line, he discovered old lumber operations had put in roads that led roughly in the direction of his claims. When he finally arrived at Porcupine Lake the ice had thinned dangerously, and his horses fell through multiple times in his attempt to cross.[147] Finally at the claim, Timmins' crew began to strip their vein in preparation for two shafts. Some of the cleared lumber became the floors and frames for tents. Timmins' nephew Alphonse Pare talked about building an assay office locally so that he could test the ore and determine directions for drilling.[148] Others followed Timmins' lead – M.J O'Brien of Cobalt shipped in a diamond drill, thirty men and supplies to last the winter, and entered talks with Alec Gillies and Jack Miller.[149] On 22 January 1910, the *Engineering and Mining Journal* ran a full article on the finds, and reported that "daily between 50 and 100 men are going in and this number will shortly be largely increased." Citing J.F. Witson, assistant chief of the Provincial Surveys Branch of Ontario, it stated that 2000 claims had been staked encompassing the entire township of Whitney and Tisdale, "excepting lots reserved for location by veterans, as well as two thirds of Shaw, and two thirds of the township south of Tisdale, which has yet to be named."[150] The journal reported new roads in the district

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[146] Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915*, 1.

[147] "It is worthwhile examining just how difficult it was for people to reach the camp then," Barnes, *Fortunes in the Ground*, 99-100.

[148] Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915*, 1.

[149] "Cobalt," *Engineering and Mining Journal* 25 December 1909, 1289; Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915*, 2. In the nineteenth century, the government of Ontario had purchased diamond drills, which they lent out to small mining operations for exploration. By 1910 this program had clearly become defunct – not only did most of the companies engaged in exploration have enough capital to purchase their own diamond drills, but many private drilling companies could easily be hired to do drilling work. *Nineteenth Annual Report of the Bureau of Mines, 1910*, 25.

[150] "Porcupine Lake Region, Ontario," *The Engineering and Mining Journal*, 22 January 1910, 209.

which would run regular stage coaches, and asserted that "arrangements have already been made to put steamers on the lake next spring."[151] On 27 January the Ontario Government created a Porcupine Mining Division and appointed Arthur Bruce as mining recorder so that prospectors no longer needed to travel to Haileybury to record claims. The move suggested confidence in the long-term viability of the mining camp, and constituted an encouraging sign for investors.[152]

By February, the positive trajectory of development at Porcupine finally encouraged some major deals. According to the *Mining and Engineering Journal* "one of the most important deals yet made in the Porcupine district was consummated on Feb 10 when the Timmins' took up their option on the Hollinger-McMahon properties." [153] The McCormick Brothers of New York purchased the Wilson property for $1,500,000 after a two week investigation by their representative Mr. Geddes.[154] Big money allowed the companies to extend their explorations into expensive underground spaces and build rudimentary processing facilities.

> On the McMahon property and it is understood that there is free gold at the bottom. This shaft was sunk off the main vein, but a 4 ft. lead was encountered a few feet down. Sinking will be continued to a depth of 100 ft. And then crosscuts will be run. A plant has been ordered and work will be prosecuted vigorously. The fact of this option being taken up will have a beneficial effect on the new camp.[155]

[151] "Porcupine Lake Region, Ontario," *The Engineering and Mining Journal,* 22 January 1910, 209.
[152] Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915,* 3. Ontario Bureau of Mines Annual Report 1910, p. 50.
[153] "Cobalt," *The Engineering and Mining Journal*, 19 February 1910, 435
[154] "Toronto," *The Engineering and Mining Journal* 12 February 1910, 387.
[155] "Cobalt," *The Engineering and Mining Journal*, 19 February 1910, 435

Investor confidence and take-overs by large, established firms allowed properties to import expensive supplies and make ambitious new plans for getting the gold out of Porcupine earth.

In a climate of escalating excitement, and perhaps having learned from the messy Cobalt experience, the Ontario government tried to plan for the long term future of the camp. It made the first steps toward the establishment of a community at the northeast end of Porcupine Lake in February. According to the *Mining and Engineering Journal*, "it has been surveyed into town lots which will shortly be offered for sale." This move was partially to accommodate the "hundreds of prospectors [who] continue to arrive, the total number of people now in the district being estimated at about 4000."[156] As more hopefuls flooded in, they moved into new areas, and the government made efforts to protect parts of the landscape.[157] An order in council protected every lakebed adjoining Whitney, Tisdale, and Mountjoy townships (or the entirety of the Porcupine district). The government also made an effort to insure the right of way of the T.&N.O., which the Ontario Railway and Municipal Board approved in September of that year. The Ontario Railway and Municipal Board approved the Porcupine spur line in September.[158] Finally, the government worried about the potential for large numbers of prospectors in the bush to start damaging forest fires: "it is necessary, therefore, during the dry season of the year

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[156] "Toronto," *The Engineering and Mining Journal*, 19 February 1910, 434

[157] According to the *Journal*, "Free gold was recently found by John Callahan, 3 ½ miles east of Night Hawk lake, the vein being reported to be 8 ft. Wide with a fair showing of gold. This is the first find east of Night Hawk Lake." "Toronto," *The Engineering and Mining Journal*, 19 February 1910, 434

[158] "Cobalt," *The Engineering and Mining Journal*, 19 February 1910, 434. Fancy, *Temiskaming Treasure Trails Vol. 5 1910-1915*, 18. Although the *Engineering and Mining Journal* seemed confident about the project much earlier. "The government will build a branch line into Whitney and Tisdale township." "Toronto," *The Engineering and Mining Journal*, 12 March 1910, 584.

to maintain a large force of fire rangers to prevent, if possible, the occurrence of fires, and to assist in their extinguishment, should fires occur." Profits from mining licensees helped to pay some of these expenses.[159]

Before the winter roads thawed in 1910, "a few plants were rushed into the camp" and plans for ore testing were well underway. Summer access continued via portage and river from Mile 228, or up the Mattagami River, which conveniently ran "within a mile and a half of the Hollinger claims."[160] By March 1910, the Bannerman claims had sunk a shaft to twenty-two feet and two veins had been stripped "for a considerable length."[161] The former Wilson claim had incorporated into Dome Mines Limited, managed by John Lawson of the Canadian Copper Company. Lawson oversaw more stripping and had one of the plants already working. The Hollinger claims (controlled by Timmins and some associates) led the camp in mine development. By March they had sunk three shafts at 55 feet, 35 feet, and 20 feet respectively. The 55 foot shaft had begun a cross-cut from the 50 foot level. A plant, consisting of boilers and a compressor, was on the ground and in the process of set up, and a train car load of ore had been shipped from the property while the winter road had still been in place.[162] The Miller claims, which adjoined Hollinger, had sunk a couple of test pits and done 205 feet of diamond drilling. O'Brian Foley, located half a mile west of Porcupine Lake, had sunk a shaft to 25 feet and done some stripping.[163] According the *Mining and Engineering Journal*, Timmins had plans for

[159] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 42.
[160] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 92.
[161] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 121.
[162] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 123.
[163] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 123.

further expansion and "much machinery is being sent into the district." The journal alluded to development on several promising properties, and continued to comment on a steady stream of complicated mining deals.[164]

Unfortunately for the miners, the spring of 1910 proved a significant barrier to rapid development. By April, the supply road built by Timmins in January (used all winter to bring in people and equipment) began to turn to mud. According to the *Mining and Engineering Journal,* it was "practically impassable for teams, and people coming out or going have to do so on foot." With the road gone, "the country will be practically isolated until the ice leaves the lakes and rivers and the navigation company starts its boats." [165] Finally in May, "as a result of the unexpectedly early spring and the breaking up of the winter roads, the Porcupine camp has been practically cut off from communication with the outside world, greatly interfering with development." Many prospectors could not access their claims or fulfil the development requirements needed to avoid forfeiture. The Ontario government took special measures in light of the situation: "To prevent forfeiture of claims, the Department of Mines has extended the time for the first 30 days' work on claims staked between Jan 1 and March 15 until June 15."[166] As the *Journal* opined, "one of the greatest needs of the new camp is a summer road, and although several have been

[164] "H.L. Timmins, who purchased the Hollinger properties, Porcupine, has taken up an option on another group of claims in the vicinity. It is to be understood that a large cash payment had to be made before the option was given." "Negotiations are under way for the purchase of the Higginson claims by New York men, and many other deals are reported." Looking ahead to summer, "the government is being petitioned to build a summer road into the camp, and a company has been organised to run a line of motor boats on the lakes." "Cobalt," *The Engineering and Mining Journal,* 26 March 1910, 678.
[165] "The Porcupine District: Special Correspondence," *The Engineering and Mining Journal,* 23 April 1910, 874.
[166] "Toronto," *The Engineering and Mining Journal,* 5 May 1910, 934.

projected nothing much has been done yet. The government has been asked to assist in this undertaking, but so far has done nothing."[167] Over the summer of 1910, the mines moved supplies via wagon as far as they could before transferring them to gasoline boats which travelled fifty-two miles down the Frederick House and Porcupine Rivers to the mine site. Eventually the mines developed a seasonal rhythm for transportation shaped by the realities of northern Ontario muskeg. Supplies were moved in the winter, "since roads which are impassable in the summer are excellent in the winter when used for sleighs."[168]

In the meantime, the prices named continued to climb. Wilson's claims changed hands again and were sold to Dome Mining Company for $1,700,000.[169] The enormous sums of cash changing hands combined with the inaccessible and mysterious landscape understandably made investors nervous. Since the Porcupine was remote and difficult to access, distant investors were forced to put significant trust in the men on the ground. Frank Cochrane, Ontario Minister of Lands, Mines, and Forests, sounded the first note of warning in January of 1910. He stated that information had reached the department that "'snow-shoe staking' is going on extensively in the district, and that it is only fair to warn the public against buying claims staked out when the whole country is covered deeply with snow, as there can be no certainty of the bona fide discovery of minerals under such circumstances."[170] His concerns about snowshoe staking proved well founded. Later that

[167] "The Porcupine District: Special Correspondence" *The Engineering and Mining Journal,* 23 April 1910, 874.
[168] *Annual Report 1911, Special Report on the Porcupine*, 3.
[169] "Six of the claims were secured by the Dome Mines Company, of New York and Copper Cliff, for $1,500,000, the remaining five being taken by McCormick Brothers, of New York, at $200,000." "Toronto," *The Engineering and Mining Journal,* 23 April 1910, 886.
[170] "Porcupine Lake Region, Ontario," *The Engineering and Mining Journal,* 22 January 1910, 210.

year, two Porcupine prospectors, E.E. Jones and A. Blackburn were charged with causing a rush to Camel's Back Lake. According to the *Mining and Engineering Journal* "about a thousand gold-seekers were deceived by erroneous reports" and "they are alleged to have sold claims to Haileybury men for $2000, signing affidavits as to their value."[171] Distant investors depended on honesty and expertise from prospectors and geologists about the nature of gold deposits and their value.

As Porcupine industrialised, the question of how to power the massive machinery became increasingly pressing. In 1910, the Ontario Bureau of mines already knew the solution: "if the new gold field of Porcupine proves to be permanently workable, there will be no difficulty in harnessing the falls on the Mattagami, Grassy and other rivers within convenient reach for use in the mines."[172] The task of harnessing these rivers to power the industrial state would eventually prove more complicated than the Bureau imagined, but in 1910 the close proximity of the mines to ready sources of hydroelectricity must have seemed fortuitous. As Bartlett commented in his 1911 report, "the importance of such water powers in close proximity to a mining camp does not call for further comment."[173]

Investors and mine owners might worry about snow-shoe staking and power supplies, but the scaling-up of the gold rush combined with its remoteness also posed problems for individuals on the ground. In 1910, an Australian paper published an anonymous Scotsman's account of travelling to Porcupine to work. The account gives an

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[171] "Toronto," *The Engineering and Mining Journal,* 5 May 1910, 934.
[172] *Nineteenth Annual Report of the Bureau of Mines, 1910*, 131.
[173] Bartlett, "The Porcupine Gold Area," *1911*, 32.

impression of the way that individuals related both to the Porcupine environment and to the new industrial mines cropping up on the muskeg. The Scot "was dumped at midnight along with about 500 others at what is called '222'" (the railway mileage), at a small town "where but three weeks before there was nothing but the virgin bush." In the morning he "woke early and...had a wash in melted ice, then a rush through the bitter cold to the cookhouse [for a] hearty breakfast of porridge and hash." Anticipating a well-paying job in Porcupine, he took the expensive stagecoach instead of walking to the gold camp (which would have taken him three days). The journey was cold and rough, and required that he occasionally jump off the coach to pick up parcels which had fallen off and to warm his numb limbs. The stage stopped at noon at Father Paradis's halfway house (on the shores of drained Frederick House Lake) where he ate again while the horses rested: "Food doesn't stay long with a fellow in that country. You seem to breathe a mouthful out with every breath."[174] The journey to Porcupine was still slow and pre-industrial in some ways, but the relatively quick access via train and stage coach and the availability of amenities like porridge and hash speaks to a landscape tied tenuously to the global industrial economy.

Once arrived at Porcupine, the Scot described Main Street as "uneven rows of log shacks." He found lodging and began to look for work. It took him three days to find a job, which ultimately disappointed him.

> To tell of the bitter cold and hard graft, and the tugging and pulling of four and five hundred weights of provisions and tools on toboggans, the shovelling of snow, the stripping of rock, and the sinking of a shaft would take too long...I put in about

[174] "Real Canada – Uninviting Place," *Darling Downs Gazette*, 12 May 1911," http://nla.gov.au/nla.news-article182678881 (accessed 16 November 2017).

> thirty-eight days at 2 ½ dollars a day and board. The man without capital has small chance here, as capitalists and prospectors have staked every inch of ground within a radius of thirty miles. It is a rich man's venture.[175]

By the end of 1910, Porcupine had become dominated by large companies with capital to employ labour and technology in extractive projects. Based on the nature of the deposits and the character of the land, a structure for mining had already begun to take shape with little room for innovation or individual enterptise.

The experience of the anonymous Scot is instructive in that it suggests that Porcupine's industrial transformation excluded individual and small-scale mining from an early date. For hired labourers, work could be difficult and dangerous.[176] The story also shows that the northern climate permeated human experiences of the land. The snow and cold stand out as definitive parts of the Scot's experience, shaping his movement, his work, and his mental state. Finally, despite industrialisation, infrastructure remained rudimentary in these early years. The Scot worked outdoors, above ground, performing a variety of tasks. His experience would not be the experience of industrial miners just a decade later working far underneath the same ground.

Wildcatters and Honey Pots: Dangers of the Canadian Frontier in the International Press

In a world that had learned to appreciate spectacular stories of frontier bonanzas, the Porcupine Gold Rush obtained easy fame despite its remoteness. International media watched events unfold in Canada with speculative interest based in experience garnered

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[175] "Real Canada – Uninviting Place," *Darling Downs Gazette*, 12 May 1911.

[176] In the spring of 1911, the Annual Report for the Bureau of mines noted that "mining companies in the initial stage of development work on their properties are often more negligent than after the mines have begun production" when it came to worker safety. For example, not providing thawing houses for dynamite. *Twentieth Annual Report of the Ontario Bureau of Mines, 1911*, 61.

from California to the Klondike. The international community's ready reception of the Porcupine reflected its membership within a global mining community built across multiple continents. By the turn of the twentieth century however, most people involved in gold rushes did so through investment rather than direct participation. Memories of late-nineteenth century economic decline combined with a few highly publicised gold rush busts coloured early coverage of the Porcupine and its investment possibilities. Wild stories of intense hardship invented by the international press reflect pessimism about the nature and risk of mining on the frontier.

Enthusiasm for the Porcupine discoveries was muted somewhat by the fact that, by 1909, people had already heard the cry of "gold!" sounded pre-maturely by speculators and "wildcatters" so often that their first response was skepticism. As the *Otago Daily Times* put it in December of 1909, "the people of Ontario are much worked up over the discovery of new and promising goldfields in the northern part of the province." This excitement was partly a product of the success of Cobalt, but "account seems not to have been taken of the fact that many more millions will have to be taken out of Cobalt before the profits equal the actual outlay." Furthermore, at the Porcupine "the gold is in quartz, and that means large capital before any return can be had."[177] In another article, a journalist wrote that "so far, a large number of prospectors have, of course, found nothing but disappointment."[178] In 1911, the *Golburn Evening Penny* reprinted a story by the

[177] "Our Canadian Letter," *Otago Daily Times*, 24 December 1909, 8, http://paperspast.natlib.govt.nz/newspapers/ODT19091224.2.75 (accessed 16 November 2017).
[178] "Gold Rush Now On: All About the 'New Klondyke" which prospectors have discovered near Ontario," *Woodville Examiner,* 3 June 1910, 5, http://paperspast.natlib.govt.nz/newspapers/WOODEX19100603.2.27.4 (accessed 16 November 2017).

Canadian Courier which was "sarcastic regarding the latest gold discovery in the Dominion at Porcupine, in Northern Ontario." Apparently, "two real gold mines have been discovered, and 8000 mining claims have been staked. The other 7998 are still prospects." This meant that "the chances [sic] of the man who invests in Porcupine companies is about one in 1987. The small investor who takes that chance must either be a gambler or a fool." The *Penny* observed that "Canada has plenty of experience to guide her citizens in relation to mining speculation. Probably twenty-five million dollars was lost in the Rossland boom. The mining brokers and the incorporators of mining properties got most of that."[179] The *New York Times* reported on the fact that the "Curb Association" needed to keep "wildcat stocks" out of the booming market for Porcupine stocks.[180] The Australian *Northern Miner* ended an otherwise bland description of operations on the new Porcupine gold fields with the statement: "Nevertheless, the camp will yield its full quota of wildcats, and many speculators will be badly bitten."[181]

The international media sensed that success or failure at Porcupine would touch distant local economies in important ways. The New Zealand paper *Star* worried that the silver from Cobalt would drive down the price of silver. "Thousands of Canadians and Americans are suffering from the Cobalt fever- not the typhoid, but something rather worse, the share-gambling mania. Shares in the paying mines stand high; but many

[179] "Chances of Finding a Nugget," *Goulburn Evening Penny Post*, 29 July 1911, http://nla.gov.au/nla.news-article137042898, (accessed 16 November 2017).
[180] "Curb hits a Stock Boom," *New York Times,* 1 April 1911, 22, https://search.proquest.com/news/docview/863762500/A5E5E38E2C764A15PQ/1?accountid=12347 (accessed 16 November 2017).
[181] "Porcupine Gold Camp," *The Northern Miner*, 2 June 1911, http://nla.gov.au/nla.news-article80353450 (accessed 16 November 2017).

companies have failed as yet to discover anything but an easy way of sinking shareholders' money in holes in the ground."[182] In Kalgoorlie, Australia, *The Sun* urged investors in its mining investment section to ignore the hype around Porcupine and instead spend investment dollars at home, on Australian goldfields in need of exploration and development.[183]

Skepticism and worry could also be seen at home. "The story sounds like similar stories that have started or rather added to other stampedes into gold camps," *The Globe* (Toronto) pointed out in December of that year.[184] The newspaper compared Porcupine to an earlier failed rush at Larder Lake: "The early history of Larder Lake country was such that it disappointed the public."[185] Even though gold existed at Larder, a lack of proper equipment meant that the "rush" quickly petered out. A gold rush was a delicate and rare thing, and *The Globe* was not yet convinced of Porcupine's viability. The paper took the indifference of experienced mining men as a sign that the finds were not worth getting worked up about yet: "It is a notable fact that right in the Cobalt camp there is not much enthusiasm just yet."[186] "The Cobalt camp" consisted of a number of experienced prospectors, miners, and businessmen, many of whom had been educated

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[182] "Cobalt: where streets are lined with silver," *Star*, 19 March 1910, 1, http://paperspast.natlib.govt.nz/newspapers/TS19100319.2.2.2 (accessed 16 November 2017).
[183] "Mining," *The Sun*, 5 March 1911, http://nla.gov.au/nla.news-article211096643 (accessed 16 November 2017).
[184] "The Gold Rush in the North" *The Globe*, 28 October, 1909, 5, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1354257799?accountid=12347 (accessed 16 November 2017).
[185] "Cobalt Engineers After Impostors," *The Globe*, 4 December 1909, 11, https://search.proquest.com/news/docview/1323712180/abstract/22FEFA91A56C40A1PQ/1?accountid=12347 (accessed 16 November 2017).
[186] "The Gold Rush in the North" *The Globe*, 28 October, 1909, 5, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1354257799?accountid=12347 (accessed 16 November 2017).

abroad. Besides, *The Globe* was wise to the fact that even good showings of gold would mean that "there will inevitably be hundreds of [prospectors] doomed to despair" and only a few who would actually profit.[187] In addition, alluvial or surface gold had become a signifier of deeper wealth rather than an end unto itself. Readers of *The Globe* knew that the presence of quartz meant that Porcupine's gold would require mills and men with capital to extract. Porcupine was not rich in surface gold to begin with – although "one optimistic prospector alleges that gold to be the value of $7,000,000 is visible on the surface of the field," readers knew not to take this sort of speculation seriously. "Official channels," *The Globe* reported, called the report "decidedly enthusiastic" and readers waited for government reports of the field's real value.[188]

Whether international or local, interest seems to have been largely restricted to the investment possibilities of the new rush. The likelihood of newspaper readers packing their bags and heading off to make their fortunes had diminished significantly since California, 1848. For example, in January of 1911 the New Zealand *Press* reported that "English and Canadian capital is flowing in for the purchase of claims in the new goldfield at Porcupine Lake, on the borders of Hudson Bay."[189] In the *New York Times*,

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[187] "The Gold Rush in the North" *The Globe*, 28 October, 1909, 5, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1354257799?accountid=12347 (accessed 16 November 2017).
[188] "The New Gold Fields," *The Globe* 3 November 1909, 1, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1354444236?accountid=12347 (accessed 16 November 2017).
[189] "New Goldfield, Many Free Gold Veins," *Press*, 16 January 1911, 7, http://paperspast.natlib.govt.nz/newspapers/CHP19110116.2.27.33 (accessed 17 November 2017).

ads ran for market letters for interested investors.[190] The *San Francisco Call* also ran advertisements for investors.[191]

Aside from a possible investment opportunity, Porcupine made for a sensational story of frontier challenges. By 1909 gold rushes already had an associated mythology for literate news consumers. The gist of this mythology involved adventurous men in adverse circumstances struggling against an untamed wilderness. Starvation narratives were one way in which this manifested. The dramatic and well-publicised famines of the Klondike gold rush may have been fresh in the minds of news readers – only a decade earlier, thousands of hopefuls arrived at the Chilcoot pass unprepared for the fact that there were no supplies food, resulting in food shortages in Dawson city and Skagway in 1897. There were also stereotypical stories of bush hardship, gambling, and murder which made international news about Porcupine. In 1910 the *Woodville Examiner* told the story of a prospector who shot his partner over a claim dispute.[192]

Reports of starving prospectors, greed, and violence made for good headlines, even if they were not particularly accurate. This resulted in a short bout of false reports about the Porcupine. In November of 1910, newspapers in New Zealand began reporting that Porcupine prospectors were starving. On the seventeenth, the *Hawera & Normandy Star*

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[190] For example, "Display Ad 53 ," *New York Times*, 12 March 1911, sec. Real Estate Financial Business News, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/97200471?accountid=12347 (accessed 16 November 2017).

[191] "Wanted – Investors for Good Cobalt Silver and Porcupine Gold," *San Francisco Call*, 3 April 1910, https://cdnc.ucr.edu/cgi-bin/cdnc?a=d&d=SFC19100403.2.173.3&srpos=1&e=03-04-1910-03-04-1910--en--20--1--txt-txIN-Porcupine------- (accessed 16 November 2017).

[192] "Gold Rush Now on: All about the New Klondyke Which Prospectors Have Discovered Near Ontario," *Woodville Examiner,* 3 June 1910, 5, http://paperspast.natlib.govt.nz/newspapers/WOODEX19100603.2.27.4 (accessed 16 November 2017).

reported that "Scores of prospectors are dead and others are dying on the trails to the Porcupine gold camps, in Northern Ontario, through the food supplies failing to get in."[193] The next day the New Zealand *Colonist* reported that "scores of prospectors are dead and other are dying on the trails to the Porcupine gold camps, in Northern Ontario, through supplies failing to get in."[194] The same story was repeated by the *Akaroa Mail and Banks Peninsula Advisor,*[195]the *Wanganui Herald,*[196] the *New Zealand Herald,*[197]the *Grey River Argus,*[198] and the *Otago Daily Times*[199] in New Zealand.

Juicy details added legitimacy to the story. In Australia, a story titled "Awful Suffering: Early California Again" repeated a report by "Mr. Mclean, who has had widespread experience in Australia, South Africa, and Alaska" that "scores of prospectors were either dead or dying on the trails to the Porcupine gold camps in Northern Ontario. He considers that the suffering being experienced surpasses that on the early Klondyke fields, and equals that in California when many hungry men ate their dead comrades." The report went on:

> Many who sought the new rush had meagre supplies with them, while those having plenty abandoned them. The impassable roads, and the barren and desolate country soon produced a famine...twenty of the unfortunates are already

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[193] "General Cables," *Hawera & Normandy Star*, 17 November 1910, 7, http://paperspast.natlib.govt.nz/newspapers/HNS19101117.2.57 (accessed 16 November 2017).
[194] "Hardships of Prospectors: Starvation in Northern Ontario," *Colonist* 18 November 1910, 2, http://paperspast.natlib.govt.nz/newspapers/TC19101118.2.25 (accessed 16 November 2017).
[195] "Gold Rush Death of Prospectors," *Akaroa Mail and Banks Peninsula Advisor*, 18 November 1910, 2, http://paperspast.natlib.govt.nz/newspapers/AMBPA19101118.2.9.10 (accessed 16 November 2017).
[196] "Prospectors' Terrible Fate: Supplies Run out. Scores Dead and Dying." *Wanganui Herald*, 18 Nov 1910, http://paperspast.natlib.govt.nz/newspapers/WH19101118.2.29 (accessed 16 November 2017).
[197] "The Lure of Gold: Deaths on the Trail," *The New Zealand Herald,* 18 Nov 1910, 5, http://paperspast.natlib.govt.nz/newspapers/NZH19101118.2.51 (accessed 16 November 2017).
[198] "The Thirst for Gold," *Grey River Argus* 18 November 1910, 5, http://paperspast.natlib.govt.nz/newspapers/GRA19101118.2.24.7 (accessed 16 November 2017).
[199] "Trail of Death: Unfortunate Prospectors, Shortage of Supplies," *Otago Daily Times*, 18 November 1910, 5, http://paperspast.natlib.govt.nz/newspapers/ODT19101118.2.39 (accessed 16 November 2017).

> dead, and hundreds are dying. Snow has obliterated the trail, and owning to this two men became engulfed in a quagmire.[200]

The story was repeated in different versions in numerous Australian papers.[201] Some papers reported that starvation was actually in the Alaskan Porcupine camp, reflecting the lack of familiarity with Canadian geography.[202] The false stories were later retracted by most papers, who admitted that "it is officially reported that no deaths have occurred in connection with the Porcupine rush, though great hardships have been endured and many are starving."[203]

By 1911, the story had morphed to focus on the unknown dangers of Canada's mysterious northern landscape. According to the *World's News* in Australia, at least five men died after sinking into the mud around Frederick House Lake. The story titled "Engulfed in Mud: Gold Seekers Sink in Presence of Onlookers" told the tale of miners "swallowed up by the "honey-pots" that lie around Frederick House Lake." The story apparently came from W.R. Macleay, a mining engineer, "who, emaciated and gaunt

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[200] "Awful Suffering: Early California Again. Twenty Dead," *Daily Herald*, 18 Nov 1910, http://nla.gov.au/nla.news-page10493134 (accessed 16 November 2017). The same story ran in *The North West Post* 19 November 1910 under the title "Canada Porcupine Gold Camp. Twenty Miners Dead. Sufferings Terrible," http://nla.gov.au/nla.news-article202034309 (accessed 16 November 2017)

[201] Including in Australia "Canadian Winter. Tragic Story from Ontario," *Bendigo Advisor* 18 November 1910, http://nla.gov.au/nla.news-article90686829 (accessed 16 November 2017); "Lust for Gold," *Riverine Herald*, 18 November 1910, http://nla.gov.au/nla.news-article114915843 (accessed 16 November 2017); "Mortality among Gold Prospectors," *Mainland Daily Mercury*, 17 November 1910, retrieved from National Archives of Australia's Trove: http://nla.gov.au/nla.news-article124268728 (accessed 17 November 2017).

[202] The Clarence and Richmond Examiner reported on the nineteenth of November that "scores of prospectors are lying dead, and many other dying of starvation through exposure on the trails to the South Porcupine gold camps in Alaska, in aid for which appeals were made but failed to come." "In the Rush for Gold," *Clarence and Richmond Examiner*, 19 November 1910, http://nla.gov.au/nla.news-article61531847 (accessed 16 November 2017).

[203] "The Quest for Gold," *Dominion* 19 November 1910, 5, http://paperspast.natlib.govt.nz/newspapers/DOM19101119.2.39 (accessed 16 November 2017); "The Porcupine Gold Rush," *Hawera & Normandy Star*, 19 November 1910, 5, http://paperspast.natlib.govt.nz/newspapers/HNS19101119.2.31.2 (accessed 16 November 2017).

visage, has come back to civilization [Montreal] into recover his health." Apparently autumn rains cut off supplies.

> Nearly everything edible had been eaten, and starvation stared the miners in the face. They were therefore confronted with a slow and miserable death, if they remained in camp, and until the frosts hardened the surface of the swamps they would encounter a no less terrible fate in striving to reach the outside world unless acquainted with the trails.

Leaving camp proved no less risky: The most difficult and deadly part of the journey was along the shores of Frederick House Lake, at the site of the old HBC post. "It was on this part of the trail," said Mr. Macleay," that I saw...two men with loads on their backs slowly sink down in the mud and disappear from sight. Their cries and shrieks were frightful to hear...the sight and sounds were horrifying." Macleay went on to talk about how "sticks made out of boughs of the trees were pushed down to probe the depth of the mire, and it was a legend in many parts you might go down 20 ft or more before solid ground was touched when the rains came in such quantity as had then fallen." Macleay told of three other similar deaths he had heard of as well.[204]

International reception of the Porcupine Gold Rush reflects the normalisation of the idea that foreign investment rather than individual effort drove the mining industry by 1909. The climate of this investment was overwhelmingly distrustful because of the development of a pattern of rampant speculation and exploitation in gold rush zones. International stories also reflect the fact that, by 1909, global literate audiences associated gold rushes (and northern landscapes generally) with certain historical tropes. Namely,

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[204] "Engulfed in Mud. Gold Seekers Sink in Presence of Onlookers." *The World's News,* 21 January 1911, http://nla.gov.au/nla.news-article128264977 (accessed 16 November 2017).

the idea of adventurous men enduring unimaginable hardships in desolate, mysterious northern landscapes encouraged hyperbolic and occasionally false stories of starvation and death at Porcupine. Distant readers did not plan to go to Porcupine themselves, and regularly misunderstood the nature of Porcupine and its emerging mining industry.

Geology, History, and the Making of a Mining Camp

By 1909, the discovery of gold implied a particular pattern of human actions which had been developed and practiced on gold fields around the world. Surface indicators showed prospectors where buried mineral wealth lay under a thick layer of overburden. An established investment community stood ready to provide capital to proven gold fields. The nature of the body of Porcupine's gold, which existed in hard rock, discouraged individual prospecting and encouraged the rapid transition to capital intensive industrial extraction based on models developed in California, Australia, British Columbia, New Zealand, South Africa, and the Klondike. By the end of 1910, large corporations dominated Porcupine and individuals worked as employees for these larger extractive organisations.

Yet by 1910, from the perspective of the development-driven Bureau of Mines and Porcupine's emerging capitalist elite, much work remained to be done. In comparison to other gold rush zones, the Porcupine remained primitive. The pervasive cold, muskeg, and isolation of the camp limited mining development by preventing dissemination of investment knowledge and restricting the amount of equipment that could be shipped in. The tensions between expectations for the Porcupine gold zone and the material reality of its environment continued to haunt the Porcupine over the next twenty years. The existence (and persistence) of First Nations economies, the emphasis of early surveys on agriculture, and the regular environmental barriers encountered by miners in the Porcupine meant that extraction never enjoyed total dominance over the land.

Nevertheless, the arrival of the mining industry in 1909 marked a moment of human and environmental change at Porcupine related closely to an existing transnational mining context. In a special report on the district published early in 1911, the Ontario Bureau of Mines accurately stated that the Porcupine discoveries represented a new era in the history of Ontario mining in which the province would become a global gold producer.[205] That year American author Henry Palmer Davis produced *The Davis Handbook of the Porcupine Gold District* in New York, a reference guide for interested international experts and investors. The book included maps and descriptions of the landscape that functioned to render the remote north legible to distant readers. Its list of promising companies showed the true internationalism of Porcupine: A combination of South African and American interests controlled the Rea Mines, Americans owned the Dome, an English group ran the Northern Ontario Exploration Company, and most of the other major companies enjoyed similarly worldly connections.[206] The rapid environmental change at Porcupine between 1909 rested on a foundation of border-crossing capital and experience.

In the aftermath of the rush, the provincial government exhibited a clear understanding of the major issues and policies underpinning extraction around the world

[205] *Twentieth Annual Report of the Bureau of Mines, 1911*, 3.
[206] Davis, *Davis Handbook to the Porcupine Mines*, 24-26.

and situated the Porcupine within it. For example, in a discussion of gold mining law, the Bureau referred to policies made in British Columbia, Nova Scotia, Mexico, and Australia. It chronicled the development of miner's custom from California, and argued that Ontario should aim to distinguish itself from the United States.[207] Rather than an influx of miners bringing their rules and customs with them, Ontario needed rational industrial law formed with the benefit of hindsight.[208] Good law would strive to be liberal and encourage free enterprise (a necessity because so much of northern Ontario remained a mystery to the Bureau), but should also ensure fair wages and safety.[209] Although "environment" in its modern sense did not feature in this discussion, principles like liberalism, free enterprise, fair wages, and safety all implicate nature – as a valuable product to be regulated or (in the case of safety) as a potential threat to workers.

The discovery of gold at Porcupine Lake occurred within a kaleidoscope of historic contexts. Events at Porcupine were driven by the Province of Ontario's conviction that the north would serve as a profitable economic hinterland. This drive for development directly influenced the treaty-making process which would remove Indigenous title to Porcupine and, later, the decision to push a railway into the Porcupine region. At the same time, mining communities around the globe had already done much of the hard work of establishing a tradition of neo-European relationships with gold-bearing ground. An infrastructure of scientific and investment ability, technology, and knowledge existed ready-made for Porcupine and was practiced at Cobalt and then rapidly applied by men

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[207] *Twentieth Annual Report of the Bureau of Mines, 1911*, 271.
[208] *Twentieth Annual Report of the Bureau of Mines, 1911*, 271.
[209] *Twentieth Annual Report of the Bureau of Mines, 1911*, 270

like Jack Wilson and Noah Timmins. As transformative as the 1909 changes would be, the Porcupine remained part of a long history of local human use and environmental change in northern Ontario implicating a variety of human and non-human communities. The existence of gold in shield rock around Porcupine Lake remains only a single characteristic of a dynamic, complicated, and variable landscape. The gold camp which had emerged by 1910 represents the point of overlap between these local/extra-local historic forces.

Chapter 2: Baptism by Fire: Mining Economies of Scale before the Great War

International presses may have exaggerated tall tales of death in an unforgiving Northern Canadian wilderness frontier in 1909, but in 1911 far-fetched stories became terrible reality. On 10 July high winds turned smoldering bush fires into a massive wildfire which moved rapidly toward the Porcupine gold fields. Residents scrambled to load wagons with belongings and headed to shelter in lakes and mine shafts. Still, people and animals alike burned in the flames, and others drowned in the storm-ravaged water or suffocated in the shafts. By the time the cataclysm was over it had claimed seventy-three lives, burned 553,000 acres and caused $3 million in property damage.[1] It was an environmental disaster of unprecedented proportions, and was called at the time the worst catastrophe in Ontario's history.[2]

Regular fire cycles are a normal and predictable part of shield ecology. The annual reports of the Bureau of Mines recorded many large burns in the years before the discovery of gold. So why was 1911 so catastrophic? Once railway workers, settlers, foresters and prospectors arrived, the province of Ontario began suppressing fires. This activity allowed fuel to build up more much than it had under Indigenous management regimes. In addition to settler fire suppression, natural forces including insect-kill and blow-downs added large amounts of combustible material to the ground. At the same time, North America entered a cycle of warm years around the middle of the first decade

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[1] A.P. Leslie, "Large Fires in Ontario prior to 1950," *Forestory* 4 (1)(2013) "Forest Fire and Firefighting History," 50.

[2] "Porcupine Disaster Intensifies; Refugees Fleeing from the Scene," *The Globe*, 14 July 1911.

of the twentieth century. Foreshadowing the July blow-up, numerous small fires burned around Porcupine in 1910 and early 1911. The fire on 10 July was merely the most disastrous: Human and natural forces worked together to create a perfect storm.

The real power of the Great Fire was that it exposed fault lines in the relationship between humans and nature at Porcupine. This relationship had begun when miners arrived in 1909 and formed syndicated companies. In the three years since gold's discovery, miners, companies, and governments had laboriously assembled networks of labour, family, technology, science, experience, legislation, investment dollars, and ideology. Some of the features of this new international-industrial regime proved incompatible with existing ecology. Acknowledging that fire patterns required adaptation if the mines were to be viable in the long term, the newcomers aimed to fireproof Porcupine after 1911. In the hands of the mining industry and its promoters, reconstruction in its aftermath symbolized transformation from wild and dangerous frontier environment into modern, massive, and well-organised global resource hinterland. Yet, the mines and communities rising from the ashes remained vulnerable to shield nature. Fluctuating precipitation, unpredictable geology, and the harshness of work underground plagued production.

The Great Fire of 1911 literally and metaphorically cleared the way for the dominance of large-scale industrial vision for mining based on international examples. It re-arranged the Porcupine's physical geography in ways that benefitted some stakeholders more than others. Well-financed mines like Hollinger, Dome, and McIntyre bounced back quickly. With their insurance settlements, they built new fireproof infrastructure, studied the newly exposed shield rock using transnational expertise, and bought up the properties of their burned-out neighbours. By the outbreak of the First World War, the "big three" mined on a scale comparable with the biggest industrial mining companies in the world. Environmental problems during and after the Great Fire of 1911 are tangled up with the acceleration of large-scale mining, growing inequality, and increased integration between Porcupine and its international context.

Before the Blaze: Fire Ecology in Northern Ontario

Ecological research on fire cycles shows that fires completely burn boreal forest like the kind at Porcupine in approximately hundred-year intervals. Within that hundred-year cycle, warm dry periods occur approximately every ten years and are marked by larger and more severe fires which burn larger areas than fires in cooler, wetter years.[3] Certain factors can further increase the likelihood of major or catastrophic burns within the cycle. For example, insect infestations and trees downed by wind can increase the amount of dry fuel and contribute to especially big fires within normal ecological cycles. Before colonialism, First Nations people played a role in fire patterns by burning forest for clearing, cultivation, and hunting.[4] The year of the Great Fire of 1911 was within a natural cycle of hot, dry weather in Ontario, but settler human factors increased its scale, intensity, and severity. Reports from the Bureau of Mines and climatic data from the early twentieth century provide a record of this relationship.

Insect infestation, specifically larch sawfly, killed many of the trees around

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[3] I.D. Thompson, A. Perera, and David Euler, Ministry of Natural Resources, *Ecology of a Managed Terrestrial Landscape: Patterns and Processes of Forest Landscapes in Ontario* (Vancouver: UBC Press, 2000), 41-42.
[4] Thompson, et. al, *Ecology of a Managed Terrestrial Landscape*, 116.

Porcupine at the beginning of the twentieth century. In the 1904 Annual Report of the Bureau of Mines, Tennyson Jarvis recorded the state of the larch sawfly infestation in the forest along the Porcupine River.[5] "Nearly all of the larch or tamarac trees in this northern country have been destroyed by the larvae of this saw fly," he observed.

> During the early part of July the adult flies were seen floating down the Porcupine River, and a few days later the shore of Night hawk Lake was covered with them. Pupa-cases were found in masses beneath the surface of vegetation of all the trees examined in the district.[6]

Later reports echoed Jarvis, recording large numbers of trees dead because of the larch sawfly.[7] The infestation resulted in considerable fuel on the ground before miners even arrived in the area five years later.

The annual reports before 1911 also record considerable windfall.[8] Of nearby Prosser Township, McMillan wrote in 1905 about the "many fallen trees in the Clay Belt" and called it an "extreme condition."

> In this area there are very few standing trees. In one locality there is a stretch of twenty chains without any. Spruce, polar and tamarack lay piled over one another, so that for chains at a time one can talk over tree trunks without touching the ground at all.[9]

Surveyors were interested in windfall largely because it represented wasted timber and

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[5] Tennyson Jarvis, "Agricultural Capabilities of Abitibi," *Report of the Bureau of Mines 1904* (Toronto: King's Printer, 1904), 122.
[6] Jarvis, "Agricultural Capabilities of the Abitibi," 128.
[7] Possibly because they visited at different times of year, or possibly because the attack was over. James McMillan, "Explorations in Abitibi," *Ontario Bureau of Mines Annual Report 1905* (Toronto: King's Printer, 1905), 189; A.G. Burrows, "The Porcupine Gold Area," *Ontario Bureau of Mines 1911*, Part II (Toronto: King's Printer, 1911), 5; A.G. Burrows, "The Porcupine Gold Area Second Report," *Ontario Bureau of Mines Annual Report 1912* (Toronto: King's Printer, 1912), 208.
[8] William Arthur Parks, "The Nipissing-Algoma Boundary," *Ontario Bureau of Mines 1899,* (Toronto: Warwick Bro's & Rutter), 1988), 178, 182, 183
[9] A.P. Coleman, "The Northern Nickel Range" *Ontario Bureau of Mines Annual Report 1904* (Toronto: King's Printer, 1904), 221.

lost value. Larch-fly attacks may have weakened stands and contributed to high numbers of downed trees. In 1910, La Nina winds brought down additional windfall across North America, contributing to a series of massive, deadly wildfires in the United States that year.[10]

Fire ecologists now know that organised, large-scale intervention in fire cycles, as occurred throughout Ontario in the twentieth century, raise fire risks.[11] Fire suppression began in Ontario in 1886 with the appointment of the first forest fire rangers. The fire service slowly expanded its mandate and increased in effectiveness over time.[12] Ontario fire policy, like that in the United States, emphasized total suppression. This mandate remained part of Ontario fire policy until the late twentieth century.[13] Documentary evidence does not show whether or not fire rangers worked around Porcupine between 1909 and 1911 – the earliest newspaper account recording their presence comes from 1915.[14] However, the arrival of the rail line and the presence of timber interests would have made Porcupine a good candidate for ranger surveillance, and miners worked to suppress fires even when there were no rangers present.[15]

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[10] Stephen Pyne, *Year of Fires: The Story of the Great Fires of 1910* (New York: Viking, 2001).
[11] Mary Grunstra and David Martell, "Along a Rickety Road: One Hundred Years of Railway Fire in Ontario's Forests," in *Forestory* 4 (1)(2013) "Forest Fire and Firefighting History": 5-10; I.D. Thompson, A. Perera, and David Euler, Ministry of Natural Resources, *Ecology of a Managed Terrestrial Landscape: Patterns and Processes of Forest Landscapes in Ontario* (Vancouver: UBC Press, 2000), 242.
[12] I.D. Thompson et al, *Ecology of a Managed Terrestrial Landscape,* 120.
[13] I.D. Thompson et al, *Ecology of a Managed Terrestrial Landscape,* 120.
[14] "Fire Rangers, Work Of," *Porcupine Advance* 25 June 1915.
[15] Railways are known to increase fire risk, a fact well understood by governments and citizens in the early twentieth century. See, for example, "Protecting Forests: Regulations Recommended to Govern Railways," *The Globe,* 3 May 1910 (accessed 24 November 2017) https://search.proquest.com/hnpglobeandmail/docview/1354545974/3695BDFE002349FFPQ/11?accountid=12347; "Railways and Forest Fires," *The Globe,* 6 June 1904 (accessed 24 November 2017) https://search.proquest.com/hnpglobeandmail/docview/1354892608/3695BDFE002349FFPQ/18?accountid=12347; "Railways Responsible: Locomotives Start 30% of Forest Fires," *The Globe,* 29 December 1910

In the early twentieth century, North America entered a period of hot, dry weather. Its effects can be seen in Ontario's fire record. Forest historians record large fires extending from Kabinagami to Little Abitibi Lake, Lake Kesagami, and Grand Lake in 1901, just north of the future mining zone.[16] Northern people were accustomed to fire cycles. Most post-1900 reports from the Porcupine mention burned patches in and around Whitney and Tisdale townships.[17] In 1905 the annual report lamented the fact that "most parts of Northern Ontario…have been swept of their timber by forest fires which devastate parts of the country almost every year."[18] Fire's central place in northern mining communities is apparent in an account written by W.L. Goodwin in 1907 as he struggled to conduct mining classes. That summer, Goodwin arrived at the Orange Hall in Haileybury to give a lecture, only to find he could not use his electric lamp because "the sawmill with which the power house was connected burned down."[19] A few days later while examining an ore pile at the Benn mine, Goodwin "noticed a very heavy explosion towards the east." He later found out that "bush fires, which were burning everywhere in the district" had blown up a dynamite magazine. Just a few days later, at Giroux Lake, Goodwin arrived at University Mine for a class and instead found "the miners fighting a

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(accessed 24 November 2017) http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1356334382?accountid=12347.

[16] A.P. Leslie, "Large Fires in Ontario prior to 1950," 50.

[17] George Kay, "The Abitibi Region," *Report of the Bureau of Mines 1904* (Toronto: King's Printer, 1904), 109, 115; James McMillan, "Explorations in Abitibi," *Report of the Bureau of Mines 1905* (Toronto: King's Printer, 1905), 193; H.L. Kerr, "Exploration in Mattagami Valley," *Report of the Bureau of Mines 1906* (Toronto: King's Printer, 1906), 124; Archibald Henderson, "Agricultural Resources of Mattagami," *Report of the Bureau of Mines 1906* (Toronto: King's Printer, 1906), 140.

