

Electronic Thesis and Dissertation Repository

10-10-2019 1:00 PM

An Environmental History of Oil Development in Southwestern Ontario, 1858-1885

Robert Armstrong, *The University of Western Ontario*

Supervisor: Alan MacEachern, *The University of Western Ontario*

A thesis submitted in partial fulfillment of the requirements for the Master of Arts degree in History

© Robert Armstrong 2019

Follow this and additional works at: <https://ir.lib.uwo.ca/etd>



Part of the [Canadian History Commons](#), and the [Other History Commons](#)

Recommended Citation

Armstrong, Robert, "An Environmental History of Oil Development in Southwestern Ontario, 1858-1885" (2019). *Electronic Thesis and Dissertation Repository*. 6717.
<https://ir.lib.uwo.ca/etd/6717>

This Dissertation/Thesis is brought to you for free and open access by Scholarship@Western. It has been accepted for inclusion in Electronic Thesis and Dissertation Repository by an authorized administrator of Scholarship@Western. For more information, please contact wlsadmin@uwo.ca.

Abstract

This thesis explores how the local population of Enniskillen, (including the towns of Oil Springs and Petrolia) Southwestern Ontario, reacted to the environmental consequences of oil development between 1858 and 1885. The inception of Canadian's oil industry in 1858 subsequently resulted in the contamination of the river systems, the pollution of the air, and the creation of new hazards in the region. The pollution led to water scarcity, the odour of oil permeating the air, and the threat of oil fires. In order to continue living in the oil region, the local population adapted, either by normalizing the new conditions of the environment or by trying to create solutions to mitigate the threats. Threats such as water scarcity and oil fires had to be dealt with because of the harm they could cause to the community. The strong odour of oil was tolerated as the locals had no way to address it and it did not pose a serious threat to life.

Lay Summary:

During the nineteenth century, in Enniskillen, Southwestern Ontario, the local population experienced drastic environmental change caused by oil industry development. As a result, the local population adapted, either by normalizing the new conditions of the environment or by trying to create solutions to mitigate the threats.

Keywords

Southwestern Ontario, Oil industry, 19th century, Environmental change, Environmental history, Sensory history, Enniskillen Township, Petrolia, Oil Springs, Oil Pollution, Water Scarcity

Acknowledgements

I am indebted to numerous people for their support and guidance throughout the completion of this thesis.

Firstly, I would like to thank my supervisor, Dr. Alan MacEachern, your unwavering patience and guidance helped me produce a thesis that I am proud to have researched and written.

Secondly, I would like to thank my second reader, Dr. Robert Wardhaugh, whose feedback during my graduate courses of study with him and his feedback during my thesis proved invaluable in strengthening the quality of my work.

To the archivists at the Lambton County Archives and the Oil Museum of Canada, thank you for assisting me in sourcing my research material.

Lastly, I would like to thank my friends and my family. To my friends, thank for reminding to strike a balance between my academic and personal life. To my family, I am eternally grateful for your support throughout the completion of my undergraduate and graduate studies. I am especially indebted to my late father, for sharing stories with me about Ontario's hidden oil industry from a young age. Without him, I might have never had the pleasure of unearthing a fascinating chapter in Southwestern Ontario's history.

Table of Contents

Abstract	i
Acknowledgments.....	ii
Table of Contents	iii
List of Figures	iv
Introduction.....	1
Chapter One: Rediscovering Oil.....	20
Chapter Two: Canada’s First Oil Boom	34
Chapter Three: First Bust, Second Boom	77
Chapter Four: Water Scarcity and Oil Spills	92
Chapter Five: Hazards of Life and Labour in an Oil Region.....	109
Chapter Six: The Smell of Air Pollution.....	133
Conclusion	160
<u>Bibliography</u>	164
<u>Curriculum Vitae</u>	172

List Figures

Figure One: Map of Enniskillen	20
Figure Two: Horse Drawn Oil Tanks	43
Figure Three: Pyramid of Oil Barrels	58
Figure Four: Map of Lambton County	86
Figure Five: Oil Wells at Black Creek.....	94
Figure Six: Water Works of Petrolea 1870 and 1900.....	106
Figure Seven: Oil Derricks Above Oil Springs	128
Figure Eight: Centre Street, Oil Fields at Petrolia, Ontario.....	129

Introduction

Global oil consumption has climbed to 100 million barrels per day.¹ For a long time, rising oil consumption was considered a positive sign, indicating economic growth, industrial development, and increased consumerism. However, scientific evidence determined that a by-product of consuming oil, the release of carbon dioxide (CO₂) and other greenhouse gases, contributes directly to an increase in global temperatures across the world.² Because CO₂ holds heat emitted from the sun, the increasing amount of CO₂ released in the atmosphere everyday has resulted in a marked increase in temperature across the atmosphere, oceans, and the surface of the earth, with this process commonly referred to as global warming. On the surface, it is easy to disregard the severity of the temperature increase when examining the numbers. Surface and ocean temperatures have increased “only” by 0.9 degrees Celsius since the late nineteenth century and 0.4 degrees on the top 700 metres of the oceans since 1969. Although this increase in temperature may seem small, the immediate impacts of this increase are being experienced across the globe by every living person. Greenland and Arctic ice sheets are shrinking, glacial retreat is occurring on every continent, there are rising sea levels, and there has been an increase in extreme weather events.³

Global warming is such a daunting problem that it is easy to overlook other environmental problems caused by fossil fuels. The development of oil in particular stands out, as it has the ability to create devastating environmental change on both a global and local scale. At every stage of

¹ Amanda Cooper, “Global Oil Demand to Top 100 Million bpd But Outlook May Cloud,” *Reuters*, September 13, 2018.

² “Carbon Dioxide Concentration | NASA Global Climate Change.” NASA. May 15, 2019. <https://climate.nasa.gov/vital-signs/carbon-dioxide/>.

³ *Ibid.*

being extracted, transported, stored, and consumed, oil has the possibility of altering its surrounding environment in an immediate and destructive manner. The derailment of a train carrying 7.7 million litres of oil in the Quebec town of Lac-Mégantic in 2013 demonstrates the type of environmental damage that stems from mishandling oil.⁴ When the train exploded, forty-seven people were killed, forty buildings in the downtown core were levelled, and an oil spill contaminated over 100,000 cubic metres of soil, while more oil spread through the water system to surrounding communities.⁵ Even after more than a hundred years in technological advancements in the oil industry, oil development continues to threaten human life and the environment.

Since global warming is necessitating change on a global scale as a direct result of human action, it becomes increasingly valuable to understand how people respond to change in their environment. The past is rich with stories of humans dealing with environmental change, so attention and effort should be directed towards history. By studying the past, it is possible to examine how we react to drastic and immediate environmental change. Given the instantaneous and extensive change that oil development can have on the environment, it is worth examining how people in the past reacted to oil pollution. As a result, a study of the local translates to a study of the global, and a study of the past translates to a study of the future.

Between the cities of London and Sarnia, there are a set of towns that stand out amongst the British-named towns common to Southwestern Ontario. Towns with names such as Petrolia, Oil Springs, and Oil City indicate an alternative history that seem more at home in today's major oil producing province of Alberta. However, those familiar with the history of these towns know that they are remnants of Canada's first oil industry. Beginning in 1858, these towns were the

⁴ Julia Page, "5 years after Lac-Mégantic Tragedy, Residents Still Waiting to Feel Safe," *CBC News*, July 4, 2018.

⁵ "Lac-Mégantic an 'environmental disaster,' says expert," *CBC News*, September 17, 2013.

centre of the Canadian oil industry for more than 40 years. During this time, these towns witnessed thousands of wells drilled into the earth, the land dotted with wooden oil derricks, the construction of refineries, and vast fortunes made by enterprising individuals. However, no attention has been paid to the environmental damage caused by the oil industry in the nineteenth-century. While fortunes were made, oil contaminated rivers and the water-table, forests were cut down, and natural gas filled the air. While many people know about the wealth made through oil development, few know about the environmental change that the oil industry left in its wake.

In his book *Changes in the Land*, environmental historian William Cronon suggests that when examining environmental change, “The study of such relations is usually best done at the local level, where they become most visible; the best ecological histories to date have all examined relatively small systems as cases.”⁶ Because the majority of oil development (and so oil pollution) in Southwestern Ontario occurred in Enniskillen Township, that will be the primary focus of this study, but the study will also have occasion to consider the Township of Plympton-Wyoming, North of Enniskillen South of Lake Huron and inside of Lambton County.⁷ Further attention will be given to the Sydenham river system and nearby Lake St. Clair, because the pollution that occurred in Enniskillen was carried through these waterways.

The study examines the mid- to late-nineteenth century history of oil development in Enniskillen Township, Southwestern Ontario, to investigate Canada’s—and the world’s—first oil boom, and how people dealt with the accompanying environmental change. This thesis begins by following the inception of Canada’s oil industry in 1858, and traces the decline of Enniskillen’s

⁶ William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983), 14.

⁷ Petrolia and Oil Springs became their own incorporated townships, distinct from Enniskillen, in the 1860s. However, because they lie within Enniskillen’s larger boundaries, and began as parts of Enniskillen, this thesis will take as its range of study “Enniskillen,” including the two towns.

oil industry into the 1880s. Due to the discovery of new oil fields across the world, Enniskillen oil was unable to compete with cheaper and higher quality oils. Additionally, refineries in London and Sarnia competed with Enniskillen's refineries over oil supplies. Although the oil industry in Enniskillen would continue to produce oil, investment and labour favoured newly discovered oil fields in foreign countries.

This thesis makes the central argument that the environmental change that occurred between 1858 and 1885 in Enniskillen resulted in the locals adapting, either by passively accepting change as a means of adjusting to the new conditions or actively attempting to create solutions to address the ramifications of oil development. Enniskillen was the site of substantial environmental change caused by the growth of the oil industry, which created situations that humans had never dealt with before. At first, the local population ignored the change whenever possible. However, given the destructive and flammable character of oil, a lot of the changes made to Enniskillen resulted in an environment that was less hospitable for humans living there. People wanting to live and work in Enniskillen had to adapt to the altered environment. In the context of this thesis, passively accepting and normalizing change refers to the ways in which locals were cognizant of the drastic change in their environment, but were uninterested or unable to act, and so adapted by ignoring or trying to ignore the transformation. The local population normalized environmental change both when the issues were too immense and complicated, and when they were too minor to be bothered with. This type of change came in the form of normalizing air pollution caused by oil spills, abandoned wells, refining waste, and the mass storage of oil. These problems were easy to ignore because developers were uninterested in the long-term consequences of destructive oil development practices beyond those that proved an immediate threat to property or the lives of the local population. Problems that were more visible and an immediate threat to the welfare of the

community required the local population to create solutions to extreme and urgent disasters such as water scarcity and oil fires. However, when locals were unable to solve a minor threat—oil spills, river contamination, odour—that did not pose a direct harm to life, they then shifted their perception by passively accepting the problem caused by environmental change.