[18] J.M. Bell, "Iron Ranges of Michipicoten West," *Report of the Bureau of Mines 1905* (Toronto: King's Printer, 1905), 296.

[19] W.L. Goodwin, "Summer Mining Classes," *Report of the Bureau of Mines 1907* (Toronto: King's Printer, 1907), 51.

fire which was threatening the buildings of the Foster mine." Rather than teach, Goodwin spent the day fighting the fire alongside the miners.[20]

Fire historian Stephen Pyne lists this early twentieth-century warming as one of the major contributing factors to the devastating forest fires in America in 1910.[21] Ontario also suffered in 1910, but while the American fires had burned out by the end of that year, Ontario conditions worsened in 1911. Data from Ottawa (the nearest city for which the record goes back far enough) suggests that temperatures in 1911 were even hotter and dryer in 1911 than 1910. Ottawa recorded its hottest ever days on 3 July, 9 July, and 10 July (the day of the fire) in 1911.[22] In the period between 1880 and 2016, 1911 has the fourth highest daily temperature ever recorded (36.7 degrees Celsius), while the highest temperature in 1910 does not even make the top hundred for the same period (at 24.4 degrees Celsius). Meteorological records for Ottawa show that 1910 and 1911 experienced well below average rain fall and low snow packs.[23] Anecdotal evidence supplements the data. *The Globe* recorded fifty-eight heat-related deaths and dangerously low reservoirs in Toronto on 8 July 1911.[24] Dominion Horticulturalist W. T. Macoun recorded a hot, dry spring for Ontario generally (which shortened the flowering season for many blooms) and noted that "July was an extraordinarily hot month, one of the hottest

[20] Goodwin, "Summer Mining Classes," 52.
[21] Pyne, *Year of Fires.*
[22] Government of Canada, "Ottawa data" in Almanac Averages and Extremes, Historical Climate Data, http://climate.weather.gc.ca/ (Accessed 18 May 2017).
[23] 31 March 1910 to 30 March 1911 recorded 27.72 inches total precipitation and 31 March 1911 to 30 March 1912 recorded 29.95 inches. The yearly average 1890 to 1912 was 34.84 inches. J.H. Grisdale, "Report of the Director," *Annual Report of the Experimental Farms for the year ending March 31, 1912* (Ottawa: King's Printer, 1912), 17.
[24] "Record is now fifty-eight deaths," *The Globe,* 8 July 1911.

ever experienced." According to Macoun the mean temperature in July was a scorching 97.8 degrees Fahrenheit (36.5 degrees Celsius), nights remained hot, and rainfall was light.[25]

Although small fires plagued its neighbours, the site of the Porcupine mines had not experienced a major burn since the beginning of the written record. Just a few months before the Great Fire, the Bureau of Mines observed that "much of the timber on the higher ridges was burned by forest fires. In this district, however, the forest fires are not wide spread."[26] Minor blazes, such as one that leveled Hollinger's almost-completed thirty-stamp mill on 19 May 1911, were quickly extinguished. [27] Fuel on the ground had never burned off as it had elsewhere. Therefore, environmental factors (insect kill, windfall, hot/dry weather) combined with human actions (settlement, railway completion, active suppression) to create perfect conditions for a destructive wildfire at Porcupine in 1911.

Day of Disaster: The Great Fire of 10 July, 1911.

The 10th of July, 1911 was hot, and several small fires burned adjacent to the mines and communities at Porcupine. In the morning, the wind united these small fires into a single, much larger fire which began moving toward the town. When the danger to structures and people became evident, women and children began crossing Porcupine Lake to Golden City. Bad weather made the water choppy, so progress was slow.[28]

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[25] W.T. Macoun, "Report of the Dominion Horticulturalist," No. 16, 31 March 1912, in *Second Session of the Twelfth Parliament of the Dominion of Canada Session 1912-13 (Sessional Papers)* (Vol. 9), 86.
[26] Burrows, "The Porcupine Gold Area," 5
[27] Hollinger Gold Mines Limited First Annual Report, January 1912, Hollinger Company Fonds, F113 Archives of Ontario, Toronto, Canada
[28] Michael Barnes, *Gold in the Porcupine* (Cobalt: Highway Bookshop, 1975), 38.

Meanwhile, men and women remaining in town tried to protect it with bucket brigades.[29] As structures in South Porcupine began to burn, people waded into the lake, bringing animals and belongings, using pieces of wood and other floating material as rafts. According to local historian Michael Barnes, the last telegraph came out of Porcupine at 3:30 in the afternoon to report that the fire "possessed" the town and the smoke was too thick to see through.[30] Fire followed smoke, consuming the town and many of the nearby mines over the course of the afternoon.

The first deaths occurred in the outskirts of Porcupine, where prospectors worked in the bush and could not get out of the fire's path. Within the town, some did not make it to the water, or died in burning buildings while trying to rescue relatives, animals, and possessions. Others drowned in the rough lake water or sought inadequate shelter in small streams or mine shafts. Robert Weiss, manager of West Dome Mines, took his wife, child, and twenty-two workers into the Dome shaft where they all died of asphyxiation when the fire sucked the oxygen out. Even after the fire was over, others died from shock or injury.[31]

In addition to human and animal lives, the fire destroyed nearly all the infrastructure built at Porcupine since 1909. The Porcupine extension from the T. & N. O. railway, mine head frames, homes and outbuildings all went up. Photographs show a

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[29] See "Pail Brigade, Porcupine Fire," CPC-00731 and "Fighting Fire Last Stand Powells Point," CPC-00712, William Ready Division of Archives, McMaster University, Hamilton, Ontario, Canada.
[30] Michael Barnes, *Gold in the Porcupine* (Cobalt: Highway Bookshop, 1975), 38.
[31] "Telegraph for Charles Murphy, Ottawa," 27 July 1911, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.

smoldering landscape dotted with the twisted remains of metal equipment (see figure 6).[32] J.B. MacDougall, a local teacher and author who claims to have arrived on the scene the day after the fire, wrote "for those of us who knew the land before, no words can tell. A stark, black, smoking shamble as far as human eye could reach – a very charnel-house of death and desolation."[33] Porcupine newcomers had celebrated the frontier spirit or development that had transformed of Northern Ontario into an industrial gold centre, but the 1911 fire reduced these signs of progress to ashes and rubble.

Figure 6 "Dome Gold Mine Plant After Porcupine Fire," C-312-0-0-0-11, C321 H. Peters Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

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[32] For example, "Dome Gold Mine Plant After Porcupine Fire," C-312-0-0-0-11, C321 H. Peters Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[33] J.B. MacDougall, *Two Thousand Miles of Gold, From Val d'Or to Yellowknife,* (Toronto: McClelland and Stewart, 1946), 181.

Transnational Fire: Human Networks and Environmental Disaster in 1911

The fire abruptly severed Porcupine's connection to the world. Paradoxically, the abrupt severing of Porcupine's transnational ties made them more visible in the documentary evidence. International migration of people, ideas, and objects between nineteenth and early twentieth-century gold fields is tricky to follow because census records in frontier zones are frequently incomplete. In Porcupine, private and informal human connections between mining zones became matters of public concern and government intervention in the aftermath of the fire. The international media immediately picked up and disseminated the story, suggesting the extent to which international audiences had a stake in Porcupine affairs. Worried friends and relatives of people living at Porcupine unable to contact their loved ones began to channel requests for information through the Canadian government. As a result, personal correspondences became preserved in government fonds. These records give a sense of the nature of Porcupine's largely informal transnational connections as they had been built since 1909, especially when combined with media reports.

A selection of press accounts suggests that the story spread widely and rapidly in the days following July 10th in both the popular media and in mining-specific publications. The wide dissemination of these stories suggests Porcupine's cachet with overseas audiences. Stories were relevant because people had money invested in Porcupine, or knew people who worked there. They also made for exciting stories of dangerous frontier life and may have served to fulfil cultural tropes about the character of miners and gold rush violence. News about the Porcupine fire served practical and ideological purposes in the international press.

On 14 July 1911, the *New York Times* ran a short piece noting that, despite the news of the fire, share prices for Porcupine mining companies had not dropped significantly.[34] However after this rather bland first report, *The Times* fell into the trope of fantastic tales of frontier danger. Two days later, it published an account of a mining engineer supposedly just returned from the scene. The account was exaggerated. It claimed "thousands, perhaps, dead, women and children were scattered all over the field of havoc," and described massive losses of life and property.[35]

The Times published a third account on 18 July from another survivor. The prospector had been living in a tent near Pearl Lake, and had only enough time to stuff a small pack before running into the water. He stayed in the water with a fellow prospector until it was over, and recalls sharing the lake with a bear and other animals escaping the flames. After it was over, the two prospectors hiked out of the burned zone to Golden City, and found the bodies of seven men on the way out.[36]

The Wall Street Journal also covered the fire, and, even though it was only days after the blaze had ended, emphasized that the damage had been exaggerated; Dome Mines could easily have its mill going again by December.[37] This was probably aimed at reassuring American investors who had learned about the fire from other sources. In fact, the fire totally destroyed the Dome mill and a new mill did not replace it until March

[34] "Outside Securities," *New York Times* 14 July 1911.
[35] "Pictures Horrors of Forest Fire," *New York Times* 16 July 1911.
[36] "In Fire-Girt Lake with Forest Beasts," *New York Times* 18 July 1911.
[37] "Fire Losses at Porcupine, *The Wall Street Journal* 18 July 1911.

1912.[38] These reports on the fire expressed the two main ways that Porcupine mattered to readers outside Canada – as an exciting story about the hazards of wilderness frontiers and as an event with potential influence on global financial markets.

Australian and New Zealand papers also covered the event. As early as 14 and 15 July major papers reported over 300 deaths and "many millions of pounds" in damage.[39] In addition to the familiar sensationalism about the danger of the Canadian wilderness, the Australian papers were especially interested in the "cowardly behavior of foreigners" who supposedly attempted to rush boats occupied by women and children.[40] The *Armidale Express and the New England General Advertiser* of New South Wales ran a story called "A Great Canadian Calamity" which described piles of dead, naked bodies and robbers who "have been going among the dead stealing clothes and belongings."[41] Others described a "train load of coffins,"[42] men "forced to [fight the flames] at the point of revolvers,"[43] huge waves pulling victims under the lake water,[44] and "trails strewn with the bodies of prospectors."[45]

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[38] Annual Report 1912, 153.

[39] For example, "Worst in Canada's History," *The Maitland Daily Mercury*, 14 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article121470933, (accessed 20 April 2018); "Cheat Forest Fires, *The Age*, 15 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article196207743, (accessed 20 April 2018).

[40] "Cheat Forest Fires, *The Age*, 15 July 1911.

[41] "A Canadian Calamity," *The Armidale Express and New England General Advertiser*, 18 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article191946484 (accessed 20 April 2018).

[42] "The Forest Fires," *Daily Post*, 17 July 1911. Retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article178345671, (accessed 20 April 2018).

[43] "The Forest Fires, *Daily Advertiser*, 15 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article142491285 (accessed 20 April 2018).

[44] "Forest Fires," *Daily Herald*, 17 July 1911, retrieved from the National Archive of Australia's Trove: http://nla.gov.au/nla.news-article105323367 (accessed 20 April 2018).

[45] "Forests Become Furnaces," *Geelong Advertiser*, 15 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article150094783, (accessed 20 April 2018); "Forest Fires in

Not all the Australasian papers were so sensational. The more conservative papers like the *Daily Post* quoted information from the Ontario Government. Minister of Lands and Forests Frank Cochrane, who, responding to the sensationalism of the international media, stated that "while he did not want to minimize a national calamity, there was every justification for the feeling that newspaper reports of the horrors at the Porcupine Gold field as a result of the forest fires were much exaggerated."[46] Most of the missing had, in fact, been accounted for and the total deaths "do not exceed 75." He speculated that misinformation stemmed from the difficulties in getting news out of the Porcupine, the fact that some casualties were accidently counted multiple times, and that the missing were reported dead pre-emptively.[47] Thus while some of the Australasian papers engaged in an intensified version of sensationalism found in reports of the Porcupine from before 1911, cooler heads were also interested in the fate of relatives and the global industry.

The fire was no one-hit wonder. International media covered the fire well into the fall. It appeared, for example, in the *Gundangai Times* on 29 September 1911 in New South Wales, Australia with many of the trappings of earlier tellings.[48] In the *Daily Colonist* in British Columbia, it was used to caution white sportsmen against smoking in the bush.[49] Its widespread and long-lived presence in international media is indicative of

America," *Gympie Times and Mary River Mining Gazette*, 15 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article190878609 (accessed 20 April 2018).

46 "Forest Fires," *Daily Post,* 19 July 1911, retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article178346141, (accessed 20 April 2018).

47 "Forest Fires," *Daily Post,* 19 July 1911.

48 "500 Burned. Worst Fire Ever Known in Canada," *The Gungandai Times and Tumut, Adelong and Murrumbidgee District Advisor,* 29 September 1911. Retrieved from National Archives of Australia's Trove: http://nla.gov.au/nla.news-page12725090 (accessed 20 April 2018).

49 "Warning to Sportsmen," *Victoria Daily Colonist,* 7 September 1911.

Porcupine's significance to a wide audience. The fire played a specific narrative role. Fire story-telling functioned alternately to reinforce sensational stereotypes about the Canadian wilderness frontier and provide updates to relatives and investors with vested interest in the Porcupine's wellbeing.

The Great Fire was also a matter of personal concern for far-reaching transnational audiences. People came to Porcupine from all over the world after gold's discovery in 1909. By 1911, the area boasted a diverse population. The town of Porcupine lists 5,391 residents (divided between Porcupine North and South). Most residents (sixty-seven percent) were born in Britain, Scotland, Ireland, or France. However, there were also large groups of Russians (eleven percent), Italians (six percent), Hungarians (four percent), Germans (two percent) and Scandinavians (two percent), and scattered numbers of African Americans, Chinese, and Indian residents (see table 1).[50]

Porcupine's demographic diversity can be corroborated from the "death lists" assembled by the Porcupine Relief Committee. The committee telegraphed these lists to international media outlets and the Canadian government for the purposes of identification. The lists include a name or nick-name and (in most cases) a place of origin for each individual. Some also included employer and next-of-kin information, along with random details of peoples' lives. Although the lack of consistent format precludes statistical analysis, a few rough patterns emerge. As in the census, people in the death lists came overwhelmingly from the British Isles, followed by the United States and Western Europe. However, both the census and the death lists also include relatively large

[50] Canada, Statistics Canada, 1911 Census, Ottawa, 1911.

numbers of Eastern Europeans from Poland, Finland, and Russia – the beginnings of a labour force which would grow significantly over the next two decades.[51] In 1911, risk remained relatively evenly dispersed among these groups. This pattern changed after the First World War, when a mature industrial mining regime allocated hazardous work along ethnic lines. During the 1911 fire, managers were no safer than labourers, and Englishmen no safer than Poles (of course, wealthy investors, connected to Porcupine only by their pocketbooks, were safest of all).

Table 1

Origin of the People by Subdistricts (Canada Census, 1911)	**Porcupine North & South**
British English	693
British Irish	1,029
British Scotch	640
British Other	10
French	1,214
German	100
Austro-Hungarian	237
Belgian	6
Bulgarian and Rumanian	57
Chinese	20
Greek	5
Indian	43
Italian	340
Jewish	67
Negro	3
Polish	78
Russian	599
Scandinavian	107
Swiss	4
Unspecified	139

[51] Enquiries Regarding Porcupine Fire, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.

Aside from the census and death lists, qualitative data adds texture to Porcupine's transnational connections. When people came to Porcupine they brought the accruements of their previous lives, including familial and relational ties. These are available because of the Canadian government's role in communicating information to and from globally-located friends and relatives. In the absence of communication from the North, and often having read alarming newspaper articles about the fire disseminated by their local papers, relatives of Porcupine residents turned to the government for news. Secretary of State Thomas Mulvey and Canadian High Commissioner to the United Kingdom were inundated with letters from worried residents in the weeks after the fire. From July until September, when the letters finally stopped, Mulvey acted as middle-man between the Porcupine relief committee on the ground in the North and family members in Britain, Australia, the United States, and Europe. The letters chronicle the emotional networks tying Porcupine to the world in 1911. Such letters may well have flowed regularly between miners in Ontario and their friends and families, in any case, the fire provides a selective snapshot of the lives of Porcupine residents and their ties to other places.

For example, on 14 July Mary Coutts of Stovehaven, England wrote to Mulvey "Sir, would you please if possible let me know the fate of my Sister, Mrs. F. Wilde...she opened a restaurant or hotel in [Porcupine] this spring...I have one of her boys at school."[52] Mrs. P.T. Bolan of Newcastle on Tyne wrote to the secretary on 17 July to ask

[52] "Mary Coutts to Secretary of State, Ottawa," 14 July 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada. Three weeks later, Wilde was reported safe by the Porcupine relief committee. "Relief Committee to Thomas Mulvey," 1 August 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.

after her husband, who had been working on the Asquith Claim. "I am nearly distracted to read of the terrible fires in South Porcupine," she wrote, "and fear for my husband."[53] These women were tied to Porcupine by family, love, and obligation. Words like "distracted," "terrible," and "fear" suggest personal emotional attachment linking people across space and political boundaries.

In addition to sending general telegram updates on Porcupine's status after the fire, the relief committee began notifying relatives of the deceased. But many relatives heard nothing or disbelieved the reports.[54] Mrs. K.V. Taylor, after receiving a telegram at her home in Berkshire, England notifying her of her husband's death, wrote to Mulvey to ask if there had been a mistake, and that she "should like further evidence that this William Taylor was my husband" and provided other details about his life which might be used to identify the body. The stakes for Taylor were high. She had sold her home to pay for her husband's passage to the mines, and had planned to join him in Canada when he found a job. "If you could inform me in any way I should be thankful as myself and three children are left destitute," she wrote. When her husband was confirmed dead, Taylor requested her name be given to the Relief Committee for possible financial support.[55]

Those who did not receive official notices read familiar names on the death lists and worried. For example, the Daily Telegraph listed "M. Martin, Thoringey, Los Angeles"

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[53] "P.T. Bolan to Secretary of State," 17 July 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.
[54] Their skepticism was understandable considering the frequent errors in the existing reports. The Porcupine Relief Committee, formed in the days after the fire, seems to have responded to requests from Mulvey on an ad hoc basis. Their telegrams out were confusing, full of misspellings, and often gave inconsistent amounts of detail.
[55] "K.V. Taylor to Lord Strathcona," 17 July 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.

among the dead. One Mr. Stanley Moon wrote to Mulvey with a copy of the clipping. His family friend, Miss Thoringey, arrived in Quebec on July 10th from Liverpool, and Moon, unfamiliar with Canadian geography, worried she'd ended up in Porcupine. She had not - as Mulvey testily wrote back, "Mr. Martin Thoringrey" was in fact a consulting engineer from California, and "in any case it is extremely improbable that a woman landing at Quebec on the 10th of July would have gone into the Porcupine district."[56] In another example Ann Hogben of Folkestone, England wrote to ask for clarification regarding her son Arthur Dexter. The name "Charles Dexter of Folkestone" had appeared in the death list, and Hogben "feared that the name given, Charles, was merely a mistake made in the general confusion."[57] If her son had indeed died, Hogben wanted to know what had been done with his body and belongings, and whether she could recover them. Her request to Mulvey was forwarded to the Relief Committee, which sent additional detail and confirmed her son's death.

The letters reveal Porcupine's personal, emotional, and familial ties to a community of anxious stakeholders around the world. Mining districts are often associated with populations of solitary men, disconnected from family, and operating in homosocial environments. Historians of mining in British Columbia, the American West, and Manitoba show how this perception obscures complex gendered relationships on the ground in emerging resource communities. Working and racialized women and men

[56] The comma in the death list had been an error. "Thomas Mulvey, Secretary of State, to Mr. Stanley H. Moon," 1 August 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.
[57] "Secretary of State to Relief Committee," 11 September 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.

formed complex internal social structures and hierarchies which shaped work and life.[58] The letters show that, in addition to these internal connections, miners on the Porcupine "frontier" remained connected to an external relational world which exerted influence over their lives even at a great distance. Men and women at Porcupine lived and worked within gendered, familial, and social structures both within and without the mining camp.

Porcupine men and women's on the ground perceptions of their place in transnational relationships are more difficult to access. Outgoing telegrams from the relief committee contain hints about the experience of Porcupine residents in the days immediately following the fire. Survivors cared for the injured and combed the debris for bodies. Many were severely burned (one man had his feet burned off), and some died in transit to hospital.[59] A telegraph from Porcupine dated 13 July states "tents blankets and provisions urgently wanted. Conditions underestimated."[60] Periodic reports suggest an ongoing search for bodies, many of which were buried in place by survivors. One telegraph reports "Mike Johnson found on Trout Creek Night Hawk district committed suicide" and "remains of man and Spaniel found under Theatre at South Porcupine supposed to be "Cripple Creek an old Western prospector."[61]

[58] Peter Boag, *Re-Dressing America's Frontier Past* (Berkeley: University of California Press, 2011), Adele Perry, *On the Edge of Empire: Gender, Race, and the Making of British Columbia, 1849-1871* (Toronto: University of Toronto Press, 2002), Mex Luxton, *More than a Labour of Love: Three Generations of Women's Work in the Home* (Toronto: Women's Press, 2009).
[59] "Murphy to Dominion, London, England," 14 July 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.
[60] "S. White, Mayor to Hon. Chas Murphy," 13 July 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.
[61] "Telegraph for Charles Murphy, Ottawa," 27 July 1911, RG 6, Vol. 150, File 1703, Secretary of State Correspondence 1911, Library and Archives Canada, Ottawa, Ontario, Canada.

Figure 7 Toronto Star, "Graves of Victims of Great Forest Fire 1911," Box 04564, MIKAN no. 3298974, Library and Archives Canada, Ottawa, Ontario.

The trauma of the fire is partially captured by the H.C. Peters photographs. Peters documented the fire and its aftermath thoroughly. In Peters' photographs men are pictured carrying bodies on stretchers on the pier at Porcupine Lake and standing next to rude graves and stacks of coffins. There are images of people wandering the ruins of the town, and one of two men sitting next to the burned-out Dome Mine shaft where Weiss and his family died (see figures 6 and 7). Many were made into photo postcards which could be used to visually describe the hazardous experiences of people in Northern Ontario to distant audiences.

Figure 8 “Mouth of the West Dome Shaft in which Captain Weiss and Family with 27 Companions died,” CPC 00707, William Ready Division of Archives and Special Collections, McMaster University.

Some postcards and letters written from Porcupine have survived from before and after 1911, suggesting that personal correspondence between Porcupine residents and loved ones abroad was not restricted to the fire. One undated letter reads “Well mother Dear I am always on the lok [sic] out for Lils nice letters...with best love to you all and trusting you are all well, From your loving son.”[62] Another refers to a missed dinner last time the author had been in the city.[63] One, on the back of a postcard showing a wooden shack, reads “Dear Mother, how would you like to live in a house like this?”[64]

As the chaos subsided in the fall of 1911, so did the visibility of intimate networks -

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[62] “The First Wedding in Porcupine,” Porcupine, Ontario, Canada, CPC-03090, William Ready Division of Archives and Special Collections, McMaster University, Hamilton, Ontario, Canada.
[63] “Stock Exchange - Porcupine - A Has Been,” 4 October 1910, Porcupine, Ontario, Canada, CPC-00729, William Ready Division of Archives and Special Collections, McMaster University, Hamilton, Ontario, Canada.
[64] “Blacksmith Shop, Timons Gold Mine,” CPC-00708, William Ready Division of Archives and Special Collections, McMaster University, Hamilton, Ontario, Canada.

which ceased to be mediated by the government and returned to private avenues of personal letter-writing, visits, and telegrams. Even when we cannot always see them in the preserved records, such networks undoubtedly shaped history. Communication breakdowns, silences, and ruptured relationships also shaped life on the frontier, although they left no documentary hints about their shape or character. The preserved correspondence serves as an important reminder of individual human stories with their own intimate connections quietly existing in the undercurrents of the broader relationships between the mining camp and the world.

The Great Fire of 1911 was a transnational event in one final way. It was only one of many similar blazes at the end of the first decade of the twentieth century, the consequence of coincidentally warm dry years on multiple continents. Between 1909 and 1914, fires in Siberia were "as commons as blackflies."[65] Australia experienced serious fires along the coast in 1910.[66] Catastrophic fires raged across the Western United states in 1910 and 1911.[67] Although unconnected from an ecological perspective, the Porcupine fire fits in to this broader cultural context of fire experiences on the margins of European and neo-European states. Foreign newspapers sometimes grouped news of the Porcupine Fire with accounts of other blazes that summer, especially those in North America.[68] Thus the Great Fire occurred at the intersection of transnational and local fire trends stretching across both time and space. Not only was it part of the natural reoccurring cycles

[65] Stephen Pyne, *Vestal Fire: An Environmental History, Told Through Fire, of Europe and Europe's Encounter with the World* (Seattle: University of Washington Press, 1997), 332.
[66] Stephen Pyne, *Burning Bush: A Fire History of Australia* (Seattle: University of Washington Press, 1991), 294.
[67] See Pyne, *Year of Fires.*
[68] "Forest Fires in America," *Gympie Times and Mary River Mining Gazette* 15 July 1911.

stretching back to the beginning of shield forest ecology, but it was also part of a wider experience of fire in 1910 and 1911. The Great Fire disrupted the human and environmental history of Ontario, but it also changed the trajectory of uncountable lives connected to Porcupine by a variety of threads – monetary, emotional, and familial.

Porcupine Rising From the Ashes: Rebuilding a Global Industry

As traumatic as the fire was, it took little time for the practical work of mining to pick up where it had left off on 9 July. Indeed, in the long run, the fire did little to alter the trajectory of extraction towards large-scale, capital intensive forms, or the "rich man's game." It may have even expedited the process by clearing land and by financially destroying small operations with few outside resources and tenuous holds on title. Yet the reconstruction of big, global industry on scales larger- and better-connected than ever before still failed to immunize Porcupine against environmental limits.

The fire undid a considerable amount of human work on the land, and delayed development which otherwise might have occurred much more quickly. Following the fire many of the survivors returned indefinitely to homes and families elsewhere. [69] On a basic level, mines had to rebuild the infrastructure they had lost before they could consider expansion. In several cases companies had been waiting for completion of the railway to bring in major equipment.[70] Hollinger had been waiting for the railway to bring in tube mills and cyanide.[71] The fire added to existing delays in rail construction and companies waited longer than anticipated for materials.

[69] As the men profiled by the *New York Times* had. "Pictures Horrors of Forest Fire," *New York Times* 16 July 1911; "In Fire-Girt Lake with Forest Beasts," *New York Times* 18 July 1911.
[70] Burrows, "The Porcupine Gold Area," 95-96.
[71] Burrows, "The Porcupine Gold Area," 101.

There were some losses for the big companies, and managers struggled to make the most of a bad situation. There was the somewhat awkward matter of the in-place burials near Porcupine Lake. Many bodies had been interred on Dome property, to the consternation of management. The site was on a high piece of rock overlooking the lake, and was the exact location where the first prospecting crews had camped in 1910. It was potentially valuable land for mine infrastructure. By the end of August Dome's management was forced to accept the loss of the land occupied by the little graveyard. In a letter to owner William Edwards, G.S. Harkness (Edwards' on-the-ground contact) explained that there were too many bodies for easy re-internment. Besides, locals already called the place "Dead Man's Point." The gruesome association, he proposed, made it unsuitable for construction, especially for a residence area or a hospital. However, he assured his employer that rock in the swampy area was unlikely to contain values. The emerging community memory combined with natural characteristics to render the land useless to Dome. Harkness eventually negotiated with the Relief Committee to survey the lot for sale to the town.[72]

For the big companies, time was money. Salvaging what they could, they went back to work at the first possible opportunity. The fact that the railway had not yet been completed became a blessing in disguise, since it meant many supplies and pieces of equipment were was sitting safe in southern depots on the day of the fire. By August, optimism (or at least boosterism) returned full force to the Porcupine camp. An article

[72] Harkness to Edwards, "Re. Point Claims," 22 August 1911 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

from the *Porcupine Press* just a month after the fire made a list of big names in the mining industry currently at Porcupine, and used their presence as evidence that "investors can be assured of the importance of the Porcupine camp because of the importance of the men now there." Names included Captain DeLamar, who had worked in Colorado, Idaho, Nevada, California, and more recently in Cobalt. Also at Porcupine was the Bewick-Moreing Company, mine managers from London who had made their fortunes in South Africa, and John Millikan, owner of Golden Cycle Mill in Gold City Colorado famous for treating a thousand tons of Cripple Creek ore per day.[73]

Although the fire represented a major financial and emotional blow to the mines and communities at Porcupine, there were some benefits to the burn-over. Specifically, the blaze cleared obscuring ground cover, exposing shield rock. Geologists and map-makers got their first good look at the underlying formations. Harkness wrote of the "point" claims (those around dead man's point) that "the fire has so swept these claims that you have a much better chance, now, to pick out the good spots, then formerly."[74] Similarly, on the Whitney claims he wrote that "the Claims are burned clear of moss, so that any outcrop of rock can be plainly seen."[75] Pesky overburden, which stymied the work of the geologist, prospector, and surveyor, was not a problem in the late summer and fall of 1911. Yet this advantage was not experienced by everyone. Harkness and the Edwards' syndicate was in a unique position. Smaller companies did not have men on the

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[73] "Greatest Mining Men are Now in Porcupine," *Porcupine Press,* 5 August 1911, File 2-9 Newspaper Clippings 1911-1924, MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[74] "Greatest Mining Men."
[75] Harkness to Edwards, "Re. Whitney Claims," 22 August 1911 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

ground, and could not return to exploration before the snow returned. Financially crippled and unable to capitalize on the small opportunities afforded by the fire, these companies began to fall behind the bigger organisations until they were eventually bought out or forfeited their claims, often after years of stagnation and financial trouble.[76]

In the post-fire era, the big mines turned to international expertise to understand and exploit its local rock.[77] Dome hired William W. Mein as consulting engineer in 1911. Mein "had a large experience in the development of gold mines, not only in America but also in South Africa." They also hired Henry Hanson as Mill Superintended. Hanson came from San Francisco, where he'd worked for Merrill Metallurgical Company.[78] The expertise of these men shaped their decisions when setting up and operating the new equipment.[79] In light of better understandings of Porcupine's low-grade ore and improvements in extractive technology elsewhere, especially from the United States and South Africa, companies re-built mines on ever larger scales. In the 1912 Hollinger annual report, Edwards told shareholders that a forty-stamp mill with tube mill and cyanide equipment was well under construction, and estimated the new equipment could handle 350 to 400 tons daily. They had made room for expansion, and the new power

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[76] Discussed in detail below. For example, Pearl Lake mining company (bought by McIntyre in 1912) "Casualties," *Canadian Mining Journal xxxiii*, 1 May 1912, 298. And Jupiter, also bought by McIntyre in 1915. "McIntyre and Jupiter," *Canadian Mining Journal* xxxvi, 1 November 1915, 668.
[77] A process likely facilitated by their foreign management, ownership, and financing.
[78] W.S. Edwards, *First Report Dome Mines Company Limited 1912,* 1-32 Dome Mines Company, LTD – First Report, MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[79] James Otto Petersen includes a lengthy discussion of these men's influence on the decision to adopt tube and ball mills at Porcupine. James Otto Petersen, "The Origins of Canadian Gold Mining The Part Played by Labour in the Transition from Tool Production to Machine Production," (PhD Diss., University of Toronto, 1977), 51; 183-185; 217; 379-406; Dianne Newell, *Technology on the Frontier: Mining in Old Ontario* (Vancouver: University of British Columbia Press, 1986), chapter 3.

house could operate a mill with double that capacity if needed.[80] The idea was to maximize the amount of ore that the plant could handle, because greater tonnages would reduce marginal costs.[81]

Porcupine mines looked for international experts and technology, but they also looked at international experience with ore comparable to that found locally. In the Hollinger annual reports, mine manager P.A. Robins argued that similarities between Ontario's geology and international geology and cooperation between mining fields could bring mutual benefit. "We are located in one of the great pre-Cambrian areas of the earth's crust," he wrote, so "the results of mining in similar rock formations cannot be ignored" when it came to developing Hollinger's strategies. He referred to a report presented at the Canadian meeting of the International Geological Congress that year by Dr. Malcom Maclaren, who had discussed the buildup on knowledge on similar rock from Western Australia, Southern India, South Africa, and Brazil. The most important finding, in Robins's opinion, was that gold deposits of the type located in Porcupine and these other places tended to be "deep seated in origin and persist in depth until some unfavorable change in rock formation occurs to adversely affect the gold bearing lode." Robins was quick to point out that, at present, they were a long way from any such geological change and that diamond drilling had shown no change to the deposit would occur in the foreseeable future.[82] The deep-seated nature of the deposits was what was

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[80] W.S. Edwards, *First Report Dome Mines Company Limited 1912,* 1-32 Dome Mines Company, LTD – First Report, MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[81] *Hollinger Gold Mines Limited First Annual Report* January 1911 F113 Hollinger Company Fonds, Archives of Ontario, 14.
[82] *Hollinger Gold Mines Limited First Annual Report,* January 1913, F113 Hollinger Company Fonds, Archives of Ontario, 22.

important. Foreign geology reinforced the notion that Porcupine mining was not unique, and that profit would come from going down rather than out.

Porcupine's post-fire reconstruction was dominated by large companies with the capital to recover from the blow dealt by the flames. Their international connections helped them to endure the disaster, take advantage of the small benefits it afforded, and re-build quickly. Based on engineering and geological knowledge of international experts, post-fire re-building prioritized large-scale, low-grade operations. In 1909, prospectors and investors had spent a lot of time improvising on a landscape with an uncertain future. After 1911, they forged ahead with a much clearer vision of how to make the ores found at Porcupine profitable, and a rich body of experience from around the world to help them get there.

Scorched Earth: Big Mines and Big Environmental Limits

Nevertheless, the big mines came out of the Great Fire of 1911 with a new respect for the power of nature. Edwards assured his readers that all the re-built mine buildings were "absolutely fireproof." The mill, rock house, powerhouse, storehouse, laboratory, and even the houses, hospital, club house, and kitchens were made of concrete or brick and steel.[83] He also noted that, when he chose the site for the new mill, "it was evident that protection against bush fires was necessary." Thus, he chose a spot protected by Miller Lake to the West, Gillies Lake to the North, Pearl Lake by the East, and to the South "one half mile of cleared ground. We propose to cultivate the ground in the spring

[83] W.S. Edwards, *First Report Dome Mines Company Limited 1912,* File 1-32 Dome Mines Company, LTD – First Report, MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

as further protection against fire."[84] The recent destruction made managers and mining investors nervous, and they worried openly about preventing future catastrophes.

As the (big) mining companies recovered from the fire, they made their operations more fireproof, but could do little to control or predict other environmental problems after 1911. Some of these other problems related directly the expansion of industrial mining. The landscape was rapidly deforested: in 1912 Hollinger towed 50,000 feet of mine timber up the Mattagami River, cut mostly from Bristol township and "territory north of the Grassy River."[85] The Great Fire only accelerated this process, making good timber harder to find. Others problems stemmed from newcomers' inability to cope with the harshness of the northern landscape. In the years leading up to the First World War, water, weather, and labour became the largest obstacles to the industry.

While the tone of annual reports was optimistic in these years, their wording obscured the day-to-day (often chaotic) activity occurring on the ground in Porcupine. Gold failed to appear where it should have,[86] veins narrowed or broke off or changed direction unexpectedly[87] and snow threatened to curtail prospecting and cover visible evidence of any claim's richness (essential for securing buyers).[88] In 1911 W.G. Allan (employed by Edwards) noted that he was "pulling out the quartz which makes a nice

[84] *Hollinger Gold Mines Limited First Annual Report,* January 1912, F113 Hollinger Company Fonds, Archives of Ontario, 20.
[85] "Mine Timber for the Hollinger," *Porcupine Advance*, 11 October 1912.
[86] "Re Whitney Claims," Harkness to Edwards, 22 August 1911, 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada; Weiss to Edwards, 28 August 1911, 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[87] Allan to Edwards, 8 October 1911, File 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[88] Allan to Edwards, 24 October 1911, File 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

showing on the dump," but that he did not want to assay as "I am getting no values." In other words, when showing the property to potential buyers, he wanted to have big, visible piles of quartz (popularly known for its association with gold concentrates) to make the claim look good – even though Porcupine quartz often contained no gold.[89] At the end of December Allan wrote that the face (where he had been taking out ore) seemed to have run out of gold, possibly because "the vein has shifted over" due to faulting. He was reluctant to sink the shaft further (at additional expense) until he saw some sign of gold. Furthermore, he complained that "our progress is very slow" because "the north crosscut is the Keewaitin and very hard rock."[90] These accounts show that profits from the fickle rock were not assured, and optimism whether well founded or not was part of a larger effort to build the enterprise.

Allan wrote to his employer regularly with details of work on claims, chronicling the regular struggles between the men representing the mining company and the landscape on which they worked. Water and weather shaped these men's experience in significant ways. On 8 October 1911, Allan wrote that the shaft "makes a great amount of water." He was required to "keep two men on a shift to keep it clear" – a major expense to the company.[91] Two weeks later he commented again that "we are developing considerable water which taxes our little plant."[92] Water in shafts plagued other companies too. In September of 1912, the *Porcupine Advance* reported that "the

[89] Allan to Edwards, 24 October 1911.
[90] Allan to Edwards, 24 October 1911.
[91] Allan to Edwards, 8 October 1911, File 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[92] Allan to Edwards, 15 October 1911, File 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

Shumacher mine at Pearl Lake has been flooded and for the present put out of business." The accident had occurred when miners blasted too close to the edge of the irregular layer of sand surrounding Pearl Lake, allowing lake water to flood in.[93]

The men also commented on the way that weather affected their work, even though in many cases the details of the weather were otherwise irrelevant to the operations of the mine. By the time August rolled around dry weather had turned to rain. Harkness wrote "the weather has been very backwards of late; it has rained nineteen days out of the last twenty-one days."[94] Photographs show men attempting to repair a flooded railway, floating houses near the lakeshore, and the newly completed Porcupine express on rails totally submerged by water (see figure 9).[95]

Winter was difficult to endure. By 8 October, there had been enough of a cold snap that Allan began winterizing the mine.[96] By the end of the month it had snowed so much that he returned to Haileybury to get his winter gear "as everything here looks as though it had set in for keeps."[97] The inclusion of these details around climate and weather suggests it was an important force in their lives which made important impressions on their mental landscapes and how they related to shield nature.

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[93] "Shumacher Mine Filled with Water," *Porcupine Advance,* 6 September 1912.
[94] Harkness to Edwards, 28 August 1911, File 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[95] H.C. Peters, "A House Afloat, South Porcupine Flood," C 312-0-0-0-3; "South Porcupine Station – Flood Time," C 312-0-0-0-45; "S. Porcupine Flood," C 312-0-0-0-43, C 312, H.C. Peters Fonds, Archives of Ontario, Toronto, Ontario, Canada.
[96] Allan to Edwards, 8 October 1911.
[97] Allan to Edwards, 27 October 1911.

Figure 9 H.C. Peters, "South Porcupine Station – Flood Time," C 312-0-0-0-45, H.C. Peters Fonds, Porcupine Area Photograph Collection, Archives of Ontario, Toronto, Ontario, Canada.

As hydroelectricity came to power the mines, water (and its absence) shaped mining in a different manner. In the early twentieth century, hydroelectricity became central to a vision of progress, modernisation, and development in industrialising Ontario.[98] In Porcupine, alternative sources of power were desperately needed, since shipping in coal was expensive. In May 1912 the Dome had to shut down temporarily due to a shortage of fuel, as it waited for the completion of the hydroelectric plant.[99] Yet even after the dams were completed, power was so unpredictable that companies planned back-up power in to their development. Hollinger, for example, built its own boiler plant on Gillies Lake

[98] Nelles, *The Politics of Development*, 215-216.
[99] "Fuel Shortage at West Dome," *Porcupine Advance*, 24 May 1912.

capable of producing 1800 horse power "for generating power in case of failure of the hydroelectric supply."[100] In March of 1914, the Hollinger cut back significantly on its production because of another power shortage.[101] The summer that year was so dry that the power companies could not supply power to any of the mines or plants at Cobalt, Porcupine, or Sudbury and put the reservoir into a deficit in 1915.[102]

Development could be stymied by labour shortages, slowing the pace of human-driven environmental change. In November Allan wrote that two Frenchmen he had hired to cut timber "disappeared with one another and jumped the job." Few others were willing to "take the work."[103] At the big mines, large strikes shut down operations in 1912.[104] The strikes aimed to increase pay and implement the eight-hour day. Hollinger insisted that pay and working conditions were better in Porcupine than elsewhere, and that the strike was the result of "a small number of malcontents…largely made up of professional agitators surrounded by a following of incompetents who have availed themselves of the opportunity to put in a winter of idleness."[105] Other documentary evidence, including a special report by Mining Commissioner Samuel Price in 1912, indicated that a desire for an eight-hour day was in fact nearly universal, even at mines

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[100] "Report Recommending the Consolidation of Hollinger Gold Mines, Limited Acme Gold Mines, Limited Millerton Gold Mines, Limited Claim 13147 of Canadian Mining & Finance Co., Limited," Hollinger Annual Reports 1914, Archives of Ontario, 19.
[101] *Hollinger Gold Mines Limited Annual Report* January 1914 F113 Hollinger Company Fonds, Archives of Ontario, 13.
[102] Thomas Gibson, "Statistical Review," *Report of the Bureau of Mines 1915* (Toronto: King's Printer, 1915), 7.
[103] Allan to Edwards, 28 November 1911, 2-23 Correspondence, General Business MG 30 William S. Edwards Fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[104] *Hollinger Gold Mines Annual Report 1912*, *Hollinger Gold Mines Limited First Annual Report* January 1912 F113 Hollinger Company Fonds, Archives of Ontario, 2.
[105] *Hollinger Gold Mines Limited Annual Report* January 1913 F113 Hollinger Company Fonds, Archives of Ontario, 15.

where employers had taken great pains to ensure the comfort and safety of employees.[106]

Although the desire for an eight-hour day might not intuitively seem related to the environmental or transnational history of the Porcupine, a closer examination of Price's report shows that the industrial environment motivated miners' actions. Underground work was physically and psychologically difficult – miners called their conditions "unnatural and trying" as they were "away from the surface and the sunlight and in air more or less impure and inferior to the natural air." Furthermore, air in the mines was "often contaminated with fumes of gas with injurious dust of particles from drilling and other operations."[107] The comments suggest that Porcupine workers worried about the health of the mine environment for their bodies, and saw the restriction of hours as a potential way of mitigating its impact.

The conversation around the eight-hour day also reflects miners' awareness of working conditions in mines and other industrial spaces elsewhere. Many pointed "to the various other mining countries where the 8 hour law is in force," and asked why Ontario "should not be as good as these." They argued that skilled miners from the western States and British Columbia might be attracted to Ontario with an eight-hour day, and dismissed the "cries of injury to the industry" by pointing out that such concerns internationally "have proved ill-founded."[108] Efficient management would mitigate any potential losses in time (the same amount of work now completed in ten hours could be completed in

[106] S. Price, "Report re. Limitation of the Hours of Labor of Underground Workmen in the Mines of Ontario," Ontario, *Sessional Papers,* No. 85, 1913, 5-6.
[107] S. Price, "Report re. Limitation of the Hours," 6.
[108] S. Price, "Report re. Limitation of the Hours," 6.

eight, miners claimed, with better planning).[109] Although not all miners agreed on strike tactics and other labour matters, Price's investigations revealed nearly unanimous agreement on the matter of the eight hour day.[110]

Mine managers likewise looked abroad in their counter-arguments to the eight hour day, stating that it "has in fact had disastrous effects in British Columbia, Australia, and parts of the United States, and is driving capital and labor out of England and the United States." They further blamed agitation from "undesirable foreign organisations" working for their own advantage. The fact that the Ontario mines competed on the global market was also used as a reason against implementing the eight-hour day.[111]

Price checked up on the assertions of both miners and managers by surveying the effect of the eight-hour day on other mining districts around the world. He wrote to a number of companies in distant locales with a list of questions about the way the new law worked. Where he could not get direct contacts, he consulted foreign companies' annual reports. Mine managers from the Western States and British Columbia responded to his letters, and reported themselves unanimously in favour of eight-hour legislation. They claimed it made workers happy, alleviating tension between labour and management. Consultation of the annual reports showed that it did not actually decrease output.[112] In the face of this evidence, Price unsurprisingly came out in favour of the eight-hour day in

[109] "View of Employees," *The Labour Gazette*, June 1913, 1392.
[110] During strikes in 1912, strikebreakers and strikers clashed repeatedly. "Strikers Fined for Assault," *Labour Gazette*, January 1913, 800. During Price's investigations, 332 (anonymous) ballots were returned in favour of the eight hour day and only twelve against. "View of Employees," *The Labour Gazette*, June 1913, 1392.
[111] S. Price, "Report re. Limitation of the Hours," 7.
[112] S. Price, "Report re. Limitation of the Hours," 8-9.

his report, and the government passed legislation to enact it the following year.

The industry accused Price of bias, and of being an advocate rather than a judge. They stated that his sample size was much too small and asserted that men were generally happy with work in the mines. An editorial in the *Canadian Mining Journal* asked why a "paternalist" government would interfere with mining (in which everything appeared to be going quite well) when there were so many other industries where workers were treated unfairly. The piece went on to address the specific concerns highlighted by Price in his report about working conditions in underground mines. In fact, they argued, underground work is "no more "unnatural" than work in any building, or on a ship, or on a locomotive…and…it is infinitely more wholesome and much more remunerative than the majority of vocations." As for concerns about air quality, "we may frankly say that we do not believe it." The *Journal* also argued that Price had neglected to mention the *benefits* of underground work environments – "the miner is not exposed during working hours to inclement weather and to variations of temperature."[113] Especially in Ontario, the stability of temperature underground should be seen as a good thing. Contradicting miners' claims about the inherent "unnaturalness" and difficulty of underground work, natural-ness and a healthy underground environment were used as justification for opposing the eight-hour day.

The mining companies eventually dealt with the 1912 strikes by bringing in labour from outside the camps – largely inexperienced and unskilled men.[114] The strike was

[113] "Commissioner Price's Report," *The Canadian Mining Journal*, Vol. XXXIV, No. 9, 1 May 1913, 262.
[114] *Hollinger Gold Mines Limited Annual Report* January 1913 F113 Hollinger Company Fonds, Archives of Ontario, 25.

called off in 1913, but was given as a reason for low production for both 1912 and 1913.[115] Letters from May of 1913 indicate that labour remained scarce that spring. One of Edwards' managers wrote "it would not be advisable to commence work on the Edwards Lot at present owing to the complicated labour situation. No good miners in camp."[116] The comment reflects the region's inability to attract skilled workers at prevailing wages and conditions, which restricted the mines' ability to extract gold efficiently in the wake of the strikes and slowed the rate of environmental change.

The documentary evidence suggests that workers' concerns about illness and injury in underground environments were justified. Industrial mining came with industrial hazards. The 1913 Annual report for Hollinger Mines records six cases of grippe, four of typhoid, four lung and throat disorders, three nerve disorders, two intestinal disorders, and three cases of lead poisoning. The report also listed nine men hit by falling rock, six injured while handling mine cars, ten by falling tools, three by dropped cages, two who stepped on nails, and six who fell from scaffolds. Men also slipped, were burned by boiling grease, hit by trees, fell from wagons and moving cages, and were injured while working with the compressor, shifting belt, acetylene gas, splinter, hoses, and spikes.[117] The accident report listed three fatalities. One man got caught up in mill machinery, which crushed him to death. The other two were caught in an accidental dynamite blast.

Hollinger was hardly alone in the respect – 1913 was a particularly bad year for

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[115] *Hollinger Gold Mines Limited First Annual Report* January 1912, 25.
[116] Harry Taylor to Edwards, 23 May 1913, RG 30 William S. Edwards Fonds.
[117] *Hollinger Gold Mines Limited Annual Report* January 1913, 26.

accidents across Ontario.[118] The 1912 annual report noted that accident statistics "reveal little or no improvement over previous years. The casualties which kill or maim so many of the men engaged in mining in Ontario are too numerous."[119] In 1914, Deputy Minister of Mines Thomas Gibson again commented on the high numbers of accidents in the previous year and this time pointed out "the large percentage of names of foreign origin" on the lists, which he argued explained the high numbers since foreigners lacked mining experience and often did not understand English.[120] The report suggests a general increase in the number of unskilled workers in Ontario in 1913 and a correspondingly high demand for skilled miners.[121] The 1914 report also discussed miners' phthisis, a disease that would later emerge as a major threat to miners and to the whole industry after it was added to workers' compensation legislation in the 1920s. Gibson encouraged the mines to implement water-spray devices for keeping dust down, but his recommendations gained little support. With the potential dangers of dust unclear and the inconveniences of anti-dust measures, enthusiasm was difficult to muster.[122] The characteristics of industrialized mining created hazardous spaces for miners which would grow after The First World War. Nevertheless, as the mining camp recovered from the fire, optimism returned to annual reports and trade journals. The industry seemed destined for greatness, even as environmental and human problems remained pescient. Having solved the problem of

[118] T.F. Sutherland, "Mining Accidents in Ontario in 1913," *Annual Report of the Bureau of Mines* 1914, 54.
[119] Thomas Gibson, "Introductory Letter," *Annual Report of the Bureau of Mines 1913*, 3.
[120] Thomas Gibson, "Introductory Letter," 1-2.
[121] T.F. Sutherland, "Mining Accidents in Ontario in 1913," *Annual Report of the Bureau of Mines* 1914, 73.
[122] T.F. Sutherland, "Mining Accidents in Ontario in 1913," 68-69.

fire, the companies still struggled with climate, water, and labour.

Living with Shield Nature: Settler Communities on the Porcupine Gold Fields

As the population began to grow, newcomers built new relationships with Porcupine nature based on more than just mining. Like the government and mine managers, settler residents saw themselves as part of a much broader transnational mining community. In 1912, the *Porcupine Advance* compared Porcupine to other gold fields in a piece called "Porcupine like the Transvaal." The paper commented on the similarities between the two camps in terms of the structure of the ore and the economy of low-grade extraction.[123] Porcupine struggled to overcome the basic challenges of a frontier community, as had other mining communities throughout the late nineteenth an early twentieth century. Between 1911 and 1914, these concerns revolved around safe drinking water and food production. Rising pressures on resources also led to tension between Indigenous and settler communities.

As the towns grew around the mines, sanitation, particularly good drinking water, became a concern for locals. Typhoid and diphtheria at Cobalt served as poignant reminders of the importance of securing basic infrastructure. Even as Porcupine put such structures in place, Cobalt continued to struggle with sanitation and water. The position of the mines relative to the townsites and the close availability of clean water gave the Porcupine a natural advantage over Cobalt, which combined with human effort to ensure that Porcupine would suffer fewer sanitation problems than Cobalt.

The secondary literature on Cobalt gives an impression of the kinds of problems

[123] "Porcupine Like the Transvaal," *Porcupine Advance*, 14 June 1912.

experienced by Porcupine's southern neighbor. In 1913, Cobalt Lake was drained. Residents objected – not on the grounds that it would detract from the town's natural beauty or take away a place for recreation, but out of fear that it would result in a "fever epidemic."[124] A local Cobalt doctor wrote to the legislature to refute these claims, stating that the lake had been "a gift of nature," but since it had been polluted there was no real argument for preserving it. He argued that, once drained, the lake bed could function as a recreational spot.[125] The lake was drained using a 3,600 foot pipeline into Farr Creek, which ran into Lake Temiskaming, spreading mine and urban pollutants into those waterways.[126]

Understandably, Porcupine residents and the Ontario legislature wished to avoid the problems endemic at Cobalt. Provincial health officials visited Porcupine in April of 1912. They examined wells and other sources of water and added chlorine to ones they considered suitable. Wells deemed unsafe were shut down. The inspectors also sought evidence of pollution of water ways "by the dumping of refuse on the banks or by allowed sewage to run into the water."[127] Nothing was said about pollution from mining, but the report closed down a number of dangerous water sources for the protection of the public.

On 3 May 1912 the *Porcupine Advance* announced that the town of South Porcupine stumbled on a convenient source for clean water. The Foley O'Brien mine

[124] Michael Barnes, *Fortunes in the Ground: Cobalt, Porcupine & Kirkland Lake* (Erin: The Boston Mills Press, 1986), 64.
[125] Michael Barnes, *Fortunes in the Ground*, 64-65.
[126] Michael Barnes, *Fortunes in the Ground*, 65.
[127] "Provincial Health Officers Begin Work," *Porcupine Advance*, 26 April 1912.

struck a natural spring under a gravel bed. Water quickly filled the shaft, rendering it useless to company. Because the water had been filtered through underground gravel-beds and sand, it was clean and clear. The Board of Trade negotiated with the company for use of the water.[128]

With the question of clean water more or less solved, Porcupine residents were left with the problem of securing adequate food supplies. The tensions between agriculture and mining were not easily solved, but most people seem to have accepted the two industries as compatible and even complementary. Public discourse on food supplies frequently touted the supposed suitability of Porcupine soil and climate for crops and implored people to pick up gardening spades and pitch-forks. The implication that Porcupine might be dependent on the industrial south for food was met with anger and disapproval. Furthermore, despite a general lack of examples, the notion that farming was the natural successor of mining persisted.[129] An article on 3 May 1912 argued that "agriculture must take a secondary place to mining as a revenue producer for many years to come," but that the mining industry could be thanked for setting up the necessary conditions for agriculture's eventual ascendance.[130]

Agriculture was seen as a solution for Porcupine's high prices for food and goods. "There is a tract of unequalled farming or truck gardening land in the Northern part of the town of south Porcupine," opined the *Porcupine* Advance in November of 1912. Cultivating the land would "do more to build up a town than any other industry

[128] "Good Water Secured from Foley O'Brien," *Porcupine Advance*, 3 May 1912.
[129] California, the Cariboo, the Transvaal, and the Klondike gold fields all remained primarily mining zones with no significant uptake of agriculture in 1912.
[130] "No Other Country," *Porcupine Advance,* 3 May 1912.

employing ten times the number of people and thirty times the amount of capital."[131] The article cited the efforts of President Taft to encourage farming in the American west (and similar efforts in Europe) as evidence of the possibilities of such endeavors, ignoring the fundamental climatic and economic differences between Porcupine and those other areas. Another article in July of the same year argued that Northern Ontario had a similar climate to Northern Europe, where "three million people are earning their livelihood by agriculture." The government's experimental farms had shown that a variety of short-season crops could be grown in the region – particularly potatoes but also cabbage, cauliflower, turnips, lettuce, rhubarb, carrots, beets, parsnips, radishes, onions, celery, and cucumbers, as well as some varieties of oats and barley. The article implored readers to "do their part." "The west has had its day," it argued. It was time for the north to come into its own.[132]

Even though the railway now worked in the service of the mining industry, it had originally been intended to spur settlement and farming. Porcupine residents knew and understood this apparent irony. T.&N.O's mining engineer Arthur Cole was finally forced to address the unexpected turn of the North's fate from agricultural to mining hinterland in his annual report in 1912. He argued that, if agriculture had in fact been the main industry of the north, that train service would have been much smaller scale. Yet the arrival of the mining industry had not killed this original vision for the railway. He went on to argue that the mining industry, in addition to ensuring significantly greater traffic

[131] "The High Cost of Your Living," *Porcupine Advance* 8 November 1912.
[132] "The North Country Coming Into Its Own," *Porcupine Advance,* 19 July 1912.

for the line, also provided inducement for the farmer in the form of "a large cash market, where good prices are paid."[133] To illustrate his point, Cole stated that $485,593 worth of food had been used at the Cobalt alone in 1911, and that the mines had spent $17,391 on horses. Cole did not comment on how much of either product originated from farms in Northern Ontario, but his use of the future tense suggests that, at the time of writing, most of the food and horses had come from elsewhere. The article went on to imagine northern Ontario as if it were a human body. In this analogy, "Mining is the industrial skeleton of the region. Farming will clothe that skeleton with flesh."[134] The moral of the story, it concluded, was that the best thing the government could do for a country was to encourage and support the mining industry, as farming would naturally follow.

The suggestion that the Porcupine was dependent on Southern Ontario for food was not taken well by local media. On 17 May 1912, the *Porcupine Advance* reprinted a *Globe* article which had stated that the Porcupine was near famine due to a recent fire on one of the railway bridges. The story was a straight out lie, *The Advance* countered. The Porcupine had never been without fresh food since the beginning of the rail line. The burning of the bridge had only meant that goods had temporarily to be transferred by hand across the gap while repairs were underway. The south should remember, the article continued, that "the time is not far distant when the Porcupine will not be dependent on any other portion of the province." And until that time, although "we cannot eat gold…we are satisfied that there are many people, even in Toronto, who would be glad to exchange

[133] "The Mining Industry and T & N.O. Railway, *Porcupine Advance*, 10 May 1912.
[134] "The Mining Industry and T & N.O. Railway, *Porcupine Advance*, 10 May 1912.

grub for gold."[135] The failure of the agricultural dream for northern Ontario remained a sore spot; meanwhile, descriptions of Porcupine's agricultural success remained in the hopeful future tense.

Although agriculture failed to materialize, many of Porcupine's new residents turned to hunting as a way of feeding themselves and their families. The new population hunted and consumed game regularly. An August 1912 article in the *Porcupine Advance* looked forward to the hunting season in the face of an apparent boom in moose numbers that year. The report included reports from a few Porcupine residents of huge groups of the animals moving through the bush, especially around the railway tracks. When a moose was hit by a train, the carcass was officially declared buried, but Chairman J.L. Englehard of the T. & N.O. "filed and smiled over" this report, suggesting that it is more likely that the moose was eaten.[136] The paper also reported duck and partridge hunting that fall on Frederick House Lake.[137] People in the new communities fished, as the *Porcupine Advance* described the local lakes as "alive with trout and bass and other game fish."[138] These ways of living off the land were more in line with historic use, but inappropriate or inadequate for feeding a large sedentary community like Porcupine in 1912.

The growing population at Porcupine put increased pressure on Indigenous populations living in the same area. First Nations had been sustaining themselves through farming, hunting, and fishing at Porcupine for thousands of years before miners started

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[135] "Near Famine Point at Porcupine" *Porcupine Advance,* 17 May 1912.
[136] "There will be Moose Meat for All," *Porcupine Advance,* 2 August 1912.
[137] Untitled, *Porcupine Advance,* 6 September 1912.
[138] "The Rivers and Lakes around Porcupine Camp," 26 July 1912, *Porcupine Advance*.

importing food on the T. & N.O. Documentary evidence, focused heavily on the mines and the emerging communities, contains little description of Indigenous activities during these years. Yet the record hints that people lived and worked on the land during this period, despite a series of economic and health problems related to colonial incursions. In August the *Porcupine Advance* carried a story about "Indians living up the Montreal River, in the direction of Fort Matachewan," suffering a diphtheria epidemic. The paper revealed that the group normally traded at Elk Lake post, but that they had been barred from entering Elk Lake in an attempt to limit the spread of disease.[139] In another story, the *Porcupine Advance* acknowledged the fact that many of the trails used by prospectors had long been maintained by Indigenous people. In the piece, the author described an annual gathering at Fort Matachewan whereby people came from all over the treaty territory to celebrate, socialize, and collect their treaty money: "The self-same river routes and portage trails are used by the Indians to-day that served their ancestors."[140] These documentary appearances suggest a continuation of Indigenous patterns of land use, trading, and movement during the early mining era even as the industry expanded after 1911.

Documents from the Department of Indian Affairs suggests that the local reserves dealt with an influx of prospectors seeking rights on their land with increasing frequency between 1911 and 1914. Although under considerable pressure, the Department of Indian Affairs was not inclined to allow prospecting, much to the consternation of prospectors,

[139] "Elk Lake is Barring Out Indians," *Porcupine Advance,* 16 August 1912.
[140] "Trails of Long Ago Turned into Good Roads," 13 September 1912, *Porcupine Advance*.

many of whom thought that their work would directly benefit the bands. In 1911 a syndicate represented by Cyril T. Young wrote to the Department of Indian Affairs to request access to the Matachewan Indian Reserve. He contended that, under the control of the "Indians," the land would never be explored or developed and besides, Treaty Nine was unclear on who controlled minerals on reserves. He wrapped up his letter with an offer to pay unspecified amounts of money for access.[141] Indian Affairs promptly rejected the request, stating that the newness of the reserve made prospecting in the area particularly undesirable and that the department would not allow any white person to occupy or use the reserve lands.[142] Young persisted, indicating that he could easily get the consent of the Indians if that was what was needed, but Indian Affairs again rebuffed him, stating that the "morality" of the Indians needed to be considered, and that there were other (unspecified) reasons why prospecting would not be allowed on Treaty Nine reserves.[143] Despite the efforts of Indian Affairs to insulate the reserves, Young's inquiry demonstrates that prospectors and mining companies interacted with First Nations communities, spent time on reserves, and exerted pressure for permission to exploit resources.

As the population grew in the aftermath of the fire, Porcupine residents found themselves confronting new environmental problems. Secure water and food formed the core of these issues. The local shield environment had never been subject to the kinds of

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[141] Cyril Young, Haileybury, to F. Pedley, Ottawa "Application," 28 April 1911, RG 10, Vol 7460, File 18043-3 (Nippissing Agency).
[142] J.D. McLean, Ottawa, to Cyril Young, Haileybury, 8 May 1911, RG 10, Vol 7460, File 18043-3 (Nippissing Agency).
[143] Cyril Young to J.D. McLean, 10 May 1911, and J.D. McLean to Cyril Young, 13 May 1911 RG 10, Vol 7460, File 18043-3 (Nippissing Agency).

population and resource pressures exerted after 1911, and the growing tensions around food, water, and land reflected this fact. Seeing themselves as part of a broader transnational community of mining people, settlers often looked abroad for comparisons and solutions to their environmental problems. As tensions around food, water, and Indigenous land use would only morph and grow over the next two decades of development, Porcupine settlers would continue to frame their experience in relation to external forces.

Consolidation: Geological Adaptation and Big Gold, 1913-1915

Meanwhile, at the mines, the trend toward corporate consolidation under the "big three" accelerated in the years leading up to the First World War. Immense profits resulted. By the time that the 1913 annual report of the Bureau of Mines was released, hardly a trace of the fire's economic scars could be seen on the big mines' record books. In 1911, Ontario had produced $42,637 worth of gold. In 1912, it produced $2,144,086, most of which came from the Porcupine. Because of the fires, this huge jump did not even represent a full year's work.[144] In 1913, totals more than quadrupled to $9,293,231, not for all of Porcupine, but for Hollinger and Dome specifically.[145] At the same time, the number of licenses sold was decreasing; small-scale independent prospecting was over for Porcupine.[146] The Bureau predicted that this was temporary, but those numbers never recovered. In 1915, the Bureau argued that prospectors should not bother looking for high

[144] Thomas Gibson, "Statistical Review," *Report of the Bureau of Mines 1912* (Toronto: King's Printer, 1912), 9-10.
[145] Thomas Gibson, "Statistical Review," *Report of the Bureau of Mines 1914* (Toronto: King's Printer, 1914), 9.
[146] Gibson, "Statistical Review," *1912*, 51.

grade veins, which "in this area have not been worked with success," but should concentrate their attention on finding the more profitable low-grade deposits.[147] Ontario gold was best exploited on the low-grade and large-scale. The industry's commitment to working with low-grade ore the years leading up to the First World War was an adaptation to shield geology and environment.

Although the records of smaller, short-lived companies have not been well preserved, there is some indication that the years between the fire and The First World War saw a drop in their numbers. In the 1912 annual report Foley O'Brien was described as carrying on work until July 1911, "when all work ceased."[148] Pearl Lake and Jupiter Mines both stopped or slowed production in these years too, and were eventually bought out by McIntyre Mines.[149] That year the *Canadian Mining Journal* ran an article titled "casualties" about Pearl Lake and the Rea mine.

> Two deaths, one by asphyxiation, the other by inanition, have occurred in the Porcupine. The Pearl Lake mine has been shut down, smothered by over-ground exposure. The Rea mine (we believe that this is, after all, a case of suspended animation), the sound of the drill is no longer heard.[150]

The *Journal* blamed poor management, by which it meant limited or small-scale development rather than large-scale, capital intensive, and internationally-minded mining.

Whereas in 1911 the Bureau counted and described thirty-four operating companies, by 1914 there were only nineteen, many of which were owned by one of the

[147] A.G. Burrows, "The Porcupine Gold Area," Third Report, *Twenty-Fourth Annual Report of the Bureau of Mines* 1915, Part III, (Toronto: King's Printer, 1915), 3.
[148] E.T. Corkill, "Mines of Ontario *Report of the Bureau of Mines 1912* (Toronto: King's Printer, 1912), 154
[149] "Casualties," *Canadian Mining Journal xxxiii,* 1 May 1912, 298; "McIntyre and Jupiter," *Canadian Mining Journal* xxxvi, 1 November 1915, 668.
[150] "Casualties," *Canadian Mining Journal xxxiii,* 1 May 1912, 298.

big syndicates. The annual reports do not give a clear reason for this change, stating simply that "a number of smaller companies were forced to suspend operations, and, as a result, development work has been considerably retarded."[151] A combination of the fire, labour troubles, and the low-grade capital-intensive nature of the shield deposits forced these smaller companies out of the business. Only those who had set themselves up for success by controlling large amounts of land from the beginning, and who had the capital to follow through with the necessary adaptations to the particular form of low grade mining required on the shield, would survive.

The diversity of company names listed in the annual reports had, from the beginning, obscured the fact that many individuals had interests in multiple companies. This had not been done with the thought of large-scale, low-grade mining specifically in mind, but was a strategy for mitigating risk – if one claim did not produce paying values, the syndicate could fall back on its other investments. However, it turned out that the nature of Porcupine gold made the scattered landscape of multiple companies less efficient than large consolidated operations. Because the gold existed in low concentrations in the rock, companies needed to pass large amounts of rock through the mills in order to make a profit. By centralizing milling operations, companies could cut down on equipment, construction, transportation, and labour costs. Furthermore, many of the veins extended across multiple properties, creating costly and inconvenient bureaucratic barriers. Once these facts became clear, and once it became obvious that the

[151] Company descriptions can be found in Bureau of Mines Annual Reports for 1912 (152-158) and 1915 (130-144).

ore bodies extended deep enough to sustain the kind of capital investment needed for low grade extraction, companies consolidated. The Hollinger merger in 1914 is an example of this process.

From the beginning, the syndicate backing Hollinger had its fingers in a number of pots. Not only did it own the four claims controlled by Hollinger, but it had also obtained seven adjacent claims. These they had broken down into three separate holdings: Acme Gold Mines, Millerton Gold Mines, and an undeveloped claim #13147. The plan had been to develop them modestly and separately, while the syndicate spent most of its resources developing the more promising Hollinger property. Thus Hollinger was the only property which had built (and then rebuilt) a mill. In 1912 it treated 138,148 tons of its own ore in addition to treating 1,840 tons for its neighbor Acme gold Mines, at a charge of $3.00 per ton. This strategy ensured that properties like Acme could develop slowly without the financial risk involved with putting in infrastructure on a property that might fail to turn up much gold; meanwhile, Hollinger benefited from a small extra income for processing its neighbours' ore.

In 1914 the syndicate changed tack. "Joint operation," the annual report argued, "would eventually prove the most satisfactory and economical way of dealing with the properties."[152] Appended to the 1914 report was an additional information booklet recommending the consolidation. This booklet gave two main reasons: first "in order to derive the best of lowered working costs," and second "to mutually insure each against

[152] *Hollinger Gold Mines Ltd Annual Report 1914*, Archives of Ontario, 3.

the vagrancies of geological phenomenon."[153] Both justifications boil down to mitigating geological risk. The deposits were unpredictable, large, low-grade, and covered in a considerable amount of "overburden" or drift. Yet if some claims contained little valuable ore they could still be profitably mined using the mills and refineries at proven properties. If all else failed, they could be used for other purposes which would support the profitable properties, such as providing space for outbuildings or waste storage.

The report began with an explanation of the local geology. "This old series of rocks has been folded and crumpled and torn until its original stratigraphical features have been effaced, and chemical changes over the course of time have so modified the rock forming minerals that there are now left practically none of the original constituents." The resulting landscape was one of high ridges, where the glacially smooth rock was exposed, and low valleys covered in drift.[154] This was less than ideal. Yet management had "found with development" that the remaining deposits "are more of less connected together in chains, forming ore bodies hundreds of feet in length."[155] Thus, the Porcupine deposits could be only rendered sensible on the large-scale.

The report continued to state that the legal requirements for claim staking were not particularly well suited to the geology. Management found that nature did not conform to established political boundaries: "While the legal requirements for the staking of claims have been left to the fixing of arbitrary boundaries, there are no natural boundaries

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[153] "Report Recommending the Consolidation of Hollinger Gold Mines, Limited Acme Gold Mines, Limited Millerton Gold Mines, Limited Claim 13147 of Canadian Mining & Finance Co., Limited," *Hollinger Annual Report 1914,* Archives of Ontario, Toronto, Ontario, Canada, 2.
[154] "Report Recommending the Consolidation of Hollinger Gold Mines," 2.
[155] "Report Recommending the Consolidation of Hollinger Gold Mines," 3.

between the properties." In fact the "arbitrary boundaries" impeded efficient exploitation because they tended to cut the ore bodies in inconvenient ways, which made amalgamation the more sensible, perhaps even a more "natural" path.[156]

Although they knew that the ore bodies were large and long, they did not know much else about them. Ore was fickle, and although it obligingly provided tons of gold-laden rock for now, the gravy train could very feasibly end at any moment. Any faulting or other irregularities in the rock could cut off an otherwise profitable ore body, a thought which made mine engineers nervous. If this should occur, it would "entail a severe setback to one property and a consequent gain for another." Consolidation would solve this dilemma by taking the uncertainty out of geology. Besides, a more complete understanding might be gained by looking at geology as a whole rather than in artificially divided parts.[157]

The argument for consolidation laid out, the report turned to a description of the practical work involved in arranging it. The Acme claim had already been developed to some extent (because it contained some high-grade ore), but Millerton and Claim #12147 had been barely touched. The two were covered with a considerable amount of drift. South Millerton was covered with "a heavy overburden of sand which has prevented prospecting," and the north had shown only low grades. Part of the property was also covered by Miller Lake. However, if the Hollinger veins continued without interruption, the report speculated that they would eventually extend on to this property. Claim #12147

[156] "Report Recommending the Consolidation of Hollinger Gold Mines," 3.
[157] "Report Recommending the Consolidation of Hollinger Gold Mines," 3.

remained totally untouched, but Vipond mines, which was adjacent to the property, was making profits and it seemed likely that its deposits might extend on to the property.[158] So although there was some risk inherent in taking on the unproven and mysterious Millerton and Claim #12147, the signs were good. Besides, the proven Hollinger and Acme claims could profitably exploit low-grade finds, whereas an independent Millerton and Claim #12147 could not.

The decision to consolidate Hollinger with these neighbouring properties was primarily shaped by environmental considerations, and especially by the desire to mitigate geological risk. The characteristics of the landscape meant that small, independent companies were exposed to more risk and higher operating costs than larger companies. By amalgamating, Hollinger's management hoped to reduce the risk of their veins ending unpredictably while lowering the costs by putting more low-grade ore through central, large-scale machinery. The dying out of small companies and takeover by the "big three" represents an adaptation to the conditions of the Porcupine deposits, and further integration of Porcupine with large-scale the international mining industry.

Remembering the Great Fire of 1911

It is worth reflecting on the particular way in which the Great Fire of 1911 has been remembered in Ontario. The event is regularly revived in newspaper articles, popular history books, and historic plaques. Commemoration is marked by the idea of the fire as a formative moment for Ontario and, most poignantly, as a reminder of the power of nature on a still-wild frontier. These invocations of the fire began within the lifetime of

[158] "Report Recommending the Consolidation of Hollinger Gold Mines," 16-18.

those who remembered it personally, and continue to the present day.

In the aftermath of the blaze, the mining companies and the communities began the work of assembling forest-fire fighting infrastructure that would ensure the Great Fire could never happen again.[159] The near obsessive levels of zeal that went into this effort only make sense when the fire is placed within the broader context of human relationships with nature in the north. Fire countermeasures were one way in which human beings could exert some control over the unpredictability of shield nature, and so they went about it with unbridled enthusiasm. These measures failed: Porcupine burned again in 1916, would experience a major mine fire in 1928, and is periodically plagued by bush fires right to the present.[160]

The continued fire risk in the north is especially apparent in local complaints about persistently high insurance rates. Despite spending "a large amount of money to secure adequate fire protection, time, attention, effort, interest, and tens of thousands of dollars" insurance companies refused to lower their rates.[161] Instead, each fire saw these rates rise ever higher. After a forest fire in Haileybury in 1922, the *Porcupine Advance* lamented

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[159] In addition to the examples cited above, the *Porcupine Advance* documents a long history of fire protection measures. See "Can New Bush Fires be Prevented?" *Porcupine Advance*, 9 August 1916; "Town Council Passes Fire Bylaw," *Porcupine Advance*, 22 November 1916; "The Heliograph used in Firefighting," *Porcupine Advance* 31 January 1917; "Government Plans for Preventing Fires," *Porcupine Advance* 14 February 1917; "Modern Electric Fire Alarm System," *Porcupine Advance, 19 September 1917*; "Getting Ready for Fire Menace," *Porcupine Advance*, 5 May 1920; "Cultivated Fields Would Remove Fire Menace," *Porcupine Advance*,11 October 1922; "Mile Firegaurd Around Northern Town," *Porcupine Advance*, 8 November 1922; "Fire Guard Around Timmins," *Porcupine Advance*, 30 May 1923; "New Fire Towers," *Porcupine Advance*, 9 January 1930.

[160] "Terrible Fires Sweep Northern Ontario," *Porcupine Advance,* 5 August 1916; "Early Bush Fires," *Porcupine Advance*, 2 June 1920; "45 Die in Big Fire," *Porcupine Advance*, 14 October 1922; "Fire Rings About Towns," *Porcupine Advance*, 4 November 1922; "Fire Hazard," *Porcupine Advance*, 4 February 1923; "Final Hollinger Fire Report," *Porcupine Advance*, 18 October 1928; "Forest Fires Rage," *Porcupine Advance*, 1 August 1929.

[161] "Fire Insurance," *Porcupine Advance*, 19 September 1917.

the fact that it would give the companies another reason not to lower insurance prices despite the communities' extensive fire prevention infrastructure. Indeed, the newspaper claimed that some insurance companies began refusing to underwrite companies in the North at all, claiming it was too risky despite "the means and methods adopted by this town for the minimizing of fire risk, the good fire brigade, and fire-fighting equipment."[162] Extensive fire prevention measures did little to reduce actual and perceived risk, a fact that created tension between Porcupine residents and their insurance agents throughout the mining town's development.

The legacy of the Great Fire for most people was its role as a measuring stick of Porcupine history. Ten years after the fire, in 1921, The Great Fire was invoked in *The Globe* in a story about new fires in the north. "Conditions very similar to those which preceded the big Porcupine bush fire of 1911 exist throughout Sudbury and Algoma districts today," the article claimed. "Should [any wind] blow up without rain serious fires are certain."[163] The story indicates persisting power of the 1911 fire in popular memory, even for distant urban populations far to the south. The severity of 1911 became a baseline against which future fire conditions might be measured. It was a common point of reference for everyone, even a decade later.

Over time the fire also became useful as a measuring stick for success and progress. Celebratory tales of the mining industry's success in Ontario look back regularly to the moment of the fire. Gibson, by then the minister of mines, invoked the fire in an article

[162] "Fire Insurance After Haileybury Fire," *Porcupine Advance*, 18 October 1922.
[163] "Two Young Men Lose Lives Fleeing Forest Fires Menacing Northern Towns," *The Globe,* 6 July 1911.

for *The Globe* in 1935 titled "Drama and Romance Form Background of Mining Progress: Foundations of Great Industry Laid Amid Tales of Accidently Discoveries Followed by Struggles of Visionary Pioneers – Legends Recalled of Early Days in Northern Ontario Camps."[164] The fire embodied the danger, struggle, and precariousness everyone expected from an early mining frontier. Porcupine residents' ability to rebuild in the face of adversity, thrive in the wilderness, and become a powerful industrial mecca in the face of disaster became part of the mining community's identity. Its industrial accomplishments shone even brighter when contrasted against the dark chaos of 1911.

The fire's role as a turning point for northern identity is articulated in old timer J.B. MacDougall's *Two Thousand Miles of Gold, From Val 'Or to Yellowknife*. Writing in 1946, MacDougall invoked the image of a fiery monster devouring the town. He described "tongues" of flame 150 feet above the forest which "swallowed" homes and buildings while men, women, and children "fled like hunted things down main street." As people sought refuge in the lake, "the demon of death" began "circling the lake on either side." When it got to Cochrane, "this demon of the flame licked his chops over this toothsome morsel for his devouring rage." Moving from animal to biblical metaphor, MacDougall also dubs it "a deluge of fire from heaven. Another Sodom and Gomorrah!" He concludes his description by calling it the first "baptism by fire" experienced by the north.[165] On one hand, nature as-threatening-beast tested the tenacity of Porcupine residents. On the other, fire wiped the landscape clean of sin, disorganization, and other

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[164] Thomas Gibson, "Drama and Romance Form Background of Mining Progress," *The Globe,* 3 Jan 1935.
[165] MacDougall, *Two Thousand Miles of Gold,* 177-181.

the trappings of the early gold rush.

The symbolic and rhetorical power of the great fire remains undiminished. In 2011 a ceremony was held at Dead Man's Point (where many of the victims were buried) in honour of the fire's 100th anniversary. In a local news story covering the event, the fire was described as "a local historical milestone – it helped shaped this community and stands as an example of the wild west, pioneer spirit that created the Porcupine Goldfields."[166] In 2012, under threat from Timmins No. 9, Timmins resident Diane Armstrong again invoked the Great Fire of 1911. Although it might seem big and threatening, Timmins No. 9 fit into a context of fires throughout history endured by locals, she argued: No. 9 "was small when compared to the Porcupine Fire of 1911." Armstrong praised the strength and tenacity of the 1911 survivors and wondered "would we be as strong today?"[167] For these twenty-first century witnesses, the Great Fire remained a measuring stick, a symbol, and an essential component of northern identity. Its role in clensing, selecting, and testing northern residents is indicative of a relationship with the environment in which nature was both something to be feared and overcome by the new citizens of a productive industrial north.

Fire Fortunes, Futures, and Failures

Newcomer practices of fire and brush management in Porcupine were unsustainable, and the fire of 1911 represented the breakdown of the relationship between

[166] Karen Bachman, "Pioneers Share Fire Tales," *The Timmins Daily Press*, 8 July 2011. http://www.timminspress.com/2011/07/08/pioneers-share-fire-tales (accessed 21 May, 2017).
[167] Diane Armstrong, "Remembering the Porcupine Fire," *The Timmins Daily Press*, 25 July 2012. http://www.timminstimes.com/2012/07/25/remembering-the-porcupine-fire-diane-armstrong (accessed 21 May 2017).

humans and the environment. Insect kill, windfall, and warm climate combined to make the north particularly susceptible to a large fire. Fire suppression, a lack of fire-proof infrastructure, easily broken transportation and communication networks, and an inability to anticipate the fire worsened the situation and resulted in the surprise, death, injury, and confusion on the day of the fire and in the days and months following. The fire cleared the landscape of most of the visible signs of Porcupine's connection to an international mining community and flattened most signs of progress erected or excavated since 1909.

In some ways, human behavior changed in response to the fire. Emotional, mental, and financial struggle followed in its wake. Reminded of the power of northern nature, companies changed their building practices and went to work assembling a powerful firefighting infrastructure. Its significance to peoples' lives both within and without Porcupine is demonstrated by its long rhetorical life. The Great Fire of 1911 is celebrated as a turning point for the community and the mining industry, a moment of transformation and rebirth. Before 1911, the uncertain future of Porcupine had resulted in slow and sporadic development and a mix of small surface and large-scale mining. By 1911, it had become clear to mining's stakeholders that profit would come from large-scale industrial extraction on par with similar projects in Australia, the United States, and South Africa. Both physically and ideologically, the fire cleared the landscape so that its transformation into a booming hinterland could take place cleanly.

Yet the communities and the mines continued to struggle with environmental issues such as flooding, weather, and the land's failure to produce enough agricultural product to sustain the community without dependence on the south. Labor discontent which emerged in 1912 stemmed from miners' dissatisfaction with the process of industrialization. The fundamental trajectory of the camp to large-scale mining under the leadership of a small number of companies had begun in 1909 and remained unchanged after 1911. The fire acted as an accelerant by clearing the land of overburden and decimating smaller syndicates already struggling with financial problems. With the basic trajectory toward industrial extraction unchanged, Porcupine was destined to confront more breakdowns in its relationship with nature on par with the Great Fire. Indeed, by the outbreak of war in 1914, large scale mining had begun to come up against large-scale environmental limits. During the war, these limits would manifest in health problems for miners and energy shortages.

Chapter 3: Entrenched Industry: War and Water Power at Porcupine into the 1920s

In April 1921, two northern Ontario industrial titans clashed head on in the province's Supreme Court. Hollinger Consolidated Gold Mines and Northern Canada Power Company were fighting over the rain. The previous year, with too many contracts to fill, low waters on the Mattagami River, and an impending power shortage, the Northern Canada Power Company had consulted with its mining customers on a scheme of equitable distribution of its remaining supply based on past usage. This attempt at a negotiated solution infuriated Hollinger management. Not only had the company enjoyed a special relationship with the Power Company in the past, but the mine was on the cusp of radical expansion fueled by the long-awaited end of the war.[1] Estimates based on past use simply did not reflect Hollinger's new, post-war operating capacity. At this moment of triumph, Northern Canada Power appeared to be pulling the rug out from under the mine. The real culprit, of course, was nature.

Having rebuilt infrastructure after the Great Fire of 1911, weathered a major strike in 1912, and started consolidation in 1914, Porcupine industry had just begun to understand the extent of its low grade deposits when the war began. Despite hopes for increased demand for gold, the shortages in investment dollars and labour resulting from the war ultimately slowed Porcupine production.[2] At the same time, the war provided

[1] Both had been owned and managed by the Canadian Mining Finance Company before 1912.
[2] Gold proved less desirable than other metals for the war effort and Porcupine benefitted less from war-time demand than other mining zones. Further, as a mining frontier still under development, Porcupine remained dependent on inputs of labour and investment for profitability when the war began. As a general rule, "producing" mines with established infrastructure fared better than those still in exploration phases.

time for the fledgling mining industry that had emerged from the ashes of 1911 to fully assert itself. After 1909, initial excitement had given way to a prolonged struggle for profitability on a poorly understood geological frontier and uncertainty about the best way to exploit low grade ore on an industrial scale. Although the war-time slow down hurt the mines economically, it gave them a chance to develop more effective extractive strategies for Canadian Shield gold. War-time conditions facilitated more corporate take-overs and produced better scientific understandings of major deposits. The war also materially helped the mines by glorifying metal production as a form of patriotism, and, as it came to a close, creating a large body of migrant ethnic labour. As a result, the largest mining companies emerged in 1921 more successful, confident, supported, and informed than ever. By the early 1920s, Hollinger, Dome, and McIntyre waited patiently for the return of normal conditions to unleash their new productive power.[3]

Ready to increase production further, the mining companies were distressed to find their ambitions stymied by a lack of hydro-electric power in 1920. At first glance, the shortages look like a case of industrial distance and human alienation from the land under a regime of transnational capitalism.[4] Indeed, divisions between scientific geologists and

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[3] The basic structure of the mines - with ore mined from the faces conveyed to central shafts to be crushed, raised, and milled, and raised to the surface up vertical shafts for processing in the mill – would largely remain the same until the end of the twentieth century. These were the last years in which Canada borrowed technology from the international mining community. After 1920, Canadian mining companies surged ahead, making their own unique contributions to industrial mining. They had not done this on a large scale before, instead importing international knowledge. James Otto Petersen, “The Origins of Canadian Gold Mining: The Part Played by Labour” (PhD Diss., University of Toronto, 1978), 51; 436.

[4] Human alienation from nature under industrial economies has become a common trope in environmental history. However, some scholars suggest, as I do here, that the relationship between humans and nature is more complicated. Richard White argues that workers know land through labour. Richard White, *The Organic Machine: The Remaking of the Columbia River*, (Hill and Wang, 1995). Liza Piper distinguishes between industrialization and commodification. She argues that commodification and the market economy, more so than industrialisation is what alienates people from the land. "Markets divorced industrial

the increasingly rare "instinctual" knowledge of locals and prospectors deepened during these years: Southern science gained legitimacy while grass-roots know-how appeared to decline. However, a closer examination shows how local relationships to land persisted in Porcupine as the scale of mining ballooned. Hands-on experience with shield nature remained an asset to the mines. Under the pressures of the market economy, mine managers and governments actively cultivated close human knowledge of the land.

Low water and related hydro-electricity shortages stemmed from the discrepancy between the mines' post-war capacities, built to compete with their counterparts in the United States and South Africa, and the limits of shield nature. Although northern Ontario possessed plenty of water power, these were not infinite. In 1921, the expanding mines reached the limits of what the north could provide without major, disruptive modifications to the landscape. These limits contradicted government and corporate expectations for water power, which had, despite evidence to the contrary, been seen as more than sufficient for the needs of industry. As the mines entered the roaring twenties, they increasingly chaffed against environmental limits. As a result, continued viability increasingly relied upon dispossession and exploitation of marginalized people, especially racialized workers and First Nations. The war and the water shortages demonstrate the tangled nature of transnational and local forces in Porcupine, and the ways in which their convergence inscribed physical change on the land and its occupants.

Gold Mines in the Trenches: Weathering the Great War

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commodities from local places, even if industrialisation remained closely tied to nature, and together shaped the long-term consequences of industrial operations to subarctic environments." Liza Piper, *The Industrial Transformation of Subarctic Canada* (UBC Press, 2009), 8.

Looking back on the first year of the war in 1915, (then) Deputy Minister of Mines Thomas Gibson wrote "[mining] statistics…reflect the influence of passing events, whether on the provincial, national, or world stage."[5] This was his way of explaining why production and profits had fallen since the outbreak of war. Initial optimism about the opportunities for gold mines under cash, credit, and metal hungry war economy had finally given way to conservatism and caution by 1916. A minor depression followed by the declaration of war saw capital dry up, prices for metals drop, supply costs rise, and labour evaporate.[6]

The outbreak of conflict had little initial effect on the Porcupine. Even after prices for other precious metals began to fail, gold remained mostly immune because of its role as the notational medium for balancing international payments on current accounts.[7] Compared to skyrocketing production since the Great Fire in 1911, profits in 1914 certainly slowed, but not nearly to the same extent as silver and other metals.[8] In fact 1914 was the year Ontario became the biggest gold producer in Canada: Ontario mined 268,942 ounces worth $5,529,767 compared to British Columbia's $5,177,343, and the Yukon's $5,125,396.[9] The numbers were a product of the early success of the large-scale low-grade mining model in Porcupine buoyed by the economic stability of gold.[10] As a result, 1914 was a year of celebration rather than apprehension for the mines.

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[5] *Twenty-Forth Annual Report of the Ontario Bureau of Mines 1915* (King's Printer: Toronto, 1915), 1.
[6] *Annual Report of the Ontario Bureau of Mines 1915*, 2.
[7] "The Cost of Production," *The Northern Miner*, 30 October 1915, 1.
[8] Gold production jumped from $42,637 in 1911 to $2,114,086 in 1912, then doubled again in 1913 to $4,558,518. So the 21 percent gain to $5,529,767 might have appeared modest in comparison. *Annual Report of the Ontario Bureau of Mines 1915*, 5.
[9] *Annual Report of the Ontario Bureau of Mines 1915*, 8.
[10] "Gold Mining," *The Canadian Mining Journal*, 1 September 1914, 567.

Not only was Ontario's gold coming from a small geographic area, but it was produced by only eight companies.[11] Larger companies with international connections and bigger bottom lines stood the best chance of economic survival. In the early years of the war the *Canadian Mining Journal* optimistically asserted that the European War would not affect the "self-supporting" mines of the Porcupine. [12] By "self-supporting," the *Journal* referred to the mines already able to ship bullion, not those still in development (or fire recovery). Foley O'Brien and Schumacher fell into this latter category, and both floundered in the fall of 1914 as capital dried up in the increasingly risk-adverse investment climate.[13] In the spring of 1915, *The Canadian Mining Journal* lamented the fact that small operations could find no footing in Ontario.[14] Without intervention, these smaller operations became early victims of tightening credit and lower tolerance for financial risk in the investment economy. Conversely, among the "self-supporting" mines, there was some modest expansion. Hollinger planned to increase the capacity of its new mill from 1,600 to 1,900 tons, sink a new shaft to connect its newly consolidated properties, and connect everything with electric locomotives.[15] McIntyre and Vipond mines expanded their mills.[16] Dome, meanwhile, focused on productivity gains by demanding more of a reduced labour force.[17] In 1915, Timmins congratulated his

[11] *Annual Report of the Ontario Bureau of Mines 1915*, 8.
[12] "Porcupine, Kirkland Lake, and Sesikinika," *The Canadian Mining Journal*, 15 August 1914, 563.
[13] Foley O'Brien suffered the additional misfortune of a fire in July of 1914. Ben Hughes, "Gold Mining at Porcupine and Kirkland Lake, Ontario," *The Canadian Mining Journal*, 1 October 1914, 635.
[14] "The Working of Small Ore Deposits," *The Canadian Mining Journal*, 1 April 1915, 197.
[15] A.G. Burrows, "The Porcupine Gold Area," *Twenty Forth Annual Report of the Ontario Bureau of Mines 1915*, Part III, (King's Printer: Toronto, 1915), 20-41.
[16] "Special Correspondence Porcupine, Kirkland Lake and Sesikinika," *The Canadian Mining Journal*, 1 September 1914, 592.
[17] "Special Correspondence Porcupine, Swastika, Kirkland Lake," *The Canadian Mining Journal*, 15 October 1914, 689.

shareholders on their Hollinger investments. He reported a massive increase in the ore reserve, and celebrated the fulfilment of estimates made in 1912.[18] According to the Ontario Bureau of Mines, by the middle of 1915 "the mines were worked with feverish activity in order to supply the abnormal demand for metals." For those already positioned to sell it, the price of gold went up in these years and gave the producing companies a boost at the beginning of the war.[19]

The optimism of the industry had been based in the assumption that the war would not last long, but by the end of 1916 it had become clear that hostilities were nowhere near finished. Even the big mines simply could not endure the inflated prices for zinc, explosives, steel, and other supplies in the long term.[20] Cyanide (imported from Germany) became the first major worry. Low-grade mining requires cyanide (mixed with water) to separate gold from ore and trace metals, but in the early twentieth century only a few places manufactured the chemical on a large enough scale for exportation. While there was some talk of an alternative supplier in Britain, the *Canadian Mining Journal* speculated that most of this would be exported to the Rand, which still outproduced Ontario and contributed to Britain's war-time finance.[21] In 1916, the Bureau of Mines expressed concern about the steady rise in prices for mining and milling supplies.[22] Mine

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[18] *Fifth Annual Report Covering Operations for the Year 1915 Hollinger Gold Mines, Limited,* (Toronto: 10 February 1916), 2.
[19] *Twenty-Fifth Annual Report of the Ontario Bureau of Mines 1916,* (King's Printer: Toronto, 1916), 1.
[20] *Fifth Annual Report Governing Operations for the Year 1915 Hollinger Gold Mines Limited,* (Toronto: 1 January 1916), 23
[21] "Gold Mining," *The Canadian Mining Journal,* 1 September 1914, 567. An unidentified alternate source was found by November of 1914. "Cobalt, Elk Lake, Gowganda, South Lorraine," *The Canadian Mining Journal,* 1 November 1914, 722.
[22] *Twenty-Fifth Annual Report of the Ontario Bureau of Mines 1916,* (King's Printer, 1916), 7.

managers expressed the same worry. “We must admit that we now have a fuller appreciation of the seriousness of the struggle in which the Empire is at present engaged,” wrote Timmins at the beginning of 1917, “and the magnitude of operations necessary to ensure victory.” As a result, “some readjustment of our plans has become necessary.” Among the challenges faced in that year, Timmins listed “annoying delays in the deliveries of machinery,” “scarcity of labor,” and the fact that “the costs of materials and supplies are still rising.”[23] Mine manager P.A. Robbins admitted that “we failed to make due allowance for the magnitude of the task confronting Great Britain and the Allies,” and that this failure accounted for the company’s inability to meet its goals.[24]

Even more than the rising cost of supplies, war-induced labour shortages threatened to slow down production. The consolidated model of industrial extraction increasingly adopted by the mines depended on a steady supply of cheap workers to move gold ore through the new industrial machinery.[25] “The labour situation has given us great concern,” Timmins stated in 1916.[26] Besides loss to war recruitments, the high wages and easy working conditions available in the American west drew experienced men out of Ontario. Mining labour in Ontario had typically followed seasonal rhythms. Agriculture took remaining men away in the summer and fall, and lumbering companies tied up men in the winter.[27] The large-scale, low grade mining model depended on cheap, efficient

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[23] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines* (Toronto: 15 February 1917), 2.
[24] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines,* 17.
[25] Pederson, “Origins of Canadian Mining,” 24.
[26] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines,* 2.
[27] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines*, 17.

labour, but during the war, mines simply could not afford to offer competitive wages to draw workers back.[28]

The importance of experienced miners for industrial success cannot be understated. Companies sometimes replaced lost skilled labour "by promoting men from the ranks of unskilled labor," but it took time for the freshly promoted men to become as efficient as their predecessors. New labour worked painfully slowly, and cut into profits.[29] Drill operators provide an example. Drilling was a skilled position which required experience and training. The mills could only process as much ore as the drillers could prepare for blasting in an eight-hour shift, so inexperienced drillers meant costly mill stoppages. The drillers determined the volume of gold ore a mine produced. Slower drillers meant less ore, smaller outputs, and less gold. As mining and technology historian James Otto Pederson put it, using unskilled workers in the mine "became logically equivalent to operating a machine below capacity."[30] This was a major problem for an industry predicated on the tight relationship between scale/volume and commercial viability.