Canada's oil industry began in 1858 when businessman James Miller Williams travelled from Hamilton to what is now Oil Springs. Williams was there to examine what had been reported as dried bitumen, the result of oil seeping out from reservoirs and drying out on the surface of the earth. Williams believed that if the bitumen was properly refined, he could use it as a form of illuminating oil, but to test his theory, he required water, so he dug a well. To his surprise, the well filled up with oil. Williams transported the oil to Hamilton where he built a refinery to process it into illuminating oil. A year later, Edwin Drake struck oil in Titusville, Pennsylvania, the first oil well in the United States. Separated by Lake Erie, Enniskillen and Titusville would share labour and capital in the subsequent decades, as speculators and investors travelled between both oil fields.

The Pennsylvania oil fields grew rapidly from 1859 forward. But the oil industry in Enniskillen struggled to grow until 1862, due to the dense forests and swampland that impeded travel. Without supplies, prospectors struggled to obtain the engines and equipment required to strike rock wells, which required engines and drill bits to cut through the rock, usually limestone, to strike oil. As a result, developers lacking cash had to rely on the lower producing surface wells, which were dug above the rock and relied on oil seepage or pumps to convey the oil to the surface. However, in 1862, when John Shaw struck Canada's first flowing well (also known as a gusher), prospectors began to pour into Enniskillen with the hope of striking their own. The flowing wells encouraged prospectors for two reasons: they produced a lot of oil, and the built-in pressure or gas

in the reservoir propelled the oil to the surface, which meant that developers would no longer have to rely on expensive pumping equipment. For a year, oil production in Enniskillen reached record amounts as these wells could produce 2,000-7,000 barrels of oil per day. The inception of the flowing wells also attracted capital, professional labour, the growth of refineries, and the rise of oil towns to service the development. However, the decline of the Oil Springs' flowing wells by the end of 1862 and their full cessation in 1863 resulted in production crashing and a marked increase in the price of oil.

The oil industry from 1863 to 1866 experienced a period marked by depression, consolidation, and expansion. The immediate crash of the flowing wells resulted in their owners losing a lot of money, but other prospectors looked to capitalize on the high price of oil. In turn, professional oil companies emerged, and larger investors searched for oil across Ontario in the hope of finding vast undiscovered oil supplies. By 1867, Petrolia became the primary centre of oil development in Canada, until 1898 when Standard Oil moved the operations of its subsidiary, Imperial Oil, from Petrolia to Sarnia. The Canadian oil industry was expanding outside of Enniskillen as early as the 1860s. For the purpose of maintaining attention on the most severe impacts in Enniskillen, this thesis will primarily focus on the period of greatest environmental change, from 1858 to 1885.

Historical publications on oil development in Southwestern Ontario have primarily been written with the goal of showcasing the importance of Canada's early oil industry. This is in large part because the majority of the literature has not been written by professional historians, but rather by journalists and local writers looking to provide an overview of the most exciting moments in the region's oil industry. The most recent publications include Hope Morritt's *Rivers of Oil: The Founding of North America's Petroleum Industry*, Gary May's *Hard Oiler: The Story of Early*

Canadians' Quest for Oil at Home and Abroad, and Patricia McGee's *The Story of Fairbank Oil: Four Generations of the Family Producing Oil Longer than Anyone in the World*. These popular histories are highlight reels of the most significant economic and social events to occur in this history of oil development in Southwestern Ontario. They all make sure to mention the start of the oil industry, Canada's first oil gusher, the Fairbank oil dynasty, and the booms and busts that followed oil development. McGee's book, however, focuses less on the importance of the oil industry and instead on the Fairbank family's history in the oil industry and their life in Enniskillen.⁸ Morritt provides a general summary of the oil industry that lacks detail, and in some cases, misidentifies key historical figures. Although her overview of the region's history is the product of deep research into primary sources that touch on issues of race, sex, and gender in Petrolia, she unfortunately does not analyse or expand on these topics.⁹ May's book provides the most comprehensive description of the oil industry itself, as he covers topics ranging from the price of oil to the use of nitroglycerin bombs for drilling wells. However, May's work lacks any analysis, as he chooses to focus on the excitement and importance of the oil industry.¹⁰

Academic historian Christina Burr explores Ontario's oil industry in her 2006 book *Canada's Victorian Oil Town*. Burr examines how a rural community moved from an agricultural economy to an industrial one. She starts her book by providing original research on the early surveys that created the Township of Enniskillen and how the increasing commoditization of oil spurred the rise of the industry. Burr then provides a detailed examination of the rise of the Oil Springs oil industry from 1858 to 1862, its decline after 1862, and then the rise and domination of

⁸ Patricia McGee, *The Story of Fairbank Oil: Four Generations of the Family Producing Oil Longer than Anyone in the World* (Petrolia: Brown Graphics & Printing Inc, 2004).

⁹ "Hope Morritt, *Rivers of Oil: The Founding of North America's Petroleum Industry* (Petroleum: Quarry Press, 1993).

¹⁰ Gary May, *Hard Oiler: The Story of Early Canadians' Quest for Oil at Home and Abroad* (Toronto: Dundurn Press, 1998).

Petrolia as the primary centre of oil development. Burr proceeds to discuss the primary focus of her book of examining how gender, class, and culture worked to transform a former shanty oil town into a respectable “Victorian oil town” in rural Ontario. Other notable contributions by Burr include an examination of land speculation, labour relations, and the culture of speculating for oil.¹¹

Although Burr provides the best historical analysis of oil development, she pays little to no attention to the industry’s environmental effects. Burr acknowledges the existence of oil pollution and environmental change in Enniskillen, but does not discuss what these changes meant to the locals. Burr is not alone in ignoring the implications of oil pollution. All other histories written about the Enniskillen oil industry have largely ignored environmental change. This despite the fact that all describe, for example, the first gusher and the early inability to cap wells, which allowed oil to pollute the land and rivers. Even Hope Morrit’s *Rivers of Oil*, which takes its title from waterborne oil pollution, fails to discuss what rivers of oil meant to the locals. May’s book does quote contemporary interest in addressing environmental pollution, but he provides no analysis to accompany it.

For my primary source base, I have relied heavily on local and outside newspapers. Like the existing local histories on the mid-nineteenth century oil boom, my thesis benefits from local Enniskillen newspapers including the *Oil Springs Chronicle* and the *Petrolia Topic*, but I have also utilized many other distant newspapers. Because of the proximity of the local papers to the Enniskillen community, these papers seemed less willing to talk about the environmental consequences of oil development. Nonetheless, they were beneficial sources for documenting

¹¹ Christina Burr, *Canada’s Victorian Oil Town, Transformation of Petrolia from Resource Town into a Victorian Community* (Montreal & Kingston: McGill-Queen’s University Press, 2006).

accidents, injuries, deaths, and social issues. Newspapers from cities throughout Ontario proved to be the most valuable source in examining the environmental change in Enniskillen, as the reporters did not hesitate to document pollution. Outside correspondents were also more willing to be critical of the oil industry, raise concerns about oil pollution, and try to investigate questions that many locals ignored. British newspapers provided insight as to how a population outside of Canada responded to the importation of a foreign and unfamiliar product. British newspapers published articles that directly criticized Canadian oil, which proved informative on how people interpreted the different odours of oil.

Other sources valuable to my research include foreign journals, government documents, scientific articles, and booklets made available at the Oil Museum of Canada, in Oil Springs, and the Lambton County Archives, in Plympton-Wyoming. Essential sources for my research included the journals of oilmen—John Henry Fairbank, J.H. Johnston, and Ken MacGregor. All of these sources provide essential information on local life, the hazards of the oil industry, and environmental pollution. The *MacGregor Journal* proved especially invaluable to my research as Ken MacGregor kept a detailed account of his life. Furthermore, he provided detail on subjects that otherwise do not receive much attention in local sources: the smell of the region, life as a youth in Enniskillen, and oil pollution in the rivers. Another valuable source is the *Tweedsmuir History of Oil Springs*. This book is a collection of stories, diary entries, and recollections of life in Oil Springs by former locals. Compiled by the Tweedsmuir Women's Institute, the book provides a variety of sources that touch on diverse topics like health, pollution, and general information about Oil Springs. Some of the most useful government sources came from the Geological Survey of Canada, which was involved with the discovery of oil in Enniskillen, and so chronicled the region's development of oil. The local histories on Enniskillen's oil industry have

all used these sources. However, by providing an examination of the environmental impacts of oil pollution in nineteenth-century Canada, I can review the same sources and contribute to an unexamined topic worthy of further attention.¹²

As more people adopted oil for machinery lubrication and illuminating oil in the 1860s, its increasing value resulted in increasingly destructive practices. In *Petrolia: The Landscape of America's First Oil Boom*, American historian Brian Black suggests, "The cultural drive to harvest resources and make them profitable at any cost had become widespread by the close of the nineteenth century."¹³ In Enniskillen, the oil boom drove speculators to manipulate, appropriate, and commodify natural energy in order to lower the cost of development. This meant that oil producers relied on the bodies of ox and horses to lower the cost of teaming oil to the markets, they used rivers to transport barrels of oil via their currents, and they profited off of the natural pressure of the flowing wells (oil gushers) to propel the oil to the surface without relying on machinery. To obtain the highest profit possible, producers appropriated this labour of nature to subsidize the cost of production and transportation. In *Value in the Web of Life, Or, Why World History Matters to Geography*, American historian Jason Moore suggests that natural labour must be appropriated because "Without the exploitation of unpaid work/energy from the rest of nature... the cost of production would rise, and accumulation would slow."¹⁴

The value of oil drove thousands of speculators to adopt risky and reckless actions when searching for oil. Even when these actions were criticized, the concerns had little to do with effects

¹² J.H. Johnston, *Recollections of Oil Drilling at Oil Springs, Ontario* (London Harvey F. Johnston, 1939). Ken MacGregor, Journal of Ken MacGregor. John. H Fairbank, *Journal of John Henry Fairbank. Tweedsmuir History of Oil Springs*, Oil Museum of Canada.

¹³ Brian Black, *Petrolia: The Landscape of America's First Oil Boom* (Baltimore and London: John Hopkins University Press 2000, 8.