The mines attempted to reduce their labour needs through mechanization, (through the installation of locomotives, for example). However, significant gaps which could only be filled by human beings remained.[31] This was particularly true for "muckers," who shoveled ore from the rock faces into ore carts (below ground) and moved ore through the

[28] Illustrating the migratory nature of war-time labour: Hollinger employed 1,230 men at the end of December 1917, but had hired, over the course of the year, 2,700. *Annual Report Governing Operations for the Year 1917 Hollinger Consolidated Gold Mines* (Toronto: 1 January 1918), 12.
[29] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines*, 17.
[30] Pederson, "The Origins of Canadian Gold Mining," 297.
[31] Pederson, "The Origins of Canadian Gold Mining," 297.

mills (above ground). In 1918, Hollinger experimented with mechanical muckers, but they proved finicky, expensive, and less efficient than men with shovels.[32]

Adding to these difficulties, workers knew their scarcity put them in a position of power, and took the opportunity to agitate for better pay and conditions. In the case of a strike, the companies would be powerless, a fact Hollinger manager P.A. Robbins admitted openly to in 1917: "it is to be hoped that their efforts to precipitate a strike will be unsuccessful. Under present conditions there would be nothing for us to do but curtail our operations."[33] In 1918, President Bickell of McIntyre Mines expressed the opinion that it might be better to close down the mine entirely than risk a strike, revealing the deep insecurity of the industry in these years.[34]

Labour shortages during the war caused a slow-down in human modifications to the environment.[35] On the recently consolidated Hollinger, Acme, Millerton, and Claim #13147 group of properties, the lack of labour severely curtailed mine managers' ability to do any significant work. Hollinger manager, P.A. Robbins stated that "shortage of labor has been a handicap to work in the mine, and has placed a limit upon the amount of development work which could be accomplished." Although the company had planned to work Claim #13147, the land was largely left alone in 1916 "as we could not spare

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[32] *Twenty-Ninth Annual Report of the Ontario Department of Mines 1920,* (King's Printer: Toronto, 1920), 86.
[33] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines*, 17.
[34] "Men Back Again at Work at McIntyre," *Porcupine Advance,* 6 March 1918.
[35] With some exceptions. The lack of labour influenced the adoption of Glory Holes at Dome, Millerton, and Hollinger by 1917. Glory Holes involved running a tunnel under the gold deposit, blasting holes in the ceiling, and slowly funneling the ore into waiting cars in the tunnels using gravity. The technique could cause major collapses and large holes on the surface. "Glory Hole at Hollinger," *The Northern Miner,* 14 April 1917, 3.

men."[36] On the main properties, work was also affected. Mining occurred closer to the surface. Men were not sent below 425 feet often, and never below 800 feet.[37] These changes are indicative of the contraction of effort and ambition on behalf of the mining companies as their ability to dig deeper for new deposits became increasingly curtailed.

By the end of 1917, even the bigger mines began openly considering leaving the ore in the ground and shutting down the mines until favourable economic conditions returned.[38] The summary report for 1917 in *The Northern Miner* included a long list of these idle properties.[39] As they had after the early spring of 1909 and the great fire of 1911, the provincial government made special exceptions to mining legislation in 1917 with an Order-in-Council which allowed the postponement of assessment work on claims for twelve months. Large numbers of property owners took advantage of this break to wait for the return of favourable economic conditions.[40] The major exceptions in the shut-downs were McIntyre, Dome, and Hollinger. Rather than cease production, the big three adapted their operations by shutting down portions of their mines, processing higher grades, and tapping reserves.[41]

Allied Mines: Transnational Geology during the Great War

Under challenging geopolitical conditions beyond their control, mining management hunkered down to wait out the slump. During war-time stagnation, northern

[36] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines*, 9.
[37] *Sixth Annual Report Governing Operations for the Year 1916 Hollinger Consolidated Gold Mines*, 9.
[38] "1917 Summary – Mines Did Well," *The Northern Miner,* 5 January 1918, 2; *Twenty-Seventh Annual Report of the Ontario Bureau of Mines 1918*, Vol. XXVII, Part I (Toronto: King's Printer, 1918), 5.
[39] "1917 Summary – Idle Properties," *The Northern Miner,* 5 January 1918, 2.
[40] *Annual Report of the Ontario Bureau of Mines, 1918,* 6.
[41] "1917 Summary – Dome" and "1917 Summary – Hollinger," *The Northern Miner,* 5 January 1917, 5.

Ontario kept a close eye on the strategies of their international counterparts. Over the summer of 1918, mining interests in the United States and Canada advocated for government aid for gold mines ahead of the annual "Gold Conference" in Spokane, Washington, organized by the Northwest Mining Association. The conference attendees came from companies on both sides of the border, and emphasized shared interests. Speakers noted that other war industries in both the United States and Canada enjoyed price-fixing, mineral bounties, and other aid from government agencies. They advocated the same for gold.[42] Porcupine papers picked up on this western movement, arguing for the addition of "a word or two regarding an assurance of sufficient labour and adequate control of aliens at work in the mines."[43] There was a sense that Porcupine was not suffering alone, but as part of a larger allied community of gold mining zones separated only by borders and minor matters of national policy.

As part of a broader community of mining zones, Porcupine occasionally adopted other mines' technologies. With production slow, some of the companies turned their focus to exploration, and experimented with new methods for finding gold deposits.[44] Specifically, diamond drilling materially advanced the mine through development with small numbers of resources. Before the war, some engineers and miners disparaged diamond drilling as expensive and unreliable.[45] Although diamond drilling had been used effectively in the hard rock camps of South Africa, miners and managers were still unsure

[42] "Western Gold Production Falling," *The Canadian Mining Journal*, 1 August 1918, 267; "Spokane – Aug. 26," *Engineering and Mining Journal*, 7 September 1918, 467.
[43] "Government Aid Urged for Gold Mines," *Porcupine Advance*, 17 July 1918. The movement eventually failed. "Dominion Government Not to Aid Gold Mines," *Porcupine Advance*, 14 August 1918.
[44] Pederson, "The Origins of Canadian Gold Mining," 315.
[45] Pederson, "The Origins of Canadian Gold Mining," 309.

about its merits when they debated the subject openly at a meeting of the Canadian mining institute in 1912.[46] The shortage of men and materials during the war made this low-labour, low-input form of exploration much more appealing. It quickly took off, and by 1916 the *Porcupine Advance* observed that the "Porcupine [was] honeycombed by diamond drills."[47] The extensive diamond drilling conducted during the war added significantly to geological understandings of what lay beneath the rock in the Porcupine, even if the mines did not have the people or the equipment to exploit it. Diamond drilling and core sample analysis on Dome Extension claims helped the company discover the extent of its main ore body underground.[48]

In general, the war years saw a blossoming of geological knowledge in Porcupine. Northern Ontario geology had been under serious scrutiny since the discovery of Cobalt silver and Porcupine gold at the beginning of the century. International knowledge had always contributed significantly to assembly of Ontario's geological knowledge. In the words of Queen's Geology professor W.B. Baker, the 1909 discovery of the Porcupine deposits "brought the world's greatest geologists to Ontario, the pre-Cambrian rocks naturally came in for the most detailed study and discussion."[49] In 1914, C.P. Berkey, professor of petrography at Columbia visited the Porcupine Crown mine to study the rocks there.[50] In 1915 A.G. Burrows wrote about the relationship between quartz and granite in Porcupine by referring to a report by C.R. Van Hise on the Black Hills in South

[46] "Special Correspondence," *Canadian Mining Journal*, 15 March 1912, 209.
[47] "Porcupine Honeycombed by Diamond Drilling," *Porcupine Advance*, 19 July 1916.
[48] "Will Systematically Prospect Dome Ex. For Dome Ore Body," *Porcupine Advance,* 21 June 1916.
[49] W.B. Baker, "The Geology of Kingston and Vicinity," *Twenty-Fifth Annual Report of the Bureau of Mines 1916*, Vol. XXV, Part III, (Toronto: King's Printer, 1916), 1.
[50] "Personal and General," *The Canadian Mining Journal,* 15 July 1914, 493.

Dakota, another by J.E. Spurr on the Yukon, and De Launay's "The Worlds Gold." Porcupine, Burrows argued, could be added to the long list of places where quartz veins were related to igneous intrusions.[51] In his discussion of the temperature of formation, Burrows cited Lindgren's "Mineral Deposits," which associated Ontario's gold-bearing deposits with high-temperature deposits found elsewhere in the world. Burrows asserted in 1915 that Lindgren failed to account for the ore at Hollinger, which showed that, in fact, the Porcupine deposits were formed at intermediate temperatures.[52]

This kind of collaborative geological work especially paid off during the war. On the Porcupine Crown, A.R. Whitmen (mining geologist) successfully mapped a broken vein in 1915 which had historically mystified experts. According to Burrows, "The vein is very tortuous along its strike, at one point making a turn of more than 90 degrees. There are also rolls and sells along the dip of the vein. One pronounced roll occurs at the 500-foot level." These anomalies had "caused some difficulty in picking up the vein," but Whitmen's work eliminated this difficulty.[53] Whitmen did the same for McIntyre, where "the location of the ore bodies has been rendered difficult by the presence of compression faults which have displaced portions of the ore."[54] With production taking a break, geologic exploration during the war allowed the mines to get a better grasp of complexities of Ontario shield rock, reducing some of the risk and uncertainty that had plagued early mining.

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[51] A.G. Burrows, "The Porcupine Gold Area," *Annual Report of the Bureau of Mines 1915,* Part III, 29.
[52] Burrows, "The Porcupine Gold Area," *Annual Report of the Bureau of Mines 1915,* Part III, 30.
[53] A.G. Burrows, "The Porcupine Gold Area," *Annual Report of the Bureau of Mines 1915,* Part III, 44.
[54] A.G. Burrows, "The Porcupine Gold Area," *Annual Report of the Ontario Bureau of Mines*, Part III, 47

Once people had begun to grasp Porcupine's underlying geology, they began to use their knowledge of the local deposits to understand new areas. This is evident in the language of geologists, who regularly referred to Porcupine as a kind of base line from which more specific descriptions of any new area might be built. In Boston Creek in 1916, the Annual Report noted that the porphyry dikes "resemble the quartz porphyry at Porcupine."[55] In the description of the Goodfish Lake Gold Area, Burrows and Hopkins stated that this rock is identical to the rock which shows large "eyes" or quartz and occurs with the pillow lava flows in Porcupine."[56] These Porcupine signs suggested the presence of gold.[57] In this way the geological knowledge that shaped war-time understandings of Porcupine spread outwards from the camp, going on to shape the histories of other northern Canadian mining zones.

Advances to Porcupine geology did not mean full comprehension of the shield's geological puzzle, and the information that geologists managed to assemble permeated the mining community unevenly. A 1920 article in the *Northern Miner* titled "Where Are Those Millions?" (based on a memo to the Canadian Mining Institute by A. P. Coleman) speculated that northern Ontario's shield-gold had been eroded long ago and washed down rivers into placer deposits still waiting to be discovered.[58] Of course, such deposits did not exist. The piece shows a rough understanding of the operations of lode and placer gold, persisting optimism in the north's economic potential, and enduring ignorance about the nature and location of gold.

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[55] *Annual Report of the Ontario Bureau of Mines 1916*, 251
[56] *Annual Report of the Ontario Bureau of Mines 1916*, 261
[57] *Annual Report of the Ontario Bureau of Mines 1916*, 261
[58] "Where are Those Millions?" *The Northern Miner*, 4 September 1920, 8.

With a better idea of the layout of their deposits, the mines eagerly anticipated the end of the war, but the return of "normal" conditions took much longer than hoped.[59] Following the November 1918 Armistice, *The Northern Miner* predicted reopened mines, higher profits, and skyrocketing success.[60] Yet the price of supplies remained high into 1920. The annual report of the Dome Mining Company gloomily confessed in its annual report that "contrary to our hopes and expectations, costs in mining…have continued high since the end of the war."[61] Strikes continued to plague the mining camps at both Cobalt and Porcupine after the war.[62] The shortage of men remained a problem, and returning soldiers expected good pay and benefits.[63] Even as men began to pour back into the camps in 1919, there was not enough to satisfy demand. As mining engineer Howard Poillon complained to Dome manager Henry Depencier in 1920, "it seemed like the hand of fate, that after having almost within our grasp a satisfactory supply of efficient labor it was removed."[64] The lumber camps took up the new labour first, and asked the provincial government to send them more. The mining companies struggled to compete.[65]

However, when favorable market conditions did return, the global demand for metals combined with slow recovery in other parts of the world to put Porcupine mines in

[59] "Re-Opening Old Properties," *The Northern Miner*, 3 January 1920, 4; "They Are Coming Back," *The Northern Miner*, 9 October 1920, 2.
[60] "The Gold Camps of Northern Ontario," *The Northern Miner*, 23 November 1918, 1.
[61] "Dome Lake Mines Report, 1919," *The Northern Miner*, 27 March 1920.
[62] "Teck-Hughes Gold Mine – Workers Quit Temporarily Over Food," *Porcupine Advance* 10 July 1918; "Strikes and Lockouts," *Porcupine Advance* 23 July 1919; "Porcupine Miners' Union – Vote on Striking," *Porcupine Advance* 23 May 1923.
[63] "Settlement in Porcupine," *The Northern Miner*, 26 July 1919, 1.
[64] Howard Poillon to Henry Depencier, 30 October 1920, File: "Introductions," Box 1, F 1350, Dome Mines Company Fonds, Archives of Ontario, Toronto, Ontario, Canada.
[65] "Steady Inflow of Men Into the Porcupine," *Porcupine Advance*, 5 February 1919.

an advantageous economic position.[66] Hollinger management and the other big mines saw this opportunity and expressed their desire to unleash their full industrial potential on the landscape without the "handicaps" of regulation.[67] The cry for de-regulation hailed back to gold rush traditions of free enterprise glorified in California and Australia – but on a much bigger scale. The *Northern Miner* became a big part of this push. The journal argued that Porcupine's quick recovery made it the world's "only flourishing gold field" in 1920 and called on Canadians to support their northern mines (by cutting red tape).[68] Rhetorically, the mines had an almost moral duty to provide the world with gold and speed post-war economic recovery at home and abroad.

Losing on the Northern Home Front: Mining Versus Agriculture during the Great War

Porcupine's duty to produce gold came at a moment of deep unease about the north's contribution to the home front. Historians of northern agriculture chronicle the difficulties that plagued government efforts to promote the industry. These failures became more painful in the context of the First World War.[69] Canadians directly equated

[66] "World needs More Precious Metals," *The Northern Miner* 28 February 1920, 3.
[67] "Report of Hollinger Officers," *The Northern Miner*, 6 February 1920, 8.
[68] "Ontario has Only Flourishing Gold Field," *The Northern Miner*, 7 August 1920, 4.
[69] In *Changing Places*, Kerry Abel writes of the area around Timmins that "working life on the farm was clearly a struggle." She describes the short growing season, poor markets, lack of transportation access, lack of labour, and environmental disaster (especially the 1916 fires) which saw "lands abandoned almost as quickly as they were taken up." Kerry Abel, *Changing Places: History, Community, and Identity in Northeastern* Ontario (Kingston: McGill-Queens University Press, 2006), 154. J. David Wood also addresses the failure of agriculture settlement in northern Canada (including the Porcupine/Timmins region) in *Places of Last Resort*. He writes: "the opening of new land for farming after 1910 and the rush of people into that land present a saga of human desire and elusive opportunity. By most measures, the occupation of the marginal areas during the inter-war period was widely blighted by failure." Wood, *Places of Last Resort*, 179.

food production, rationing, and agricultural self-sufficiency with patriotism.[70] In this rhetorical context, Porcupine residents were uncomfortably reminded of the Bureau of Mines' promises of an agricultural frontier in the north – promises which had been largely forgotten since the silver and gold discoveries at Cobalt and Porcupine, but gained new life during the war. Adding to their discomfort, efforts to kick start the farming frontier between 1915 and 1919 largely failed. These tensions resulted in a series of assertions about the under-recognized value of precious metals (and Porcupine as a whole) to Canada and the war effort.

In 1915, A.G. Burrows of the Bureau of Mines dusted off and paraded a host of optimistic agricultural predictions not seen since the Parks, Kerr, and McMillan surveys. He reminded his audience that Porcupine lay south of the Manitoba border with the United States, and just south of the Ontario clay belt. Within the context of the new war, Burrows argued, "it is desirable to have a great part of the townships immediately north of the Porcupine gold area, which are in the clay belt, settled, as the farmers will have a near-at-hand market for their produce" in the mines.[71] Of course, the wet muskeg remained a problem, but Burrows remained firmly optimistic about the viability of such a project: "Owing to the lack of drainage, much of the country, though higher than the rivers and lakes, is very wet, but would be suitable for agricultural proposes if properly drained."[72]

[70] See Ian Mosby, *Food Will Win the War: The Politics, Culture, and Science of Food on Canada's Home Front* (Vancouver: UBC Press, 2014).
[71] A.G. Burrows, "The Porcupine Gold Area," *Annual Report of the Bureau of Mines 1915,*Part III, 1-2.
[72] A.G. Burrows, "The Porcupine Gold Area," *Annual Report of the Bureau of Mines 1915,*Part III,, 5.

By 1916, despite Burrows' prophesizing, farms failed to materialize on their own and the Ontario government began offering limited support to settlers who would come to live in the north.[73] When these incentives proved insufficient, the provincial government took things a step further by simply offering free lots to farmers who would work the land in 1917.[74] Ontario also proposed an agricultural high school for training youth in northern farm techniques.[75] The northern Monteith government farm ran crop experiments (including potato experiments in 1916) and recommended residents keep bees for pollination.[76] Later it recommended hardy varieties of northern flax and turnips.[77]

After years of lukewarm results, farm administration gave up its agricultural dream for a pastoral one. At the annual farm picnic in 1920, directors announced they would turn their attention instead to stock raising. The farm would become "a sort of breeding ground for stock for the benefit of settlers." They planned to raise cattle, sheep, swine, and poultry. According to the Honorable Manning Doherty, "the great agricultural future of the North Country lay in livestock rather than grain."[78] The farm's fate mirrors a broader struggle to make the north relevant to a war-time society which valued agricultural self-sufficiency in a climate that stubbornly yielded little settler food.

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[73] "Scheme to Develop the North Country," *Porcupine Advance*, 12 April 1916.
[74] "Free Lots Offered Here for Greater Production," *Porcupine Advance*, 23 May 1917; Cultivate a Lot and Help a Little," *Porcupine Advance*, 30 May 1917.
[75] "New Experimental Farm for the Great North Land," *Porcupine Advance, 28 February 1917*.
[76] Potatoes had been successfully grown by Indigenous people since at least the turn of the century, as seen in the early Ontario Bureau of Mines reports. "Honey Bees Thrive in the North Land," *Porcupine Advance*, 28 February 1917; "Results of Potato Culture Experiments by the Government," *Porcupine Advance*, 17 May 1916.
[77] "Flax as profitable crop for north land," *Porcupine Advance* 7 March 1917.
[78] "To Test Northland as a Ranching Country," *Porcupine Advance*, 11 August 1920.

As the war dragged on, the notion that the north might not be pulling its own weight on the home front provoked defensive reactions. In December 1916, Arthur Cole, president of the Canadian Mining Institute and Mining Engineer for the Temiskaming and Northern Ontario Railway, reminded listeners at a public talk that mining had done a lot of good for Canada, despite the fact that the railway had originally been intended for agriculture. Yes, ore, not agricultural products, made up the bulk of railway traffic, yet Cole argued that this was a fortunate turn of events. Agriculture would not have provided sufficient business to run trains as regularly or profitably as they did under the mines. Furthermore, Cole explicitly linked the metal industry to the allies' ability to win the war. The public, Cole continued, did not appreciate the essential role of the mining industry in ensuring the continuation of the Canadian economy in war time.[79] His speech highlighted the fact that mining's invisibility made it look like it did not contribute as much as the settled and productive south, but that mining was just as legitimate an occupation for hard-working Canadians.

Anxiety that Porcupine lagged behind on its home-front contributions worked its way regularly into local discourse. An article in 1917 unfavorably compared the Porcupine to communities slightly further south which had successfully improved their agricultural output. The article acknowledged that bad weather and different soil had made agricultural increases impossible thus far, but enjoined residents to keep trying because "every little helps."[80] In the fall of 1917, the women of the district met to discuss

[79] "Importance of Mining," *The Northern Miner*, 16 December 1916, 2.
[80] "Every Little Will Help in Production of Food," *Porcupine Advance*, 2 May 1917.

food conservation and rationing.[81] These efforts represent residents' attempt to do their part for the war effort within an environment that stubbornly resisted home-front agricultural ideals.

If rising enthusiasm for agriculture in the Porcupine did not result in a proliferation of actual farms, it did provide the motivation for a wide range of infrastructure projects during the war. The Mountjoy Settler's Association and the Timmins Board of trade used the "benefit of settlers" as a lever to extract a government promise for a bridge across the Mattagami River.[82] The same reason was given for the construction of a new road connecting Matheson and Timmins. The three-pronged argument went that the land was all prime agricultural country, farmers would have ready access to markets in the mining towns, and that the land would be good for settling returning soldiers.[83] These old visions of progress in the north contributed to some road and bridge-building during the war and showed the power of the agriculture argument even in the absence of evidence for viability.

Although the northern muskeg never bloomed with acres of productive crops, there were some success stories. In May of 1917, the *Porcupine Advance* celebrated the success of Mr. B. Dewar, who had managed to grow flowers, vegetables, and strawberries through much of the winter in his special nurseries.[84] An article from June of 1918 commended Mr. J.D. Carron on his Mountjoy farm. The paper had acquired two photographs of the farm, which they described as doing "credit to any of the smaller

[81] "Mrs Parsons Suggests Food Allowance," *Porcupine Advance*, 12 September 1917.
[82] "Bridge to be Built Across Mattagami," *Porcupine Advance*, 1 January 1919.
[83] "Highway to Connect Matheson and Timmins," *Porcupine Advance* 5 Feburary 1919.
[84] "Strawberries and Flowers in Winter in the North Land," *Porcupine Advance, 2 May 1917.*

Southern Ontario farms" (but did not actually publish). Charron was an "old timer," having come to the area shortly after the rush, and knew the land well. He grew oats, barley, potatoes, and hay, and had two teams of horses, thirteen cows, and other unidentified farm stock. He also had twelve children, ranging from twenty-two to five years old (the *Advance* joked that "Mr Charron has solved the farm help problem").[85] Charron was the ideal northern farmer, but the title of the article about him ("One of Mountjoy's Successful Farmers") and the amount of attention paid to his relatively standard accomplishments suggests that the bar was low.

Historians of northern Ontario agriculture describe farming as part of a mixed subsistence economy for settlers and Indigenous people.[86] In Porcupine, settler men combined farming with mine work. P. Faulkenhain worked a farm in Carr Township in the summer, and worked at the Hollinger mine as part of the underground staff in the winter. In 1918, the *Porcupine Advance* celebrated his innovative method of clearing land, which involved cutting roots close to the surface and prying out the tree from its base with a long pole. The method only worked well in the kind of clay soil found in the north where roots tended to spread horizontally through the earth rather than straight down, as they might in sandy soils.[87] The story suggests considerable ingenuity and adaptability on behalf of local farmers making a living at Porcupine. Ultimately, however, the kind of mixed mining and agricultural work engaged by Faulkenhain, and the half-

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[85] "One of Mountjoy's Successful Farmers," *Porcupine Advance*, 26 June 1918.
[86] Abel, *Changing Places*, 154.
[87] "Clearing and Stumping All at the One Time," *Porcupine Advance*, 27 February 1918.

wild potato patches recorded by surveyors since 1899, were far from the settler families envisioned by agriculture advocates.

The failure of the agricultural frontier in Porcupine was not due to a lack of local demand. Just like the boosters had predicted, the mines and towns provided a ready market for produce. But the mining communities and the mines continued to rely on imported food. For example, a 1920 letter from Dome manager Henry Depencier to Langstaff farmer W.J. Morrison looking for reasonably priced vegetables suggests two interrelated patterns: first, that the topic of food supply enjoyed the attention of even the highest-paid figures of mining company administration; and second, that no satisfactory source existed nearby.[88]

By the time the war ended, Porcupine's inadequacy as an agricultural zone had become obvious, especially in comparison with more successful agricultural frontiers among allied nations. In their attempts to explain northern agriculture's shortcomings, opinionated editorials drew direct comparisons between Porcupine and the world. An article in the *Northern Miner* in 1920 blamed a wide variety of barriers to agricultural production and pointed to international examples for potential solutions. The piece talked about the permafrost, and blamed the tree cover for keeping the earth in the shade year-round, never giving it a chance to warm. It advocated clearing the land so that settlers' crops could grow. But what was really lacking was "an energetic and enterprising policy" based on business principles for northern agriculture. The mining economy was a model

[88] The letter refers to a conversation between Depencier and Vice President W.S. Edwards. Henry Depencier to Major W.J. Morrison, 24 November 1920, File: "Introductions," Box 1, F 1250, Dome Mining Company Fonds, Archives of Ontario, Toronto, Ontario, Canada.

of the possibilities of such business principles in the north. Although the author acknowledged the shortcomings of business models for agriculture (including rampant speculation), they argued that these problems could be solved by copying strategies employed successfully in New Zealand.[89] The *Northern Miner* assumed Porcupine belonged within the ranks of other frontier colonies and successor states and proposed solutions for its shortcomings based on the assumption that northern Canada possessed the same potential for economic development as its peers, despite massive geographic and geophysical differences.

Tensions between mining and farming became a part of the rhetoric following the election of the United Farmers of Ontario-Labour Coalition Government in 1919. Like most of the rest of the province's newspapers and business people, the *Porcupine Advance,* the *Northern Miner*, and the local mining companies distrusted Premier Edward Charles Drury and the "Ontario Farmer's Government's" ability to stand up for their interests. In heated dispute over a new mining tax for example, the *Porcupine Advance* blamed the new government for discouraging investment in the north with their proposed mining tax.[90] The election confirmed the idea that "northern" and "farming" interests did not overlap in Ontario.

The failure of the home front during the Great War did not end the agricultural dream for northern Ontario. It would be periodically revived throughout the twentieth century. However, the justifications and explanations for Porcupine's missing farmers

[89] "A Real Development Policy," *The Northern Miner*, 25 January 1920.
[90] "Government Attitude Stops Another Big Deal," *Porcupine Advance*, 6 April 1921.

worked rhetorically to justify and explain the dominance of the mining industry. If Porcupine was not (yet) a great farming hinterland, then it should still be praised for contributing to the national economy through mining. If they had not already done so, Porcupine residents had new reasons to identify as miners rather than farmer settlers by the time the war was over.

“Unscientific Instinct:” Valuing Local Knowledge at Porcupine

The failure of farming in Porcupine might seem at first to confirm the association between industrialization, commodification, and disconnections between people and nature.[91] Rather than nurturing a sustainable connection between small-time cultivators feeding local demand, Porcupine people could only succeed by extracting metal and other raw materials for sale on distant markets. Indeed, during the First World War, residents and governments worried not just about failed homesteads, but also about the local knowledge that was lost in a globally-tied industry guided largely by foreign-trained experts. In some ways, these fears were justified. Local economic pursuits like trapping, food gathering, and animal husbandry always stayed subservient to mining, and the small, community-level relationships with the environment often suffered under the extractive regime. Yet the divide between local versus extra-local remained incomplete and messy. Governments and mine owners worried deeply about the loss of local mining knowledge (specifically, the old-time prospector). Their concern and reliance on ground-level experience reveals its continued value and relevance to industrial mining.

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[91] See Liza Piper, *The Industrial Transformation of Subarctic Canada* (Vancouver: UBC Press, 2009), 4, 8. For a classic discussion of this idea, see William Cronon, *Changes in the Land: Indians, Colonists and the Ecology of New England*, (Hill and Wang, New York, 2003), 75.

Indeed, although farming had failed, other non-mining economies provided alternative forms of work and substance for Porcupine residents during the war. For example, people had trapped furs at Porcupine for hundreds of years before the mining industry arrived, and the occupation continued to form part of Porcupine's local economy through the war years. Periodic stories about trappers (many of them Indigenous) appear in the local papers. There were also several high-profile legal cases involving trapping out of season and fur theft.[92] In 1920, *The Art of Trapping* ran full page ads in the *Porcupine Advance* to promote its trapping guide books.[93] Shubert, a Canadian Fur Dealer out of Winnipeg, also took out full ads in the *Advance* asking trappers to "help us supply our tremendous demand for muskrat, fisher, beaver, and all other furs from your district."[94] Such stories persist well into the 1920s, suggesting that trapping for cash continued well into the industrial period.[95]

Locals, especially women, also harvested food in an around Porcupine. In 1915, a newspaper article described the work of berry pickers near the Hollinger mine.[96] During the war, berry picking was an important part of supporting the home front. One *Advance* advertisement implored readers to "Pick the Berries!" because "tame fruit is scarce down south, and so all the wild fruit gathered will help in making a further supply of tame fruit

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[92] "Fined for Having Furs," *Porcupine Advance*, 25 June 1915; "Crime - beaver skins out of season," *Porcupine Advance*, 19 March 1917, 7; "Frozen to Death," *The Northern Miner*, 11 March 1916, 5; "Prospector Missing Search Party Return Without Him," *Porcupine Advance*, 26 January 1916; "Cochrane Drayman Acquitted in Fur Case," *Porcupine Advance*, 15 December 1920.
[93] For example, see "Trappers It's Free!" *Porcupine Advance*, 3 January 1920.
[94] "Furs," *Porcupine Advance*, 14 April 1920.
[95] "Tears Frozen on Chees as Trapper Meets Death," *Porcupine Advance*, 21 December 1921.
[96] "Record Thunderstorm" *Porcupine Advance*, 20 August 1915.

available for the soldiers and sailors."[97] Berry picking continued well after the war, too. In October of 1920, the *Porcupine Advance* celebrated a second crop of strawberries, which ripened along the banks of the Mattagami River during the particularly warm fall.[98] There were similar sentiments around fish - During the war Porcupine residents were enjoined to eat fish as a way of saving food and money for the war effort.[99] Awareness of these food resources suggest an intimate connection to the wild landscape throughout the war period.

Furthermore, people kept domesticated food and work animals on a small scale. In 1917, local entrepreneurs began the process of obtaining a large tract of grazing land for a cattle ranch.[100] Locals kept other grazing animals closer to town, too. In 1917, an article in the *Advance* lamented "horses, cows, calves, and what-not" running loose in the streets, destroying gardens.[101] Similarly, the actions of marauding dogs prompted the *Porcupine Advance* to reveal details of northern residents' fowl- and canine-keeping during the war. A 1917 article lists four separate chicken coops raided by problem dogs, with laying hens and roosters of several varieties. Besides the four coops mentioned, the paper listed "other losses of fowl, both thoroughbred and common varieties."[102] Stray dogs in town caused the *Porcupine Advance* to differentiate between useful and useless dogs. "Useful" dogs

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[97] "Pick the Berries!" *Porcupine Advance,* 14 May 1918.
[98] "Strawberries Ripen Outside this Month," *Porcupine Advance*, 20 October 1920.
[99] "Help Win the War by Eating Fish," *Porcupine Advance,* 20 June 1917.
[100] "Big Cattle Ranch Scheme for Northern Ontario," *Porcupine Advance*, 2 May 1917; "Northern Ontario's Big Cattle Ranch," *Porcupine Advance*, 9 May 1917.
[101] The animals' transgressions into the sensitive issue of northern war-time gardening made their actions particularly atrocious. "Wandering Animals Destroy Gardens," *Porcupine Advance*, 25 July 1917.
[102] It blamed the "many USELESS dogs in the district," differentiating "useless" dogs from working, well-bred dogs who were properly cared for. "Serious Loss in Town Through Dogs Killing Chickens," *Porcupine Advance*, 1 August 1917.

included those still used for transporting people and goods over the snow in the winter time. Indeed, local papers reported extensively on Porcupine's annual dog race, suggesting dog transport remained crucial for the community.[103] During the war, however, the presence of animals was in transition. Mechanization resulted in the replacement of most animal labour with electric or coal-powered energy. At Hollinger, a new surface tram "enabled us to dispense with most of our teams, with a subsequent reduction in costs" according to the annual report.[104] These transitions had the side-effect of undermining local agriculture, since one of the few profitable crops in northern Ontario had always been hay for work animals.[105] Animals remained an important part of domestic life in Porcupine even after they began to disappear from the mines.

Porcupine residents also connected with the land through recreation. A small cottage culture began as early as 1917, when residents started buying islands on Night Hawk Lake as summer retreats.[106] Later on in 1921, the *Advance* floated the idea that a new road from Timmins to Iroquois Falls would "open up a fine summer resort section."[107] In the winter, the community held races on the ice of Porcupine Lake. Car, horse, dog, and human races drew spectators from around the region.[108] There were also annual snow-shoe races which included categories for women and children.[109] In the

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[103] "The Big Dog Team Race on Saturday This Week," *Porcupine Advance*, 7 March 1917. "Porcupine Dog Race Likely Saturday 19th," *Porcupine Advance*, 9 March 1921.
[104] *Fifth Annual Report Covering Operations for the Year 1915 Hollinger Gold Mines, Limited* (Toronto: 10 February 1916), 21.
[105] Abel, *Changing Places*, 154.
[106] "Buying Whole Islands in Night Hawk Lake," *Porcupine Advance*, 22 August 1917.
[107] "Road Would Open Up Fine Summer Resort Section," *Porcupine Advance,* 6 April 1921.
[108] "Ice Racing Popular on Porcupine Lake," *Porcupine Advance*, 15 December 1920.
[109] "Good Trail Now for the Porcupine Dog Race," *Porcupine Advance*, 16 March 1921.

summer, starting in 1921, the community put on the first annual Mattagami River regatta, with canoe races, swimming races, tilting, launch races, highdiving contests, and other sports.[110] There was also a golf course used by women and men, and a baseball diamond where company-sponsored teams competed in the summer.[111] Recreational activities on/in local landscapes and waterways expressed residents' enduring connections to the land.

Local interactions with nature were not always rosy. Porcupine residents continued to live under the constant threat of forest fires. In July 1914, a bush fire threatened South Porcupine and wiped out the Foley O'Brien Mine. By September, rain quenched the danger for another year, but in 1915 several small bush fires again threatened the community.[112] Then in 1916, huge forest fires swept through the north, tore through neighbouring cities, destroyed mining infrastructure, and killed several hundred people.[113] Similarly to the 1911 fire, the 1916 fires traumatized Porcupine residents and shaped their perceptions and actions in the environment. Just as they had in 1911, prospectors took advantage of the burnt-over earth to get a good look at shield rock and stake claims in promising areas.[114] Municipal governments took a renewed interest in fires and fire prevention, and cooperated with the provincial government to take special measures for

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[110] "First Annual Regatta," *Porcupine Advance*, 22 June 1921.
[111] "Golf Enthusiasts will have a great season in 1922," *Porcupine Advance* 26 October 1921.
[112] Special Correspondence Porcupine, Kirkland Lake and Sesikinika," *The Canadian Mining Journal*, 1 September 1914, 592; "South Porcupine Fire Department Proved Their Ability," *Porcupine Advance*, 3 September 1915; "The Memory of the Fire," *Porcupine Advance*, 9 July 1915; Prevention of Conflagrations," *Porcupine Advance,* 25 June 1915;
[113] "Small Fire Threatens Schumacher," *Porcupine Advance,* 14 June 1916; "Wife and children of Bill McLinchey die in Forest Fire," *Porcupine Advance*, 2 August 1916; "Forest Fire Threatens Timmins," *Porcupine Advance*, 2 August 1916; "Terrible Fires Sweep Northern Ontario," *The Northern Miner,* 5 August 1916, 1; "FOREST FIRES - Small fires between Rea Hill and Schumacher," Porcupine Advance, 9 Aug 1916.
[114] "Prospectors in Burnt Country," *The Northern Miner*, 26 August 1916, 3.

brush clearing and monitoring fire conditions.[115] Deep fears about fires persisted well into the 1920s, although the return of a cycle of wet years and cooler conditions reduced the number of fires in the north after the war.[116]

The towns flooded several times during and immediately after the war.[117] Although Porcupine had a source of pure drinking water, the newer town of Timmins struggled. According to a November 1915 article, "during August the water was discovered to be tainted, and chlorination was resorted to, to ensure the safety of the community." Weekly samples were sent to Toronto, and by November the water was clear again.[118] Yet the article suggests that Timmins' water was far from predictably safe to drink, and suffered from periodic contamination. In 1920, the *Porcupine Advance* celebrated the fact that Porcupine's sandy soil had made it less prone to water-borne disease than Cobalt and other mining camps, but the Timmins Board of Health recommended that all residents boil their water anyway.[119] A report from Dr. Herman Henry Moore suggests that he, at least, distrusted local water supplies. Moore came to Porcupine as McIntyre's physician and surgeon in 1912, served on city council from 1914 until 1918, and ran for mayor in 1919 before becoming the town's Chief Medical Officer in 1920. Moore described the community's history of disease (including influenza and typhoid) and recommended an automatic chlorination system "to minimize the danger, always present, in our water

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[115] "Children Must Not be On the Streets After Nine, Forest Fire Protection, Sanitation, and Other Matters Discussed by Council," *Porcupine Advance* 9 May 1917.
[116] "North Fortunate as to Fires This Season," *The Northern Miner*, 9 October 1920, 7.
[117] "Timmins - Downtown flooded by spring run-off," *Porcupine Advance,* 25 April 1917, 4; "FLOODS - South Porcupine spring flood," *Porcupine Advance*, 2 May 1917, 1; "Much Damage Done by Mattagami River Flood," *Porcupine Advance,* 4 May 1921.
[118] "Timmins Water Pronounced Pure," *Porcupine Advance*, 19 November 1915.
[119] "Boil the Water Simply by way of precaution," *Porcupine Advance*, 22 September 1920.

supply, which is ever open to contamination."[120] He was still fighting for chlorination a year later, and stated that analysis of the water still showed that Timmins water contained contaminants.[121] Poor water quality may have been related to problems with waste disposal, which grew in tandem with the population. In the winter of 1919, Timmins and Tisdale considered a joint incinerator project which would deal with fifteen to twenty tons of garbage per day when it was eventually completed in 1921.[122] The district also worked together on a joint water and sewage plan after the war was over, which helped alleviate some of the community's problems with waste.[123]

Muskeg remained a barrier to easy transportation throughout the war. In 1915, snow, rain, and frosts in the fall caused ruts and mud on local roads which made them dangerous and impassible.[124] That spring a rapid thaw made access to smaller mines impossible, causing production stoppages when equipment and supplies could not be brought in. Some mines, having watched the weather and foreseen impending problems, had brought in extra supplies in anticipation that the roads would turn to mud.[125] Streets in town were not much better. It was not until 1918 that the *Porcupine Advance* declared Timmins "a stumpless town." Before then, the streets, especially the back roads, still bristled with stumps from old trees.[126] Bad roads continued to plague the mining camp into the 1920s, particularly in the spring when the muskeg began to soften. In May 1920,

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[120] "Timmins had 133 Births and 77 Deaths This Year," *Porcupine Advance* 15 December 1920.
[121] "Improved Process for Purifying Town Water," *Porcupine Advance*, 3 August 1921.
[122] "Excellent Report on Joint Incinerator," *Porcupine Advance*, 17 December 1919. "Good Progress being Made on Incinerator," *Porcupine Advance*, 16 March 1921.
[123] "Waterworks Extension and Sewage Extension Considered," *Porcupine Advance*, 19 March 1919.
[124] "Roads of Porcupine District Very Bad," *Porcupine Advance*, 29 October 1915.
[125] "Rapid Thaw Hinders Work," *The Northern Miner*, 8 April 1916.
[126] "Timmins is Now a Stumpless town," *Porcupine Advance*, 31 July 1918.

the *Northern Miner* disparaged the roads, saying that it could be considered "cruelty to animals" to ask them to walk through the deep mud.[127]

The railways were not much more dependable than the roads, and could be especially unreliable in the winter. In January of 1916, heavy snow on the tracks prevented coal delivery at a time when supplies were already strained by war-time shortages. To warm their homes, local people went into the woods to cut fuel from the timber.[128] In the spring of 1917, Porcupine experienced a late snowstorm, the "worst snow storm of the year," which blocked rail traffic for five days and took down the telegraph lines, effectively cutting Porcupine off from the outside world.[129] Another coal shortage hit the town in 1918, forcing some businesses to close, and later that year another snowstorm blocked the roads and the rail for a short time.[130] Not only the mines but other local businesses struggled to bring in supplies under the dual strains of war conservation and snow-blocked rails. In the spring in 1918, local bakeries ran completely out of white flour.[131] Even in normal times, northern residents and small business owners paid more for freight and transportation, and so carried a greater financial burden for basic mobility and supplies and mobility than their counterparts in the urban south.[132]

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[127] "Mud Hounds," *The Northern Miner,* 8 May 1920, 4.
[128] "Scarcity of Coal in Timmins Causes a Little Hardship," *Porcupine Advance,* 19 Jan 1916. There was no concern about wood shortages, although wood was unsuitable as a fuel for some people, and in fact burning wood helped reduce the fuel load for summer forest fires. "Fuel Order Well Observed in Town," *Porcupine Advance,* 13 February 1913.
[129] "Weather - Unusual snow storm," Porcupine Advance, 28 Mar 1917; "Weather - no outside mail for five days as a result of the snowstorm," Porcupine Advance, 4 Apr 1917; "Worst Snow Storm of Year: No Outside Mails for Five Days," *Porcupine Advance,* 4 April 1917.
[130] "Timmins Apparently Sidetracked for Coal," *Porcupine Advance,* 6 November 1918.
[131] "Food Controller Holds up Four for Timmins." *Porcupine Advance,* 27 February 1918.
[132] "Increase on Passenger Rates Is Twenty Per Cent., and Forty Per Cent. On Freight," *Porcupine Advance,* 15 September 1920.

Porcupine residents balanced their dependence on a massive international mining economy with sensitive understandings of the nuances of their adopted home. Old timer "Geo. Grey" is a case in point. According to the *Advance,* Grey could predict an early spring by looking closely at the landscape around him. "He says there is going to be an early spring sure. 'How do I know?' says Geo. 'why the pussy-willows tell me so.' The pussy-willows are all out in bud these days and this is considering an unfailing sign of an early spring."[133] Grey and his neighbours observed the landscape closely during their tenure in the mining zone and came to understand even the smallest signs provided by nature. Gold provided the impetus for Porcupine settlement in 1909, but once established, the rise of a settler community during the First World War saw a cascade of environmental and ecological changes only indirectly related to mining. These changes forged new human relationships with nature at Porcupine tangential to industrial extraction but central to forging a mining community identity.[134]

Such mundane local interactions with nature did not interest the mining companies.[135] There was one essential exception: Prospecting. Governments, geology professors, and mine managers worried about the disappearance of on-the-ground mining experience and worked actively to cultivate it. Concern about dropping prospector

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133 "Here is a Sure Sign of Early Spring, Says G.G." *Porcupine Advance*, 2 March 1921.
134 Jessica Van Horssen describes a similar process in the mining town of Asbestos, Quebec, home of the Jeffry Mine. Building on Richard White's notion that humans know the land through labour, Van Horssen argues that "bodily knowledge of nature is gained not only by those who work directly with it, such as the men and women at the Jeffry Mine, but also by those who live around it. The people of Asbestos knew the land through work, but men, women, and children young and old, also knew it intimately simply by living in the community." Jessica Van Horessen, *A Town Called Asbestos: Environmental Contamination, Health, and Resilience in a Resource Community* (Vancouver: UBC Press, 2016), 8.
135 Race and gender may have played a role in the de-valuing of economies like trapping (Indigenous people) and food gathering (women and Indigenous people).

numbers first appeared during the war. As Thomas Gibson wrote in his statistical review for the 1918 Annual Report of the Bureau of Mines, "Gold and silver mines are not like farms, and cannot be worked for ever [sic], or even for many years. There must be a constant succession of new properties to take the place of those being exhausted, otherwise the industry will languish"[136] Here Gibson articulated the non-renewable nature of mining, a faith in northern wilderness to supply new mines, and the necessity of individual labour for the success of the industry. Similarly, *The Northern Miner* saw prospectors as the natural successors of the fur traders in "opening up" these vast tracts of unexplored land in the service of the Canadian economy. This was an essential project, and the war added urgency. According to the *Northern Miner* "the oil supply of the United States will be exhausted in thirty years," and "Canada will need the minerals and wheat growing lands to reduce and pay for her war debt.[137] Prospectors were a natural and essential part of economic cycles, and their absence concerned everyone.

Gibson and *The Northern Miner* may have had good reason to worry. Prospecting, with its attendant trenching, assaying, and sampling, slowed significantly during the war.[138] Mobile men in their working years were exactly the sort most likely to be recruited.[139] Besides, there was no money available for risky exploration ventures. Prospecting license sales dropped abruptly. New areas, including Shining Tree, which

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[136] *Twenty-Seventh Annual Report of the Ontario Bureau of Mines 1918* (Toronto: King's Printer, 1918), 5.
[137] "Unexplored Canada" *The Northern Miner*, 3 February 1917, 2.
[138] "Prospecting - War affects prospectors," *Porcupine Advance,* 7 March 1917.
[139] "the war has taken a big proportion, and the Mines have taken many," "Prospectors not so Plentiful Now," *The Porcupine Advance,* 7 March 1917.

experienced a minor rush in 1915, could not sustain development during the war.[140] The same was true of the short-lived Kow Kash gold rush in the same year. The *Northern Miner* explained the Kow Kash failure by arguing that prospectors had been "reduced to the eight-hour day and the regular pay envelope in mine and mill." Miners took industrial jobs because better prospects no longer existed on the Canadian Shield.[141] News of the new rush caused them to temporarily quit their jobs and head for the bush - prospectors flooded in to Ontario from Winnipeg, New York, and "Iron Country" in Michigan.[142] However, like Shining Tree, Kow Kash eventually crumbled under the stale investment climate created by the war economy.

Besides their role in developing new finds, the presence of local, knowledgeable men was essential for waiting out the slow war-time economy on local properties. On the undeveloped mines, capitalists like Edwards kept small numbers of men on the ground engaged in small-scale prospecting and assaying in anticipation of more favorable future conditions. On the Dome Extension property a man named H.C. Anchor worked steadily through 1915 until at least 1918. In his letters to his employers Anchor describes small-scale, independent daily activities like assaying, planning infrastructure, and collaborating with neighbours.[143] On one occasion he borrowed the geologist ("Mr. Kraft") from Dome

[140] "Shining Tree - area suffering a partial eclipse, Discontinuance of work on some properties," *Porcupine Advance*, 21 March 1917.
[141] "Posts for Prospectors: Stampeders vs. Prospectors," *The Northern Miner*, 18 September 1915, 8.
[142] "The Rush into Kow Kash," *The Northern Miner,* 11 September 1915, 4.
[143] He suggests that a low, timbered area might be converted into a plant: "Of course, the timber has been burned some and therefore dead, but it is good wood. No trouble to blow out a hole for water." A neighbouring prospector had a road in place which might be used to access the area. H.C. Anchor to W.S. Edwards, "Dome Ex," 16 November 1915, 2-27 Correspondence, general business, 1915, MG 30 W.S. Edwards fonds, Library and Archives Canada, Ottawa, Ontario, Canada.

to come help him assay.[144] Working mostly alone and above ground, seasonal changes shaped Anchor's work. He left the claim in the winter time when snow covered the workings, in the spring he hired "two white men" to help with the trenching and blasting,[145] and in the winter he "borrowed a man from Dome Lake for a little while to do a little digging and draining."[146] The local labour of men like Anchor kept the mines going through the war.

As much as the industrialists appreciated and worried about the fate of men like Anchor, they sensed that the profession could be made more effective, especially following the improvements to geological science made in the early twentieth century. Prospecting was unscientific work, hampered by superstition and a lack of scientific education. However, the fresh-faced mining engineers unleashed on the north from the new mining schools were not to be preferred – their lack of practical skills and local knowledge made them ineffective in the northern camps. The ideal solution, according to the *Northern Miner*, was that the "unscientific instinct" which had served prospectors so well in the past would be best combined with scientific knowledge.[147] *The Northern Miner* disparaged the shiny, government-produced prospector's guides and prospector's workshops. They similarly disdained soft, southern mining school education.[148] Good quality mining men, regardless of whether engineers or prospectors, got their education

[144] H.C. Anchor to W.S. Edwards, 29 November 1915, 2-27 Correspondence, general business, 1915, MG 30 W.S. Edwards fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[145] H.C. Anchor to W.S. Edwards, "Re. Lot 7" 6 June 1916, 2-27 Correspondence, general business, 1915, MG 30 W.S. Edwards fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[146] H.C. Archer to W.S. Edwards, 9 December 1918, 2-27 Correspondence, general business, 1915, MG 30 W.S. Edwards fonds, Library and Archives Canada, Ottawa, Ontario, Canada.
[147] Prospectors vs. Engineers," *The Northern Miner*, 4 November 1916, 3.
[148] Prospectors vs. Engineers" *The Northern Miner* 4 November 1916, 3.

from the land, not governments or schools. The paper lamented the loss of men who lived "the life that is near nature and to the rainbow dream of the future."[149] In the slow, conservative, and practically-focused war years, mining seemed a particularly unromantic and conservative business. To *The Northern Miner*, it was not just sad but economically alarming that this adventurous element had been lost with the prospectors.

Others echoed this sentiment. In the spring of 1917, A.R. Whitman, a respected consulting geologist in Ontario, explained to the Cobalt Board of Trade that many old-fashioned mining men saw geology as "too theoretical for use." In order to actually help men find gold, "a knowledge of the earth must be useful." Geologists should strive for usefulness because old-fashioned mining men remained stuck in their old ways and "dogmatism is the great stumbling block for science." Science was truth for Whitmen, and thus it was essential that the old-style mining men buy into it.[150] This mission was lent urgency by the fact that Whitmen believed that the entirety of northern Canada represented one great ore field. Thus the "conservative attitude" of the modern mining industry was "injurious to its proper development."[151] The risk-taking, independent prospector (not the university-trained engineer) was a necessary predecessor of successful, stable industry, and so must be able to make practical use of geological science.

Indeed, if engineers replaced the prospectors, a certain well-rounded holistic knowledge of the land would be lost to book-learned expertise. Foreign or southern-

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[149] "Prospecting," *The Northern Miner*, 27 Jan 1917, 6.
[150] "Mining Future of Ontario," *The Northern Miner*, 28 April 1917, 1.
[151] "Mining Future of Ontario," *The Northern Miner*, 28 April 1917, 5.

trained engineers often had little knowledge of the characteristics of the local rock. The problem received media attention in 1915, when an American engineer came to Porcupine and wrote "one of the most extraordinarily inaccurate reports that it has ever been our painful duty to pursue" (according to the *Canadian Mining Journal*). The man had sampled the wrong parts of the rock for gold (the country rock rather than the schists), and concluded it contained no gold.[152] The *Porcupine Advance* argued that "unique conditions at certain properties" meant that "even experts might be wrong" without the help of local knowledge.[153] In a column giving advice to young engineers in 1920, *The Northern Miner* recommended taking on a variety of small opportunities so that, once the perfect job came along, the young engineer would have developed a multi-faceted approach to mining. "An expert along any one line is like a diamond with but one bright face," the paper chided.[154]

One way of ensuring multi-faceted diamonds was to incorporate practical experience into mining education. This mandate had been written right in to the foundational documents of the new Queen's School of Mining and Agriculture in the late 1890s. A letter from Kingston's municipal government described a vision for a school that would teach about "soils, plants, animals and their production, and by the application of Science to mining, the training of prospectors and the economic treatment of minerals." The letter went on to imagine that "students would be trained in the winter months in Practical Chemistry, blow-piping, assaying, methods of mining, the

152 "Inexperience can condemn a camp," *Porcupine Advance,* 4 June 1915.
153 "Inexperience can condemn a camp," *Porcupine Advance,* 4 June 1915.
154 "Developing a Career: Old Hand Gives Advice to the Young Mining Engineer," *The Northern Miner,* 22 May 1920.

composition and relative position of rocks and minerals, and in the summer they would go out to prospect and to determine accurately and scientifically the mineral wealth of counties in detail." Winter instruction should directly enable students "to apply the lessons learned on returning to their summer's work."[155]

Starting some time before 1911, professors in the School of Mining and Agriculture at Queen's began sending summer students into northern mines. The most coveted positions were at Porcupine in the biggest companies.[156] Students gained experience working in the mine in a variety of areas around the property. At the end of the summer, they compiled reports on their experiences. Although students were unlikely to work hard jobs (like mucking) for long, the content of their reports suggests that their work nevertheless put them in close contact with the physical reality of Porcupine rock. Each report discussed the history of the area, described its geology, and detailed the day-to-day operation of the mine. The reports do not sanitize their descriptions, often including comments on the difficulties, dangers, and inefficiencies students experienced. One student described what happened when an ore shoot gets "block-holed," and must be worked loose with a crow-bar or explosives.[157] At the end of his report he predicted

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[155] Minute Book, Board of Governors of the School of Mining and Agriculture Dec. 1892-Nov. 1909, File 3, Box 1, Queen's University School of Mining 1893-1914 Ledgers, School of Mining and Agriculture Fonds, Queen's University Archives, Kingston, Ontario, Canada.

[156] Preserved correspondence ends in 1911, but the letters suggest a standing working relationship between the school and the mines which probably extended further back. For example, E.H. Calling to E.C. Keeley, 13 March 1911, File 6, Correspondence to Dr. Goodwin, 1911, Jan-June A-H, School of Mining and Agriculture Fonds, Queen's University Archives, Kingston, Ontario, Canada: "There are so many applicants for the job at Porcupine that I am leaving the election of the men with Prof. Guillan and Dr. Goodwin."

[157] B.H. Budgeon, "Mining Methods at the Hollinger Consolidated Gold Mines," Summer Essay 1923, File 8, Student Essays, School of Mining and Agriculture Fonds, Queen's University Archives, Kingston, Ontario, Canada.

potential future environmental problems with the mine based on his experience: "Their biggest problem will be the filling of old stopes. If caving of the walls between empty stopes should start it would be very disastrous due to the honey-combed nature of the mine."[158] The students cited their experiences up front with statements like "from experience I found…" or "the information I picked up and the notes I made."[159] Those who attended schools without summer programs worked hard to obtain practical experience: The Dome fonds contain a series of introductory letters from other universities' students hoping to find connections on the ground.[160]

The government and the industry claimed that even the most well-rounded engineers could not replace the classic, hardy prospectors. Prospectors were comparatively cheap, self-sufficient, and possessed valuable knowledge about the specific nature of local geology. The Bureau expected prospecting to pick up again after the war, when soldiers and capital returned from Europe, but by 1920 it still had not made a come-back.[161] *The Northern Miner* blamed the government. Timber interests and the high costs associated with patenting claims were to blame for keeping enterprising men out of the woods, the paper lamented. Cutting red tape and expanding the railway system was what the profession really needed. The periodic government prospecting schools run at

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[158] Budgeon, "Mining Methods at the Hollinger."
[159] Budgeon, "Mining Methods at the Hollinger"; A.H. Paterson, "Mining at the McIntyre Porcupine Mines," Summer Essay 1924, File 8, Student Essays, School of Mining and Agriculture Fonds, Queen's University Archives, Kingston, Ontario, Canada.
[160] One letter reads "I am a student at McGill University, in my second year Applied Science. I am seeking employment during the summer months of June-Sept. As I intend to following mining as a profession I should like to get as much experience in that line as possible." Lyle J. Cornell to D.B. Depencier, 31 March 1922, "Introductions, Box 1, F1250, Dome Fonds, Archives of Ontario, Toronto, Ontario, Canada.
[161] "After the war the explorers will scatter all through these wildernesses," "Unexplored Canada," *The Northern Miner*, 3 February 1917, 2.

Porcupine and other northern communities were scoffed at as a conciliatory gesture in the face of a need for real tangible action.[162]

Yet if the romanticized self-made prospectors of the good old days of mining exploration no longer graced the Porcupine bush by 1920, locally-derived practical knowledge of prospecting persisted. The success of the Bureau of Mines' prospecting classes is a final indication of this. The Bureau of Mines expanded its educational classes in 1920 due to popular demand when classes at Porcupine filled up rapidly. The two-week courses were led by experienced government geologists who taught mineral identification, geology, and blow-piping (where labs are available).[163] The *Porcupine Advance* described attendees as mostly "old-time prospectors," but also students and a few experienced mining men hoping to "brush up" on geological knowledge.[164] These were the individuals who remained "on the ground" in Porcupine throughout the industrial period, reading and responding to the land and its geology with a combination of personal experience and hard science. Although they might have looked and acted differently from the prospectors who had discovered Porcupine in 1909, they nevertheless possessed specialized on-the-ground knowledge valued by the mining industry.

"Russian Blown to Pieces; Greek Buried Alive…Italian Crushed by Rock:" War, Labour, and Environmental Risk

Entrenched social and racial structures made up Porcupine's major inheritance from the Great War. Of course, pre-existing socio-racial hierarchies existed at Porcupine

[162] "Prospecting a Dying Industry; Govt Indifference a Big Cause," *The Northern Miner*, 1 January 1921, 3.
[163] "Classes May Be Held Here For Prospectors" *Porcupine Advance*, 24 November 1920.
[164] "Classes for Prospectors Make Good Start Here," *Porcupine Advance* 4 May 1921.

between white settlers and Indigenous people (discussed at length below in the context of the water power crisis). Kerry Abel portrays northeastern Ontario as a meeting place: "the entire history of the land between the Abitibi and Mattagami Rivers has been a continuing story of meeting and adjusting to newcomers," of which Germans, Scandinavians, Italians, Ukrainians, Chinese, and natives of the Balkans were only the most recent during the war years. Although there had been a loose ethnic segregation of the labour market before the war, these boundaries hardened after 1915, and the workplace became "an increasingly hostile place for…workers from what were now enemy countries."[165] Anti-German and Eastern European sentiments in Ontario mining camps have already been examined by labour historians, and so will not be explored at length here.[166] This hostility created unequal environmental consequences for Porcupine residents. In addition to bearing the hostility of co-workers and mine management, distrusted "aliens" in Porcupine became concentrated in parts of the mines where they experienced disproportionate risks to their lives and their health.

Industrial mining involved ethnic divisions of labour throughout the mining world, so Porcupine was hardly unique. During the gold rushes in the United States, Australia, British Columbia, New Zealand, and South Africa, immigrant, black, and Indigenous miners often worked the tailings of white prospectors, filled unskilled labour positions in early mining companies, and conducted other forms of necessary low-prestige work at mining camps such as cooking and laundry. The introduction of large-scale industrial

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[165] Abel, *Changing Places*, 108.
[166] For example, Peter Vasiliadis, *Dangerous Truth: Interethnic Competition in a Northeastern Ontario Goldmining Center* (New York: AMS Press, 1989).

machinery after the turn of the century and the war-time creation of new classes of marginalized workers after 1914 did not fundamentally change these patterns of racially divided mine labour. Rather, escalating scales of production created bigger spaces for unskilled labour in the global gold mines which an influx of non-allied ethnic groups helped fill during war time – not just in Porcupine, but around the world.[167]

The connection between ethnic labour and increased environmental risk is perfectly articulated in a *Porcupine Advance* headline from 1 January, 1917, "3 Accidents in Camp Last Week Russian Blown to Pieces; Greek Buried Alive in Gravel Pit, Italian Crushed by Rock." Statistics support the newspaper's report. Over the course of the war, Porcupine's Italian population doubled, its Chinese population more than tripled, and Austrian, Finnish, Polish, and other Eastern European populations increased significantly.[168] Accident statistics show that non-English-speaking workers usually made up most victims in mines: Over the course of the war, 110 of 199 fatalities were non-English speaking workers.[169] The Bureau of Mines recognised the connection between foreigners and injury, but blamed it on ignorance. Foreign workers were "slow in adapting themselves to their work and surroundings," E.T. Corkill had remarked back in 1911, "and are as helpless as children in protecting themselves from injury."[170] The statistical association between non-English speaking workers and accidents did not

[167] James Otto Pederson, "The Origins of Canadian Gold Mining," 437.
[168] Canada, Statistics Canada, 1911 Census, Ottawa, 1911. Canada, Statistics Canada, 1921 Census, Otttawa, 1921.
[169] In 1914, 21 of 38; 1915, 11 of 21; 1916, 29 of 51; 1917, 16 of 36; 1818, 12 of 14; 1919, 21 of 39 mine accident fatalities were non-English speaking people.
[170] E.T. Corkill, "Mining Accidents," *Annual Report of the Bureau of Mines 1911,* 66.

diminish over the years, and was true even in 1915, when most "alien" workers were fired and replaced with workers from trusted allied nations.[171]

Indeed, the firing of Porcupine's entire non-allied workforce in 1915 demonstrates the lack of power experienced by foreign workers at Porcupine during the war. Even though the Porcupine camps hurt for labour, suspicion of workers originally from the Central Power counties led to turnovers. In 1915, the Mining Corporation of Canada (operating at Cobalt and headquartered in England) fired all its "alien enemy" employees. Porcupine properties followed suit – in 1915, fifty-one "alien enemies" (Germans and Austrians) employed in the mines were replaced by men from neutral or allied nations.[172] Yet in a climate of labour scarcity, banning workers from enemy nations could not last. By 1917 there were over 600 "aliens" registered in the Porcupine area, most of them working in the mines. Even though they were allowed to work, their presence caused considerable anxiety in the community and in the mining workforce. Locals worried about the sheer numbers of foreigners in their community, and where their true allegiances lay. They saw the gold mines as particularly vulnerable to German influence because of their value to the allied nations' economy. Some objected to the idea that "alien labourers" might receive the same wages as locals.[173] Such distrust created a working environment laden with suspicion and hostility. As Michael Barnes chronicles

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[171] Eleven out of twenty-one men killed in or around the mines in 1915 were non-English speaking. T.F. Sutherland, "Mining Accidents in Ontario in 1915," *Annual Report of the Ontario Bureau of Mines 1916*, 55; "All Alien Enemies Discharged," *The Northern Miner*, 13 November 1915, 1.
[172] "All Alien Enemies Discharged," *The Northern Miner*, 13 November 1915, 1.
[173] "World War I - Aliens: Over 600 aliens registered in the Porcupine Area," *Porcupine Advance*, 25 April 1917, 1; "World War I - Alien Labourers: Alien labourers to receive same wages," *Porcupine Advance*, 13 Jun 1917, 5; "World War I - Aliens: Court case shows attitude towards aliens," *Porcupine Advance*, 18 Jul 1917, 5; "World War I - Aliens: German influence in Canada," *Porcupine Advance*, 18 Jul 1917, 7.

for nearby Cobalt, management used detectives to spy on workers and quash union activity mercilessly.[174] Fear of foreigners, particularly Austrians and Germans, and a hatred for "the red element" meant that there was little sympathy for striking workers, and companies kept lists of undesirable and blacklisted individuals throughout the war years and well into the 1920s.[175]

Protecting allied resources, including gold, became an important project for Britain and her colonies and successor states during the war. The allied nations particularly feared Germany's perceived power on the international mining economy.[176] In 1918, a British Act restricted the ability of "aliens" or alien-owned companies to take out licenses, mine, or process metal. Martin Burrell, Canadian Minister of Mines, formed a committee including G.G.S Lindsey of the Canadian Mining Institute, Thomas W. Gibson, Deputy Minister of Mines for Ontario, and A.W.G. Wilson of the federal Ministry of Mines. Their final report argued that the British Act, which only covered Zinc, Copper, Lead, Tin, Nickel, and Aluminum, be expanded to include "every mineral or minerals in place" (including gold) and be adopted in Canada. The committee looked for even greater restrictions on aliens.[177] Shortcomings of the British Act, including its omission of rules related to land or licenses obtained by aliens prior to enforcement could

[174] Michael Barnes, *Fortunes in the Ground: Cobalt, Porcupine & Kirkland Lake* (Erin: The Boston Mills Press, 1986), 63.
[175] Barnes, *Fortunes in the Ground,* 66.
[176] Resulting in the British Non-ferrous Metal Industry Act in 1918. Report of the Departmental Committee Appointed by the Honourable Martin Burrell, Federal Minister of Mines, to Consider the British Non-Ferrous Metal Industry Act, 1918 and to Advise with Respect to Similar Legislation for Canada (Ottawa, 1918), No. 77: List of Minerals in Short Supply, RG 87 Mineral Resources Branch, Library and Archives Canada, Ottawa, Ontario, Canada, viii.
[177] Report of the Departmental Committee, xi.

be solved by looking to "the provisions adopted in England, Australia and the United States."[178] Ultimately, they stopped short of making concrete recommendations and argued that such legislation should be handled provincially rather than nationally.

After the war, mining companies and the Ontario government would continue to look to their international neighbours on legislative matters related to labour and economic security. During a labour dispute in 1923, Alex Fasken of the Dome Mining Company leveraged wage information gathered from friends and contacts in the United States, British Columbia, and Mexico.[179] These moments show how Porcupine mine management and the Ontario government saw itself as part of a broader global community of employers with shared interests in terms of the management of ethnic workers and threats to the mining economy.

Besides outright discrimination, smaller injustices also affected Porcupine's "alien enemy" workforce. In the spring of 1918, McIntyre Mine decided to follow the example of other mines in the area and asked their underground workers to eat their lunches underground rather than coming up to the surface for a break. Apparently "the Company…found [coming to the surface] an unnecessary loss in these days of high costs." The men objected, and 170 walked off the job citing, among other reasons, their right to fresh air at meal times. Unfortunately, most of the workers were aliens working in the mines as an alternative to internment camps. Threatened with having to return to the camps, most of the men went back underground and suffered underground meals.[180]

[178] Report of the Departmental Committee, xiii.
[179] See "Labour, 1923, Board of Conciliation," Box 8, MU 8781, F1250, Dome Fonds, Archives of Ontario, Toronto, Ontario, Canada.
[180] "Men Back Again at Work at McIntyre," *Porcupine Advance*, 6 March 1918.

Ironically, earlier that winter the *Northern Miner* had declared "Tuberculosis Sunday" a day of observance and education on the dangers of lung disease - in which adequate sunshine and fresh air important parts of prevention.[181] Marginalised workers would be denied these freedoms, which later contributed to their disproportionately high representation among silicosis cases (see chapter 4).

Outside of the mines, life in an industry town carried hazards for all people, but especially for racialized people. In 1918, a diphtheria "epidemic" sent the town into panic. The houses of the sick were quarantined and put under guard. The *Porcupine Advance* argued that the fear sparked by the "epidemic" was justified considering the "large foreign population" and the "crowded housing conditions in many sections." Indeed, one of the cases was a child living in a house with fifteen boarders in addition to the family.[182] Although the diphtheria case seems to have been somewhat overblown (only two deaths resulted), major epidemics did from time to time sweep through the north. In the fall of 1918, influenza killed nearly a hundred people and halted civic services.[183]

The racial divisions created and strengthened by the war continued to inform hiring practices after the war. In 1920, an editorial in *The Northern Miner* argued that the government should bring in Italian labourers to do "the heavier kinds of mining work."

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[181] "Tuberculosis Sunday," *The Northern Miner*, 24 November 1917, 6.
[182] "Town has only two diptheria cases," *Porcupine Advance*, 2 October 1918.
[183] "Total Deaths in Camp Now 87 from Influenza," *Porcupine Advance*, 20 November 1918. To give a sense of the sheer scale of the crisis, on 6 November, 1918, the illness of Police Magistrate S. Atkinson prevented the holding of court, so that cased piled up on the docket. The only consolation was that some of the cases were "automatically disposed of by the death, following influenza, of those accused." "Illness of Magistrate Prevents Court Here," *Porcupine Advance*, 6 November 1918.

Although English workers had filled some positions, most quickly moved up the ranks leaving holes the labour force.[184] In a private letter from mining engineer Howard Poillon to Dome Manager Henry Depencier, Poillon opined that the mine might fill its labour needs with hard-working Cornishmen, who he associated with being hardworking and experienced drillers, while French-Canadians and Finns were unreliable.[185] By 1924, a student geologist working at McIntyre Mines observed that "laborers are mostly foreigners including Russians, Italians, Swedes, Finlanders, Croatians and many others. The timber-man, track-men, surface men and cage men are mostly French Canadians…Practically all the drilling, blasting and sucking is done by foreigners. Sinking and raising shafts, and the shop work is done mostly by Canadians."[186]

The Great War expanded and reinforced existing social hierarchies in the Porcupine by exacerbating divisions between allied and non-allied ethnic groups. War entrenched the pattern of marginalised groups filling low-prestige, low-paying, and dangerous jobs on the mine sites. These racial divisions of labour would have long-term consequences. By the mid-1920s, environmental risks including fires, explosions, land-slides, and silicosis disproportionately affected the same ethnic groups.

Hollinger versus Northern Canada Power: Post War Production and Environmental Limits

Despite a slow recovery and persisting anxieties around the loss of prospector knowledge, the industry experienced unparalleled extractive successes after 1920. For the

[184] "Italians for the Gold Mines," *The Northern Miner* 9 October 1920, 2.
[185] Howard Poillon to Henry Depencier, 30 October 1920.
[186] A.H. Paterson, "Mining at the McIntyre Porcupine Mines," Summer Essay 1924, File 8, Student Essays, School of Mining and Agriculture Fonds, Queen's University Archives, Kingston, Ontario, Canada, 22.

first time, many companies began looking outside of the Porcupine for financial opportunities. For example, Dome looked around for additional claims for purchase, including the Foley O'Brien mine, and Hollinger bought Schumacher in 1922, while both upped production on existing claims.[187] With improvements to geological science, the return of labour, and stabilizing global economic conditions, the companies once again felt comfortable extending their reach.

Expansion of all kinds inevitably required additional power. During the war, power demands had remained roughly within the limits of locally available sources. The mines traditionally depended on a combination of wood (in its earliest days), coal-fired steam plants, and hydroelectricity. But wood simply could not meet the massive needs of the industrial mines, and labour difficulties among American coal suppliers caused high prices and supply difficulties.[188] Hydroelectricity increasingly appealed, but had not been without its own historic difficulties. Although rivers abounded near the mines, there never seemed to be enough power to go around. As early as 1914 *The Canadian Mining Journal* discussed the possibility that Hollinger would be restricted by its water power supply.[189] In 1915, the *Northern Miner* observed that "practically all the principal mines of the province are driven by hydro-electric energy."[190] That year, W.R. Roger's statistical review for the Bureau of Mines observed that "of late years there have been clashes

[187] Geo. Wright to Henry Depencier, 3 January 1923, Dome Fonds, Box 1, Exploration, 1923, Archives of Ontario, Toronto, Ontario, Canada; Noah Timmins, "Director's Report," *Annual Report for Hollinger Consolidated Gold Mines, Limited* 1 February 1923, F1335 Hollinger Company Fonds, Hollinger Annual Reports 1912-1935, Archives of Ontario, Toronto, Ontario, Canada, 3.
[188] Jean L. Manore, *Cross-Currents: Hydroelectricity and the Engineering of Northern Ontario* (Wilfred Laurier University Press, 1999), 43-44.
[189] "Porcupine, Kirkland Lake, and Harricanaw," *The Canadian Mining Journal*, 1 January 1914, 30.
[190] "Water Powers and Mines," *The Northern Miner,* 4 December 1915, 2.

between lumbering and water power interests, the former naturally wishing to take advantage of the spring run-off for floating logs, and the latter to store it for use during dry periods." Amendments made to the Rivers and Streams Act, 1915, gave authority to the minister of Lands, Forests, and Mines to adjudicate such conflicts.[191] But the Porcupine's power problems would persist because the existence of an adjudicating body to divvy up water resources could not solve the basic problem of supply. In 1916, *The Northern Miner* observed that "more power is needed in Porcupine to keep up with the rapidly increasing demand." It explained efforts by the Northern Ontario Light and Power Company to put in two new turbine unites and wood stave flume at Wawaitin Falls on the Mattagami River with the capacity to produce an additional three thousand horse power.[192] Although the first plant had been expected to be more than sufficient for the Porcupine camp's long-term needs, it now seemed puny.[193]

The essential problem had always been that, no matter how much capacity they added, the plants count not compensate for the massive fluctuations in water level inherent in northern Ontario rivers. February and March had become times of regular power failure because of unpredictable thaws and snowpack in the north. The Bureau of Mines pointed out that such fluctuations might be managed with better storage. If only large enough reservoirs could be built to hold water, dry periods could be mitigated by slowly releasing build-up from wetter months. The problem was voiced as one of inefficient management of the environment. "Storage facilities…are very meagre, and

[191] *Annual Report of the Ontario Bureau of Mines 1916*, 5.
[192] "More Power for Porcupine," *The Northern Miner*, 26 August 1916, 7.
[193] "More Power for Porcupine," *The Northern Miner*, 26 August 1916, 7.

consequently the river cannot be described as well-regulated in its natural condition," opined *The Northern Miner* during a period of low water levels.[194] With better management, the environment could be made to produce the power the mines needed. However, the chaotic rivers proved too much for most management schemes, and the breakdowns and flooding continued despite new dams. In the spring of 1917 problems caused by run-off at the Sandy Falls power plant forced the mines to temporarily shut down.[195] That spring the Miller Lake dam broke and flooded school buildings in Porcupine.[196] It was repaired, but only two weeks later it flooded again.[197] During low water periods, the mines were forced to slow or stop production. The extractive capacity of the mining companies, fueled by the global market economy, had come up hard against the limits of the environment.

In 1921, frustrated by the persistent and costly failures of hydroelectricity in the north, Hollinger sued Northern Canada Power Company for failing to fulfil is contractual obligations to provide power to support the mine's post-war expansion. Jean Manore wrote extensively about the struggles of northeastern Ontario's hydroelectric project in *Cross-Currents: Hydroelectricity and the Engineering of Northern Ontario.* Manoe argues that hydroelectric development "sought to reduce rivers to energy sources, denigrate Aboriginal rights and encourage the absorption of the northeastern region into southern Ontario." These goals remained unrealized because "the hydroelectric system proved vulnerable to environmental conditions, to political interference, and to other

[194] "Power Available at Porcupine, Storage Most Vital Point," *The Northern Miner*, 26 February 1916, 7.
[195] "Power Troubles in Porcupine," *The Northern Miner,* 14 April 1917, 3.
[196] "Miller Lake – Break in Dyke Floods School Buildings," *Porcupine Advance*, 21 March 1917.
[197] "Miller Lake – Dam Breaks Again," *Porcupine Advance*, 4 April 1917.

interests who used the rivers for purposes apart from obtaining hydroelectric energy."[198] Manore covers Hollinger Versus Northern Canada Power in the second chapter of her book. The case exemplifies Manore's argument that the way that engineers applied technology to an unruly land also functioned to prioritize newcomer economies over Indigenous ones. However, the case also shows how transnational mining networks reached through the consolidated industrial mining companies to materially shape Porcupine's landscape and communities. In the face of the natural limits of Canadian Shield watersheds, Porcupine's place among the greatest gold mining regions could only come at the expense of Mattagami livelihoods.

Back in the early days of development, the Canadian Finance Company owned both Hollinger and Northern Canada Power, but the two became separate entities in 1912. A contract signed at that time guaranteed that the Hollinger would continue to buy power from Northern Canada Power, and that the Power Company in turn would supply enough power to run Hollinger's operations. At the time, Hollinger's power requirements had been around 700 horsepower. The compatibility between the available water power and foreseeable needs of the mines seemed obvious.[199] No one predicted the exponential growth of power requirements for the large-scale industrial mining techniques which came to dominate the profitable extraction of Porcupine's low-grade ore during the war.

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[198] Jean Manore, *Cross-currents: Hydroelectricity and the Engineering of Northern Ontario* (Waterloo: Wilfrid Laurier University Press, 1999), 8-9.

[199] In a description of the abundant rivers and waterfalls in the Porcupine area, A.G. Burrows wrote: "the importance of such water powers in close proximity to a mining camp does not call for further comment." *Twentieth Annual Report of the Bureau of mines, 1911, Vol XX, part II The Porcupine Gold Area* (Toronto: Kings Printer, 1911), 32.

In 1920, Hollinger claimed it needed 10,000 horsepower.[200] In the meantime it had become Hollinger Consolidated (with the addition of Acme and Millerton begun in 1914). Northern Canada Power had also grown, taking on additional contracts with other mining companies and increasing the capacities of its plants and storage facilities to meet the rising demand. On paper, the capacity of its plants should have been more than enough to supply the Porcupine with its power needs, but the extreme low water over the winter of 1919 to 1920 foiled everyone's plans.[201] The Power Company went to its clients to work out an equitable plan for distribution of available power based on the companies' history of usage. Under this scheme, Hollinger would not get its requested 10,000 horsepower.

Hollinger's suit for damages in 1921 ended unsuccessfully at first. The trial judge ruled that, although Northern Canada Power had agreed to supply power to the original Hollinger Ltd., this agreement did not extend to the greatly expanded Hollinger Consolidated. Furthermore, Northern Canada Power could not be blamed for the low water levels of 1920, which were due to natural conditions beyond the Company's control. Although likely a (temporary) relief to Northern Canada Power, the suit solved few problems because there still was not enough electricity to go around. The company was under considerable pressure to expand. At the end of 1921, the *Northern Miner* proclaimed, "Power Supply at Porcupine Must be Increased." Now operating at full post-war capacity, the mines overloaded the existing resources of the power companies on a

[200] The estimate was based on the capacity of the plants, not actual usage, which was only 8,000 horsepower even two years later.
[201] Statement of Appellants' Case, On Appeal from the Supreme Court of Ontario Appellate Division, File 57-13, Northern Canada Power Co. et al Vs. Hollinger Consolidated Gold Mines et al. P.C. 1924, MG 28 III 35 57, Library and Archives Canada, Ottawa, Ontario, Canada.

regular basis.[202] Then, the Ontario Court of Appeal reversed the earlier decision, and the Judicial Committee of the Privy Council seemed less sympathetic to Northern Canada Power. The fact that the local watershed simply could not provide enough power to sustain low-grade industrial mining carried little weight in the Appeal. Porcupine's low-grade gold required large-scale extraction, and large-scale extraction required sufficient power. The camp was part of a constellation of industrial mining zones in Australia, South Africa, Mexico, and the United States. With so much human and financial capital already sunk into deeply into Porcupine's earth, and so much potential wealth still trapped in the country rock, the possibility of scaling down never crossed anyone's mind.

Although Hollinger insinuated otherwise, Northern Canada Power had not been caught entirely flat-footed by the water shortage. It had already been working hard to secure a larger reservoir for water. At around the same time as Hollinger and Northern Canada Power lawyers faced each other in court in the spring of 1921, General Manager of Northern Canada Power J.H. Black wrote to the Department of Indian Affairs to negotiate a settlement. He wanted to build a new dam that would flood some of the timber on the Mattagami River Indian Reserve. Black wanted Indian Affairs to send a representative to examine the area and suggest an arrangement for damages.[203] Indian Affairs duly sent out by Henry J. Bury, who found that the land had no value, the timber being small and the alternately rocky and swampy soil being no good for agriculture. He found, however, three houses and three gardens owned by Chief James Naveau and his

[202] "Power Supply at Porcupine Must be Increased," *The Northern Miner*, 25 December 1920, 1.
[203] J.H. Black to Department of Indian Affairs, 4 June 1921, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.

relatives, Thomas Naveau, William Naveau and Jimmy Naveau Junior. There was also a cemetery where “60 Indians and 4 whites” were buried next to the old Hudson’s Bay Company Post and adjacent to the reserve. Under the circumstances, Bury recommended the Northern Canada Power compensate the Naveaus’ for their houses and “also be responsible for the entire cost of removing the Indian cemetery to the new location.”[204] Indian Affairs took the recommendations at face value and passed Bury’s compensation plan on to Northern Canada Power.[205]

When the chief and council of the Mattagami First Nation caught wind of the scheme, they immediately went to local Indian Agent T.J. Godfrey for more information. When Godfrey proved useless, Chief Naveau wrote directly to the department of Indian Affairs. He expressed his extreme dissatisfaction and described his own understanding of the flooding process and its potential impact on the community. Naveau’s account of the potential implications of the dam differed significantly from Bury’s. The water “will drown about…one fifth of our Reserve and damage about the same amount or a little more of the Timber on the Reserve.” Naveau wanted to know how they would be compensated by the power company, and whether “you intend to give us another piece of land to live on. As we do not care to live away back in the bush where we could have to go if the Power Company raises the water.”[206] The Department wrote back to assure Chief

[204] Memo, H.J. Bury to Acting Deputy Superintendent General, “Raise of Level of Mattagami River,” 5 August 1921, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[205] Actg. Asst. Deputy & Secretary to J.H. Black, 9 August 1921, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[206] Jas. Naveau (Chief) to the Minister, Department of Indian Affairs, 1 October 1921, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.

Naveau that his people would be compensated, that “arrangements are now under way to remove the bodies from the cemetery,” but that “the department has not considered furnishing additional lands in lieu of those which will be flooded.”[207]

As Manore points out, the exchange reveals the government’s disregard for the traditional local economies. The only economic activities mentioned (and seen as requiring compensation) were agriculture and timber.[208] That the Department of Indian Affairs, the Ontario government, and the mining and power companies would prioritize industrial development over Indigenous livelihoods is not surprising considering the context of government-First Nations relations related to mining. In 1919, the Department of Indian Affairs had overseen changes to the Indian Act which would facilitate exploration and mineral development on reserves.[209] Relaxed regulations immediately resulted in increased pressure on Indigenous land by prospectors and mining companies, who entered reserves and successfully obtained licenses to stake claims in the early 1920s.[210] This was a change from the less permissive pre-war years, and is indicative of both the industry’s growing lobby power and of Canada’s mounting contempt for its 1905 treaty obligations.[211]

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[207] Deputy Superintendent General to Chief James Navion, 6 October 1921, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.

[208] Jean Manore, *Cross Currents: Hydroelectricity and the Engineering of Northern Ontario* (Waterloo: Wilfred Laurier University press, 1999), 53.

[209] PC 2523, 30 December 1919, Correspondence Regarding Indians and Mining in General, 1919-1937, RG 10 (C-11587), File 18001 Pt. 1, Volume 7630, Library and Archives Canada, Ottawa, Ontario, Canada.

[210] See, for example, J Lorn McDougal to Duncan Campbell Scott, 17 November 1922, “Abitibi Mining” File 18074, Vol. 7632, RG 10 (C11589), Library and Archives Canada, Ottawa, Ontario, Canada. The letter is a request to explore and stake 900 acres on the Abitibi Indian Reserve No. 70, just east of the Porcupine mining area. Several similar letters exist in this file.

[211] Department of Indian Affairs rebuffed applications and arguments for claim-staking on reserve before the First World War. See discussion of Cyril T. Young in Chapter 2.

The Department's answer did not satisfy the Mattagami, who depended on the soon-to-be-flooded landscape for their livelihoods. By December members of Mattagami First Nation expressed disappointment with the dam, the flooding, and the whole compensation process to the Department of Indian Affairs. The Department wrote to Northern Canada Power to find out what had gone wrong.[212] The Company replied that it had compensated three Indians, but that William Naveau had refused to take his cheque.[213] The Department of Indian Affairs asked Godfrey to speak with William Naveau personally.[214] The Department also asked Northern Canada Power to send receipts and blueprints, which the company obligingly provided. Upon receiving the blueprints, the Department realized that the total flooded land was over a thousand acres. At this point it reconsidered Bury's original assertion that the land was valueless, and asked the Power Company for an additional $272.25, or 25 cents per acre.[215] Furthermore, it now became clear that Bury's original assessment had missed several properties eligible for compensation. On discovering this oversight, the company compensated Charles Naveau for an additional $200 for damages.

Then, after flooding commenced in the summer of 1922, more claims came forward. Alex Pahguish of the Whitefish Reserve claimed that the water surrounded his

[212] Assistant Deputy & Secretary J.D. McLean to A.H. Black, 29 December 1921, Vol. 7584 File 6065-3, RG 10 (C11559), Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[213] A.H. Black to Department of Indian Affairs, 30 December 1921, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[214] J.D. McLean Assistant Deputy & Secretary, Department of Indian Affairs, to T.J. Godfrey, Indian Agent, Chapleau, 4 January 1922, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[215] Asst. Deputy & Secretary J.D. McLean to Northern Canada Power, 13 February 1922, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.

house and flooded storage areas, damaging his goods. Rather than write to Indian Affairs, Pahguish went to a lawyer. His house had been big and well appointed (including an organ, which was destroyed), and attached to an acre of land on which he grew potatoes.[216] A year later, his destroyed property was assessed by the Indian agent at being worth $850, but in September of 1923 the Department decided he would be compensated only $500.[217] The Northern Power countered with an offer of $200.[218] The Department of Indian Affairs asked Godfrey to check and see if this significantly lower amount would be acceptable to Pahguish, but by the time their letter reached him, Godfrey reported that "all the Indians have left for their hunting rounds" and there was no one around to talk to.[219] After some wrangling, Northern Canada Power eventually agreed to pay $500, but only after Pahgeuish signed a wavier voiding his right to any further claims. After lengthy exchanges over this waiver, Northern Canada Power finally released Pahgeuish's cheque in September of 1924, by which time he had been forced to relocate north of Cochrane. His wife and children remained at Sturgeon Falls, on reserve. He did not actually receive his money until the summer of 1925, three full years after his home was destroyed by the power company.[220] Furthermore, the Department of Indian Affairs did not compensate the

[216] Godfrey to J.D. McLean, 17 May 1923, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[217] T.J. Godfrey to Department of Indian Affairs, 22 September 1923, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada
[218] Northern Canada Power to Department of Indian Affairs, 18 October 1923, RG 10, (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[219] J. Godfrey, Indian Agent, to Department of Indian Affairs, 30 October 1923, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.
[220] Indian Agent, Sturgeon Falls, to Department of Indian Affairs, 27 June 1925, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.

Mattagami community at all for the loss of timber or land to flooding. The timber question would not be addressed until the rest of the Mattagami reserve was flooded (for further reservoir expansion) after 1930.[221]

Hollinger Versus Northern Canada Power ended in 1925 with an out-of-court settlement.[222] According to mining media rumors, Northern Canada Power guaranteed the mining company lower rates and other benefits in exchange for dropping the suit.[223] Manore argues that there was no clear-cut victor.[224] Considering the economic, social, and environmental disruption experienced by Mattagami First Nation in the aftermath of the reservoir's completion, one might hope that, at the very least, it solved the Porcupine's power problem. Unfortunately, the creation of storage reservoirs failed to end the mining companies' shortages. Well after the reservoir became operational, Member of the Ontario Legislature Mac Lang railed against the slow action of Drury's "Farmer Government" on the matter of water power in 1923: "the shortage of electric power…is seriously handicapping the operation of the mines," he argued. In response, Attorney-General William E. Raney "hazarded the opinion that the present shortage was due to the

[221] Naveau and his council wrote the Department of Indian Affairs in 1923 to ask what would be done, but received no response. James Naveau, Sam Luke, and James Naveau to Department of Indian Affairs, 17 August 1923, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada. They wrote again in 1925. Mattagami Band to Department of Indian Affairs, 30 September 1925, RG 10 (C11559) Vol. 7584 File 6065-3 Dams and Flooding on Mattagami 1921-38, Library and Archives Canada, Ottawa, Ontario, Canada.

[222] Fasken, Robertson, Sedgewick, Aitchison & Pickup to Messrs. Blake & Redden, "Re: Northern Canada vs. Hollinger," 18 May 1925, File 57-13, Northern Canada Power Co. et al Vs. Hollinger Consolidated Gold Mines et al. P.C. 1924, Correspondence 1924-1926, MG 28 III 35 57, Library and Archives Canada, Ottawa, Ontario, Canada.

[223] "Is Price Cut in Mine Power Coming?" *Northern Miner*, 3 April 1926.

[224] Hollinger agreed to draw power from a new Northern Canada Power plant on the Quinze River in Quebec. Northern Canada Power eventually paid $500,000 in compensation. Hollinger absorbed the cost of a now-useless transmission line. Manore, *Cross-currents*, 50-51.

severity of the weather." To this Lang scoffed that "the weather was not something which was here today and gone tomorrow." A permanent solution should account for precipitation fluctuation.[225] As the events of 1921 show, solutions to environmental problems often did little more than offload costs to those with little political and economic power.

In the aftermath of Hollinger versus Northern Canada Power and the flooding of the Mattagami reserve, the limits of northern water obviously had a place mitigating the industrial plans and aspirations of northern Ontario. Yet throughout the case, no one suggested that Ontario's hydroelectric resources might be incompatible with the immense power requirements of post-war low-grade mining, or that environmental limits might present a meaningful barrier to mining's growth. Given historic and well-recorded fluctuations of northern Ontario's rivers and chronic power shortages since 1909, the fact that no one worried about whether or not there would be sufficient power for the booming Porcupine deserves explanation.

In the minds of the industry's supporters at local, provincial, and international levels, there was no question that the landscape could support extractive expansion -- if properly managed. After all, the Bureau of Mines had been publishing long lists of potential waterfalls suitable for hydroelectricity plants since William Parks first travelled through the area in 1898. Doubt about the future of mining was unthinkable against a long history of industrial optimism, especially when that optimism was backed by enormous

[225] "Government's Inaction Criticized by Mac Lang," *Porcupine Advance,* 28 February 1923.

human and capitalist investments already sunk into Porcupine rock from around the world.