¹⁴ Jason W. Moore, "Value in the Web of Life, Or, Why World History Matters to Geography," *Dialogues in Human Geography* 7, no. 3 (2017): 328.

on the environment. Instead, people tried to determine whether oil development was profitable enough to justify the risk. As oil speculators risked money and sometimes their lives, newspapers wrote articles questioning the risky decisions made by prospectors. In support of development, scientific publications and lectures by scientists provided information as to the ideal locations to search for oil. In some cases, these speculators developed relationships with these professional geologists who devoted time to provide detailed theories on the location of oil. Criticism against oil speculation came in the form of poems, short stories, and news articles warning of the danger of catching “Oil Fever,” whereby sensible men were driven to risk everything for oil.

The prospect of wealth from oil development encouraged men to adopt environmentally destructive practices as they attempted to maximize their profits. Starting the arduous process of producing oil meant cutting down forests, constructing derricks, and drilling thousands of wells into the earth. From lack of care and preparation, speculators drowned the rivers and the land with thousands of barrels worth of oil. Oil spills were a persistent reality of nineteenth-century oil development, and little concern was paid to them. Oil pollution was principally not a concern until it began to radically complicate the life of inhabitants. Only when the environmental change began to pose a direct threat to their health and safety did locals start to create partial solutions. When water scarcity was an issue, they shipped water to the region, and when oil fires were a threat, they created measures to prevent them. However, the extensiveness of the environmental change required actions that were less superficial and more permanent if life was to improve. Instead, the locals and even reporters encouraged and created initiatives that attempted to hide the environmental pollution. Overall, attempts to remedy the threats rarely addressed the root cause of these problems.

Cronon suggests that the “Environment may initially shape the range of choice available to a people at a given moment, but then culture reshapes the environment in responding to those choices.” The environment produced oil, culture determined that oil possessed utility worthy of becoming a valuable commodity, and from there, people developed the land to extract this resource. Cronon subsequently suggests, “The reshaped environment presents a new set of possibilities for cultural reproduction, thus setting up a new cycle of mutual determination.”¹⁵ Once people started the process of oil development, the environment permanently changed. Oil pollution made the rivers undrinkable, the odour of petroleum and sulphur made the air difficult to breathe, and the threat of fire made some parts of the region unlivable. Over the mid to late-nineteenth century, the oil industry had left its touch on Enniskillen, making this a new type of environment determined by the pursuit of oil. With Enniskillen adopting traits of an oil region, its landscape offered new hazards and threats that people had never lived with before, and culture determined the type of reactions that people adopted to counter these changes. When people were unable to address environmental pollution, they normalized these changes. Locals grew accustomed to the odour of petroleum and sulphur in the air, despite outsiders consistently complaining about the smell. Locals grew accustomed to the oil wells, derricks, and other machinery that were a consistent part of life in the region.

When analyzing the implications of oil pollution, it is easy to fall into the trap of making this a story of the destruction of an untouched, pristine environment. Although the oil industry drastically altered the environment of Enniskillen, the primary focus of this paper is to examine how people reacted to environmental change. Oil development transformed the environment, which in turn meant that the altered environment offered new opportunities and restrictions. The

¹⁵ Cronon, 13.

locals might become rich from oil development, but at the same time, their continued pursuit of oil created a less hospitable environment. To survive, locals had to adapt, and did so by creating solutions and catering their choices to lower the risk of being harmed by the hazards. However, the solutions were largely band-aids that did not address the fact that oil development itself was the underlying problem. Powerless to address all their concerns, locals learned to accept the odours of oil and the smell of natural gas. This thesis argues that the locals acknowledged and attempted to address environmental change as a means of adapting to a less welcoming environment. When hazards became an immediate threat and significant inconvenience, locals tried to create solutions to problems that few humans had ever dealt with before. When environmental change posed no threat to people's lives or capital—or when it was too extensive of a problem for either individuals or the community to address—it was tolerated and ignored. Ultimately, the past actions by the locals of Enniskillen are not that different from our own: we know that continued oil consumption contributes to global change in our environment and so damage to ourselves, yet we keep consuming.

Today, not much evidence remains on the surface of Enniskillen of the nineteenth-century oil industry that dominated this area, except for a few derricks and a museum dedicated to the industry's memory. However, examination reveals further remnants of the oil industry in the form of environmental pollution. The towns of Petrolia, Oil Springs, Oil City, and Enniskillen have had to obtain their drinking water from Lake Huron for over a hundred years because the groundwater has long been contaminated with oil.¹⁶ Other major environmental concerns are found in the thousands of abandoned oil wells that have not been plugged, which can result in pollution of ground water as oil and rainwater mix. Although the province has attempted to plug these wells, it

¹⁶ William Marsden, *Stupid to the Last Drop* (Toronto: Alfred A. Knopf, 2007), 238.

is estimated that there are over 50,000 abandoned wells, but the provincial government only has records for 20,000.¹⁷ With no immediate solution to address these marks of the past, these wells could continue to pollute the land for an undetermined period.

The first section of the thesis covers Chapters One to Three, and follows the activities of Enniskillen's oil industry from 1858 to 1885. Chapter 1 examines how the value of oil evolved from a medicinal product in the 1830s to a form of illumination in the 1850s, ending with the start of the first oil boom. The chapter proceeds by examining the natural origins of oil, and then tracing the subsequent use of oil for medicinal purposes, first by aboriginal peoples, and then by European settlers in the 1840s. By this time, word of the region's oil had reached the Geological Survey of Canada, which took an interest in the economic potential of oil. Once the Geological Survey staff obtained samples of oil, they raised sufficient awareness of the oil's utility that it attracted the attention of speculators. Chapter 2 follows the inception of the oil industry in 1858, its boom in 1862, and its collapse in 1863 from the cessation of the flowing wells (oil gushers) in Oil Springs. The dense terrain of Enniskillen made it difficult for prospectors to transport their oil to the market, forcing prospectors to rely on natural labour—horses, oxen, and the current of the river—to transport oil out of the swampland. Given the high costs associated with transporting oil, there was little opportunity to turn a profit in the oil industry, until John Shaw struck Canada's first flowing well in 1862, outside of Oil Springs. With that, Enniskillen experienced a real oil boom, but the cessation of the flowing wells resulted in Canada's first oil bust in 1863. Chapter 3 analyzes the fallout of this, and traces the rise of Petrolia as the next centre of Canadian oil development until its decline in the 1880s. The loss of the flowing wells in Oil Springs spawned a scene of chaos as

¹⁷ R. Short, "Locating Existing Water, Gas or Oil Wells," *Locating Existing Water, Gas or Oil Wells*. Ontario, Ministry of Agriculture, Food and Rural Affairs, May 2010. <http://www.omafra.gov.on.ca/english/engineer/facts/10-041.htm>.

speculators were unsure where to look for oil, forcing many to turn to science and the supernatural to provide answers. By 1866 enough oil had been discovered in Petrolia to encourage investors and prospectors to focus their development efforts around the growing town. Although Petrolia became the primary centre of oil development in Canada, it struggled to retain this position as more distant oil fields opened beginning in the 1870s.

Section two documents environmental change caused by oil pollution, examining the ways in which locals adapted to their altered environment between 1858 and 1885. Chapter 4 discusses how wasteful practices of oil development polluted the river system and water table, and how locals constructed solutions to deal with the loss of sanitary water. Chapter 5 is an analysis of how locals fought new hazards stemming from the oil industry, such as oil fires, natural gas poisoning, and contaminated water. Finally, Chapter 6 examines how the odour of Enniskillen oil provoked different reactions from three different groups—people in Britain, Canadians outside of the oil region, and locals in Enniskillen. British people were revolted by the smell of Canadian oil exported to them in 1862, and they worked to ban it from their cities. Canadians from outside Enniskillen – particularly newspaper correspondents coming to the oil region – also reacted with disgust at the odour. But Enniskillen locals seem to have been unbothered by the smell, either because they grew accustomed to it or simply understood it as a price of their livelihood.

Chapter One: Rediscovering Oil

At its core, oil is both a part and a product of nature. Oil began as organic material from marine life that became trapped under layers of sediment and clay. In this new environment, the organic material through heat, pressure, decay, and deprivation of oxygen over millions of years became oil.¹⁸ Because of the low density of hydrocarbons that make up oil, the pressure built up in the earth pushes the oil to the surface, where it either forms a bituminous layer on the earth's surface or becomes trapped beneath a non-porous stone or clay, which creates a reservoir of oil.¹⁹ As a result, the twenty-seven year focus of this thesis is simply a small blip in the history of the oil of Enniskillen.

Historical evidence suggests that the Chippewa First Nation of Southwestern Ontario were the first people to know about and utilize the oil of present-day Enniskillen. Currently there has been little research done on the relationship between the Chippewa First Nations and the oil of Enniskillen. However, oral histories and indigenous sources might shed some light on the relationships between First Nations use of oil before the 1830s. Additionally, there has been little archeological research as to the First Nations' prehistoric use of oil in Southwestern Ontario, but there is evidence of their use of it in journals by Europeans and Canadian newspapers.²⁰ Although there is evidence of First Nations using the Athabasca oil sands in Alberta as a way to patch their canoes, the Chippewa in Southwestern Ontario were reported to use the oil primarily for medicinal purposes.²¹ In his article to the *Canadian Journal of Industry, Science, and Art* in 1861, Montreal

¹⁸ Robert Bott, "Evolution of Canada's oil and gas industry," Canadian Centre for Energy Information, 2004, <http://www.energybc.ca/cache/oil/www.centreforenergy.com/shopping/uploads/122.pdf>.

¹⁹ Bott.

²⁰ Although there is little secondary information on First Nations use of oil, it is possible that evidence in the form of oral histories might shed some light on this topic.

²¹ Bott.

engineer Charles Robb reported that prehistoric evidence of oil extraction had been discovered at the bottom of an abandoned oil well in Enniskillen. Robb wrote, “deers horns, and pieces of timber bearing marks of the axe, have been dug up from considerable depths, below the surface, in what appears to be oil wells.”²² Robb’s account of the discovery of prehistoric items used to extract oil is the only recorded account of archeological evidence of First Nations use of oil that does not include accounts from journals or newspapers. Over the past several years, the Oil Museum of Canada in Oil Springs has been attempting to attract archeological research to examine aboriginal uses for oil.