The embarrassing war-time agricultural failure made mining's success even more intellectually imperative, as proof of the north's ability to contribute to the global economy. Unlike agriculture, industrial mining had come naturally to Porcupine. Facilitated by the shield's hard rock deposits, the Great Fire of 1911, the war, and finally by a roaring 1920s investment economy, the take-over by big multinational companies became a seamless part of a predictable trajectory toward industrial greatness. The companies' ability to compete on the world stage stemmed directly from its ability to solve local environmental problems. Hollinger versus Northern Canada Power is the story of how Porcupine's mining industry, with all its international connections, successfully navigated a major fissure in the relationship between extraction and nature only through the invisible sacrifice of Mattagami livelihoods.

Roaring Markets, Silent Rivers: The Aftermath of the War Years

After 1922, the *Porcupine Advance* and the *Northern Miner* began publishing triumphant accounts of Porcupine's progress since 1909. These pieces included a brief description of the region's history and its founding "discoverers," the latest news from the mines, and a series of incredible statistics – one of the earliest boasted that "during the past ten years, over eighty-five millions have been taken from…the Hollinger, the McIntyre and the Dome" and predicted that these amounts barely "scratched the surface" of the future possibilities.[226] The federal and provincial governments commissioned films

[226] "The Porcupine – The Golden-Hearted Land," *Porcupine Advance*, 20 December 1922.

on the mining industry featuring Porcupine, further integrating it into broader national stories.[227] Porcupine became part of a larger story of national advancement, improvement, and industrial triumph in 1920s Canada.

For a brief moment in 1920, with reservoirs empty and the mills shut down, the dream of unfettered industrial extraction on Porcupine's mining frontier might have remained just out of reach. Instead, mining companies, power companies, Indian Affairs (federal) and the Bureau of Mines (provincial) worked together to pull additional power out of northern rivers. This power came at a social and economic price to Mattagami people who were inadequately compensated for serious losses to land and resources. At the same time, the geopolitical context of the First World War produced a cheap workforce of racialized migrants who shouldered disproportionate risks in the service of unskilled industrial mining. Such inequalities made up the bedrock of human relationships with nature at the Porcupine through the rest of the 1920s. In the aftermath of the Great War, Porcupine's mining industry overcame economic, human, and environmental limits to become one of the world's greatest producing mining areas. It did so only because it benefited from social and environmental inequalities produced by a mix of local and international historical forces.

[227] "Movies of the Hollinger," *The Northern Miner*, 6 March 1920, 5.

Chapter 4: Digging up Disaster: Environmental Crises and Transnational Solutions in Ontario Mines during the Roaring Twenties

On 6 October 1924, the body of Canada's first official silicosis victim arrived on A.R. Riddell's Toronto-based autopsy table. Two months earlier, Riddell had diagnosed the anonymous Italian patient as silicotic. X-rays had revealed dark cotton-like shadows in his lungs and an interview (conducted between coughing fits) revealed a history of work in a dusty crusher room. As Riddell cut the chest open, the lungs bulged out. A dense fibrous tissue coated their surface, one and a half centimeters thick places. The upper part of the lung was blueish grey in colour and contained so little air it sunk like a rock when Riddell submerged it in a beaker of water. Glands had been nearly obliterated by fibrosis, and were so hardened that they were difficult to cut. Lab analysis of the silica content in the dead man's lungs showed they contained five or six times what Riddell had expected.[1]

To this point, fire, water, and geology have dominated Porcupine's environmental history, but concern about rock dust had long lurked under the surface. To its credit, the Ontario Bureau of Mines had pushed for wet drilling and proper ventilation since its inception in 1891, although their sermons must have seemed absurd to the tiny gold mining companies scraping moss from rock in northern Ontario in those years. Ventilation concerned only the biggest industrial mines, and Canadian companies were late to realize that they had joined the ranks of global giants. In many ways the Canadian

[1] A.R. Riddell, "A Case of Silicosis with Autopsy," *The Canadian Medical Association Journal*, August 1925 15(8): 839-841.

companies still struggled with pre-industrial frontier problems of basic survival in a harsh and unpredictable climate. Compared to South Africa, where silicosis was prevalent, Canadian mines were young, the mining less deep, the rock of a different character, and the workforce small and healthy. Even as awareness of the enormous human costs of silicosis grew in other parts of the world, there was some sense that the disease would not be a Canadian problem. In 1924, the body on Riddell's autopsy table argued differently.

Insidious and nearly invisible, silicosis became a slow, violent, and un-fixable disaster for the Porcupine mines.[2] Its power is best understood in contrast with a more acute disaster: the 1928 Hollinger fire. The fire was sudden and violent; silicosis was slow and degenerative. The fire killed thirty-nine miners in a matter of hours; silicosis killed hundreds over the course of a lifetime. By looking at the common threads that run through these two calamities, themes emerge in the relationship with the environment built in the Porcupine since 1909. The roots and responses to both silicosis and the Hollinger fire show important commonalities. Both resulted from the unanticipated consequences of increased production: rock dust and mining waste. Both had precedents elsewhere, but had been thought impossible in Ontario. In both cases, miners, mining companies, and the government turned to their international community for solutions. The fixes they wanted were technical, demonstrating the ongoing faith of the industry and of

[2] Silicosis fits neatly with the conception of slow disaster or slow violence found in Environmental History. For example, see Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge: Harvard University Press, 2013), 2. "Violence is customarily conceived as an event or action that is immediate in time, explosive and spectacular in space, and as erupting into instant sensational visibility. We need, I believe, to engage a different kind of violence, a violence that is neither spectacular nor instantaneous, but rather incremental and accretive, its calamitous repercussions playing out across a range of temporal scales."

Canadians more generally in scientific solutions to environmental problems: waste and dust problems could be solved with proper management. Unfortunately, in mine ecology, technological fixes could only transfer environmental costs, not eliminate them. By the end of 1930, Porcupine had become powerful player in an international conversation about the science, safety, and justice issues in gold mines around the world.

Voices from the Ground: The Nature of Post War Mine Labour

The deadliness of both silicosis and the Hollinger fire stemmed partly from the structures of labour dominant in 1920s mining. Recall the complaints of the anonymous Scot from 1910 (Chapter One). Mining had become a rich man's game, he lamented, and the cold, largely unskilled work of the developing camp unprofitable and undesirable for an individual.[3] In the ten years since, the nature of large-scale mine labour reached new extremes. The big mines employed hundreds of men who worked specialised jobs underground, in the mills, or in the offices. The large majority were unskilled "muckers," who worked to move ore from the underground faces to the ore cars, and then from the ore cars through the mills. Free-wheeling, independent prospectors had become rare (much to the anxiety of the government, as seen in Chapter Three), and the mine owners and businessmen had retreated to downtown offices in Toronto and New York. This state of affairs stemmed from the nature of hard rock mining at Porcupine, which had, over time, favoured companies backed by big capital operating under economies of scale. Within this context, physical and social gaps grew between human actors in the mining

[3] "Real Canada – Uninviting Place," *Darling Downs Gazette*, 12 May 1911. Retrieved from the National Archives of Australia's Trove: http://nla.gov.au/nla.news-article182678881, (accessed 20 April 2018).

companies which left room for communication breakdowns and, eventually, environmental disaster.

One side-effect of increased scale was that, by the early 1920s, many of those who produced a lot of the industry's documentation (secretaries, clerks, accountants, lawyers, and presidents), had left the north and taken their paperwork with them. The result is a sense of distance in the archival record – few documents leave an impression of lived experience or relationships with Porcupine nature. In 1923, testimony for a tailings dispute between Digby Vet and Dome mining company, revealed that the majority shareholder and vice president of Digby Vet, William John Aikens, could not describe the basic physical characteristics of his claim, the extent of recent work, or even give the correct name for the equipment used to convey mine waste (which he incorrectly called a "sluice"). Aikens was based in Bay City, Michigan, and had only ever visited his Porcupine property twice – the most recent visit being eight years before his testimony.[4] While Aikens was an extreme case, his experience suggests that some management and record keeping had moved off the land.[5]

If distant head offices produced most the 1920s mines' documentary record, occasional letters from local operations provide glimpses of life on the ground. The

[4] Examination – William John Aikens, Supreme Court of Ontario between Digby Dome Mines Company Limited (Plaintiff) and The Dome Mines Company Limited (defendant), Digby Vet (Ontario Supreme Court Case), Box 6, General Superintendent's Files, 1926-1935, F 1350 Dome Mines Company Fonds, Archives of Ontario, Toronto, Ontario, Canada, 4-25.

[5] Aikens' ignorance about the physical nature of his Porcupine property was not universal. His opponent, Henry Depencier (vice president at Dome) spent more than a decade on and off the land, and knew (parts of it) intimately. Examination – H.P. Depencier, Supreme Court of Ontario Between Digby Dome Mines Company Limited (Plaintiff) and the Dome Mines Company Limited (defendant), Digby Vet (Ontario Supreme Court Case), Box 6, General Superintendent's Files, 1926-1935, F 1350 Dome Mines Company Fonds, Archives of Ontario, Toronto, Ontario, Canada, 1-4.

"A.F." reports are one example of this kind of archival window. The Dome mining company hired A.F. in 1922 in response to an alleged massive highgrading (slang for gold theft by miners) conspiracy begun in 1917. According to an anonymous letter received by Vice President of Dome H.P. Depencier in his Toronto office in November of 1921, three men smuggled over $150,000 in gold into the United States and sold it to the San Francisco Mint between 1917 and 1921.[6] One of the men was a former employee, but another remained employed by Dome. Depencier hired A.F. to work secretly within the company and record suspicious activity to expose the scheme. A.F. worked in many parts of the mine, and, fortunately for the purposes of this study, became regularly sidetracked by the day-to-day environmental problems associated with his job. A.F. embodies a complicated convergence of internal and external forces: he gained a deep appreciation for those working in the mine, but at the same time he represented the interests of the company. His letters show how the messy boundaries between internal and external relationships with nature left room for environmental and social instability.

The A.F. reports contain a wealth of historical information above and beyond Porcupine environmental history. Highgrading had become a chronic problem in the Porcupine by 1920. Numerous police reports chronicle a variety of crimes from individual, opportunistic thefts to large-scale heists via organized criminal networks.[7] The

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[6] Thomas Johns to Henry Depencier, 5 November 1921, Box 3 MU 8689, K.S. and A.F. Reports, 1922, F 1350, Dome Mines Company Fonds, Archives of Ontario, Toronto, Ontario, Canada.
[7] Kevin Vincent self-published a volume called *Bootlegged Gold: Amazing Untold Stories from the 20th Century's Lucrative World of Gold Smuggling* which gives a somewhat sensationalised summary of the high grading problem in Porcupine. Also see "A. Adjison Guilty of Highgrading," *Porcupine Advance* 18 January 1922, "Three Year Term for One High-Grader Last Week," *Porcupine Advance,* 27 May 1925; "Charged with illegal possession of gold ore, *Porcupine advance* 10 June 1926; "Not less than a year on charge of high-grading," *Porcupine Advance,* 7 July 1927; "Fine of $1500 imposed no High Grading

thefts caused considerable consternation from management, who retaliated with law suits and fines. In this age of industrialism, opportunistic men picked gold off of the bottom of the expensive imported slime trays, out of the mesh linings of enormous company sluices, or from the bottom of carefully engineered cyanide vats. In doing so they subverted the industry by piggybacking on its laboriously constructed infrastructure to cherry-pick its hard-won products. The incident reveals the disconnection, animosity, and deep distrust between management and employees in 1921.

Of specific relevance for this project, however, the A.F. reports described the day-to-day (largely unskilled) work conducted on and under the land. The complicated interplay of external and internal interests is especially apparent on the front lines of industrial labour. In general, both miners and management benefited from efficiency in mine production. Everyone suffered when insufficient water supply cut power for the mines. The hardship caused by irregular power supplies permeates the A.F. reports, causing almost as much annoyance for him as it did for litigious Hollinger management. On 18 March A.F. noted "at 1.00 P.M. the power went very low and it looked as though it would be necessary to shut down the mill. Gillette told me there was to be a 30% cut in power because there was no water to develop the power."[8] When there was not enough power to run the mill, staff and hours were reduced. A.F. commented that low power and reductions in work depressed his colleagues because of lost hours and wages.[9] In general,

Charge," *Porcupine Advance* 13 October 1927; "Jail terms given in two gold ore cases," *Porcupine Advance* 1 December 1927;
[8] A.F., South Porcupine, 18 March 1922.
[9] A.F., South Porcupine, 18 March 1922.

both miners and management shared an interest in the steady continuation of industrial extraction.

Miners and managers with shared stakes in industrial production at Porcupine nevertheless perceived and prioritised environmental risk differently. The reports show that work was especially dangerous and difficult for miners when management failed to understand the particular needs and limits of the working machinery. The slow recovery of the post-war labour market encouraged slow mechanization in mines and mills at Porcupine in the 1920s. Low-paid workers became increasingly integrated into complex mining systems still requiring large amounts of unskilled human labour for generalized functions such as shoveling ore ("mucking"), cleaning machinery, or construction.[10] Early on in his time at Dome, management stationed A.F. in the cone room and assigned him to clean an agitator tank which mixed ore with lime. "This is cleaned once every six months, whereas it should be cleaned at least once a week," A.F. opined in his reports. As a result, the tank would get choked up with sand, stone, and lime which A.F. had to labouriously clear. He brought the matter to the attention of a supervisor, but the supervisor was dismissive, stating that "the cone men…cleaned the tank whenever they had the time." A.F. insisted in his notes that "it is a very unpleasant job and is always put off as long as possible" by those responsible.[11]

In another instance, A.F. worked in the mine mill where he became a "slime helper." Here he complained several times about the difficulties "experienced in

[10] James Otto Pederson, "The Origins of Canadian Gold Mining: The Part Played by Labour in the Transition from Tool Production to Machine Production," PhD Dissertation (University of Toronto, 1977), 437.
[11] A.F., South Porcupine, 15 January 1922.

controlling the slime," which tended to flow unevenly through the mill and needed constant attention.[12] A.F. claimed that it was difficult to manage the slime while also taking care of all the oiling, greasing, repairing and cleaning necessary to keep the mill running. After bringing the issue to the attention of his supervisor on 3 February, his concerns were again dismissed.[13] The very next day the mixture became so thick and heavy that it clogged the machine and halted work until it could be cleaned out, a process which would take anywhere from ten days to two weeks. Having brought his concerns to management only days before, A.F. covered his feelings of vindication thinly in his report.[14]

Cold weather made the slime issues even worse. A.F. was not the only one who got frustrated: He wrote that miners greeted such work conditions "with much profanity."[15] He did not understand why the company did not just adjust and slow the amount of slime that was processed, so avoid overburdening machinery and men. A later conversation with another supervisor revealed the (unsatisfactory) answer: "Frank Horne, the Superintendent, always complains whenever the ball mills have to be stopped." Horne complained because profitability was proportional to ore volume. When the mill stopped, profits declined, and Horne worried that the shareholders would see stoppages as inefficient. However, as A.F. pointed out, while continual operation "may look good in the reports, a ball mill running without stop, it caused a lot of extra work cleaning up

[12] Slime referred to crushed tailings getting mixed with chemicals to extract fine gold.
[13] A.F., South Porcupine, 3 February 1922.
[14] A.F., South Porcupine, 4 February 1922.
[15] A.F., South Porcupine, 9 February 1922.

unnecessary waste and makes the job of solution helper the most hated job in the mill."[16] Without hands-on experience, investors and managers could not understand such subtle losses to time, resources, and morale. Neither seasonal variability nor miners' annoyance carried much weight in an annual report, and so over-loading the ball mill continued at the expense of miners' frustration and additional labour.

At the core of such disconnection was the fact that miners bore different risks than management.[17] Specifically, the work of mining exposed miners' bodies to greater danger than in mine offices. Miners confronted these risks up close and in person on a daily basis. Miners knew that sickness and injury could have social, economic, and physical consequences. In one instance, A.F. had to work extra hours to cover for a sick co-worker: "I had to put in [an]…extra 4 ½ hours because Tom Sawyer, solution helper, whom I relieved, suddenly took sick and had to be removed to the hospital."[18] On 26 May, A.F. had asked miners to talk about their dissatisfactions (in the hopes of forcing malcontents to reveal themselves). Instead he heard about miners' worries about their physical safety: "I was speaking to a man named Fitzpatrick who is employed underground and he was denouncing the company for not taking better care of the safety of the men working underground, as he said there is continued danger from falling rock."[19] The next day, "Lou Wright, who works underground, said that of all the mines he has worked in, the least precaution for safety of the underground men is taken by the

[16] A.F., South Porcupine, 12 February 1922.
[17] For a discussion of risk, labour, and mining in Canada in the early twentieth century see Karen Buckley, *Danger, Death, and Disaster in the Crowsnest Pass Mines, 1902-1928* (Calgary: University of Calgary Press, 2004).
[18] A.F., South Porcupine, 18 March 1922.
[19] A.F., South Porcupine, 26 May 1922.

Dome Mines."[20] According to Wright, Dome did not employ a standard "scaling crew" to cut loose hanging rock from expanded tunnels and pits. Wright also noted that the ethnic diversity of miners created an unsafe environment, since foreigners could not understand English warnings and vice versa.[21]

The workers' concerns proved well founded. At two in the morning on 27 May 1922, a tunnel ceiling collapsed on the night shift.[22] The event shocked the camp. Miners immediately went to work pulling dead and injured coworkers from the rubble. While working in the power room, A.F. overheard two miners angrily deriding two Polish men who had refused to help with the gruesome task (possibly because the collapsed area remained unstable and dangerous). The two angry men also said that the mine should have stopped work out of respect for the dead. Management declined to do so, and A.F. (somewhat shaken) worked right to the end of his usual shift.[23] A.F.'s reports give a strong sense of disconnect between mining's stakeholders. Pulling the bodies of co-workers from mine shafts sparked unease among miners as they confronted the gruesome reality of environmental risk in the industrial mine. There was a sense that the great cog of capitalist extraction should pause for a moment of reflection on the gravity of these risks. Such sentiments carried little weight for external management, for whom the greatest risks lay in expensive interruptions to production. The death of miners (although

[20] A.F., South Porcupine, 27 May 1922.
[21] A.F., South Porcupine, 27 May 1922.
[22] A.F. wrote "at 2.00 A.M. a workman was crushed by falling rock on #10 level." A.F., South Porcupine, 27 May 1922.
[23] A.F., South Porcupine, 27 May 1922.

serious) remained an abstract, unsurprising, and impersonal problem unrelated to the question of whether or not to shut down the mine.[24]

Miners were not helpless subjects of managerial will. Anything distant stakeholders wished to enact on the land by necessity was filtered through the minds and bodies of miners, and miners rarely carried out the vision of their managers without shaping it to suit their own priorities. As a result, the act of extraction was always shaped by a mix of human priorities. The richest parts of the A.F. reports describe the ways workers controlled and managed a dangerous and unpleasant working environment. A.F. reported several instances of corner cutting by fellow employees who left work early or sat around on the job. Others struck back at the company (and unintentionally at the environment) by purposefully wasting materials. A.F. spoke about mine waste to Archie Dowell, a machine helper, who said "it is the duty of all men to waste as much material as possible, as by so doing he is creating work for fellow workmen employed in factories manufacturing the material."[25] He said that machine men would "go for a fresh supply of

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[24] The industry and the government tended to worry about miner deaths in a broader statistical sense. Individual deaths were not in themselves particularly interesting, but trends (increases or decreases) warranted official attention. See, for example, T.F. Sutherland, "Report on the Mining Accidents in Ontario in 1925," Bulletin No. 54 (Toronto: King's Printer, 1926), 1. Of course, dissatisfied workers could also interrupt production, and so the decision to keep working after the deaths had to be carefully weighed against the possibility of a strike. Dome followed the example of its international colleagues in the decision to continue work. In the aftermath of three deadly explosions in Colorado Coal Mines in 1910, the mines re-opened as soon as logistically possible, despite the discomfort of workers and community members. Thomas Andrews describes this decision sparked discomfort among miners and community members and "reenergized long-festering conflicts among mine worers, mining companies, and the broader public." Thomas Andrews, "Dust to Dust: The Colorado Coal Mine Explosion Crisis of 1910," in John McNeill and George Vrtis eds, *Mining North America: An Environmental History since 1522* (University of California Press, 2017), 133.

[25] Dowell saw his interests as aligning more closely with the wider industrial workforce to the south than with managers working in the same industry. His identity as "miner" was less powerful than his identity as "worker." For the latter half of the nineteenth century, Arn Keeling and Patricia Boulter note that miners tended to form powerful identities around their occupation. This does not necessarily contradict the evidence from the A.F. reports, but may represent the fact that, in the 1920s, the identity of the industrial

grease each shift" even though "only a small quantity of it is used." The extra would be dumped rather than conserved for the next shift: "a great deal is wasted and buried beneath the rock during the blasting. He said the men never try to save it. He said the lubricating oil is also wasted in the same way."[26] In dumping their grease every shift, Dowell and his colleagues rejected the interests of the mine in favour of saving their own labour, wages, and time.

Miners also expressed their agency in the mine dining hall. Miners ate the imported products of the southern industrial economy, grown on distant farms, purchased in bulk by the mining companies, shipped to Porcupine via rail, and then mass produced by professional cooks – not always to miners' satisfaction. Although protests around food might seem trivial or even comical, A.F. treated them seriously. Food could easily become the basis for organised resistance. For example, on Sunday 9 April 1922, during his free time, A.F. entered the dormitories of some colleagues and joined up a conversation. "The chief topic…was the poor food being supplied in the dining room," he wrote: "Sour milk, half-raw bacon, hot water instead of tea or coffee…were being met with strong condemnation by the men."[27] A few days later, things became more serious.

> I had breakfast in camp this morning at 6.30 A.M. and while in the dining hall heard numerous complaints being voiced regarding the meals generally served in camp and this morning's breakfast in particular. Many of the men were grumbling about paying for good food which they never receive. I overheard several

miner was still in the making. Arn Keeling and Patricia Boulter, "From Igloo to Mine Shaft: Inuit Labour and Memory at the Rankin Lake Nickel Mine." In John Sandlos and Arn Keeling eds., *Mining and Communities in Northern Canada: History, Politics, and Memory* (Calgary: Calgary University Press, 2015*), 35-58.*

[26] A.F., South Porcupine, 29 May 1922.

[27] A.F., South Porcupine, Sunday 9 April 1922.

> suggestions during breakfast to raid the kitchen and throw out the cook, but could not ascertain from whom these suggestions came.[28]

Food represented a potentially dangerous mobilizing force amongst the miners, and a point of serious friction between employees and management.

The connection between food and other, more serious complaints about the company is nowhere clearer than in A.F.'s conversation with Jack Smith, a member of the Worker's Party. After work, A.F. joined Jack Smith and two other employees for an outing into South Porcupine. A.F. reported a conversation in which the men discussed the transfer of "Old John" from the rigging gang to the kitchens, where he washed dishes. "Old John" was "a consumptive," and Smith argued that "the company has no right to place a consumptive washing dishes in a camp kitchen." One of the other miners suggested that, if they informed the camp Doctor, something might be done. But Smith insisted that the company already knew about the problem: "Everyone could see that 'Old John' is a consumptive and…he was put in the kitchen just to buck the men." In reality, the company may have transferred "Old John" to the kitchens to reduce his exposure to dust – a practice for retaining silicotic workers that would become policy after 1924. However, Smith saw the move as classic corporate impenitence and predicted that if they left "old John" in his position much longer, "there will be 'hell to pay.'"[29] Later that month, the topic came up again when some of the men suggested writing to the Provincial Health Department about the matter.[30] A man named "Frenchy" complained to A.F. that

[28] A.F., South Porcupine, Sunday 16 April 1922.
[29] A.F., South Porcupine, Sunday 25 April 1922.
[30] A.F., South Porcupine, Sunday 16 May 1922.

the mine was "employing a tubercolosis [sic] man as dishwasher in the kitchen, thereby exposing the men to infection through the dishes."[31] By this time, South Africa, Australia, and the United States all had widely publicized research on the dangers of miners' phthisis, and many Porcupine miners came from these other mining fields. Contemporary confusion about the overlaps between tuberculosis, consumption, and silicosis (explained below) may have sharpened the miners' fears about lung disease.

Recognizing that the state of the kitchens brought employees to the point of revolt, Dome hired new cooks that spring. The move placated employees temporarily – on 2 May A.F. noted that "the men all appear to be much better satisfied with the meals turned out by the new cook."[32] But the calm did not last. On 7 May 1922, reporting on a conversation held in the dorms, A.F. stated that "in no instance did any of [the men] manifest any grudge or antagonism toward the management of the mine, but they did make competed [sic] complaints that the new cooks employed in the camp kitchen are serving meals almost as bad as their predecessors."[33] A few days later, "a surface pipe fitter named Allan Lemon said that the work about the Dome property would be a good thing were it not for the poor meals served in the camp dining room."[34] The next day, he spoke with a fellow employee named Andy Burke who suggested that the workers needed to "get together and either send a formal complaint to the manager, Mr. DePencier, about the food served in the dining room, or else take the matter into their own hands and throw the cooks out of the kitchen, thereby forcing the management to take steps to improve

[31] A.F., South Porcupine, Sunday 16 May 1922.
[32] A.F., South Porcupine, Sunday 2 May 1922.
[33] A.F., South Porcupine, Sunday 7 May 1922.
[34] A.F., South Porcupine, Sunday 23 May 1922.

matters."[35] It did not take long for the issue of food to escalate, regardless of who was in the kitchen. The rapidity with which men could mobilize around the subject suggests its centrality in miners' lives and its power to determine labour relations at the mine.

In addition to food, water was an occasional source of concern. On 15 May, A.F. spoke with a machine man who stated that "some provision ought to be made for drinking water for the men working underground." Apparently men working underground were forced "to drink the partly poisonous cyanide seepage water, which is the only water to be had underground at present." Others in the vicinity "voiced the same complaint regarding the bad water supply."[36] Although Porcupine was not technically a company town, its remoteness, and the fact that miners often lived in company housing and ate company food, gave it some of the same characteristics. As Neil White argues, company towns are shaped by multiple layers of unintended consequence, human agency, and adaptation. Miners' loud complaints may have been part of the "shifting rounds of negotiation" which take place in company town settings.[37] The complaints may have been perfectly legitimate, but the context also mattered: in the nineteenth century gold rushes, miners celebrated flour "mush," canned pork, and beans as symbols of their hardiness and adaptability on an unforgiving frontier; in the twentieth century, fresh bacon, coffee, and vegetables brought north on the T.&N.O. possessed no redeeming characteristics.[38]

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[35] A.F., South Porcupine, Sunday 24 May 1922.
[36] A.F., South Porcupine, Sunday 15 May 1922.
[37] Neil White, *Company Towns: Corporate Order and Community*, (Toronto: University of Toronto Press, 2012), 5.
[38] Kathryn Morse, *The Nature of Gold: An Environmental History of the Klondike Gold Rush* (University of Washington Press: Seattle, 2003), 138-*154*

Miners objected to the health risks associated with bad or contaminated food and water, especially when it was forced on them by mangers who did not share the same risks.

Based on the above descriptions, one might be forgiven the impression that A.F's life in the mine was little more than a tortuous cycle of bad food, poisonous water, and pointlessly back-breaking physical labour. Life in the Porcupine was not always a misery. Work was not the entire world of Porcupine miners, who escaped its pressures with a variety of recreational activities outside of the mines. Most notably, a sense of comradery permeates A.F.'s reports. The conversations he recorded took place both on and off the job as a way of building connections and passing the time. The sheer amount and diversity of miners' gossip (ranging from food, to mining stocks, to venereal disease) suggests an active and interesting social atmosphere.[39] Although ostensibly for the purposes of gathering information on highgrading, these conversations suggest that miners enjoyed close friendly ties both on and off duty. The frustrations of their jobs brought them together and made the time they spent outside of work intensely important. Although winter might bring more difficult and unpleasant labour in the mines, it also brought winter sports: In January, A.F. spent at least one afternoon "skating and playing hockey" with his co-workers.[40] After playing hockey, he joined them for an evening poker game.[41] His reports of these outings contain tantalizing hints of life on the land enjoyed beyond the confines of work, and paint a picture of men who had learned to live in (and with) northern nature.

[39] A.F., South Porcupine, 23 February 1922.
[40] A.F., South Porcupine, 29 January 1922.
[41] A.F., South Porcupine, 29 January 1922.

Yet his reports also demonstrate the enormous scale of the 1920s mines and chronic dysfunction both in human relationships with mined nature and with each other. The day-to-day experience of miners' work involved physically dangerous, difficult, frustrating labour. Social and racial hierarchies shaped their interactions: tension between Eastern European and English-speaking workers caused strife, while fear of union activity kept management and miners suspicious of each other. Internal and external interests remained fluid, and the act of mining one of constant negotiation. Miners did not passively accept perceived injustices and worked actively within their means to improve their work and life conditions in Porcupine. In general, it was the large, unskilled, and somewhat disenfranchised workforce which bore the brunt of environmental disasters that rocked the mines in the 1920s, but the A.F. reports show how they did so actively and with acute awareness of the inherent risks of their work.

The Trouble with Tailings: Expanding Mine Waste and the 1928 Hollinger Fire

The environmental disasters of the 1920s stemmed not just from poor, external, top-down management but from complicated human and environmental factors working together to create chronic oversights – especially in waste management. In the case of the 1928 Hollinger Mine Fire, all levels of the industry were complicit. Management failed to keep up with the volumes of waste produced by the mines during post-war expansion, but miners and their labour-saving shortcuts provided the fuel and the spark for the fire. Coal mines routinely exploded in the early twentieth century, but the gold mine operators considered themselves safe from this sort of calamity. Unlike in coal mines, neither the ore nor the biproducts of gold mining are flammable. Besides, gold mines are usually wet:

The shafts and tunnels at Hollinger dripped water all day, and engineers regularly worked to keep the mine from flooding. When it came to fire management below the ground, everyone had grown complacent. Miners and management's shared interest in the profitable continuation of industrial mining and lack of interest in the by-products of progress led to serious environmental oversights. At the same time, fissures between different social group hindered communication and made disasters worse.

Tailings problems caused by a lack of waste management planning in the years leading up to the Hollinger fire demonstrate how little attention anyone paid to the by-products of industry until they (sometimes literally) blew up in peoples' faces. The rapid pace of industrialisation in the 1920s saw the mines struggling with unprecedented circumstances, including massive amounts of garbage generated during production. There was little profit to be made in waste disposal. Instead, engineers focussed on bringing ore from the faces through the mill as efficiently as possible. After the gold had been taken from the rock, whatever non-gold-bearing rock was left over became singularly uninteresting. Traditionally, mines simply dumped the tails wherever they could find a good spot – usually in a lake or other natural depression. When the volume of waste increased over time, this practice created problems both above and under the ground.

Above ground, trouble with tailings was foreshadowed during the war. By the spring of 1916, Hollinger's tailings threatened to block access to its supply road. "The old road has been in danger of flooding by tailings for a year past," reported *The Northern Miner*, "and will certainly be inundated this spring." The company solved the problem by dumping fill between Miller and Gillies Lake and building a new road on top of the fill.

The project made Miller into a giant tailings pond, but this solution was considered temporary: "It is not anticipated that it will suffice for more than a year and a half at the rate it is expected that tailings will flow from the mill."[42] The new road still had to detour around another large section of slimes.[43] In the winter of 1917, Peterson Lake Company discovered that Nova Scotia and Dominion Reduction companies had dumped 300,000 tailings into Peterson Lake. Pederson Lake sued for damages.[44] The situation inconvenienced the mines, but there was no sense that anyone considered changing waste practices at this early date.

The lack of planning around waste storage played out dramatically in 1923 When Digby Vet sued Dome for allowing its tailings to run uncontrolled across the Digby property. The tailings spills began some time in 1913, the same year that Henry Depencier arrived at Dome as an employee. At the time, Depencier later recalled, the company dumped its tails directly into nearby Edwards Lake.[45] As the lake filled, these tailings began to escape through the Lake's outlet. This stream flowed across the Digby Vet claim and Dome management let this happen, with no intervention or monitoring, allowing the slimes to flow where gravity took them. Occasionally the tailings would

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[42] "Hollinger Tailings Pond," *The Northern Miner*, 8 April 1916, 4.
[43] "New Dome Road Almost Finished," *The Porcupine Advance*, 16 February 1916.
[44] "Tails in Dispute," *The Northern Miner*, 15 December 1917, 1.
[45] Examination – H.P Depencier in the Supreme Court of Ontario Between the Digby Dome Mines Company Limited and the Dome Mines Company Limited, 15 January 1923, p. 3, Digby Vet (Ontario Supreme Court Case), General Superintendent's Files, 1926-1935, Box 6, Dome Mines Company Fonds, F1350, Archives of Ontario, Toronto, Ontario, Canada.

form a dam, which would divert the tailings elsewhere, but then they would build up and flow over again in a continuous cycle.[46]

The mine made only feeble efforts to manage its tailings and paid almost no attention to where they ended up. At some point prior to 1917, Digby management complained to Dome and forced the company to take some responsibility for the tailings overflowing from Edwards Lake. Dome built a sand-bag dam across the middle of the old lake-bed, but it proved “a total failure in the wintertime” and quickly disappeared under the sheer volume of Dome’s outflow.[47] Dome also tried a series of elevated troughs and pipes to dispose of tailings by spreading them around the landscape.[48] As new areas filled up, Dome shifted its pipes gradually west to distribute the outflow more evenly.[49] So the tailings continued to flow.

Dome’s tailings pollution had escaped notice during the slow war years – tailings production was relatively low, and the transgressions on neighbouring claims, many of them temporarily abandoned, did not noticeably inconvenience anyone. After the war, small claim owners, including Digby, began to think seriously about returning to development. Meanwhile, the improving labour and investment economy saw Dome’s production pick up and the volume of its tailings increase. In 1919, Digby’s lawyer wrote to Dome and asked them to remove the tailings from the Digby claim to which Dome’s

[46] Neither the lawyers nor Depencier really understood this process, as exhibited by their back and forth during this part of the case. Frustrated, Depencier eventually exclaimed “it is just a little higher and a little higher and then commences to silt across on the other side. Possibly the wind has an effect on it, I don’t know.” Depencier’s interest in ore ended at the mill. Examination - H.P. Depencier, 15 January 1923, p. 7-8.
[47] Examination - H.P. Depencier, 15 January 1923, p. 12.
[48] Examination - H.P. Depencier, 15 January 1923, p. 13.
[49] Examination - H.P. Depencier, 15 January 1923, p. 15.

lawyer Alex Fasken unhelpfully replied, "as you know it is impossible to move this stuff."[50] In 1921, Digby finally agreed to consider selling the land to Dome for tailings storage, but wanted $2000 per acre, a price Dome described as "so utterly fanciful that it could hardly have been intended to lead to any business."[51] Dome countered with an offer of $50 per acre, and (perhaps understandably) Digby responded with a suit for damages.

In court, Depencier showed he had either not thought much about the matter of tailings disposal or was stalling. Indeed, if remarkable advancements had been made in other areas of mine technology, little had changed in the way that mines dealt with waste. When pushed on the matter of where and when Dome tailings had flowed on to the Digby property, Depencier deferred, saying that such information was impossible to say for sure "because it changes from day to day to the south" as the slimes moved and settled out from their disposal system. Besides, a complete survey was impossible while the snow lay on the ground.[52] When Digby's lawyer assumed that "this question of disposition of slimes is an important one in any mining venture," Depencier replied "I don't understand your question." When pushed on the methods of slime control, he stated that there are "very limited" means available, and that he "did not know of any other means in operation today except to discharge them out on to some area."[53] When pushed even

[50] Statement of Facts on Behalf of Dome in the Supreme Court of Ontario Between Digby Dome Mines Company Limited and Dome Mines Company Limited, p. 4, Tailings, Digby, Box 10, General Superintendent's Files, 1926-1935, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario, Canada.
[51] According to Dome's statement of facts, the price may have been based on a similar transaction recently conducted by Hollinger where the company had in fact bought "one or two small parcels that were necessary to the control of the area" for an average price of about $2000. Statement of Facts on Behalf of Dome, p. 5.
[52] Examination - H.P. Depencier, 15 January 1923, p. 17-18.
[53] Examination - H.P. Depencier, 15 January 1923, p. 20.

further, Depencier scoffed that "in a warm climate you can build a dam," but explained that the spring thaw in the north made damming impossible for Porcupine. Digby's lawyer then asked about stacking, which Depencier similarly dismissed: "I have seen it tried, but it failed" in South Africa, he claimed. His mining experience had also taken him to British Columbia, Washington, and Michigan, and in all of these places had he seen the same methods of dealing with slimes. He explained further that other mines might not have the same problems with tailings disposal as northern Ontario. Because of the very low grade and highly dispersed nature of the gold, Porcupine ore must be ground into a fine slurry for processing. Other mines could get away with grinding to sand, which could be more easily stacked.[54]

Aside from rudimentary dams and pipes, Dome had invested little time or energy in technical solutions. Instead it pursued quick fixes. Dome had periodically entered arrangements and purchased land for tailings disposal, but these actions were always reactionary rather than preventative or precautionary. In 1922 spring breakups washed tailings downstream where they backed up against the T&N.O. rail spur. Dome management wrote the railway's Chief Engineer in 1922 to request that the line be raised and additional culverts put in to compensate for the changes to the landscape's natural drainage patters.[55] In the months surrounding the Digby case in 1923, Dome cast around desperately for unused land, and struggled to find a dump site where their tailings would

[54] Examination - H.P. Depencier, 15 January 1923, p. 22.
[55] Letter to S.B. Celement, Esq., Chief Engineer, T.&N.O. Railway, 23 September 1922, Tailings, Box 3, Dome Mines Company Fonds F1350, Archives of Ontario, Toronto, Ontario.

not run into streams and cause more potentially expensive damage downstream.[56] They even tried to get permission to dump into Porcupine Lake, but were stymied by the provincial government's stipulation that the lake could not be fouled without obtaining rights from all stakeholders in its watershed.[57] The fact that the company had more or less exhausted its options by 1924 is evident in the fact that, after Digby filed an injunction preventing further dumping, the mine was forced to buy another property (on the other side of Digby) for an exorbitant price, and then obtain rights from Digby to pipe the slimes across it.[58] The Dome tailings problem is indicative of the priority given to the production side of mining which provided little opportunity for thinking about waste disposal. There was little incentive to think about tailings until Digby's litigation made the costs of ignoring them too high.

Mine officials were no better at dealing with waste generated below the ground. By the 1920s, Hollinger routinely stored explosives in naturally warm underground chambers as a cost-saving measure aimed at keeping dynamite thawed and close to blasting faces. This measure only became possible when the mines went deep enough to insulate the tunnels from surface temperatures. Before deep mining, dynamite had been stored above ground in special sheds. Frozen dynamite had to be thawed thoroughly

[56] Alex Fasken to Depencier, 26 October 1922, Tailings, Box 3, Dome Mines Company Fonds F1350, Archives of Ontario, Toronto, Ontario.
[57] "The crown insists on insertion in the grant to your Company of a reservation…the result of this will be that you will never be able to drain the lake or to foul the waters of the lake without settling with all riparian owners." Alex Fasken to Henry Depencier, "Re. Purchase of the Bed of Porcupine Lake," 9 September 1924, Tailings, 1923-24, Box 10, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.
[58] Statement of Facts on Behalf of Digby, in the Supreme Court of Ontario Between Digby Dome Mines Company Limited and Dome Mines Company Limited, p. 19, Tailings, Digby Vet, Box 10, Dome Mines Company Fonds F1350, Archives of Ontario, Toronto, Ontario.

before it could be used, a fuel-expensive (and sometimes dangerous) process. Miners used dynamite daily, so keeping enough explosives warm and ready for use posed a continuous problem in the winter. Underground storage came with new problems of waste. For transport and storage, miners stored dynamite carefully in large wooden crates. When dynamite first moved underground, miners had onerously moved empty crates to the mine surface and burned them. However, by the 1920s this practice had slowed – partly because its sheer volume of the waste took up space in the carts and elevators that could have been used for men and ore, and partly because unused detonators left in the crates sometimes exploded unexpectedly in the garbage fire. Thus, when explosives were unpacked underground, the wood boxes and shavings would be dumped on the stopes along with other underground waste – fuse ends, dirty oil, dysfunctional detonators, rags, and timber ends.[59]

The practice of dumping excessive waste below ground really began in earnest in the early 1920s, with the post-war production boom. In his testimony following the Hollinger Fire, Safety Inspector John Knox stated that the debris found on the stopes dated back to 1923.[60] By 10 February 1928, when it went up in smoke, the debris pile where the fire started was twelve feet wide, one hundred feet long, and forty-five feet deep.[61] It was just one of many similar piles scattered throughout the mine. These piles probably would have been completely safe if the stopes had then been backfilled with a

[59] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[60] "Hollinger Probe Opens," *Northern Miner*, 1 March 1928.
[61] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.

covering of rock, but the informal practice meant that no coordination or planning for backfilling took place and the flammable debris remained exposed.

Before the fire, the mines had little reason to think that their dumping practices constituted any sort of danger. The walls literally dripped with water and there was very little timber in the hard rock shafts. Metal mines, as a rule, did not burn in the same way that coal mines did.[62]

> The fact appears to be that in no part of the North American Continent where metal mines are in operation is there a specific requirement by law or regulation that empty boxes, paper, and combustible refuse must be brought to the surface and the further fact is that such refuse, as a general practice, is placed underground.[63]

Hollinger had been following the practice of all metal mines in its dumping practices, and it had occurred to no one that this might be a problem before 1928.

Official inquiries could not determine the source of the spark, but could trace the fire back to stope 55-A on the 550-foot level. The fire immediately sucked oxygen out of the stope and produced deadly carbon dioxide and carbon monoxide.[64] Air currents and the force of the fire drove the smoke and gasses through crosscuts and shafts at velocity, killing men caught in their path. In the aftermath of the fire, men and media tried to make sense of some of these deaths. According to the *Porcupine Advance*, miners believed that carbon dioxide lay low in the shafts, while the carbon monoxide rose. They described a process whereby the crosscuts acted as giant containers in which the fire transformed the air from oxygen to carbon dioxide and finally into carbon monoxide.[65] The story is

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[62] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[63] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[64] Judge Godson, Commissioner, "Hollinger Mine Disaster," *Labour Gazette*, June 1928, 612.
[65] "Gases Generated in the Mine at Tie of the Fire," *Porcupine Advance* 23 February 1928.

indicative of the way in which the miners actively engaged in creating knowledge about the deadly, invisible, and poorly understood forces which threatened their lives and livelihoods.[66]

Miners began evacuating when they noticed smoke at 10am. Unlike the Great Fire of 1911, Porcupine was no longer as remote or isolated as it had once been. News spread rapidly, and aid immediately began pouring into the community. Air quality detection equipment came from Toronto, provided by the Consumers Gas Company Limited. More rescue equipment and apparatus, including a rescue car specially designed to enter mines during emergencies, came north from the United States Bureau of Mines. "No boundary line was recognised in the act of co-operation between neighbours interested in the same industry," observed the *Northern Miner*.[67] The rescue car was essential in the aftermath of the fire. Noah Timmins wrote to Scott Turner of the American Bureau of Mines on 21 February to thank him for its use, writing that "without [the assistance of the car and its crew] we were in a position of helplessness."[68] The railway opened the line and the equipment arrived in the North in eleven hours, faster than any express train.[69] A few months later, the Creighton Mine began a ten day training course for its employees based on the American Bureau of Mines "Advanced Training for Recovery Operation during

[66] These were not the first deaths by gas in Porcupine, but accidents involving gas were very rare. In 1916, two blasters entering an area which had been recently blasted fainted after breathing in "mine gas." One of the men died. "Mine Gas is the Cause of Death," *Porcupine Advance,* 3 May 1916.
[67] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[68] Hearings Before the Committee on Mines and Mining United States Senate Seventeenth Congress Second Session on S. 2079 A Bill Authorizing an Appropriation for Mining Experiment Stations of the United States Bureau of Mines, Part 2, 15 February 1929, (Washington: Government Printing Office, 1929), 30-31.
[69] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.

Metal Mine Fires."[70] By 1928, Porcupine had become thoroughly integrated into an international community of mining interests.

Although the fire killed more or less indiscriminately, its victims were mourned within divided communities. The old hierarchies established during the war played out in socially separated memorial, funerary, and investigative activities. Finnish, Ukrainian, Croatian, and Cornish victims had separate funerals organized by their respective communities.[71] In a general meeting held just days after the fire, the *Porcupine Advance* noted that speakers addressed the audience in six different languages. Some expressed "the usual denunciation of the capitalistic system" and used the word "murder" to describe the fire, but others were "restrained and reasonable." These divisions are suggestive of a community deeply divided along religious, economic, and ethnic lines. Despite these divisions, the fire did create a sense of shared trauma - ultimately the diverse group came together to ask for a public enquiry into the accident.[72]

Two enquiries resulted, one by local coroner's jury report and a second by a government commission headed by Ontario Court Justice T.E. Godson.[73] The coroner's jury blamed the companies for negligence while Godson's report made unsurprising recommendations around the frequency of mine inspections, new rules for waste management, and guidelines for ventilation and escape routes for miners. More

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[70] T.F. Sutherland, *Report on the Mining Accidents in Ontario in 1928* (Toronto: King's Printer, 1929), 15.
[71] "Impressive Funeral of Group of Finnish Men on Wednesday," *Porcupine Advance*, 3 May 1928; "Funerals of Croatians Held on Wednesday Here," *Porcupine Advance*, 16 February 1928; "Double Funeral Held for Cornish Friends," *Porcupine Advance* 16 February 1928.
[72] "Mass Meeting Addressed by Speakers in Six Languages," *Porcupine Advance* 16 February 1928.
[73] Kerry Abel, *Changing Places: History, Community, and Identity in Northeastern Ontario* (Kingston: McGill-Queens University Press, 2006), 142

interesting from the perspective of environmental history was Godson's invocation of nature as both the enemy and the maker of Porcupine men. Godson wrote that "environment molds character." He invoked one specific example:

> I vividly remember Fred Jackson, quietly and unobtrusively telling his story of conflict with nature's forces. Without exaggeration or boastfulness he recited how he and his four companions retreated from one vantage point to another, slowly and stubbornly backing away from the fumes of the deadly gas; how he turned on the air and directed it against a plank to cause the current to rebound; connected lengths of hose in an attempt to blow the smoke away, and how he cut his smock in four pieces and unselfishly gave his companions a piece to place over their mouths.[74]

Here the miners' battle with rock, air, and fire takes on war-like qualities. Bravery, strategy, and an intimate knowledge of the workings of the tunnels allowed Jackson to come out victorious. Men like Jackson, Godson said, were "a tribute to the manhood of the North, made sturdy and true by their contact with nature's forces and their fellow man."[75] Yet their battles were not waged alone, but in solidarity with men working in similar conditions around the world who worked together for the common goal of economic and industrial triumph.

While men and rescue equipment poured in to the burning crosscuts from the transnational mining community, the lessons learned from the Hollinger fire fanned outwards. As it had following other environmental disasters in Porcupine, the international press picked up on the fire almost immediately. By 1928, Hollinger was widely considered "one of the greatest gold mines in the world," and so events at the mine naturally interested fellow mining nations.[76] The disaster made front page news in

[74] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[75] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[76] "Perished in Fire," *The Mail,* 11 February 1928, (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article58549268); "Trapped: Fire in Mine," *The Sun* (Sydney),

British Columbia and in California on 11 February.[77] Notably, the day after the disaster several Australian newspapers (in Adelaide and Sydney) had details cabled from Toronto on the cause of the fire and rescue efforts.[78] By 13 February, major papers across New Zealand ran the story, with most of its salient details.[79] By 15 February, most papers had an accurate death toll.[80] The papers then followed the process of the investigation into the spring and summer of 1928.[81]

The lessons drawn from the fire, according to these stories, centred on managerial negligence and mine safety. The accusatory language of the local coroner's jury inquiry

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(retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article224223232).

[77] "Disaster Befalls men in Hollinger Mine," *The Daily Colonist*, 11 February 1928 (Retrieved from University of Victoria's The Daily Colonist Digital Collection, 24 October 2017, https://archive.org/details/dailycolonist0228uvic_9); "40 Canadian Miners are Trapped," *Madera Tribune*, 11 February 1928, (retrieved from California Digital Newspaper Collection, 24 October 2017, https://cdnc.ucr.edu/cgi-bin/cdnc?a=d&d=MT19280211.2.2&srpos=4&e=-------en--20--1--txt-txIN-Hollinger+Fire-------1).

[78] "Perished in Fire," *The Mail*, 11 February 1928, (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article58549268); "Trapped: Fire in Mine," *The Sun* (Sydney), (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article224223232).

[79] The Aukland Star received a cable from Vancouver which knew the numbers of trapped men and the details of the rescue effort. Although it was rough on location, saying that the disaster had happened at North Bay. The Otago Daily Times had a cable from Sudbury with similar details, and so did the Stratford Evening Post, the New Zealand Herald, and other papers "Forty in Peril," *Aukland Star*, 13 February 1928, (retrieved from National Library of New Zealand's Paper's past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/AS19280213.2.46); "Fire in Canadian Mine," *Otago Daily Times*, 13 February 1928, (retrieved from National Library of New Zealand's Paper's past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/ODT19280213.2.50); "Trapped in Mine: Canadian Tragedy," *Stratford Evening Post*, 13 February 1928, (retrieved from National Library of New Zealand's Paper's Past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/STEP19280213.2.30); Fire in Goldmine," *New Zealand Herald*, 13 February 1928, (retrieved from National Library of New Zealand's Paper's Past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/NZH19280213.2.65).

[80] "The Quartz Mine Fire," *Otago Daily Times*, 15 February 1928, (retrieved from National Library of New Zealand's Paper's Past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/ODT19280215.2.90).

[81] "Hollinger Mine," *Otago Daily Times*, 26 March 1928, (retrieved from National Library of New Zealand's Paper's Past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/ODT19280326.2.38); "Gross Negligence," *Aukland Star*, 26 March 1928 (retrieved from National Library of New Zealand's Paper's past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/AS19280326.2.83); "Mining Fire Disaster," *Northern Star*, 26 March 1928, (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article93667669).

seems to have carried the most weight among the international papers. The *Aukland Star*, for example, wrote "there had been gross negligence on the part of the management and operating executives. They were blamed for permitting rubbish to be dumped in the old stopes."[82] The stories also focused on the fact that men could not escape the fire fast enough because the lifts carried a limited number of people.[83] These kinds of arguments rang true in the context of workers' movements in mining districts around the world. Any industrial miner could recognise the trope of negligent management and empathise with the terror of being unable to escape up over-taxed shaft elevators.

The papers also emphasised the unprecedented nature of the fire. Coal mines exploded frequently, but quartz mines had always been thought comparatively safe. The story of the Hollinger fire shook that fundamental belief in other quartz camps. The disassociation between quartz mines and fires was so strong that one newspaper even mistakenly called Hollinger a coal mine in its report: "47 men are believed to be dead through a fire in the Hollinger coal mine, Ontario, Canada," reported New South Wales' *Barrier Miner*.[84] As one Tasmanian paper put it, "a fire in a quartz mine [was] previously unknown."[85] Before Hollinger, the idea that gold mines could catch fire would not have

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[82] "Gross Negligence," *Aukland Star*, 26 March 1928 (retrieved from National Library of New Zealand's Papers Past, 24 October 2017, http://paperspast.natlib.govt.nz/newspapers/AS19280326.2.83).
[83] For example, "Trapped: Fire in Mine Too many For Lifts," *The Sun* (Sydney), 11 February 1928, (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article224223232).
[84] "Mining Disaster Fire in a Coal Mine," *Barrier Miner*, 13 February 1928, Trove (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article46003426).
[85] "Hollinger Mine Fire," *Advocate*, (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article67572798). In fact, underground fires at gold mines were not totally unknown. Periodic reports appear in Australia and California. "Gold Mine Fire Out After Three Months," *Los Angeles Herald*, 22 December 1919, (retrieved from California Digital newspaper Collection, 24 October 2017, https://cdnc.ucr.edu/cgi-bin/cdnc?a=d&d=LAH19191222.2.1046&srpos=2&e=-------en--20--1--txt-txIN-underground+Gold+Mine+Fire-------1); "Gold Mine on Fire," *Evening News* (Sydney), 20

readily occurred to stakeholders in any of the world's major mining zones. These nations had their own quartz mines which could potentially catch fire, and so the Hollinger case provided some potential lessons.

Meanwhile, Godson's lengthier and less accusatory report carried the lessons from the Hollinger fire were more palatable to those in positions of power. For example, an American Bureau of Mines circular by Daniel Harrington on mine ventilation used the Hollinger fire to call attention to the fact that metal mines around the world "had been of the opinion that [metal] mines were essentially immune to fire."[86] The practice of dumping garbage on stopes was "a practice which has been more or less prevalent (and one of whose probable dangers would be, in fact have been, on numerous occasions, scornfully minimized) in metal mines not only in Canada but in various parts of the United States." In addition to the Hollinger example, the circular cited a 1928 metal mine fire in Mexico which killed twenty men (but remarkably only destroyed about three cords of mine timber) and discussed the problem of open lights (for smoking or for lamps) and unsafe dynamite handling. [87] Harrington then reproduced Godson's entire list of recommendations.[88]

The report was part of Harrington's call for increased state regulations of ventilation in metal mines and additional corporate attention to the ventilation problems.[89]

March 1903, (retrieved from National Library of Australia's Trove, 24 October 2017, http://nla.gov.au/nla.news-article113403447).

[86] Daniel Harrington, "Progress in Mine Ventilation," Circular 6136, Information Circular Department of Commerce, (United States) Bureau of Mines, (Washington: U.S. Department of the Interior, May 1928), 9.

[87] Harrington, "Progress in Mine Ventilation," 9.

[88] Harrington, "Progress in Mine Ventilation," 10-12.

[89] D. Harrington, "Progress in Mine Ventilation," 1.

His aggressive campaign for mine fire safety resulted in a number of similar reports through the late 1920s and into the 1930s. An article in the *Canadian Mining Journal* in December 1928 called on mine managers to make basic adjustments to their operations to improve safety, including enforcing no-smoking rules and safety doors. The piece referred to Harrington's extensive American experience and the international conversation sparked by the Hollinger fire: "there have been a number of misconceptions in mining circles concerning the affair," Harrington wrote, before adding his own opinion on the matter: "it was caused in my opinion by an open light" possibly "a match from a smoker" but more likely "due to a very reprehensible habit which persists in metal mines that in order to obtain information as to what may be the condition in a winze or a stope which is below…the metal miner frequently lights a piece of paper and throws it into the opening."[90] The article implored mine managers to learn from the history of metal mine fires in the United States and Canada, exert control over the dangerous habits of their employees, and modernize their infrastructure to save lives.

Data collected by Harrington on the Hollinger fire (along other reports on mine fires collected through the 1920s and 1930s) informed the official recommendations of the Safety Division of the United States Bureau of Mines. The Safety Division conducted education and training nearly 10,000 workers and mine officials, collected safety reports from engineers and mine operators, disseminated data on mining safety, visited fire sites, provided resources for administers and government officials, and ran International First

[90] Daniel Harrington, "Fires in Metal Mines: Causes, Prevention, and Methods of Handling," *The Canadian Mining Journal*, 21 December 1928, 1059-1060.

Aid and Mine Rescue Meets across the country.[91] Although the onset of the depression slowed widespread adoption of legislation on metal mine fires in the United States, some adopted new laws based on the Safety Division's recommendations by 1930.[92] Harrington's extensive reporting on metal and coal mine fires would later go on to shape American legislative change in the United States in the 1940s.

Back in Ontario, the government and the mining companies responded to Godson's recommendations with a series of changes directed at ventilation, waste disposal underground, signage, emergency exits, safety training, and rescue equipment. The Pittsburgh rescue car became the first example of a steady stream of American (mostly coal mine) safety equipment and expertise coming into the north to help improve Ontario mine safety. In August, 1928, companies brought in G.W. Grove, an engineer for the United States Bureau of Mines to instruct crews building new rescue stations.[93] Porcupine's waste management problems were not unique, but part of a larger set of chronic problems experienced by numerous mines around the world. Solving them meant an elaborate exchange between members of Porcupine's transnational mining community.

Dust to Dust: Silicosis in the Twentieth Century

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[91] Daniel Harrington, "Work of the Safety Division of the United States Bureau of Mines, Fiscal Year 1930," Circular 6400, Information Circular Department of Commerce (United States) Bureau of Mines, (Washington: U.S. Department of the Interior, November, 1930).

[92] Daniel Harrington "Progress in Metal-Mine Ventilation in 1930," Circular 6469, Information Circular Department of Commerce, (United States) Bureau of Mines, (Washington: U.S. Department of the Interior, July 1931), 5.

[93] "Latest Equipment for Combating Fire Installed at Mine," *The Globe*, 4 August 1928. Proquest Historical Newspapers. http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1352068378?accountid=12347 (accessed 1 April 2018).

Along with mine fire data, Harrington's ventilation circular also invoked South African silicosis research (and reproduced an editorial from the South African Mining and Engineering Journal published that year) in its discussion of modern mine ventilation.[94] Like waste management, silicosis emerged directly from the advent of industrial mining. Gold associates with silica bearing material like feldspar and quartz in the hard rock that makes up the deep rock of the Canadian Shield and the South African Rand. Unlike other kinds of rock found in different types of mines, hard rock produces sharp and corrosive silica shards when miners break it down. When combined with the capital and labour structures of industrial mines, silica-bearing rock proved deadly. Within the confined spaces of deep industrial mine tunnels and working near dust-generating machinery like drills and crushers, miners breathed silica dust on every shift.

The scientific understanding of silicosis invoked by Harrington and his South African Contemporaries took time to coalesce. Before the turn of the century silicosis had not been used to label miners' lung disorders. Instead, consumption, tuberculosis, or the "white plague," was widespread in Europe's crowded cities, killing more people than any other disease in the eighteenth and early nineteenth centuries.[95] Lung disease specific to miners had been well understood since antiquity, and was referred to as miners' phthisis or miners' lung: broad categories that encompassed any kind of pulmonary distress related to life or work in dirty, damp, crowded, or dusty spaces.[96] Historians of silicosis argue that Robert Koch's discovery of the tuberculosis bacillus in 1882 delayed

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[94] Harrington, "Progress in Mine Ventilation," 7-8.
[95] David Rosner and Gerald Markowitz, Deadly Dust: Silicosis and the Politics of Occupational Disease n Twentieth-Century America (Princeton: Princeton University Press, 1991), 14.
[96] Rosner and Markowitz, *Deadly Dust*, 15.

legislative and scientific action. After Koch, physicians began associating any kind of respiratory distress with the tuberculosis bacilli. According to this argument, experts overlooked the possibility that dust and environment caused lung distress in favour of a bacteriological explanation.[97] The scientific context aided the entrenchment of this intellectual doctrine: tuberculosis fit easily with other similar nineteenth century bacterial/micrographical discoveries. "Silicosis" as a distinct pathology only emerged after the turn of the twentieth century and the rise of new interest and research on industrial disease. Unlike the acute violence of the Hollinger Fire, silicosis was a slow disaster which proved much more difficult to recognize and address for both Porcupine and its international counterparts. Brave northern men could not fight silicosis as they had the Hollinger Fire, and clear lessons for future prevention proved difficult to discern.

The association between dustiness and people with lung problems remained obvious enough to require some sort of explanation, and not everyone subscribed to the bacteriological model. Physicians explained the connection between dust and disease by framing dirt as a vehicle for tuberculosis: Dust in the workplace or home might carry tuberculosis bacteria from person to person. In the mines, coughing and spitting on the ground resulted in the transference of tuberculosis between miners living and working in the same space.[98] These nuances of the tuberculosis/consumption debate had little impact on laymen and miners: Germ theory did not always resonate with working class experiences or perceptions of disease and health. Miners who could objectively observe

[97] Rosner and Markowitz, *Deadly Dust*, 18.
[98] Rosner and Markowitz, *Deadly Dust*, 19.

the connection between breathing in dust and chronic lung disease blamed their problems on the environment without reference to the bacteriological explanations forwarded by scientists.[99] Even within the research community, scientific categories generated in Europe did not always reach its colonies and successor states, and spread unevenly even within the research community.[100]

As time went on, tuberculosis proved increasingly insufficient as a catch-all diagnosis. Lung diseases manifested in multiple environments among many different demographics and produced a wide variety of symptoms. To make sense of some of these complexities, British physicians began to differentiate more clearly between different types after 1900. One of the earliest mentions of "silicosis" appeared in the *British Medical Journal* in 1903. The author, Thomas Oliver, referred to silicosis as a particular variant of miner's phthisis found in quarrymen and gold miners. Oliver differentiated phthisis from tuberculosis by pointing out that the lungs of gold miners suffering from silicosis contained no trace of tuberculosis bacilli. Quoting work conducted by a number of doctors throughout England, Oliver further argued that silicosis and tuberculosis were related but distinct. The silica shards seem to have provided entry for tuberculosis in some (if not all) cases. This was proved by comparison between coal miners and quarry-workers from the same area. The quarry workers suffered from lung diseases while the coal miners (although spitting up quite a lot of black phlegm) did not. Oliver

[99] Rosner and Markowitz, *Deadly Dust*, 23.
[100] Rosner and Markowitz, *Deadly Dust*, 21.

hypothesised that the sharp silica dust in the quarry, unlike the softer coal dust, provided entry points for tuberculosis bacteria.[101]

Within this context of debate within the scientific community, a newly formed class of unskilled industrial miners began dying on an unprecedented scale. South African politicians, mining companies, and scientists perceived the potential human and financial threat posed by silicosis first. Chronic labour shortages and the need understand and control migrant workers provided favourable conditions for studying miners' health.[102] South African historian Jock McCullough calls the period between 1902 and 1912 a "silicosis crisis" in the newly formed state. New dust generating technology, increasingly confined underground spaces, and enormous unskilled workforces combined to create the perfect conditions for a silicosis epidemic.[103] The 1902-1903 Weldon Commission identified silicosis as a major problem and recommended dust reduction measures in the mines.[104] However, with no precedents to turn to and little political will, the Commission accomplished little except increased surveillance of the medical condition of new labour arriving on the gold field.

Yet by naming the problem, the Commission set a slow process in motion. After 1914, mining companies subjected black miners to regular examinations and the 1916 Miners' Phthisis Act stipulated examinations every three months. As with everything in

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[101] Thomas Oliver, "A Discussion of Miners' Phthisis," *The British Medical Journal* 2 No. 2228 (Sept 12 1903): 568-573.
[102] Alan Jeeves, *Migrant Labour in South Africa's Mining Economy: The Struggle for the Gold Mines' Labour Supply, 1890-1920* (Kingson: McGill-Queens University Press, 1985), 46-47.
[103] Jock McCullough, "Air Hunger: The 1930 Johannesburg Conference and the Politics of Silicosis," *History Workshop Journal* 72 (Autumn, 2011): 118.
[104] Jock McCullough, *South Africa's Gold Mines and The Politics of Silicosis* (Rochester: Boydell & Brewer, 2012), 15.

the industrial mines, these examinations became large-scale: The massive numbers of men examined under these programs required a kind of medical mass production. McCullough estimates South African doctors conducted a minimum of 700,000 examinations per year and cites one doctor who bragged he could conduct 1000 tests in three hours.[105] Exams relied on a miner's weight (any more than five pounds lost between examinations could be a basis for diagnosis) and x-rays (for whites only). These systems were not particularly effective for a variety of reasons, but especially because labour-hungry mines proved unwilling to exclude any potential worker who could pass a cursory exam.[106]

Nevertheless, standardised testing under the 1916 Act established a stable biomedical understanding of silicosis. Pieced together using a combination of South African, British, and Australian research, the newly emerged epidemiology maintained the following: Dust caused silicosis; it was difficult to diagnose (particularly in its early stages); there was a strong relationship between silicosis and tuberculosis; and continued exposure to dust after diagnosis is always fatal. It also introduced distinct stages, each associated with a different level of debilitation and compensation. "Primary-stage" silicosis implied that the man had not been totally incapacitated, whereas "stage two" silicosis meant the man was so sick he could no longer work at all. These categories were eventually expanded in 1919 to include "ante-primary" to describe silicotic men who could still work, but only if they left the mining industry.[107] As the first and only clear

[105] McCullough, *South Africa's Gold Mines*, 20.
[106] McCullough, *South Africa's Gold Mines*, 18-20.
[107] McCullough, *South Africa's Gold Mines*, 38-39.

description of silicosis, this orthodoxy would come to be accepted widely across the world, and formed the basis of compensation and employment policies almost everywhere men mined for deep gold.[108]

Australian research followed closely on South African foundations. Concerned officials and medical professionals pointed out high lung disease and death rates in Bendigo as early as 1900. Western Australia saw the first major inquiry into these alarming numbers in 1905, finding, in a report similar to the South African Weldon Commission, that the Kalgoorlie mines exposed miners to dust due to inadequate ventilation. Although the Western Australian government took measures to improve conditions, a 1910 report found that miners still suffered disproportionately from lung disease, which it divided diagnostically into early, intermediate, or advanced fibrosis and/or full-blown tuberculosis.[109] Lack of political will resulted in minimal reform before the 1920s, but Western Australia did institute an examination scheme similar to South Africa's as well as a modest compensation program for affected miners before the First World War[110]

Officials in American jurisdictions followed the South African and Australian events, but proved extremely slow to adopt meaningful silicosis legislation. Unlike the Commonwealth countries, in which government commissions sounded the alarm,

[108] Australia held royal commissions on the dust problem starting in 1905 with the Royal Commission on the Ventilation and Sanitation of Mines in Kalgoorlie. Britain produced the influential 1902-1904 Royal Commission into the Health of Cornish Tin Miners" which linked dust and lung disease. Marcus James, "The Struggle Against Silicosis in the Australian Mining Industry: The Role of the Commonwealth Government, 1920-1950," *Labour History* 65 (1993), 76-77; McCullough, *South Africa's Gold Mines,* 59.
[109] James, "The Struggle Against Silicosis," 77.
[110] James, "The Struggle Against Silicosis," 78.

American insurance companies spoke up about silicosis first. In 1908, statistician for the Prudential Life Insurance Company Frederick L. Hoffman unmasked silicosis as a distinctly industrial disease threatening the sanitary and economic health of America.[111] He was followed by Metropolitan Life Insurance Company statistician Louis Dublin, who publicised similar findings.[112] But within major medical journals and among doctors, the bacteriological explanation continued to dominate discussions in America, so these economic arguments enjoyed little official attention.

Eventually, European and South African studies combined with statistical materials about mortality in metal miners aroused enough concern to spark a U.S. Public Health Service investigation (in collaboration with the Bureau of Mines) in 1911. The investigation resulted in the identification of silicosis as a major health hazard for metal miners. It was followed up in 1914 with a landmark investigation on the lead and zinc mining region of Missouri, Kansas, and Oklahoma conducted by Anthony J. Lanza. Lanza emphasised environmental causes for industrial disease and relied on worker testimony in addition to traditional laboratory tests.[113] The Lanza method of collecting worker history became an important model for silicosis diagnosis (as well as other industrial diseases). He found high rates of tuberculosis and a close relationship between consumption and tuberculosis.[114] Yet Lanza continued to emphasise the bacteriological factors in lung disease (especially living conditions) until further 1919 statistical work by Frederick L. Hoffman on miners in Barre, Vermont finally demonstrated conclusively

[111] Rosner and Markowitz, *Deadly Dust*, 25-26.
[112] Rosner and Markowitz, *Deadly Dust*, 27.
[113] Rosner and Markowitz, *Deadly Dust*, 34.
[114] Rosner and Markowitz, *Deadly Dust*, 35.

that lung disease persisted long after tuberculosis declined. After this point, silicosis became widely accepted as an industrial disease, forming the basis for strikes and expanded reform efforts into the 1920s.[115]

As part of the international mining community, the Canadian industry participated in these discussions around lung disease. Ontario's Inspector of Mines A. Sleight commented extensively on mine ventilation in the Ontario Bureau of Mines' First Annual Report in 1891 and exercised his authority to force some mines to improve air quality underground.[116] In 1912, Mining Commissioner S. Price's report on the benefits of an eight-hour day directly and prophetically linked dust to miners' phthisis. On the whole Price disagreed with miners' assessment of underground work as unnatural and unhealthy – "The mines in Ontario, I believe, are naturally as healthful as any in the world." Nevertheless, he thought that there probably was reason for concern around the inhalation of dust from drilling. Although phthisis "is at present a disease little known in Ontario," it was only a matter of time and development before it started to become a problem. Besides, he noted, even if miners were not dropping dead from dust, it probably was not good for them. Reducing the number of hours exposed thus might improve miner health. He noted that inspectors knew about phthisis, and were keeping an eye on the problem.[117] Indeed, in 1912 the Bureau of Mines cited improper ventilation of mines as one of seven major ways mining companies failed to abide by mining regulation in Ontario,

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115 Rosner and Markowitz, *Deadly Dust,* 37-38.
116 For example, on page 227 of the 1891 (in his inspector's report) Sleight talks about forcing West Silver Mountain Mine to increase ventilation. He does the same for Martindale Mine (Gypsum) on 243. *First Annual Report of the Ontario Department of Mines* 1981 (Toronto: Warwick & Sons, 1892).
117 S. Price, "Report re. Limitation of the Hours," 11-12.

contributing to increased mining accidents.[118] In a long write-up on the topic, Inspector E.T. Corkill wrote that "little attempt has been made in the mines of Ontario to adopt any form of artificial ventilation" even though "in recent years…owing to the extent to which some of the metalliferous mines have been worked," artificial ventilation was probably necessary. Corkill directly copied Transvaal ventilation standards into his report. He went on to cite evidence from the East Rand in South Africa and the Comstock mines in Nevada, United States to conclude that "the installation and operation cost of any of these at the mines in Ontario…would be comparatively small, and would be insignificant compared with the valuable results obtained."[119] Corkill implied here that increased worker health and safety equalled corporate profitability for the industry, but left the reason for instituting changes (worker health) unnamed. Labour publications, including the federal *Labour Gazette* also monitored miners' health and specifically paid attention to instances of miners' phthisis.[120]

The Bureau of Mines first named miner's phthisis in Canadian mines in 1913. In his inspector's report, Corkill demonstrated a keen awareness of the disease's problems elsewhere in the world and admitted ignorance as to its relevance on the Canadian field. He knew that the disease associated with quartz, and that increased use of hammer drills would make dust "a serious menace" unless preventative measures were taken. In 1913,

[118] *Twenty-First Annual Report of the Bureau of Mines, 1912,* Vol. XXI, Part I (Toronto: L.K. Cameron, 1912), 58. The Act stated that ventilation was required "so that the shafts, adits, tunnels, winzes, raises, sumps, levels, stopes, cross-cuts, underground stables and working places of the mine and the travelling places to and from such working places shall be in a fit state for working and passing therein." *Annual Report of the Bureau of Mines, 1912,* 64.
[119] *Annual Report of the Bureau of Mines, 1912*, 64.
[120] "Mining Accidents," *The Labour Gazette,* April 1913, 1145.

these measures meant simply ordering mines to equip drills with a water spray which Corkill did. Ontario was the first and only Canadian jurisdiction to take such measures, and as a result Porcupine became the front line for Canadian dust legislation.

A year later, Corkill admitted that his attempts to force mines to use water sprays had largely failed in the face of considerable resistance from several fronts. The water spray attachments on hammer drills frequently failed: "the spray chocked [sic] up easily, and required considerable care to keep in good working order." Not only that, but miners had to carry water up the raises and stopes to get it to the drills, and often unintentionally got the driller wet. The pace of drillers determined the amount of ore processed in the mines, and water "undoubtedly decreases the footage drilled, [so] the foremen and managers probably gave more serious consideration to these objections than they otherwise would have done."[121] By 1915, spray attachments had been abandoned.[122]

The consequences of Ontario's failure to deal effectively with its dust problems had not yet become obvious, but Corkill knew it was only a matter of time. In these pre-war years, "there are not yet many cases of miner's phthisis," he wrote, but it was difficult to tell what the effects had been because "when men become sick at the mines or feel unable to work, they leave at once for their old homes and are lost track of."[123] The problem of tracking the health of migratory workers was something Ontario shared with South Africa. The Transvaal already bore the distinction of being a leader in phthisis management, and Corkill reproduced several pages of findings from the Mining

[121] *Twenty-Third Annual Report of the Ontario Bureau of Mines, 1914* (Toronto: L.K. Cameron, 1914), 68-69.
[122] *Twenty-Forth Annual Report of the Ontario Bureau of Mines, 1915* (Toronto: L.K. Cameron, 1915), 78.
[123] *Twenty-Second Annual Report of the Bureau of Mines, 1913*, (Toronto: L.K. Cameron, 1913), 69.

Regulation Commission of the Transvaal under the "Health of Miners" section of his Ontario report.[124] The piece he chose argued unequivocally that the phthisis experienced by the miners was silicosis, not tuberculosis, but that it could be complicated by tuberculosis if the bacterial infection "becomes superimposed" on the damage caused by rock dust. The report cited statistical studies in Cornwall (England) and Bendigo (Australia). Corkill's choice to include this large section is indicative of his perception of Ontario within this pantheon of industry giants, susceptible to the same problems. Perhaps his audience had not got the point, however, because Corkill reproduced the same report again in 1914, this time adding details from a silicosis publication from the *Rand Daily Mail*.[125]

Corkill's warning remained mostly unheeded outside of the Bureau. When the Workmen's Compensation Act came into force on 1 January 1915, it deeply disappointed him: its single provision for silicosis seemed a poorly thought-out side note. The Act stipulated that the mines paid an annual amount based on the Board's assessment of accident compensation costs, and this amount was then used to pay out sick or injured workers (or paid out to their families in the case of death). Industrial disease (it specifically named miners' phthisis) was considered a personal injury by accident. Corkill saw this as a singularly ineffectual way to address the disease. Phthisis did not behave like other accidents. It was chronic, degenerative, and could take years to appear. Employers were required to notify the Board by mail within three days of an accident, but

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[124] *Annual Report of the Bureau of Mines, 1913*, 70. Corkill's interest in noxious fumes likely stems from the fact that five men died in 1913 from gas remaining in poorly mine shafts following explosives. *Annual Report of the Bureau of Mines, 1913*, 71.
[125] *Annual Report of the Ontario Bureau of Mines, 1914,* 69.

in the case of phthisis there was no “moment” at which it occurred, and a man might not even know he had the disease until many years after leaving the industry.[126] The new Act focused on obvious and instant accidents, and was totally unequipped for dealing with the slow violence of Miners’ phthisis. Corkill also complained that the Act did nothing to prevent foreign miners already carrying the disease from entering Canada and taking advantage of compensation, although he had no numbers to back up his suspicions.[127] Meanwhile, he continued to follow the progress of South African research. In 1915 he cited findings from the interim report of the Miners’ Phthisis Committee of the Union of South Africa, which argued that water was the only way to prevent dust and also emphasised the danger of combining silicosis with tuberculosis.[128] He could see the applicability of this research for Ontario, and the new compensation laws seemed an unsatisfactory answer to what had clearly become a major problem on other gold fields receiving much more attention than it did in Canada.

Thus the alarm bells sounded by South Africa, Britain, and Australia resulted in little tangible action in Canada before the 1920s. The cumulative/degenerative nature of dust exposure meant that an incubation period of a decade or two of sustained industrial mining needed to pass before the disease’s effects became visible in the mining population. South Africa and Australia already had witnessed several decades of underground hard rock mining before they recognised silicosis as a problem. In contrast,

[126] *Annual Report of the Ontario Bureau of Mines, 1915,* 74.
[127] There are no numbers showing whether or not people actually did this because neither the federal nor the provincial government recorded silicosis in incoming migrants. Furthermore, the blurriness and unpredictability of the speed and moment of “onset” of silicosis made it impossible for physicians to tell when/where a silicotic had contracted it. *Annual Report of the Ontario Bureau of Mines, 1915,* 7474.
[128] *Annual Report of the Ontario Bureau of Mines, 1915,* 7478-79.

hard rock gold mining did not begin in Canada until 1909. Compared to regions already beginning to worry about silicosis at the turn of the century, Porcupine was a comparatively new field. Then, for the first few decades of extraction, environmental and human factors kept the mines comparatively small. High turnover of men and mining companies, fires, floods, wars, remoteness, and other problems kept men above ground and out of immediate danger. Even as extraction expanded, this context of constant crisis management left little room for poorly understood problems like silicosis, especially since no one could see or measure its effects in these early years.

Besides, there was the matter of accepted risk in the mining industry. Historians of mining in the United States note that, in the early twentieth century, environmental danger and lung disease constituted normal (and perhaps even acceptable) risks associated with the work of mining. These conditions would only become problematized after the war with rising awareness and concern about industrial disease and worker rights.[129] Even then, workers could get caught between those who saw silicosis as an industrial disease and those who attributed it to poor sanitation and moral depredation – matters of individual responsibility. Miners' relative invisibility (underground, in remote locations) compared to other industrial workers made the debate even more amorphous.[130] In Canada, the sense that the mines remained a risky place despite the best efforts of government, operators, and miners themselves remained prevalent throughout the 1920s. Even at this late date, popular opinion was that the best anyone could do was "provide for

[129] "Issues such as symptomology, what constitutes a disability, what is normal and what constitutes pathology in the human lung, what is an environmental danger, and what is an occupational risk were all questions that every generation in the silicosis debate redefined." Rosner and Markowitz, *Deadly Dust*, 217.
[130] Rosner and Markowitz, *Deadly Dust*, 220.

constant watchfulness and care."[131] Furthermore, even into the 1930s there was a moralistic tone to silicosis diagnoses. In a letter to Depencier in 1933, the Secretary of the Ontario Mining Association G.C. Bateman wrote that Lanza had confirmed that "syphilis may be an important factor in the development of silicosis" and recommended blood tests become part of the routine examination conducted on Ontario miners.[132] By linking illness to the miners' moral and physical depravity, Bateman rhetorically shifted blame off of the shoulders of his mine and on to the miners' themselves. If silicosis was a question of lifestyle, it was unclear who was responsible for compensating its victims: Individuals, the company, or the state.

The transient nature of work in Ontario mines also slowed recognition of the disease. As unskilled generalists in the industrial mine model, miners moved around a lot – not only from job to job, but from mine to mine and from occupation to occupation within a mine.[133] Few recorded silicosis victims had been lifetime miners. The biographies taken by doctors chronicle this occupational mobility: for example, an Italian who arrived in Canada in 1906 worked on the railroad for six years. When the mining boom began he found employment at Porcupine. In 1912 he worked doing odd jobs on the surface, then began as a mucker for one year, ran a hoist for six months, was a machine helper for one year, before finally moving into machine drilling where he contracted silicosis.[134] Another, a thirty-five-year-old French Canadian, worked at "bush

[131] "The Risks in Mining," *The Globe*, 16 April 1928.
[132] G.C. Bateman to H.P. Depencier, 9 May 1933, Silicosis Prior to 1920, Box 6, 1925-26 Files, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.
[133] Elliot, "Silicosis in Ontario Gold Miners," *The Canadian Medical Association Journal* 1924, 937.
[134] Elliot, "Silicosis in Ontario Gold Miners," 933.

work" from the age of thirteen, then for the logging industry as a log driver until he was twenty, before turning to prospecting, which he did for six years. When he arrived in Porcupine he engaged in mixed mining and prospecting before finally settling in as a timberman and eventually an underground shift boss.[135] This kind of mobility slowed the progression of the disease and made keeping track of victims difficult.

Increasing attention to workers' rights and escalating post-war production combined to highlight instances of lung disease among Ontario miners. As the case numbers rose, the regulations in place under the Worker's Compensation Act proved inadequate. The international context indicated that the potential solutions would be complicated and expensive because silicosis was an economic and environmental issue not easily detangled from the structural and ideological underpinnings of industrialisation as a whole. Ontario entered its silicosis crisis with the Italian on Riddell's autopsy table in 1924.

Canadian scientists and the government reacted first, the mining companies only joining in the general panic after 1926. Riddell was not the only one working in silicosis in 1924. That year, Jabez Elliot wrote a paper for *The Canadian Medical Association Journal* which chronicled the research in South Africa, Australia, Missouri, and Vermont and noted that Ontario mines, expanding rapidly, had been digging into geologically similar silica ore. Ontario schist did not shatter like quartz. In the past visual assessment of the rock's smoother edges led the industry to believe that their rock did not cause the same kind of damage inside miners' lungs. Examination under a microscope showed,

[135] Elliot, "Silicosis in Ontario Gold Miners," 932.

however, that Ontario schist rock still had "uniformly jagged and sharp edges and are occasionally needle-like in form."[136] On the request of the Division of Hygiene in the Provincial Health Department, Elliot gathered slides from x-rays of miners' lungs. Dr. R.R. Sayers, chief Surgeon of the U.S. Bureau of Mines, and Dr. Henry Pancoast, a Consulting Physiologist from the U.S. Bureau of Mines, examined the slides, reflecting the transnational nature of Canadian silicosis work.

Elliot was careful to eliminate any miners who had worked at Porcupine for less than five years, mined at other camps, or did not work underground. These stipulations were meant to show definitively that miners could contract silicosis from Ontario rock, rather than having contracted it elsewhere. Elliot eliminated all but eleven miners based on these criteria.[137] In the tradition of the ground-breaking silicosis studies in the United States and South Africa, he combined personal history-taking with x-ray and physiological examination.

The results of the study were alarming. Four of the eleven showed evidence of silicosis; three showed fibrosis "which may or may not have been due to dust;" two showed evidence of early stage silicosis. Only two showed freedom from silicosis.[138] The ethnic divisions inherited at Porcupine since the war loomed large in this small sample. Of the four confirmed cases, two were Italian, one Finnish, and one French Canadian. All had varied experiences underground mucking, timbering, driving locomotives, drilling, or scaling. The French Canadian had been an underground shift boss, but the other victims

[136] Elliot, "Silicosis in Ontario Gold Miners," 930.
[137] Elliot, "Silicosis in Ontario Gold Miners," 931.
[138] Elliot, "Silicosis in Ontario Gold Miners, 931.

all worked difficult and dangerous underground mine jobs. Racialized eastern Europeans labourers bore the cost of silicosis most acutely in Elliot's study.

Elliot's had also examined the physical presence of dust in the mines. The methodology was strongly influenced by American studies, to facilitate direct comparison to American mines. Meanwhile, South African standards provided an acceptable base line: 300 particles per one cc of air, or 7,680,000 per cubic foot. Compared to their international colleagues, the Canadian mines came out rather well. The only place where dust was above "acceptable" levels (defined by international standards) was in raises, where wet drilling proved insufficient for keeping down dust. Although Elliot argued that the mines seemed to be doing well in terms of avoiding dust so far, he warned that the problem would grow worse as the industry developed. In his conclusion he recommended annual examinations for all men employed underground for more than five years, increased ventilation in the mines, and the discontinuation of all dry drilling. The mining industry was listening, although it would not realise the extent of the crisis for two more years. In 1924 the Dome Mining Company bought its own x-ray machine.[139] This was housed in the compressor room until 1929. Experts from Toronto (Dr. Haig and the Dr. Bain) used it to examine miners. The x-ray had a long life in the mines, and was used to test thousands of miners in Porcupine over the next several decades.[140]

[139] X-ray apparatus receipt, Dome Mines Limited, 21 April 1924, Silicosis, Box 10, General Superintendent's Files 1926-35, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.

[140] In 1929, the equipment was finally moved to Saint Mary's Hospital in Timmins as part of the transfer of silicosis examinations to the mandate of the Worker's Compensation Board that year "Fine New X-Ray Equipment Installed at the Hospital," *Porcupine Advance,* 10 Jan 1929.

In the summer of 1925, the Ontario Department of Mines sent its Chief Inspector T.F. Sutherland to South Africa to study mining conditions. He was specifically instructed “to report upon…accident prevention and silicosis.”[141] The choice reflected South Africa’s perceived status as a leader in terms of silicosis research and treatment. Broadly, his trip was promoted as part of the government’s effort to deal with the increasing size and depth of the Ontario mines. “We have not yet had…much deep-mining in Ontario,” Sutherland told *The Globe* in the days leading up to his trip, but “both the Hollinger and McIntyre gold mines are pushing down their shafts, the latter having a present objective of 4,000 feet.” The hazards involved in deep mining “increases with depth: cables require to be heavier and stronger, hoisting machinery more powerful, and the difficulties of ventilation increase.” Heat and pressure underground represented additional dangers, and although “Ontario’s present regulations are based on South African experience…they are long standing, and in many cases new methods have come into use.”[142]

In his report, Sutherland compared Ontario to South Africa. South African deposits tended to occur horizontally (whereas Ontario’s were vertical), so “gravity accidents” tended to be less frequent on the Rand than in Ontario. Yet Sutherland believed that “the fact that nine-tenths of their labour is Kaffir [sic]” made the underground conditions more dangerous in Africa than Canada – a racial argument echoed (on a much smaller scale) in Ontario around safety and non-English speakers.

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[141] T.F. Sutherland, *Report on the Mining Accidents in Ontario in 1925*, Bulletin No 54 (Toronto: Clarkson W. James, 1926), 40.
[142] “Is to Study Rules Adopted for Mines in Rand of Africa,” *The Globe*, 25 June 1925.

He also noted that prosecution for violations to workplace safety measures in Africa was much more effective due largely to the fact that specific men were made responsible for workmen. “In Ontario,” he wrote (with the weariness of an experienced Mine Inspector),

> if a stope is not properly scaled, the mine foreman says the shift boss is responsible; the shift boss claims the scalers are responsible for that work, and the scalers say they had not time to get around to it and anyway the machine men are supposed to scale before setting up. Against whom can you take action?[143]

Responsibility in Ontario was not clearly defined. The result was that in South Africa there were a total of 1,673 successful prosecutions in a labour force of 208,000 (1:124) whereas in Ontario there were two prosecutions in a workforce of 12,500 men (1:6,250).[144] The difference reflects Ontario’s much later large-scale industrial development. For many years, Ontario’s mines remained small. The safety of a few miners and prospectors was much more easily monitored and managed. In the newer industrial mines, safety became a complex operational task. As mining’s scale ballooned, safety became a collective problem requiring top-down intervention, especially when the financial interests of the company (and therefore the pressure it put on the miners) prioritised speed and volume.

But the real reason Sutherland had gone to South Africa was because of silicosis. In his luggage on the way home was a copy of South Africa’s Silicosis Act, subsequently filed at Queen’s Park for reference. Sutherland reproduced large sections of it in his

[143] Sutherland, *Mining Accidents 1925,* 41.
[144] Sutherland, *Mining Accidents 1925,* 41.

report, with particular emphasis on examination schedules and compensation schemes.[145] He also brought home a copy of a 1924 Pamphlet by the Transvaal Chamber of Mines outlining the research done to date on Phthisis in South Africa. The pamphlet emphasised water, ventilation, and dust sampling as the most important preventative measures.[146] Finally, Sutherland brought back dozens of blueprints and reported on the practices currently in favour among South African Mining engineers.[147] These were not limited to observations about silicosis. This part of the report wandered away from silicosis and even safety generally to explore everything from rope design to compressors to furnaces to welding techniques currently in vogue in the Rand, and suggest Sutherland (and the Ontario government's) fascination with South Africa's cutting edge brand of industrial extraction.

Meanwhile, silicosis and silicosis research continued to progress on Canadian rocks, with northern Ontario on the front lines. In the latter part of 1925 and the early months of 1926, the Division of Industrial Hygiene and the Provincial Board of Health conducted a survey of workers in Ontario mines and concluded, to no one's surprise, that silicosis was a problem. In 1926, the Ontario Bureau of Mines announced that "in view of the seriousness of the [silicosis] situation," it would begin remedial and preventative measures following South African Practices.[148] The work of Riddell, Elliot, Sutherland, and others contributed to this effort.

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[145] Sutherland, *Mining Accidents 1925*, 45.
[146] Sutherland, *Mining Accidents 1925*, 46.
[147] Sutherland, *Mining Accidents 1925*, 48.
[148] T.F. Sutherland, *Report on the Mining Accidents in Ontario in 1926,* Bulletin No. 59 (Toronto: King's Printer, 1927), 12.

The 1926 accident report for the Ontario Bureau of Mines reproduced Sutherland's 1925 report along with a series of research papers from South African and Canadian experts.[149] No specific recommendations or implications for Ontario were identified for special consideration. It seemed the Bureau intended to copy wholesale the science and recommendations of South African Research. Indeed, on 8 April 1926 the Workmen's Compensation Act was amended to include more specific language for silicosis which separated it from other types of compensation. The language exactly copied the definitions of the silicosis stages as they were articulated by the South Africans. By that year, the Board had accepted fifty-three cases in the ante-primary stage, forty-one in the primary, fourteen in secondary, and fourteen with silicosis complicated by tuberculosis. The year before, it had compensated its first case of death by silicosis.[150] This new, separate system of compensation reflected silicosis' special status within the category of industrial disease, as well as the perception among legislators and workers compensation advocates that the disease was somehow different than other ailments.

With these changes to the compensation Act, silicosis finally hit mine operators in their pocketbooks, and the disease became much more widely discussed. The community had seen it coming: people had seen (and even been tested by) the Toronto doctors travelling in and out of Porcupine to take chest x-rays and life histories. Although rumours flew, few understood the disease (or its implications) very fully. Dr. Hague held a public address at the Kiwanis Club in Porcupine in July 1926 to address some of their

[149] Sutherland, *Report on Mining Accidents 1926,* 12.
[150] Ante-Primary being the least severe, primary and secondary being debilitating, and complicated with tuberculosis being nearly always fatal. Sutherland, *Report on Mining Accidents 1926*, 11.

concerns. Here Hague explained in layman's terms how dust might be taken in to the lungs of men working in enclosed spaces. He touched briefly on the tuberculosis bacilli, its relationship to silicosis, and (demonstrating considerable awareness of the progression of lung disease research) its role in impeding understandings of silicosis. He also acknowledged the recent presence of foreign doctors and other experts at Porcupine, and the alarm their presence sparked in the community. He told the audience not to worry, because "many examined here had been found entirely OK." He finished his talk by showing slides of diseased lungs, including one of a tuberculosis victim whose body had begun to heal itself.[151] The overwhelming sense was one of reassurance and control.

Hague's talk emphasised the cooperation between the government and the mining industry on the silicosis matter, but the truth was that the government possessed a much better grasp on the situation. Silicosis' seriousness had only recently dawned on the mining companies. In 1926, they took their first step toward action. On November third and fourth, the Ontario Mining Association pulled together a Silicosis Committee, which met for the first time in Hollinger's offices in Porcupine. Representatives from companies across the gold zone were present, along with members of the worker's compensation board (V.A. Sinclair, Chairman, Dr. Bell, Chief Medical Officer, and Mr. Graham, head of claims) and two men from the American Bureau of Mines in Washington (Dr. R.R. Sayers and Mr. D. Harrington). Two other doctors with silicosis experience (Haig and Bain) also sat in.

[151] "Earnest Work in Combatting The Spread of Silicosis," *The Porcupine Advance*, 15 July 1926.

Until 1926, silicosis compensation had been relatively disorderly. Sinclair pointed out that some men who had received a payout for silicosis continued to work underground in dusty conditions, even though the payout was intended as compensation for lost wages following disability, and some even continued to receive awards as their conditions worsened. Not only that, but there was no agreed-upon method for determining whether a man suffered definitively from silicosis, and no way for a mine to know if a man they hired had already been diagnosed with the disease. Furthermore, silicosis compensation came out of general funds. This was a problem because silicosis only affected miners in the gold industry and therefore a special assessment above and beyond what the mines already paid for accident compensation was recommended.[152]

If the compensation process thus far had been ad-hoc, the Workmen's Compensation Board was nevertheless more motivated to assist men with silicosis than mine management. The minutes from the Silicosis Committee's meeting suggests that the companies were caught flat-footed. Like tailings waste and dynamite boxes, Silicosis had not been something they had thought much about. They had no statistics of their own, knew very little about the disease and its progression, and relied almost entirely on the Board representatives and the doctors in the room. On the advice of Sinclair, following the 1926 meeting, the companies hired two doctors (Haig and Bain) recommended by Dr. Bell of the Public Health Department for $1200 per year. They would referee silicosis cases because the x-ray machines alone, according Dr. Sayers from the American Bureau

[152] Minutes of a Meeting of the Silicosis Committee, held at the Hollinger Mine Office, Porcupine, on Wednesday, November 3rd, 1926, at 8pm, Silicosis, Box 10, General Superintendent's Files 1926-35, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.

of Mines, were unreliable. The films must be taken in conjunction with the history of each man and his individual physical condition. This, combined with ventilation and water, was the only way to manage the crisis. Sayers also noted that the Porcupine x-ray films closely resembled those he had seen from South Africa, and had fewer similarities with the Broken Hill slides collected in Australia. The committee expressed interest in obtaining the services of "Dr. Irvine" or "Dr. Smith," famous South African doctors experienced in silicosis diagnosis.