Because there has been little archeological research on First Nations use of oil in Southwestern Ontario, Canadian newspapers are the most common source to attribute the use and discovery of oil to the aboriginal peoples. Generally, sources agreed that aboriginal peoples collected oil known to float on the surface of the Thames and the Sydenham river systems. To collect the oil, the aboriginal peoples placed blankets on the surface of the river where oil collected as scum and they proceeded to wring the oil into buckets. They further collected oil from the dried bitumen that accumulated on the surface of the land.²³ The dried bitumen was, of course, the result of oil seeping to the surface and drying out. Settlers later referred to these as the “gum beds,”²⁴ where “black stuff, at places in liquid form oozing through the ground or soft like chewing gum other places hard and brittle....”²⁵ An English farmer, Joseph Pickering, wrote in a mid-19th century travel narrative, “A singular spring of oil issues out of the banks of the river near here [Morovian Town], on the land belonging to the Indians. It is of the consistency and colour of tar

²² Charles Robb, “On the Petroleum Springs of Western Canada,” *Canadian Journal of Industry, Science, and Art*, no 34 (July 1861): 315.

²³ “The Enniskillen Mineral Oil,” *Sarnia Observer*, January 27, 1859.

²⁴ May, 17.

²⁵ John McLeod, “Tweedsmuir History of Oil Springs: Papers of Revered McLeod,” *Women’s Institute of Oil Springs*, 8.

with a peculiar smell.” Pickering added that the “oil is gathered from the surface of the water (by Indians and others), by blankets extended and lightly dropped on the surface, when they absorb the oil.”²⁶ The oil was said to have been used by aboriginal doctors on surface wounds and consumed for a variety of different ailments.²⁷ However, the newspapers noted First Nations’ use of oil for medicinal purposes as a way to insinuate that they had missed out on its greater value of oil as a source of illumination.

The foundation for modern day Lambton County and Enniskillen was built on the acquisition of land belonging to the Chippewa First Nation. Representatives of the British Crown signed Treaty 25 on July 8, 1822 and Treaty 29 on July 10, 1827, with Chiefs of the Chippewa peoples for the purpose of opening the lands of Ontario for the arrival of European settlers.²⁸ The acquisition of the majority of land in Lambton County meant that Surveyor General Samuel Heard, under the order of the Commissioner of Crown Lands, sent Lewis Burwell to perform a survey of Enniskillen in 1832. Burwell was instructed to provide a detailed account of the geography, resources, and agricultural potential of the land.²⁹ Burwell and the other surveyors were largely unimpressed with Enniskillen because a combination of hard clay and seasonal flooding created impenetrable seasonal swamps. According to their report, “a great deal of swamp . . . in some places is quite impassable,” and because of this obstacle, “two of the concession lines were not

²⁶ Joseph Pickering, *Inquiries of an Emigrant: Being The Narrative of an English Farmer from the Year 1824 to 1830* (London: E Wilson, 1832), 122.

²⁷ “The Lambton Oil Springs,” *Sarnia Observer*, July 5th, 1860.

²⁸ Canada, Dept. of Indigenous and Northern Affairs, Treaties and Agreements. Treaty Text-Upper Canada Land Surrenders. <https://www.aadnc-aandc.gc.ca/eng/1370372152585/1370372222012#ucls21>. The full list of Chippewa Chief for Treaty 25 and 29 can be found on the website.

²⁹ Burr, 18.

carried quite through.”³⁰ The conditions made it impossible for the surveyors to provide a comprehensive survey of the land.

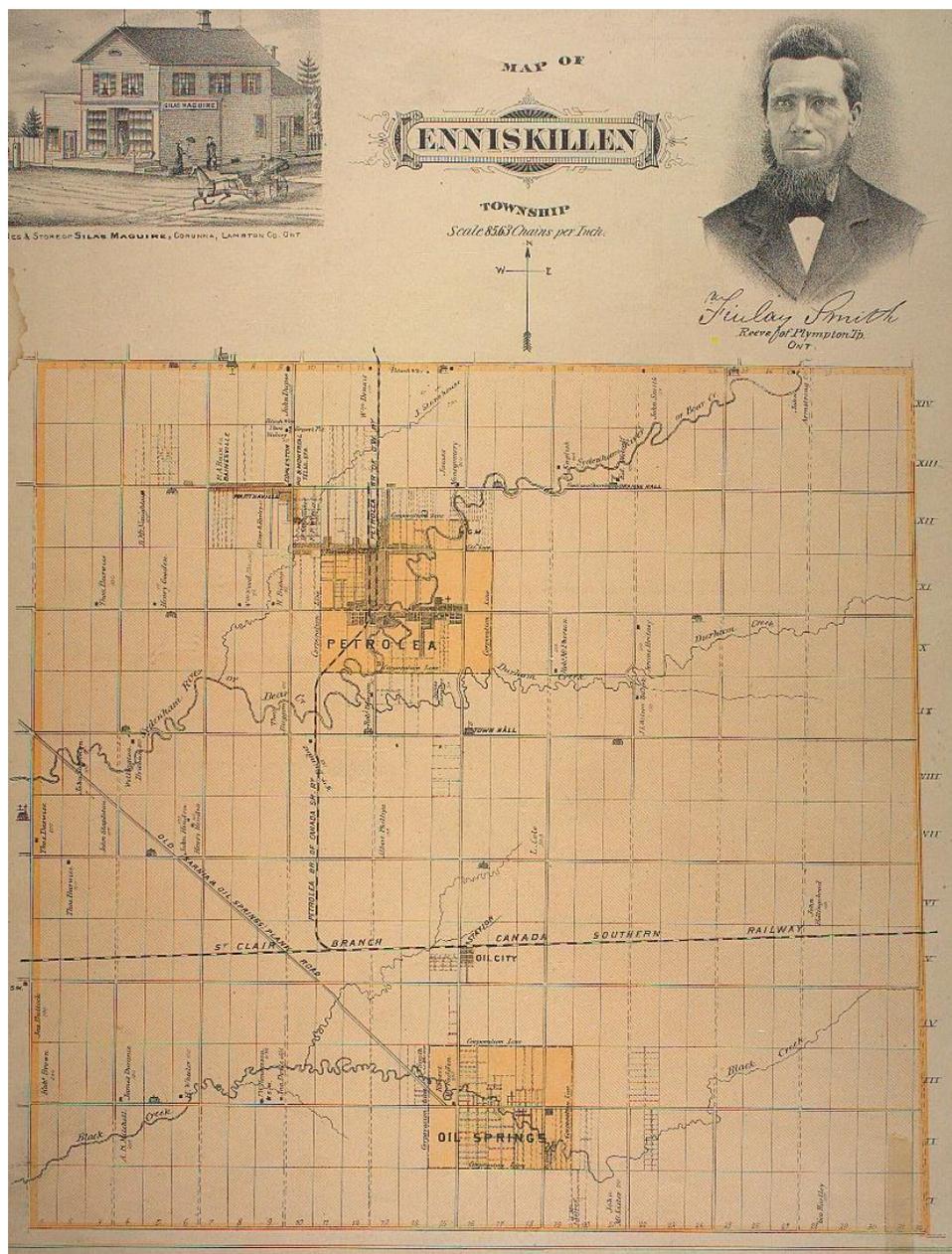


Figure 1: Map of Enniskillen, Petrolea, and Oil Springs 1880.³¹

³⁰ Burr, 19.

³¹ McGill University Digital Library, *In Search of Your Canadian Past: The Canadian County Atlas Digital Project*, <http://digital.library.mcgill.ca/CountyAtlas/default.htm>. Over the course of the nineteenth-century Petrolea was referred to as both “Petrolea” and “Petrolea.” However, when the town was incorporated, it was under the name of “Petrolea” in 1866. For the purpose of this paper I will only be using the name Petrolea.

Burwell recommended drainage of the region, as the soil was presently too wet for farming and the creeks were too unreliable to establish mills to cut down the dense forests of ash, elm, and soft maple. It is curious that the surveyors made no mention of oil, considering that Burwell was expected to look for useful resources in the region. However, he might not have seen the oil given that, during his survey, there was a large quantity of rain. What the people referred to as the Enniskillen Swamp was the result of a seasonal phenomenon that was caused by impermeable clay holding rainwater with nowhere for the water to drain. As a result, the rain and snow during fall, winter, and spring transformed Enniskillen into an untraversable swamp during these seasons, while the swampland would recede and return to dry land during summer months. On two occasions, Burwell was forced to stop his survey entirely because he could not traverse the deep waters of the swamp. The difficulty of travelling in Enniskillen and the isolation of the region was reflected in Burwell's inability to obtain supplies locally. As a result, his survey incurred additional costs as he was forced to travel to Port Dalhousie, in present-day St. Catharines, to obtain supplies.³²

Despite such difficulties, the surveyors mapped the boundaries of the township into fourteen concessions containing 448 lots, a total of 82,174 acres of land.³³ By 1835, the Crown opened up Enniskillen for settlers. However, settlers who arrived in Enniskillen during the 1830s were largely unimpressed with the dense forests or the thick swamps that covered the region. They quickly came to the same conclusion as Burwell, that the land would not be suitable for farming until it was drained, and that the dense swamps currently made it impossible to transport the large quantities of supplies that settlements required. As a result, the region remained sparsely

³² Burr, 19.

³³ Burr, 20.

populated, as better opportunities for settlement could be found outside the “Great Swamps of Enniskillen.”

Nevertheless, a few settler families such as the Rouses, Evelands, and Durances settled in the region. John Rouse and his family had arrived from Florence, Ontario after falling into financial hardship, and decided to make their home in what is now Oil Springs. They were drawn to start a farm on affordable land near the village of Black Creek. Although Rouse and his family had to contend with the difficulties posed by the swampland environment, they benefited from using the oil as a medicinal treatment that could be sold. According to the letters of a local resident of Oil Springs, Reverend MacLeod, settlers such as the Rouse family likely adopted the use of the oil by watching the actions of the Chippewa. Word of oil’s medicinal properties spread outside the region, according to Reverend MacLeod, “causing unusual interest, and visitors occasionally arrived, asking to be directed to the Black Pool, or asking one of the family to get some of this oily substance.”³⁴ In his travel journal, Pickering corroborates the account of Reverend MacLeod by claiming that it was common for people to collect the oil and sell it for treating physical surface injuries on people and animals. In very small quantities it was also consumed to deal with other health complaints. Pickering wrote that in 1826, oil “sold from 2s. 3d. to 4s 6d. per quart, and sent to all parts of the province, and even the States, as a cure for rheumatism, sprains &c., and is sometimes taken internally, in small quantities, for strengthening the tone of the stomach, and other complaints.”³⁵ Although this collection and sale of oil was far from the oil boom that would follow, it is one of the earliest accounts of oil being used as a medicinal commodity in Ontario.