Based on the assessment of silicosis cases thus far, the secretary of the committee presented a silicosis index which calculated fair rates of assessment based on incidence of silicosis thus far detected in the different mining camps. Amounts were calculated based on the percentage of silicosis cases found in each area. Although the sample sizes were small and irregular, the Committee needed a quick financial solution to its looming compensation problem. Members agreed to the board's assessment – on the understanding that this was a temporary arrangement subject to revision following better silicosis research. From this point on the mines began keeping careful silicosis records. The Dome Fonds, for example, contain multiple boxes of silicosis records starting after 1926. By 1930 the firm had its own statistics to employ in discussions on compensation and regulation of the disease.

As the mines struggled to come to terms with the invisible threat within their midst, social inequalities established in the previous decade structured parts of the debate. In 1927, a memorandum on Dr. Haig's examination technique noted that at one point two Finns were examined. Only one of the men spoke passable English, which was a major problem considering the central role of occupational history in diagnosing silicosis. Haig relied on translation, and as the memorandum noted, "some mistakes might be very apt to occur" in such circumstances.[153] In (undated, post-1929) meeting notes, Dr. N.H. Russell, Medical Officer in the Porcupine District for the Workmen's Compensation Board was "questioned as to whether or not there was any relation between nationality and incidence of silicosis and tuberculosis." In response, Russell "stated that Finns and Italians were apparently more susceptible."[154] He also recommended that Finns and Italians be subjected to more frequent and intensive examination than other miners.

South African expert Dr. J.M. Smith eventually did come to Ontario to research silicosis. He spent several months in northern Ontario examining miners and administrative systems and left, in 1928, with the somewhat relieving news that "conditions were not as bad as had been feared," but that all workmen should be examined and that a regular system monitoring the disease needed to be maintained.[155] This finding was lauded by the industry – the *Northern Miner* ran an article called "Silicosis Not So Bad As Feared" in the summer of 1927, following the annual meeting of the Mining Association which pointed out that the disease affected the gold mines, but not the silver or nickel mines, and, further that Ontario was not suffering nearly as badly as the Rand.[156] A year later, the journal published nearly the same article ("Silicosis Not Bad As Thought") which argued that inexperienced Canadian doctors had overestimated

[153] "Memorandum in Connection with Examinations by Dr. Haig at Porcupine," Silicosis Prior to 1920, Box 6, 1925-26 Files, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.
[154] Meeting of the Silicosis Committee, n.d., Silicosis, Box 10, General Superintendent's Files 1926-35, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.
[155] "Silicosis Grants," *The Northern Miner* 29 March 1928.
[156] "Silicosis Not So Bad as Feared," *Northern Miner* 14 July 1927.

the prevalence of the disease, and had since been corrected by American and South African experts.[157]

But statistics told a different story, and deaths and new cases crept upwards into 1930.[158] By the time Ontario's Dr. J.G. Cunningham returned from the League of Nations' first annual Silicosis Conference in Johannesburg in 1930, eighteen more silicosis victims died and hundreds more identified as suffering from various stages of the disease.[159] By this time, the mines' silicosis policy almost perfectly mirrored South Africa's: Ontario exactly adopted the scheme of diagnosis and the recommendations of the Miners' Phthisis Bureau of South Africa over the course of its silicosis saga.[160] Silicosis was a thoroughly transnational event. Government fonds abound with communication between government offices on the subject of silicosis and compensation, especially between Canada, the United States, and South Africa.[161] Ontario sent copies of its silicosis legislation to foreign governments for reference and collected literature and statistics from abroad.[162]

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[157] "Silicosis Not Bad as Thought," *Northern Miner*, 21 June 1928.
[158] John F. Paterson, *Silicosis in Hardrock Miners in Ontario (A Further Study)*, Bulletin 173, Ministry of Natural Resources, Ontario (Toronto, 1973), 33-35.
[159] Dr. J.G. Cunningham, "Occurrence of Silicosis in Canada," *Labour Gazette*, January 1931, 39-40.
[160] Cunningham, "Occurrence of Silicosis in Canada," 39-40.
[161] See, for example, C.S. Oettle to The Secretary of Health, 31 July 1929, Vol. 629, File 455-13-6, Industrial Health – Diseases – Silicosis, in the Environmental and Occupational Health Files, RG 29, Department of Health Fonds, Library and Archives Canada, Ottawa, Ontario.
[162] See, for example, "Department of Commerce, Washington, 18 November 1925, Vol 629, File 455-13-6, Industrial Health – Diseases – Silicosis, in the Environmental and Occupational Health Files, RG 29, Department of Health Fonds, Library and Archives Canada, Ottawa, Ontario; "number and percentages of miners according to nationality and final diagnosis Western Australia – 1925-26," Vol 629, File 455-13-6, Industrial Health – Diseases – Silicosis, in the Environmental and Occupational Health Files, RG 29, Department of Health Fonds, Library and Archives Canada, Ottawa, Ontario.

The transnational nature of the mining industry allowed the government and the mining companies to collaborate on solutions, but it also created unexpected problems. In a series of correspondence between the provincial and federal governments in 1930, officials discussed the problem of miners arriving in Canada already suffering from silicosis. A Timmins-based correspondent for the ministry of mines wrote in 1930 that "there are a considerable number of miners coming in to this camp from the old country, who, upon examination, have been turned down for silicosis." Apparently, many of these men had worked in the South African gold mines, been compensated there, and then moved to Canada to find work.[163] The lack of clarity around the causes of silicosis played a significant role in enabling Canada to prevent the immigration of silicosis victims. Since silicosis was not in itself infectious, it was not clear grounds for denying entry to the country. In a letter to London, the Canadian government cited a research paper showing the association between silicosis and tuberculosis to argue that silicosis victims should be prohibited from entering the country: "some pretty good authorities suggest that an infective element must always be present in addition to the dust to enable it to exert its fibrotic influence," reads a letter from the Canadian Immigration Medical Services. In deciding what to do about the issue, the first order of business was to find out how other countries were handling the situation: "it is thought that you would do well to begin your work by first getting information as to what the other dominions and the United States are

[163] W.J. Egan to J.A. Amyot, 14 May 1930, Vol 629, File 455-13-6, Industrial Health – Diseases – Silicosis, in the Environmental and Occupational Health Files, RG 29, Department of Health Fonds, Library and Archives Canada, Ottawa, Ontario.

presently doing, if anything, to prevent silicotic people from migrating."[164] British doctors followed this advice and heard back from Australia, South Africa, and the United States.

Indeed, if the government and mine management tried to give the impression of control, this was a regime of crisis management. A post-1929 Dome memo referred to the massive prices paid by the South African government and urged a joint research project on Ontario silicosis. It pointed out that the South African government had a cheap Indigenous labour force which took the brunt of silicosis exposure at a cheaper cost: "one fact we must not lose sight of. The figures given for the Rand did not include amounts expended on native labor…with us we have no such cheap native labour to be compensated for at lower rates so that every silicotic case we have means expenditure on the maximum basis."[165] The Rand had been able to offload the costs of its environmental crisis to its African workforce, something that the Canadian mines with their hierarchical but still predominantly white workforce could not afford to do. The sheer cost of silicosis caused constant anxiety for the mines, and still many questions remained. How could silicosis be separated from tuberculosis victims? Should tuberculosis be considered an industrial disease? How could the companies keep silicotic workers from contracting silicosis and worsening their case (and thereby increasing the amount of compensation they were eligible for)? How could remote mines, which must depend on whatever labour came to them, regulate silicosis? Where would the money come from for compensation,

[164] J.D. Page Chief Immigration Medical Service to Dr. H.B. Jeffs, 13 October, 1930 Vol 629 File 455-13-6, Industrial Health – Diseases – Silicosis, in the Environmental and Occupational Health Files, RG 29, Department of Health Fonds, Library and Archives Canada, Ottawa, Ontario.

[165] Meeting of the Silicosis Committee, n.d., Silicosis, Box 10, General Superintendent's Files 1926-35, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.

sanitoriums, and education? At one point one of the mining company representatives chillingly "referred to the fact that in South Africa there were mines which were unable to close down because their liability for silicosis compensation is so great that all future profits would be required to pay their silicosis liability."[166] The specter of massive compensation costs haunted the mines well into the 1930s, and proved a powerful motivator for corporate action.

Silicosis produced the first shreds of doubt about the ability of the international community to provide good answers for Canadian environmental-industrial health problems. The silicosis committee agreed on the fact that the results of all the cumulative research from the last two decades of silicosis in other nations "were not very definite." There was a clear sense that there was no blanket solution Canada could adopt from this body of international work.

> South Africa was not wholly comparable to Ontario and it was felt that the Mining Association should make a study of the causes of silicosis and try and find a remedy. Medical men should consult geologists and mineralogists; they should examine slides to determine the shape and nature of dangerous dust particles and should not believe that South Africa and the United States have the only results that can be obtained.[167]

Ontario, it was felt, might be different. And at any rate, no one else seemed to have a good handle on the situation. Finally, "the situation is serious enough for us to spend a substantial amount of money to try and determine the cause and remedy."[168] At that point, Depencier from Dome pulled out information from Mysore mines in India, where they

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[166] Meeting of the Silicosis Committee, n.d., Silicosis, Box 10, General Superintendent's Files 1926-35, Dome Mines Company Fonds F 1350, Archives of Ontario, Toronto, Ontario.
[167] Meeting of the Silicosis Committee, n.d.
[168] Meeting of the Silicosis Committee, n.d.

drilled dry, which showed that "the miners did not develop silicosis."[169] There were a lot of questions about silicosis that still needed answering, and the Canadian mining association felt that perhaps it was time to come up with their own answers. This moment was a marked significant change in the history of the industry, which had almost always exhibited the deepest trust in the knowledge, technologies, and people from its overseas community.

The silicosis story has a heavily ironic ending. Cases continued to escalate throughout the 1930s until the aluminum dust solution "McIntyre Powder" emerged from work conducted by the McIntyre Foundation (the research body which grew out of the Mining Association's desire for Canadian studies on silicosis).[170] The McIntyre Foundation research showed that aluminum dust administered to rabbits prevented silica dust from dissolving into the silicate acid which damaged the lungs. A short study on volunteers was conducted in 1939, but some medical professionals wanted more human testing (with control groups) done. Unfortunately the long delay needed for results of these tests combined with the immediate need of the mines meant that further testing was never conducted and many mines adopted the powder wholesale without knowing its full effects.[171] The Canadian government neither endorsed nor condemned the practise of administering "dust therapy" in the absence of research showing either its benefits or risks. Now infamous for its role in neurological disease among miners, McIntyre Powder

[169] Meeting of the Silicosis Committee, n.d.
[170] Dieter Grant Hogaboam, "Compensation and Control: Silicosis in the Ontario Hardrock Mining Industry, 1921-1975," (Master's thesis, Queens University, 1997), 121.
[171] Hogaboam, "Compensation and Control," 121.

was eventually used in America, Australia, Chile, Mexico, and South Africa as well as in Canada.

The international community finally blew the whistle on McIntyre powder. Citing Australian research which showed aluminum powder heightened tuberculosis risk, United Steelworkers of America and other North American unions began rejecting the forced inhalation of the powder in miners' change rooms in the 1950s. The practice of administering the dust to miners finally ended in all mines in 1979.[172] McIntyre Powder embodies the international nature of Porcupine mining, the hegemony of technological solutions to environmental problems, and numerous other themes in the history of the industry in Canada such as its adopted socio-racial hierarchies and gradually escalating scale. In searching for a technical solution to silicosis, Ontario mines would once again offload the cost of overcoming environmental problems elsewhere. In this case, this burden was immediately invisible, only to crop up much later when retired miners began dying of neurological disorders. After more than a century of violence against workers' bodies, silicosis has proved the slowest and deadliest environmental disaster stemming from the mining industry at Porcupine.

Crisis Environment: Conclusions on the Nature of 1920s Disaster Management

In the aftermath of the Hollinger fire, Supreme Court Justice T.E. Godson wrote "the evidence does not indicate, nor do I find that a recognized danger was carelessly cast aside in order to achieve major production."[173] The same might be said of silicosis. As

[172] Hogaboam, "Compensation and Control," 121-132.
[173] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.

tempting as it may be, the silicosis crisis cannot be used as evidence of a malicious corporate scheme to undermine the health of miners. Both silicosis and the Hollinger Fire snuck up on mine managers and miners alike, who acted logically given the circumstances. Their hold on viability in Porcupine had always been tenuous, and they treated these 1920s disasters with the same solutions that had worked well for them in the past: By drawing on international expertise for technical solutions. McIntyre powder, like the Mattagami dam, offloaded the costs of overcoming environmental problems to marginalised people (retired miners). However, there are plenty of examples where the mines bore the costs of environmental solutions with increased operational costs – albeit usually at the direction of the provincial government (for example, the adoption of improved ventilation techniques and rescue cars following the Hollinger Fire). Indeed, as the mines forged ahead into deeper shafts and lower grades, the provincial government and mine managers actively looked ahead (and abroad) in an effort to prevent environmental roadblocks like silicosis from adversely affecting profits.

Understanding the environmental history of mining in the 1920s means recognising that the stakes of overcoming crises had become extremely high. In the pursuit of ever-lower grades, the mines had become industrial behemoths. In 1928 Hollinger employed 2500 men, 1,540 working underground, with 89 bosses. The mine included 100 miles of underground drift, 8 miles of shafts, consumed 835,000 gallons of water per day, and produced 370,000 tons of waste rock per year. Meanwhile, work commenced on 156 working stopes, while 113 stopes waited to be filled, 29 stopes in the process of being filled, 153 stopes partially filled, and 42 stopes filled.[174] All this to produce 6000 tons per day of ore. Powered by ever rising numbers of men, money, and machines, the mine rumbled on through time and space with an incontrovertible momentum. Unexpected environmental problems threatened to bring down everyone with personal, financial, and ideological stakes in their production, and there is little wonder that everyone scrambled frantically for solutions to keep the gold coming out of the ground.

Both silicosis and the Hollinger Fire came out of human and environmental change. In the case of the fire, the increased tempo of industrial mining produced waste above and beyond what mines had ever imagined having to deal with. This waste built up above and below ground, changing the physical landscape so rapidly it became difficult to keep track of. In the case of silicosis, the disease was recognised because of the work of international science and the rise of consciousness around industrial disease and worker's compensation at home and abroad. But it was also a natural product of the rock which had always been there and had always released silica dust. These processes were only ever partially under human control.

American silicosis historians David Rosner and Gerald Markowitz read silicosis' story as the first instance in which people finally began to doubt the notion that science and technology were unrivaled forces for good. The dust's clear link to industrial extraction and the inability of the mining companies to adequately address it, they argue, shook human faith in modern projects of industrial development.[175] However, the

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[174] "Hollinger System Blamed," *Northern Miner*, 31 May 1928.
[175] Rosner and Markowitz, *Deadly Dust*, 8.

evidence from Canada shows that no one north of the border ever doubted technical solutions. There was an unwavering faith at all levels of the documentary evidence in the possibility of international and/or technical expertise to solve environmental problems. When the international scientific community failed to provide satisfactory answers, mine management looked to do *more* science, not less. It was this faith in technical environmental management which shaped the nascent conservation movement in Porcupine as it emerged out of the tailings-filled lakes and dust-filled shafts in the late 1920s.

Conclusion: Mining Stories, Conservation, and Fulfilling the Industrial Dream

As the financial crisis took hold after 1929, Porcupine entered a long period of relative stability. Unlike many global commodities, gold held and even increased in value through the depression. The patterns of industrial extraction begun in 1909 had matured into fully fledged mining systems. Many of the environmental difficulties of the past two decades had been solved or mitigated. Miners still suffered from silicosis, but workers compensation had been mostly worked out and mine safety had become a matter of routine. Companies could usually rely on having enough power to process their ore. Better roads and rail infrastructure meant transport was rarely interrupted by snowfall or spring mud. The depression created a plentiful labour market. Dividends steadily rose, wages were good, and the town sprouted new homes, schools, and parks.[1] Mining's stakeholders had endured the challenges of discovery, fire, floods, geological uncertainty, consolidation, war, strikes, electricity shortages, and industrial disease. Now they entered a period of relative calm as their community became a seemingly permanent node of the industry supported by a growing network of local, provincial, and international connections.

The industry possessed a new self-confidence buoyed by its improving fortunes and reinforced by its successes. The period was marked by expansion, celebration, and reflection by the companies and the government. Many of the prospectors who entered new gold fields at Red Lake and Woman Lake in 1925 and 1926 did so with technology,

[1] Michael Barnes, *Fortunes in the Ground: Cobalt, Porcupine, & Kirkland Lake* (Erin: Boston Mills Press, 1986), 139.

capital, and experience gained at Porcupine. These tentative experiments of the 1920s expanded into full-scale expansion projects in the 1930s. After recovering from a mill fire in 1929, Dome began looking overseas to South African frontiers, and obtained stocks in several South African properties through the 1930s.[2] The company also sent prospectors into Quebec and the Northwest Territories.[3] Similarly, Hollinger pursued a "policy of exploration and investigation of outside properties…more vigorously than in former years," especially at nearby properties around Kirkland Lake.[4]

By 1930, the mines were surrounded by a community which drew its identity from the industry. These years became an important moment for story-telling about people and their relationship to the land as it had evolved since 1909. The inner workings of big mines had become more mysterious over time - only underground miners regularly entered the depths of the mine, and new safety standards created physical barriers between the mine and the community. As a way of dispelling mystery, and perhaps spurred by the deaths of some of the industry's founding figures, corporate and popular media increasingly felt the need to explain the community's mining past.[5] The *Porcupine Advance* told Hollinger's foundation story in 1929, and Hollinger produced a movie (shown at the Goldfields Theatre in Timmins) which portrayed the underground workings and other features of the mine.[6] The *Porcupine Advance* published a regular "Ten Years

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[2] Girdwood, *The Big Dome*, 85.
[3] Girdwood, *The Big Dome*, 91.
[4] Hollinger Annual Report 1935, 3. Archives of Ontario.
[5] Noah Timmins and Sandy McIntyre, among others, died in the early 1930s.
[6] Smith, W.H. "Tells the Story of the Discovery of the Hollinger Mines," *Porcupine Advance*, 7 March 1929; "Goldfields to Show New Picture of Hollinger," *Porcupine Advance*, 11 July 1929.

Ago in Timmins" segment, and ran a history of the origin of area names in 1930.[7] In 1936, General Manager of McIntyre Mine R.J. Ennis published a history of the mine, and Stephen L'African wrote an exhaustive piece on "early mining facts of Porcupine."[8] Despite the fact that industrial mining possessed few of the characteristics of early prospecting, these accounts invoked an older narrative of hard work, adventure, and risk. The 1930s marked the sensational return of the "good old days" of the original Porcupine Gold Rush.[9] Such stories served both as a marker for the technological advancements made since 1909 and as a way of romanticising what had become corporate-dominated industrial work.

Among these narratives, a sense of Canadian exceptionalism on the international mining economy was taking shape. In a 1929 article called "Toronto Becomes Big Mining Centre" Canadian Mining World editor Sidney Norman declared the Toronto Stock Exchange "not only the leading mining market on the North American Continent…but the greatest in the world." Norman cited Toronto's unique location at the "centre of the most productive and intensely industrialised area in the Dominion" only a short train journey away from the location of "one of the greatest mining movements the

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[7]"History – Origin of Mine Names – Hollinger, Dome, McIntyre, Coniagas, Norenda etc. Origin of names on T &N.O. Railway Extension," *Porcupine Advance* 8 May 1930, 2.
[8] " "McIntyre Mine – Mine History by R.J. Ennis, General Manager," *Porcupine Advance,* 15 June 1936, "History – Early Mining Facts of Porcupine Revealed by Stephen L'African," *Porcupine Advance,* 31 May 1936.
[9] See "Boom Days of Porcupine Returning," *The Globe,* 28 August 1924, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1350738491?accountid=12347 (accessed 2 April 2018); James Scott, "Who Were Discoverers of Porcupine Camp?" *The Globe and Mail*, 26 June 1939, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1323570725?accountid=12347 (accessed 2 April 2018).

world has witnessed."[10] News of Canada's ascendance was a well-publicised phenomenon: *The Globe* said that, thanks to northern Ontario, "Canada has today earned a position of international prominence among the mineral producing countries in the world." In 1935, at the peak of the industry's success, the Canadian Department of Mines published *Gold In Canada* – a complete report on the state of the industry. It began with an analysis of Canada in relation to the world: it compared Canadian production against contemporary Australian, Russian, American, and South African figures.[11] Although the Transvaal dominated the numbers, Canada's production had climbed steadily through the 1920s until it rivaled the bigger producers in the 1930s. *Gold in Canada* suggested that the greatest parts of Porcupine history were yet to come. It told the story of gold from ancient Egypt to the present, and identified distinct eras of the industry: the conquest of central and South America, the nineteenth century gold rushes exemplified by Australia and California, and the industrial period dominated by South Africa and Canada. The 1930s marked the dawn of an era that belonged to Canada - specifically to the Porcupine, which produced the vast majority of Canada's supply.[12]

In 1936, the Canadian Government's Motion Picture Bureau collaborated with the Department of Mines and Resources to create a series of motion films depicting gold

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[10] "Toronto Becomes Big Mining Centre," *The Northern Miner*, 28 February 1928.
[11] A.H.A. Robinson, *Gold In Canada*, (Ottawa: King's Printer, 1935), 20. By the 1930s, northern Ontario was responsible for more than 90 per cent of gold production, and within this context, British Columbia and the Klondike received only passing mention.[11] Robinson, *Gold In Canada*, 19, 23-34.
[12] For a discussion of the centrality of mining investment for Canada from an Ontario perspective in the post-war era, see Chris Armstrong, *Moose Pastures and Mergers The Ontario Securities Commission and the Regulation of Share Markets in Canada, 1940-1980,* (Toronto: University of Toronto Press, 2001).

mining in Porcupine, Kirkland Lake, and Norada.[13] The Department of Mines and Technical Surveys also produced a series of photographs of Porcupine mines highlighting the technology and infrastructure of the camp. Classic examples of industrial sublime, these images portray massive cyanide vats, mills, offices, furnaces, shafts, mine timbers, trams, nuggets, and gold bricks. The people in these images are seamless parts of the mining system: Miners are pictured moving between parts of the mine, drillers and drill bits lean against the walls of huge underground chambers, long rows of ball mills gleam under the eves of enormous structures, and assayers carefully pour molten metals (see figures 9, 10, 11, and 12). In these images, Porcupine, its geology, and its environment becomes a backdrop for displaying Porcupine's industrial ascendance.

Stories about the past also functioned to celebrate the connections Porcupine had built with an international community of mining frontiers since 1909: A *Globe and Mail* article from 1938, for example, commemorated the ten-year anniversary of the Hollinger Fire with a piece about international friendship between mining nations.[14] This was not a one-sided portrayal: International media also wrote about Porcupine as part of a bigger (romantic) era of gold discoveries. For example, Kalgoorlie mining investor and prospector James P. Hallahan recounted his adventures at multiple goldfields, from Chile to New Zealand to Mexico to Australia to the United States and finally to Canada in the nineteenth century, and a full page of *The Australian* was devoted to "the importance of

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[13] Dominion of Canada Report of the Department of Mines and Resources for the Fiscal Year Ended March 31, 1937 (Ottawa: King's Printer, 1937), 14.

[14] "Hollinger Tragedy Just Ten Years Ago marked by Great Heroism and International Friendship," *The Globe and mail* 10 February, 1938, http://libaccess.mcmaster.ca/login?url=https://search.proquest.com/docview/1351772018?accountid=12347 (accessed 2 April 2018).

Ottawa" in the "primary industries of the Empire."[15] The celebration of the Porcupine Gold Rush was tied to celebrations of gold mining generally, and to the accomplishments the industry had experienced across multiple goldfields by the1930s.

Figure 10 Hollinger Mine - View from Survey Office roof looking east showing men after changing coming off shift and entering punch house (left), Timmins, Ontario, 1936, PA-017577, MIKAN No. 3374942, Canada Department of Mines and Technical Surveys, Library and Archives Canada, Ottawa, Ontario, Canada.

Porcupine's place in this wider transnational context meant that the community

[15] "From Windjammer to Gold Trail: Adventures in Many Countries," *The Daily News* 15 January 1923, http://nla.gov.au/nla.news-article82520086 (accessed 2 April 2018); "Primary Industries of the Empire," The Australasian 28 May 1932, 39, http://nla.gov.au/nla.news-article142426668 (accessed 2 April 2018).

wove together a mining identity with other relationships to the land. Porcupine residents enjoyed active outdoor lives and engaged a nascent tourism industry. The road north of Cobalt through the Temagami Forest Reserve had originally been built for tourist traffic coming north in newly popular automobiles.[16] An emerging cottage industry at Nighthawk Lake and a Bayside Beach Resort with "dancing, boating, bathing, fishing, tourists' huts for Rent, Camp Sites, etc." sprung up at Frederick House Lake.[17] Dog races and long-distance skiing became celebrated forms of recreation in the winter, and baseball on new company-funded diamonds drew crowds and media attention in the summer.[18]

George Prucila, interviewed about growing up in Porcupine in the 1930s in 1982, explained how mining identities were balanced in the mining town. Prucila recounted the famous story of the Porcupine fire as the old timers had recounted it to him in the 1930s. Prucila's interviewer assumed that, besides the fire, "memories of South Porcupine would be mining." Prucila countered with "mining and sports." Mining was important, but other parts of community life defined Porcupine equally powerfully. Prucila's father had been a miner and tied his identity closely to his craft. Prucila called his father a "development miner." Development mining was different: "There was a certain type of person that would be a miner of this [development] type," he explained. Development miners were paid more and they were "freewheeling…risk-taker[s]." At Prucila explained:

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[16] S. A. Pain, *Three Miles of Gold: The Story of Kirkland Lake* (Toronto: Ryerson Press, 1960), 69.
[17] "Bayside Beach Resort Opened at Barber's Bay," *Porcupine Advance*, 13 June 1929.
[18] "Special Features of the Big Dog Race, March 6th," *Porcupine Advance*, 21 February 1929; "Clair Severt Starts to Ski to Ottawa in 14 Days," *Porcupine Advance*, 21 February 1929; "Kirkland Lake Wins from McIntyre at Timmins 15-8," *Porcupine Advance*, 24 July 1930; "Successful T.B.A.A. Sports Day Here on Dominion Day," *Porcupine Advance,* 3 July 1930."

> [his father was] a competitive miner…I think they [the development miners] enjoyed not just the good wages from the bonus system but also to be able to keep up and try to be as good or better than the next man and most of the development miners were Finns and Canadians that were Nova Scotians.[19]

There was a sense of pride in the kind of work that he did, which was skilled and highly paid. But there were also drawbacks: the family moved constantly. As a development miner, Pruclila's father primarily work with new mines in the "development" phase, when engineers and managers were still building infrastructure and exploring the deposit. Once the mine reached its stable production phase, he moved on to the next new mine. Other parts of life in Porcupine stand out just as strongly and brought more joy to Prucila's life. He remembered hockey and skating in particular, and he said that being "of Finnish background they had their competition sports and their Finnish theatre and drama and there was always some kind of activities going on." Prucila's interview suggests the way that mining paralleled other ways of being on the land. As a child growing up in Porcupine, Prucila was a (development) miners' son, a hockey player, and a Finn. These identities determined his place in the community and shaped his relationship to place.

Multi-faceted identities and multiple land use occasionally caused conflict between the mines and the community on environmental issues. Porcupine residents relied on the natural environment to support alternative industries to mining. Agriculture continued to limp through the 1930s, although optimism was low. In 1929, the *Porcupine Advance* proclaimed goats the new "cow for the north" and celebrated the success of local hay

[19] Interview of George Prusila, May 1982, Summer Canada Project, Sudbury Public Library, "Memories & Music" 2-4.

growing.[20] Active hunting, trapping, and stock-raising industries appeared in the media during debates about the north's "Wolf Menace."[21] Berry-picking became its own industry -- several tons of blueberries were shipped to Toronto and other urban areas in August 1929. That year, a bumper, the *Porcupine Advance* reported that many families were out in the bush securing "large quantities of fruit for immediate use and for preserving."[22] Prucila's interview offers additional insight. He described a sophisticated and widespread system during the 1930s and 1940s whereby out-of-work miners would pick blue-berries in the bush, flag down the train to Toronto, put their baskets on board, and "get a cheque in about a week's time."[23] The availability of all of these forms of non-mining work relied on separation between the negative effects of the mining industry and large parts of the productive landscape. However, as mining expanded, it increasingly overlapped with alternative economies.

Rising parallel with the industrial sublime, a narrative around conservation and care for nature began to take shape among some Porcupine residents. Starting in the 1920s, a heightened awareness of environmental issues appeared in the documentary record. In the early years, conservation was sold to Porcupine residents on the premise that it could help prevent forest fires – a powerful argument given the town's history.[24] Later, sportsmen extolled the values of the movement's principles for preserving game. Jas. R. Todd

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[20] "Would Goat Make a Good Cow for the North?" *Porcupine Advance*, 4 April 1929, "North Adapted for Making Hay," *Porcupine Advance* 18 April 1929.
[21] "Hope for Legislation to Help Remove Wolf Menace," *Porcupine Advance*, 3 October 1929.
[22] "Now Shipping Tons of Blueberries From North," *Porcupine Advance*, 29 August 1929.
[23] Interview of George Prusila, May 1982, Summer Canada Project, Sudbury Public Library, "Memories & Music" 7.
[24] "Educating the People to Forest Conservation," *Porcupine Advance*, 12 August 1926.

published a long editorial in the *Porcupine Advance* asking that Frederickhouse Lake be set aside as a feeding and breeding place for wild ducks.[25] In 1929, the *Advance* printed an article about the efforts to preserve migratory birds in Canada which referenced the American conservation movement and argued that Canada take similar actions.[26] That year, an active rod and gun club described themselves explicitly as conservationists and worked with the Department of Game and Fisheries to stock local waterways, including Pearl Lake and the Mattagami River.[27] Conservation ideology permeated local consciousness.

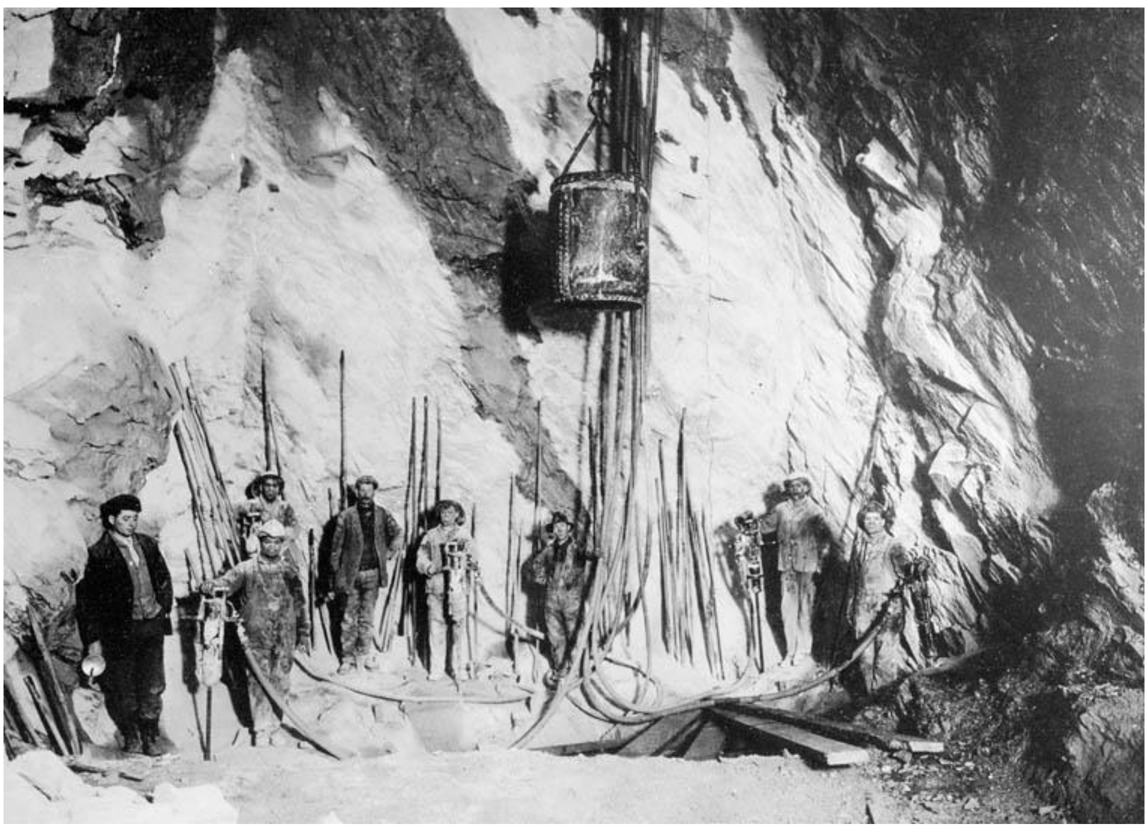

Figure 11 Dome Mine, Porcupine, Ont., 1936, PA-017433, MIKAN No. 3374188, Canada Department of Mines and Technical Surveys, Library and Archives Canada, Ottawa, Ontario, Canada.

[25] "Will you Help Save a Place in the North for Waterfowl?" *Porcupine Advance*, 22 April 1925.
[26] "Efforts to Preserve the Migratory Birds*" Porcupine Advance*, 29 March 1929.
[27] "Speckled Trout Fry for Waters of This District," *Porcupine Advance*, 28 March 1929.

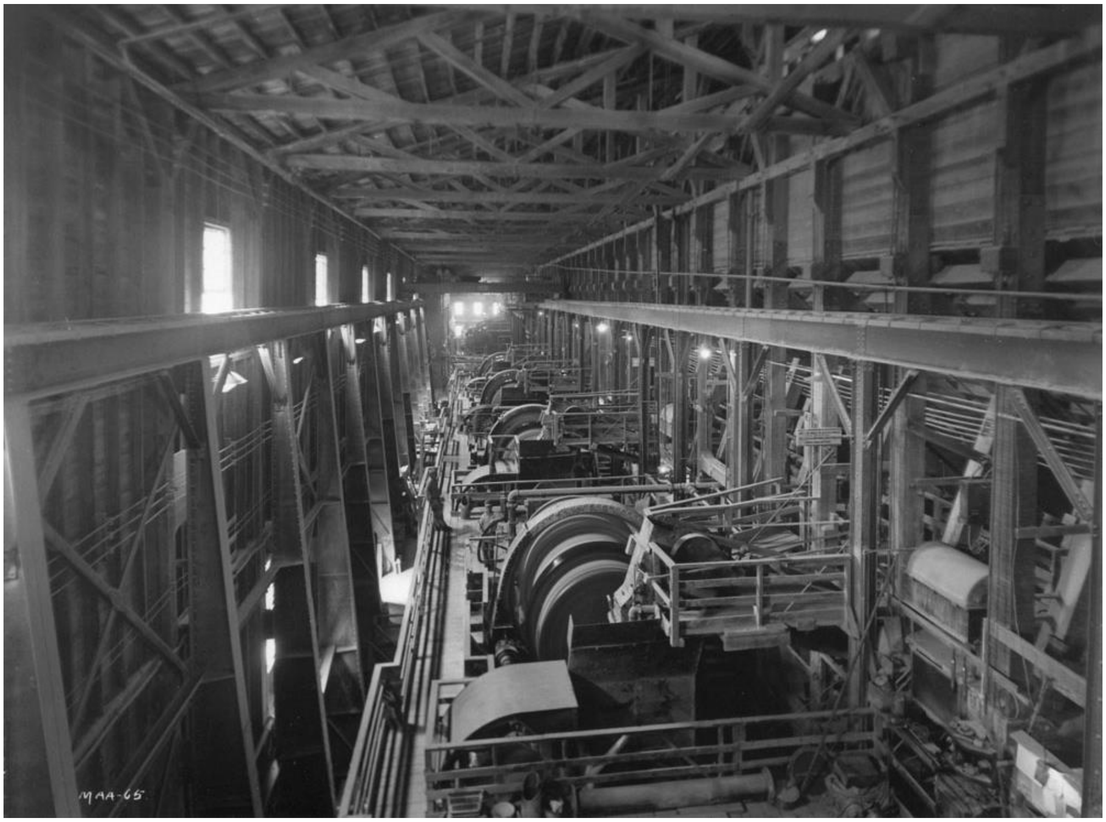

Figure 12 “Hollinger Mine - General view of Marcy ball mills. Timmins, Ont. 1936,” MIKAN No. 3374201, PA-017528, Canada Department of Mines and Technical Surveys, Library and Archives Canada, Ottawa, Ontario, Canada.

Contradictions between mining and conservation began in the 1920s and continued into the 1930s. Water proved the most contentious battleground. However, conflicts usually ended amicably, reflecting Porcupine residents’ confidence in industrial technology to solve environmental problems. For example, in 1923, fishermen noticed that the new dams on the Abitibi blocked spawning sturgeon from travelling up the river. In response, the Hollinger built fish ladders that would allow the animals to pass upstream from their power plants. In the aftermath of Hollinger versus Northern Canada Power, fishermen requested similar modifications on the Mattagami.[28] Media coverage of the incident came off as inquisitive, then celebratory. No one criticized Hollinger's actions or questioned the rightness of the mine's presence on the land.[29]

Direct conflicts of interest existed, and relations were not always friendly. Porcupine residents and mining companies alike kept an eye on the local waterways and their health. In the midst of the conflict between Dome and Digby Vet over tailings disposal, Henry Depencier received a curt letter from the Council of the township of Tisdale inquiring about rumours that Dome planned to pump its tailings into Porcupine Lake.[30] Depencier replied, untruthfully, that "it is not the present intention of this company to pump our tailings into Porcupine Lake" and asked the Council to "inform me as to who intimated…that it was our intention" to do so.[31] Of course, Dome *was* planning to use Porcupine Lake water – until obtaining usage rights became too expensive and it was taken off the table. The animosity and competition between Dome and Digby had radiated from the mines into the community. In 1924, the matter of Porcupine Lake water was again on Depencier's mind, but this time it was Porcupine community members who were the polluters. The township of Tisdale wanted to use it as an outflow for South Porcupine sewage. In a letter to his lawyer Alex Fasken, Depencier observed that "Porcupine Lake water is used throughout our property for washing, laundering, etc, but

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[28] There is no record of whether or not they were ever built on Mattagami. "Hollinger Protecting the Fish in Abitibi River," *Porcupine Advance*, 5 December, 1923.
[29] As preserved in the documentary record, at least.
[30] Frank Evans to Dome Mines Co. 20 June 1922, Box 1 MU 8687 Introductions F 1250 Dome Fonds Archives Of Ontario, Toronto, Canada.
[31] Dome Mines Co. to Frank Evans, 23 June 1922, Box 1 MU 8687 Introductions F 1250 Dome Fonds Archives Of Ontario, Toronto, Canada.

not for drinking purposes." South Porcupine's sewage plans threatened this use, and Depencier wondered "whether we have any rights at Porcupine Lake in this connection." If the sewage plans proceeded, Dome would have to implement "some system of purification in order to be safe, and such an operation may be quite complicated at our plant."[32]

Tensions around water continued into the 1930s. In 1929, a settler sued Hollinger for damages after the mine polluted a stream on his property. The case appealed to notions of water rights which forced the retraction of hydraulic mining in California fifty years before.[33] Although details of the Porcupine case are scarce, it seems that arguments about the value of farm land versus mining carried less weight in Porcupine than they had in California: the settler's suit failed.[34] In another instance, conflict between the mines and the city over water became electoral issue in 1932. Eventually, new water mains, a new pumping station at Gull Lake, and new steel pipes to bring in water from McTavish Lake to Gull.[35] Even where the work of mining directly conflicted with peoples' ability to use the land for washing, drinking, or farming, technology provided solutions for managing resources in a way that satisfied everyone.

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[32] Henry Depencier to Alex Fasken, 14 August 1924 Box 1 MU 8687 Alex Fasken F 1250 Dome Fonds Archives Of Ontario, Toronto, Canada.
[33] Robert L. Kelley, *Gold Vs. Grain: The Hydraulic Mining Controversy in Califnornia's Sacramento Valley: A Chapter in the Decline of the Concept of Laissez Faire* (Arthur H Clark Company: Glendale, 1959)
[34] "Settler Loses Appeal Against Mining Court," *Porcupine Advance*, 2 October 1930.
[35] *Three Miles of Gold*, 85.

Figure 13 “Hollinger Assay Office - Pouring pots containing molten lead & slag into a tray in front of row of muffle furnaces. Timmins, Ont, 1936,” PA-017587, MIKAN No. 3374948, Canada Department of Mines and Technical Surveys, Library and Archives Canada, Ottawa, Ontario, Canada.

These local tensions over land and resources connect to the broader trajectory of the resource economy in the 1920s and 1930s. As the mining industry matured, the connections tightened between Porcupine and broader transnational trends in migration, markets, and mining history. They were fueled by local relationships with the land, but they were also the product of conservation ideology, the global market for gold, the onset of the depression, and common law water rights shared by the British colonies and successor states. These diverse forces converged on the Porcupine and fueled all sides of the debate. Their effects included material alterations to the character of both the landscape and people.

A Century of Mining: The Environmental Legacy of the 1909 Porcupine Gold Rush

If William Parks, the first Bureau of Mines Surveyor in Porcupine, were to retrace his route over the old portage in 2018, he might still find parts of the landscape recognisable. Above the hydroelectric dams to the south, the Mattagami river still flows through its old bed, even if the banks are now lined with Timmins' homes, streets, and businesses instead of tamarac and spruce. At the portage route's halfway point, the little lake Parks observed (Pearl) still exists, but its been half filled in and Goldcorp is pumping oxidized mine water into it from behind a chain-link barbed-wire-topped fence. At the end of the old portage route, a spacious alder forest similar to the woods Parks packed through still surrounds the southern end of Porcupine Lake. Beyond it on the eastern shore, an exposed chunk of shield rock (perhaps the one he proclaimed as "giving promise of reward to the prospector") juts from the lake water. At the north end of the lake, the Porcupine River still winds a meandering, inconvenient path to Night Hawk Lake, crossed only occasionally by enormous haul roads for Kidd Minerals and Goldcorp ore trucks.

Of course, there are also changes. At Pearl Lake there is a new memorial park created for miners who died at work in disasters like the 1928 Hollinger Fire, the rock on Porcupine Lake marks the graveyard put there for victims of the 1911 Porcupine Fire, and remediated tailings flats line the banks of the Porcupine River leaking red oxidized water where gravel caps have eroded. Parks might see these changes as the realization of the Bureau's nineteenth century industrial dreams. By many metrics, mining here has been a massive success. Porcupine played a key part in the formation of a powerful network of international mining companies in which Canada remains a central player. In an industry famed for instability, uncertainty, and unsustainability, Porcupine proved remarkably durable. In a world where historians point to mining as the emblem of our unsustainable relationship with nature, Porcupine looks like evidence that given the right timing, the right networks, and the right geology, extraction can keep going for a very long time.

Gold is finite and Porcupine mining will eventually end. This moment seems to have finally arrived: Goldcorp's Hollinger pit, the last vestige of the 1909 gold rush, will officially close in 2019. In the aftermath, mining's legacy for people and the environment at Porcupine will be difficult to evaluate. The transnational mobility of miners means we will never know the total damage to their bodies wrought by silicosis (or by its aluminum-based "cure," McIntyre Powder) in Ontario or around the world. The economic and social losses experienced by Mattagami First Nation in the wake of 1920s dam building are difficult to quantify given the multi-faceted and multi-generational effect of colonial violence. Even the basic financial costs to Canada as a whole are difficult to calculate. Goldcorp spends hundreds of millions of dollars on remediation every year, and there are hundreds of abandoned properties at Porcupine, all needing care. Cleanup at nearby Kam Kotia mine has already cost the provincial government more than seventy-five million dollars (the government estimated it would cost twenty-seven million in 1999). The mine, originally owned by Hollinger, leaked acidic water into nearby waterways until 1972, including into Kamiskotia Lake, where Timmins residents have summer cottages.[36] Once mining leaves, there are few economic alternatives at Porcupine. The miners may leave for new frontiers – Ontario's Ring of Fire, Alberta's Tar Sands, or the booming mining economies controlled by Canadian companies in Latin American and Africa. When they do, they will bring pieces of Porcupine with them. Shared experiences and expectations for mined land rooted in northern Ontario are already shaping these distant ecologies via established transnational mining networks.

At Porcupine, the story of transnational mining permeates the landscape right down to the cellular level. The origins of this story occurred between 1909 and 1929, as miners, mining companies, and the Ontario government embarked on a Canadian experiment in hard rock industrial mining. As inheritors of multiple generations of global gold rushes and as members of the British colonies and successor states, they did not embark on this experiment blindly. Throughout Porcupine's development, stakeholders in the industry drew on a transnational network of mining colleagues with similar values, goals, and challenges. The boundaries between the townships, the district, the province, and the nation proved permeable to ideas, objects, and people moving between mining frontiers of the early twentieth century. Local environmental history reflected Porcupine's connection to these networks, and it is these connections that make the post-mining future of this land so complicated.

[36] "Environmental cleanup continues at 'Canada's worst mining disaster' in Timmins," CTV News Northern Ontario, 8 June 2017, retrieved from https://northernontario.ctvnews.ca/environmental-cleanup-continues-at-canada-s-worst-mining-disaster-in-timmins-1.3449983 (accessed: 8 April 2018).

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