³⁴ McLeod, 8.

³⁵ Pickering, 122.

Furthermore, the attention oil received as a cure for sprains would encourage others to recognize its potential other uses.

Enniskillen did not develop or grow much in population between 1835 and 1859. Its wet and flat land made it impossible for poor settlers to drain and create the conditions necessary for farming. In 1846, the population of Enniskillen and Moore townships together stood at only 780. But by 1861 the population of Enniskillen alone had risen to 1,076, the majority of the increase accounted for by the discovery of oil in 1859. By 1861, only 18.6 percent of Enniskillen Township was being used for farming. Those who did farm did so along the Bear and Black Creek as a way to escape the deeper swampland found among the forests of elm, ash, hickory, and birch trees.

Oil's transformation from a medicinal product to a source of illumination would take some time. It would first require people to recognize the other characteristic of oil. Black states, "In such a process [commoditization], resources attain value based on the existing culture's fluid and changing need or desire to possess them. The value of an object or a substance is fully governed by the surrounding human culture."³⁶ Since people did not recognize oil's utility beyond its medicinal uses, it would remain a minor commodity. In the case of Enniskillen oil, the changing perception of its worth would start with the Geological Survey of Canada, which brought oil into the national spotlight.

The Geological Survey of Canada was created in 1842 to examine the valuable minerals and resources of what was then Canada West and East.³⁷ The Canadian government did not create the Geological Survey to contribute to the scientific field of geology, but rather tasked it with

³⁶ Black, 19.

³⁷ Morris Zaslow, *Reading the Rocks: The Story of the Geological Survey of Canada 1842-1972* (Ottawa: The Macmillan Company of Canada, 1975), 34.

cataloging and determining the location of valuable materials. Once the ideal locations for producing minerals were located, the Geological Survey would report back with samples, maps, and diagrams to assist in determining the quantity of the minerals. The information provided by the Survey would serve to encourage the expansion of colonial settlement and industry in areas that possessed the appropriate resources.³⁸ Once the Survey located the minerals, it organized and classified them by their potential uses as commodities.

To support the goal of mapping the minerals and resources of Canada, William Edmond Logan was appointed the first Director of the Geological Survey of Canada. Logan brought to the survey his academic background from the University of Edinburgh, an up-to-date understanding of geological theory, and a desire to contribute to the field of geological research.³⁹ However, he understood that the focus of the Geological Survey of Canada was to locate valuable minerals for commercial development, or it would lose funding. Logan's process for researching minerals involved him examining the geographic conditions that made it possible to form potential resources like coal.⁴⁰ Understanding that coal was found at the bottom of shallow bodies of water, and because these occurred in areas overlaid by layers of sediment, it became possible to isolate resources by determining where these formations occurred.⁴¹ To assist with the project, Logan brought on talented geologists such as Alexander Murray in 1842 and Dr. Sterry Hunt in 1846 to assist him with the project. Murray did not have a formal education in geology, but through personal study and his experience accompanying Logan on earlier geological surveys in Great

³⁸ Zaslow, 34.

³⁹ Zaslow, 38.

⁴⁰ Zaslow 36.

⁴¹ Zaslow, 33.

Britain, he became an important member of the Canadian Survey.⁴² Hunt's previous experience as a chemist in the Vermont Geological Survey made him invaluable during the start of the survey.⁴³

In 1848 or 1849, the Second Earl of Cathcart and Governor General of Canada, Charles Murray Cathcart, acquired samples of the Enniskillen bitumen and sent them to Hunt. In the 1849 Progress Report to the Canadian Legislative Assembly, Hunt wrote that there was a form of "asphalt or mineral pitch found on the nineteenth lot of the sixth or seventh range of the Township of Enniskillen, Canada West... it is said to spread over an area of several acres, and from the specimens received it is at least two feet in thickness."⁴⁴ Through scientific experiments, Hunt ascertained that this material was "seventy-eight to eighty-one percent, of combustible and volatile matter."⁴⁵ By determining the flammable nature of oil, he believed that there was potential in its use as an illuminating oil. "The consumption of this material in England and on the Continent for the construction of pavements, for paving the bottom of vessels, and for the manufacture of illuminating gas... is such that the existence of deposits of it in this country is a matter of considerable importance." Given the declining whale population, which were the primary source of illuminating oil in the early nineteenth century, an alternative form of illuminating oil was required. As a result, Hunt announced that "A careful examination of the locality with regard to its extent, will be made during the ensuing season."⁴⁶

In 1851, Murray would be the first member of the Geological Survey to visit and examine the bitumen of Enniskillen. Murray began his examination of the bitumen by sinking holes in the

⁴² Zaslow, 20-21.

⁴³ Zaslow, 47.

⁴⁴ Report to the Legislative Assembly, *Report of Progress for the Year 1849-50*, (Toronto: Lovel and Gibson, 1850), 99.

⁴⁵ Report to the Legislative Assembly, *Report of Progress for the Year 1850-51*, (Toronto: Lovel and Gibson, 1850), 100.

⁴⁶ Report to the Legislative Assembly, *Report of Progress for the Year 1849-50*, (Toronto: Lovel and Gibson, 1850), 99.

deposits to determine its thickness and whether the oil was coming from below the soil. He determined that the deposit was about two feet deep and it appeared that the bitumen permeated the soil. Further investigation revealed that “The bitumen is underlaid by a very white clay, which I was informed had been bored through in one part for thirty feet. The upper portion of the clay was observed to be more or less penetrated with petroleum, and small black globules of the same were seen scattered through the mass for a depth of four or five feet.” Murray also reported that oil could be found flowing on the surface of the Black Creek, although it quickly disappeared in the current. Murray also reported, however, that “This bed of bitumen, which in some parts has the consistency of mineral caoutchouc [natural rubber], occurs on the sixteenth lot of the second concession of Enniskillen in the county of Kent, but its extent does not appear to be so great as we were at first led to understand.”⁴⁷ The early reports had exaggerated the size of the bitumen bed: Murray estimated that it constituted no more than half an acre. Overall, Murray’s *Report* provided the first scientific examination of a combustible resource that seemed to permeate the ground of the region.

Because of Murray’s detailed description of bitumen and Hunt’s experiment as to its qualities, Logan decided that a bitumen sample would be included as part of the Canadian mineral exhibit at the 1851 London Exhibition.⁴⁸ Logan prepared a detailed display of Canadian minerals and resources that the survey had discovered. Given that the goal of the exhibition and the survey was the promotion of commoditized materials, Logan organized the Canadian exhibit around the different uses for the materials: building materials, metals requiring refining, minerals for painting, grinding and polishing materials, etc. The Enniskillen bitumen was included under the category of

⁴⁷ Report to the Legislative Assembly, *Report of Progress for the Year 1850-51* (Toronto: Lovel and Gibson, 1852), 90.

⁴⁸ Zaslow, 55.

combustible materials, and presented as an asphalt.⁴⁹ Here, the oil of Enniskillen would begin its shift from a medicinal product to something far more valued.

Logan's comprehensive display of minerals at the London Exhibition resulted in an invitation to the 1855 Universal Exhibition in Paris. Throughout 1854 the Survey dedicated considerable resources to the collection of samples for the exhibition.⁵⁰ Logan and Hunt also coauthored a catalog that provided a detailed description of every mineral and other resource at the exhibit to provide information to visitors. The Surveyors referred to oil as Petroleum, and Logan and Hunt acknowledged that bitumen could be found in Western Canada on the surface of the land. They further pointed to the fact that springs of petroleum could be found along the Thames River and the creek of Enniskillen.⁵¹ The Geological Survey's inclusion of oil in the exhibit and information as to its location would bring further recognition to the utility of oil that lay below Enniskillen.

By 1850, attempts were occurring across Canada, Europe, and the United States to find alternatives for the decreasing supply of whale oil necessary to produce illuminating oil.⁵² Several attempts were made in the United States to create alternatives, such as using lard oil from the pork industry of Cincinnati, redistilling spirits in turpentine which would burn on their own, and relying on combustible gas from coal to produce light.⁵³ However, the use of animal fats resulted in noxious odours, and the cost of the gas proved too expensive for the average consumer in the United States because it required expensive infrastructure in the form of gas lines. In 1847, James

⁴⁹ Sir William Logan, *Catalogue of Economic Minerals, &c., of Canada* (Lowell and Gibson, Toronto, 1861), 5.

⁵⁰ Zaslow, 56.

⁵¹ Sir William Logan and Sterry Hunt, *A Sketch of the Geology of Canada: Serving to Explain the Geological Map and the Collection of Economic Minerals Sent to the Universal Exhibition at Paris, 1855* (Paris: Hector Bossange & Sons, 1855), 434.

⁵² Black, 20.

⁵³ Black, 21.

Young of Scotland attempted the process of creating an illuminating oil out of petroleum he found near Glasgow, but because the supply ran out, he shifted his attention towards distilling coal. However, the by-product of burning coal oil was large quantities of smoke, limiting its potential for inside use.⁵⁴ Canadian scientist Abraham Gesner in 1846 successfully distilled oil from bituminous coal and by 1854 he patented it under the label of kerosene.⁵⁵ However, like the other potential substitutes, kerosene suffered from a reputation of a foul odour. By the 1850s, there was clearly a market for a product that had a consistent supply and a less off-putting odour.

According to Christina Burr's *Canada's Victorian Oil Town*, the jump from oil as a local resource did not emerge until Charles Tripp, a labourer in a foundry in Hamilton, learned about the oil under Enniskillen. According to Burr, because Tripp lived in Woodstock at the same time as Alexander Murray, it is possible that he heard about bitumen beds from Murray.⁵⁶ Alternatively, he may have read publications from the Geological Survey of Canada that indicated the existence of oil.⁵⁷ Regardless, Tripp believed that there was potential utility in the use of oil in the form of paving asphalt.⁵⁸

After examining the bitumen beds in Enniskillen, Charles Tripp believed that the bitumen possessed the proper chemical consistency to be used and sold as a paving asphalt for roads. Before beginning the process of extracting the bitumen, Tripp took samples to New York chemist Dr. Thomas Antisell and to Thomas McIlwraith, a manager of the Hamilton Gas Company.⁵⁹ Antisell's examination of the samples concluded that the utility and value of the bitumen existed with its use

⁵⁴ Black, 20.

⁵⁵ G. W. Gesner, "Biographical Sketch of Dr. Abraham Gesner," *New Brunswick Natural History Society* Vol. no. 06025, (1896): 8.

⁵⁶ Burr, 64.

⁵⁷ May, 29.

⁵⁸ Burr, 65.

⁵⁹ May, 29.

as a waterproofing agent, lighting oil, and adhesive product. By conceptualizing the uses of bitumen beyond the medicinal uses promoted by locals, Antisell was furthering the process of commoditizing it for broader markets. Burr states that “Antisell’s report illuminates how science was used to serve the purposes of capitalism.”⁶⁰ McIlwraith further increased the value of oil by providing evidence that by adding gas to the bitumen, it could become a suitable product as a lighting oil.⁶¹ Their recognition of oil as a flexible resource meant that its worth in the market would change because its utility transferred from a medicinal to an illuminating or energy product.

With his belief in oil’s potential confirmed, Charles Tripp established the International Mining and Manufacturing Company to extract and sell the beds of bitumen as a resource for creating asphalt.⁶² The company that Tripp had created purchased large tracts of land in the hope of extracting the bitumen and refining it for Canadian and European markets.⁶³ Charles Tripp’s company began the significant step of extracting oil as an energy and construction product for the first time in Enniskillen history. However, due to insufficient capital and the difficulty in transporting the bitumen out of the county, the company failed by 1857.⁶⁴

On the other side of Lake Erie, in Pennsylvania attempts were being made as early as 1855 to drill for oil. A businessman in the coal oil industry, George Bissel, managed to acquire a sample of the medicinal Pennsylvania oil, however, lacking the financial support from partners he attempted to shift the value of the product from medicinal use to a form of fuel. As a result, Bissel hired a scientist to prove that oil could be distilled for illuminating. Because Bissel was able to

⁶⁰ Burr, 65.

⁶¹ May, 29.

⁶² May, 29

⁶³ Burr, 65.

⁶⁴ May, 30.

shift the definition of oil's potential use, he was able to shift its value in the market.⁶⁵ Tripp and Bissel share a similar journey, but Bissel's success and Tripp's failure came from, respectively, focusing and not focusing on oil as a source of illumination. Furthermore, Tripp made the mistake of rushing into development without obtaining partners to provide additional capital in his endeavour.

The bankruptcy of the International Mining and Manufacturing Company meant that Charles Tripp was forced to sell off large pieces of land to his brother and James Miller Williams, a successful carriage maker in Hamilton.⁶⁶ Unlike Tripp, Williams was not interested in the bitumen as a source of asphalt but instead believed that it held greater value as an illuminating oil. Williams travelled to Enniskillen in the summer of 1858 to examine the "gum beds" that were sprawled across his land. In August of 1858, when digging a well, Williams noticed that the well began to fill up with an odorous black liquid that smelled like gas tar and onions. To his surprise, he had discovered oil through the creation of a surface well, a type of well which entailed only digging into the earth and stopping before hitting the limestone. The oil driven up by the pressure in the earth filled the well at a slow rate since the oil stemmed from the seepage of a larger reservoir further below. There are some uncertainties as to why Williams decided to dig this well. Some local histories suggest that he was looking to find a water supply for his labourers, other stories say that he was attempting to obtain a fresh supply of water to boil the bitumen into asphalt.⁶⁷ Whatever his reasons, Williams struck an oil well, and his immediate recognition of its value and his immediate sale of this oil made his the first commercial oil well in North America.

⁶⁵ Black, 29.

⁶⁶ May, 33.

⁶⁷ May, 33.

Williams' extraction of oil and his decision to refine and sell it as an illuminating oil in Hamilton gives greater credence to the claim that he had created the first commercial oil well. A year later, on August 28th, 1859, Bissell's company, under the supervision of Edwin Drake, struck oil for the first time.⁶⁸ Because it is not clearly established whether Williams discovered oil by accident or was actively attempting to determine where the bitumen on the surface was coming from, it is fair for American historians such as Black to claim that the discovery of oil in Pennsylvania was the first intentional attempt to drill for oil.⁶⁹ However, Williams was actively searching out bitumen as a source of illuminating oil, and when he discovered the supply of oil, he shipped it to his factory in Hamilton. Although Williams' discovery may well have been unintentional, both Americans and Canadians were pursuing an alternative form of illuminating oil, with the Canadian obtaining it first.

By 1858, Williams had completed the process of changing the value of oil from its medicinal use to a source of illumination. After further research as to the chemical properties of the oil, Williams would be able to use the oil as a source of illumination. However, it would take several years before demand for oil would increase enough to promote extensive oil development in Enniskillen. The difficulty in refining oil and the off-putting odour made it difficult to encourage its adoption amongst the average consumer. Furthermore, endless questions arose with oil's discovery: How much oil could be found in the earth? How should oil be refined? How long would the supply last? What uses did oil possess beyond illumination? Although Williams had started the process of shifting the value of this new product, many uncertainties ensured that it would take several years before oil became the dominant source of illuminating oil.

⁶⁸ Black, 32.

⁶⁹ Black, 34.

From First Nations' use of oil to its adoption by European settlers, recognition of oil's illumination characteristics shifted the product's value. By the 1850s the declining whale population offered the opportunity of immense wealth to whoever was successful in developing a source of illumination. Concurrently, the Geological Survey of Canada garnered enough attention to demonstrate the utility of the bitumen in Enniskillen through their government reports and their exhibits on the international stage. By the time the search for an alternative form of illuminating oil was ongoing, the oil in Enniskillen had received enough attention to be considered as a resource beyond medicinal purposes. Because aboriginal peoples and settlers had already been using oil as a medicinal product, the recognition of oil's utility as a source of illumination was a new discovery. Moving forward into the 1860s, oil would continue to rise in value as consumers came to adopt it as their source of illumination.

Chapter 2: Canada's First Oil Boom

News of Williams' discovery spread quickly outside of Enniskillen as newspapers across Southwestern Ontario picked up the story. The *Sarnia Observer* reported, "We noticed the discovery, in the Township of Enniskillen of an abundant supply of mineral oil, which the owner of the fluid was taking steps for making available for light & by erecting works thereon for purifying said oil and making it for use." Like Williams, the *Observer* considered the newly discovered oil springs as a new source of illuminating oil. A reporter from the *Observer* travelled to Enniskillen to obtain a sample of the oil that Williams had found. After testing it, the *Observer* concluded, "If clarified... we see no reason why it should not make a splendid lamp oil."⁷⁰ Of their own volition, the reporters at the *Observer* had already shifted their perspective of oil as a future source of illumination. Williams erected a minor refinery at Enniskillen for purifying the oil. However, the difficult swampland terrain and the lack of infrastructure resulted in him transferring his refining practices to his properties in Hamilton.⁷¹ Although the news of Williams' discovery spread through urban centres such as Hamilton and Sarnia, it is not clear if it was this specific event that attracted a large number of speculators to Enniskillen by 1859. Nevertheless, word of a potentially valuable oil saturating the ground of Enniskillen began to spread.

One result was that a large number of American speculators poured into Enniskillen. In general, the proximity of the Enniskillen and Pennsylvania oil fields to one another resulted in Americans and Canadian oil speculators and workers travelling between the two fields during the 1860s.⁷² Although both oil fields started around the same time, the Pennsylvania oil field would grow much faster than the Canadian field due to greater access to capital, better infrastructure, and

⁷⁰ "Mineral Oil," *Sarnia Observer*, August 26, 1858.

⁷¹ May, 36.

⁷² May, 34.

the early involvement of major oil companies that could support larger extraction projects. In addition, Black suggests that the Pennsylvania oil field benefited from the rise of the 1849 California gold rush, which created an existing idea of extracting wealth through natural resources. In comparison, the Canadian oil field struggled to grow due to the isolation of Enniskillen from any major railroad, which increased the cost of producing oil. As a result, the low margin of profit from extracting oil and the high risk associated with development resulted in investors unwilling to invest in the Canadian oil field. The high risk associated with Enniskillen's oil industry and the consolidation of Pennsylvania's oil industry led many American speculators to try their luck in Canada. In 1859 the first wave of American prospectors came, with the second wave arriving in 1865, at the end of the American Civil War and during the declining supply of oil in the Pennsylvania fields.⁷³

In 1859 Enniskillen Township changed overnight. Thousands of prospectors from Canada and the U.S. arrived in the isolated region hoping to strike a fortune in oil. The village near Black Creek—a waterway that was named for the small traces of oil that leaked into the Creek—received several names throughout the oil boom over the next few years, including Black Creek, Oilicia, Victoria, and its present name Oil Springs. A reporter from the *Chatham Planet* suggested that Oilicia came from the Latin term “olicius-oily-full of oil.”⁷⁴ At one point someone had set up a sign outside of the town with the name Victoria, written in oil. However, a number of American settlers preferred the name Oil Springs. As a result, most newspapers by 1862 referred to this town as Oil Springs, which would become the official name of the township by 1865.⁷⁵ In 1859, Oil Springs was nothing more than a couple of wooden houses built in a small clearing amongst the

⁷³ “The Oil Region of Canada West: Petrolia,” *Hamilton Evening Times*, February 28, 1866.

⁷⁴ “The Great Flowing Well,” *Planet*, March 24, 1862.

⁷⁵ “The Oil Region,” *Toronto Globe*, September 2, 1861.

ash and elm forests. The small size of the town and limited number of boarding houses created a crowded and uncomfortable environment for these early settlers. A reporter from the *Globe* described the scene where men were “sleeping on counters and hen beds, on floors and planks, all the room to be got packing two in a bed and half a dozen in a small chamber having been previously exhausted.”⁷⁶ The limited space for these speculators meant that sleeping spaces became communal. To address the chaos that arose from the lack of beds, some speculators created agreements that stipulated that people working at night could have the bed in the morning and those working during the day could have the bed at night.⁷⁷ Other people responded by trying to make shanty homes made out of bark and whatever wood they could gather from the forests to accommodate their needs.⁷⁸ Because the speculators required resources, they started to consume the forests of elm and ash to support their accommodation and their drilling needs.

There is no single reason for the large number of Americans present in the early Canadian oil fields, but part of the reason likely stems from the influence of the California gold rush, which partly introduced the concept of becoming rich through resource development. Furthermore, the proximity to the Pennsylvania oil fields likely made Enniskillen a welcome alternative option. The *Globe* noted that “There are not a few Californian miners, whose experience in gold digging materially assists them in their search after ‘grease.’” Although there is no clear idea as to the number of Californian miners in Enniskillen, oil was valuable enough to attract their attention. The *Sarnia Observer* described the increase of people in 1861 by writing, “Hundreds of people are coming in every week from all parts of America, most of them being from Ohio and Pennsylvania

⁷⁶ “Enniskillen Oil Territory: Its Past and Present Condition Our Special Correspondent,” Toronto *Globe*, April 26, 1865.

⁷⁷ “The Oil Region,” Toronto *Globe*, September 2, 1861.

⁷⁸ “The Oil Diggings,” *Montreal Witness*, undated, reprinted in Toronto *Globe*, August 2, 1861.

– men who have seen the good thing made by those who were lucky in getting into the Pennsylvania oil region at the beginning, but who were too poor to do anything there now.” Clearly, the close proximity of Enniskillen to Pennsylvania, combined with the slow start of the Canadian oil industry, resulted in a large number of Americans opting to try their luck in Canada.⁷⁹

When speculators arrived in Oil Springs, they did not have a clear idea as to the quantity of oil or the ideal locations to drill. As a result, speculators developed their own theories as to possible locations best suited for producing oil. According to Burr, “The prevailing notion among oil speculators, popularly known as creekology, was that extensive deposits of oil could be found near the creek beds.”⁸⁰ As a result, the speculators began to drill near the banks of Black Creek.

Other workers hypothesized that the ideal location to strike oil was wherever the bitumen “gum beds” could be found.⁸¹ However, an enumerator named John Smith argued that “The problem to be solved at present is does this substance abound in the crevices of the rock generally or is it confined to those spots where it had sowed itself spontaneously.”⁸² Speculators seemed to have success by drilling for oil beside the edge of Black Creek and by digging into the gum beds.⁸³ Although people had known about the gum beds for a long time, this was the first time that they were not considered as a minor medicinal commodity. As a result, farmers and settlers who had largely ignored the gum beds now began looking at them with fresh eyes. Settlers who arrived to start farms changed their plans when they discovered that they possessed land ideal for oil

⁷⁹ “Enniskillen Oil Region,” *Sarnia Observer*, August 30, 1861.

⁸⁰ Burr, 67.

⁸¹ “The Lambton Oil Springs,” *Sarnia Tribune*, undated, reprinted in *St. Thomas Weekly Dispatch*, July 5, 1860.

⁸² Burr, 67.

⁸³ “The Lambton Oil Springs,” *Sarnia Tribune*, undated, reprinted in *St. Thomas Weekly Despatch*, July 5, 1860.

development. In turn the farmers started leasing the land to speculators in exchange for a portion of the oil discovered.⁸⁴

Although there was confidence in the short-term supply of oil, there were concerns directed as to its long-term supply. According to a *Globe* reporter, “the question of eternal supply cannot be fully listed till more is known of the mode of its production.”⁸⁵ Because the oil industry was in its infancy, producers were unable to test if the supply would become exhaustible if they increased production. Furthermore, no one possessed an understanding of why oil was found in Enniskillen, why it was pouring out of the ground, and whether this supply could be relied upon to last for more than a couple years. All these uncertainties attracted the attention of scientists and geologists. The *Globe* further noted that although no answer has been offered as to the production of oil, within time someone would provide a clear answer as to the origins of oil.⁸⁶ Eventually, scientists would arrive to play an important role in providing scientific explanations necessary for explaining the location of oil and its supply.

Charles Robb, a mining engineer from Montreal, attempted to provide one of the earliest scientific summaries of how to find oil in Enniskillen. Robb placed special emphasis on rock wells, which were wells that required producers to drill through the limestone to strike the oil reservoir below. Robb believed these were the best type of wells to strike because they produced a higher yield of oil and a greater quality of oil than surface wells. By his estimate, one had to drill forty to 120 feet into the earth and through the limestone to find oil.⁸⁷ However, most speculators lacked the finances to purchase a steam engine and the equipment necessary to drill that deep, past the

⁸⁴ “Oil Diggings,” *Sarnia Observer*, undated, reprinted in *London Free Press*, April 5, 1861.

⁸⁵ “The Oil Region of Enniskillen,” *Toronto Globe*, January 28, 1861

⁸⁶ “The Earth Oil,” *Sarnia Observer*, February 15, 1861.

⁸⁷ Robb, 317.

limestone.⁸⁸ Robb recommended that speculators drill on the hills rather than the flats near Black Creek because men drilling on the flats had to drill three times as deep to strike the same quantity of oil.

Dr. Sterry Hunt of the Geological Survey provided research on the occurrence of oil in Enniskillen with his published lecture “Notes on the History of Petroleum or Rock Oil” in *The Canadian Naturalist* in 1861.⁸⁹ Building off the observations that Logan made about oil springs in Gaspé, Hunt believed that the anticlinal position was likely to be the location where oil would be most likely to occur.⁹⁰ Anticlinal positions are arch-shaped folds made up of stratified rock near the surface of the earth, sometimes appearing as hills or bumps in the earth. Through the arch shape, anticlines can provide enough space in its inner layers to hold the elements necessary for creating oil. According to Hunt, the anticlinal position and the locations of oil proved to coincide.⁹¹ As a result, Hunt recommended that in Enniskillen where there were indications of limestone, speculators should try to find oil near these anticlinal positions.⁹²

Because Hunt’s anticlinal theory argued that oil was found near disturbed fissures and anticlines that were mainly found near rivers, locals turned to drill near the edge of Black Creek. Although there is no known correspondence between Hunt and any oil producers, there is evidence of him having a relationship with some of them. In several of his reports, Hunt used information such as oil drilling practices and the number of wells in certain fields that he would have had to obtain from oil producers. His anticlinal theory was proven correct with the discovery of oil in

⁸⁸ Robb, 317.

⁸⁹ Sterry Hunt, “Bitumens and Mineral Oils,” *Montreal Gazette*, March 1st, 1861.

⁹⁰ Sterry Hunt, “Notes on the History of Petroleum or Rock Oil,” *The Canadian Naturalist*, Vol VI. No.4 (July 1861): 9.

⁹¹ Hunt, “Notes on the History of Petroleum or Rock Oil,” 11.

⁹² *Ibid*, 10.

Bothwell and Petrolia in 1862. With the start of oil development, Hunt argued, “This anticlinal structure appears to be a necessary condition of the occurrence of abundant oil wells....”⁹³

Through their pursuit of wealth, oil workers came to develop an understating of the region’s environment. By digging for fortune in the earth, workers came to develop their own theories and categories regarding the geology of the land. For example, speculators categorized blue clay as a sign that oil would be found once they hit a patch of gravel. Other speculators argued that because limestone was too impenetrable, it would be impossible to find oil there.⁹⁴ Nevertheless, oil producers who were able to obtain equipment such as steam engines and metal drill bits were able to drill through the stone and discover reservoirs of oil.⁹⁵

The locations of the oil fields in the swampland of Enniskillen meant that oil producers had to struggle through difficult terrain to transport oil to the markets. From 1858 to 1863, oil production was primarily concentrated in the region of Oil Springs, twelve and a half miles (twenty kilometres) south of the closest train station in Wyoming, Ontario.⁹⁶ The distance in between was covered by dense swampland and forests that actively influenced the routes teamsters would take in their attempts to transport oil and supplies.⁹⁷ Due to the difficulty and expense of transporting supplies into the region, the less financially stable speculators had to adopt innovative drilling methods. For example, some oil workers adopted the spring pole method of drilling.⁹⁸ This method involved erecting an oil derrick, a frame used to hold drilling equipment. In Enniskillen, speculators primarily erected three-poled oil derricks, which were essentially giant tripods made

⁹³ Edgar Wesley Owen, *Trek of the Oil Finders: A History of Exploration for Petroleum* (Tulsa: The American Association of Petroleum Geologists, 1975), 64.

⁹⁴ *Toronto Leader*, October 1, 1861.

⁹⁵ *Toronto Leader*, October 1, 1861.

⁹⁶ “The Oil Region,” *Toronto Globe*, September 1, 1861.

⁹⁷ “Wealth of the Enniskillen Oil Regions,” *Hamilton Evening Times*, May 30, 1861.

⁹⁸ Johnston, 3-4.

of out of logs. Although producers used larger derricks, the three-poled derricks were easy to set up and were inexpensive. Once the derrick was built a pole would be made from a local ash tree, then by attaching a heavy sharpened steel drilling bit to it, the pole was suspended by a chain above the hole.⁹⁹ Three-poled derricks, which became characteristic of the oil development throughout nineteenth-century Enniskillen, were used to hold the pole and other drilling equipment.¹⁰⁰ A treadle was constructed over the hole, and the spring pole was attached. The oil worker would then apply their labour by stepping on the treadle, and from there, the spring action of the tree trunk would lower the iron rod into the ground in a back-and-forth motion. When the workers hit the maximum depth with the pole, they added a new link to the pole to drill deeper. Although the spring pole method lowered the amount of human labour required, it was not the most effective method as the spring pole could only create a “surface well”- that is, no more than forty feet deep, not drilled past the stone. A steam engine was required to drill past the stone.¹⁰¹

Whenever the spring snow melted away, or rainwater increased, so did the size of the swampland, which meant that oil production effectively shut down without alternative methods of transportation.¹⁰² In these early stages, the environment actively determined when the oil industry would start and stop. In response to the difficulty in transporting oil and supplies, increasing value was placed on the labour of horses and oxen.¹⁰³ Preference was given to horses, as teamsters viewed them as more reliable and able to get through the thick mud in the region.¹⁰⁴ This is reflected in the increasing number of horses that began to be adopted for the transportation of oil.

⁹⁹ Johnston, 2.

¹⁰⁰ Norman Ball, *Petroleum Technology in Ontario During the 1860s*. (Master's Thesis: Toronto, Institute for The History and Philosophy of Science Technology, 1972), 107.

¹⁰¹ Johnston, 4.

¹⁰² “Ho! for The Oil Springs,” *Sarnia Observer*, February 1, 1861.

¹⁰³ “The Oil Region of Enniskillen,” *Toronto Globe*, January 28, 1861.

¹⁰⁴ Charles Whipp, *Road to Destiny: A History of Highway 21* (Petrolia: Lambton Editorial Associates, 1983), 12.

In Lambton, there were 1,961 horses and 3,658 oxen in the entire county in 1851. By 1861, the number of horses had risen to 6,221 while the number of oxen had dipped to 2,234.¹⁰⁵ Horses were considered more flexible in their ability to transport oil on carriages through the rain and on sleighs during winter.¹⁰⁶ Additionally, the horse's combination of speed and endurance made them useful for the carriage system that transported oil workers in and out of the region. The ability of a single horse to cut through the impassible swamps made it a necessary part of transporting minor supplies and assisting jobs such as the delivery of mail.¹⁰⁷ Although there are mentions of teamsters using oxen, the animals' lower center of gravity and their proximity to the earth increased their likelihood of getting stuck in the swampland.

Historian J. I Little argues that horses grew in popularity in Canada due to their superior energy and endurance.¹⁰⁸ According to Little, "oxen made more economic sense in England, where labourer were relatively plentiful, than in North America, where wages were high, and quick work is therefore desirable."¹⁰⁹ Although Little was examining the use of horses on farms in Lower Canada, the circumstances were similar in Enniskillen and Lambton County. The scarcity in labourers demanded that the horses supplemented human labour when it came to transporting oil to the market.¹¹⁰ Even though a considerable number of speculators and their hired help arrived to

¹⁰⁵ Edward Phelps and H. Belden & Co, *Belden's Illustrated Historical Atlas of the County of Lambton, Ontario 1880* (Sarnia, Ont: E. Phelps, 1973), 7.

¹⁰⁶ "The Enniskillen Oil Regions," *Hamilton Evening Times*, May 23, 1862.

¹⁰⁷ "The Oil Region of Canada West: Petrolia," *Hamilton Evening Times*, February 28, 1866.

¹⁰⁸ J.I Little, "Ox and Horse Power in Rural Canada," in *Powering up Canada*, ed. R.W Sandwell (Montreal & Kingston: McGill-Queens Press, 2016), 62.

¹⁰⁹ Little, "Ox and Horse Power in Rural Canada," 62.

¹¹⁰ "The Oil Springs and A Visit from Dresden to the Oil Regions," *Toronto Globe*, February 20, 1862.

work in the oil fields, the population in the region remained relatively small, and therefore oil workers cut the high cost of human labour by relying on horses.



Figure 2: Horse-drawn oil tanks¹¹¹

Nevertheless, the challenging terrain meant that transportation was still expensive. The teamsters who traversed the land between Oil Springs and Wyoming had to develop an understanding as to the best route, and they had to understand the limitation of their horses. According to a *Globe* correspondent, teamsters required “Skilful driving ... to evade the stumps; broken wheels here and there tell tales of collisions and smashes, said stumps [sic] upon all occasions coming out of the contest unhurt.” When teamsters did not take the environment into account, “Waggons pushed aside into the bush or still sticking in the mud, and piles of lumber on the road, tell where attempts to reach Wyoming or Oil Springs have been abandoned in despair.”¹¹² Due to the challenging conditions of transporting oil through Enniskillen, the price of transporting

¹¹¹ “Hauling Oil from a Big Well at Petrolea, Ontario,” (Provided by Lambton County Archives).

¹¹² “The Oil Region,” *Toronto Globe*, September 2, 1861.

oil was always expensive, with rainy seasons increasing the price to a point where it would outpace the profit that could be accumulated by extracting oil. Because of rain in September of 1861, oil could be sold for six cents a barrel, but hiring a professional carriage from Oil Springs to Wyoming cost the producer four cents or five cents, and the horse could transport at most two barrels of forty-gallon oil.¹¹³ The price of teaming the oil during rainy seasons meant that producers were paying close to half the value of the price of oil to transport it to Wyoming. Despite the increasing cost of oil development, workers continued to attempt to make their fortune in the dense swamps. Ultimately, without the labour of horses and ox, the Enniskillen oil industry would have ceased for several years.

Constrained by the land and desperate to transfer their oil to the market, some oil workers looked to the local Black Creek and the Sydenham River system as a potential solution. Oil producers viewed the river system as free labour that could lower the cost of transportation. However, the river was not deep enough for a schooner to travel up to Oil Springs to collect oil.¹¹⁴ Instead of bringing the schooner to the oil, a producer by the name of Ellis recognized that he could utilize the current of the Sydenham River System to transport the oil to the schooner waiting in Lake St. Clair.¹¹⁵ Although the oil producers could exploit the labour of the river, in winter they still required human labour at the cost of twenty-five cents a barrel to break up the ice on Black Creek from Oil Springs to Wallaceburg, a distance of twenty-seven miles.¹¹⁶ In other cases, oil producers such as Messer. Bradley & Co shipped 600 barrels of oil to a schooner in the River St. Clair, where a crane collected the barrels onto the ship.¹¹⁷ One of the most successful oil producers

¹¹³ "The Oil Region of Enniskillen," *Toronto Globe*, January 28, 1861.

¹¹⁴ "The Transit of Coal Oil," *Toronto Leader*, March 18, 1862.

¹¹⁵ "Canadian Oil Springs," *The Toronto World*, December 1, 1862.

¹¹⁶ "Canadian Oil Springs," *The Toronto World*, December 1, 1862.

¹¹⁷ O.S.C "The Enniskillen Oil Regions: Their Importance, Topography, Soil, Climate, Extent, Productiveness, &c.," *Hamilton Evening Times*, May 23, 1862.

in Enniskillen, Henry Fairbank, also co-opted the current of the river to transport a total 3,000 or 4,000 barrels of oil.¹¹⁸ Although the labour of nature could be appropriated to supplement some of the cost of transportation, the cost of human labour and the difficulty in moving through Enniskillen meant that the high price of transportation would persist.

In addition to the difficulty of transporting oil out of Enniskillen, there was constant uncertainty concerning the supply of oil. This problem had plagued the people since Murray visited in 1850 and had been unable to estimate the amount of bituminous shale to be found in Enniskillen.¹¹⁹ Although the Geological Survey of Canada was able to ascertain the location of oil on the gum beds and in the Thames and Sydenham river systems, it had no way of gauging the quantity. A Ph.D. student by the name of Neil Morrison left a summary of his 1859 visit to Enniskillen to examine the newly discovered oil. He wrote, “Whether the supply is to be inexhaustible or not, no one knows; but so far as the experience of the work goes no diminution in the supply has yet been experienced. It continues to flow into the well just as water would do.”¹²⁰ As he indicated, no one had any idea what to expect in terms of the supply of oil. Morrison’s claim of the uncertainty of the extent of the supply was supported by a correspondent from the *Sarnia Tribune*. Although Morrison was unwilling to estimate the amount of oil in Enniskillen, the correspondent believed that the discovery of gas in some of the wells, and the abundance of natural gas throughout Lambton County all pointed to massive reserves of oil.¹²¹

¹¹⁸ Edward Charles Phelps, “John Henry Fairbank of Petrolia (1831-1914): A Canadian Entrepreneur,” (Master’s Thesis, London: University of Western Ontario Faculty of Graduate Studies, 1965), 26.

¹¹⁹ Report to the Legislative Assembly, *Report of Progress for the Year 1850-51* (Toronto: Lovel and Gibson, 1852), 90.

¹²⁰ Neil F. Morrison, “Visit to Oil Field in 1858,” *Unknown Newspaper*, May 16, 1889.

¹²¹ “The Lambton Oil Springs,” *Sarnia Tribune*, undated, reprinted in *Toronto Globe*, June 29, 1860.

Such anxieties were further exacerbated whenever the flow of oil seemed to slow down. Theories and debates emerged amongst the oil workers as to whether the supply would last. The immediate impression was that the supply would last for the short term. Rock wells continued to produce oil at a consistent supply, new rock wells were being discovered, as more speculators were obtaining the equipment necessary to strike these types of wells. On the other hand, the *Sarnia Observer* indicated that the surface wells' output was beginning to slow down. The *Sarnia Observer* further added that "indications of a falling off in the supply were becoming more marked, and that extra body and diligence and the introduction of machinery has already become necessary in order to keep up the flow."¹²² The fact that the wells were not filling up as they once had meant that producers had to purchase expensive steam engines with the added cost of transporting them to the Enniskillen swamp, so they could pump the oil to the surface. The decline in production and rising extraction costs meant the potential profits would continue to shrink.

The decline in surface well production concerned speculators who believed that this was indicative of the entire supply of oil. Without a reliable source of oil, the early oil industry was bound to crumble on top of itself, because without oil there could be no boom. Furthermore, uncertainty surrounding oil development meant that investors would continue to avoid investing in the oil industry until a clear estimate of supply was produced. In order to answer the question of supply, scientists and oil workers agreed that by drastically increasing production, they would be able to ascertain whether the supply of oil was bound to last. They argued that if the supply of oil did not slow with production at maximum capacity, then the supply would last for the long-term, and if the oil production did slow down, then it was clear that the oil might last for a couple

¹²² "Earth Oil Discoveries," *Sarnia Observer*, February 15, 1861.

of years.¹²³ However, speculators were never able to test this theory as the Enniskillen swampland prevented the mass transportation of oil and the lack of proper storage meant that they were unable to store vast volumes of oil. Logan agreed that the plan suggested by the producers would indicate the extent of the region's oil supply. In discussing petroleum, Logan argued that "It is not easy to know the amount of oil which these wells are capable of supplying; since from the great difficulty in getting it to market, arising from the want of good roads, few of the wells are regularly and continuously pumped."¹²⁴ Without proper infrastructure, producers were unable to do anything else that would have helped determine the extent of the region's oil supply.¹²⁵

Uncertainty was also found in trying to understand where to search for oil. Since most speculators lacked a scientific background, they reacted by creating their own theories and relying on the advice of reporters and scientists. One reporter for the *Globe* even went so far as to create a crudely drawn diagram to demonstrate where oil had been found and where no one had attempted to strike oil.¹²⁶ The reporter emphasised that the map was intended to advise and protect prospectors from paying exorbitant prices for land that had no history of supplying oil. According to the same authority, "Of course, all people who own property in the neighbourhood [whole township Enniskillen] are anxious to have it believed that their land is oil territory: and it is rather difficult to ascertain where the really favoured locality begins and where it ends." At the time oil had only been found around Oil Springs and Black Creek, and as a result, the reporter felt it necessary to emphasize that oil had not been found elsewhere in Enniskillen. The reporter's actions

¹²³ "The Oil Region of Enniskillen," Toronto *Globe*, January 25, 1861.

¹²⁴ Sir William Logan, *Descriptive Catalog of Economic Minerals of Canada* (Montreal: John Lovell, 1862), 23.

¹²⁵ "The Oil Traffic," *Sarnia Observer*, May 31, 1861.

¹²⁶ "The Oil Region of Enniskillen," Toronto *Globe*, January 25, 1861.

were defined by their concern of the increasing amount of land that was promoted as land in the “oil region.”¹²⁷

As early as 1861, advertisements offering to sell or lease oil lands started to fill the pages of the *Observer*. These advertisements claimed that they possessed land abundant with oil, which would have been unlikely given how little people knew about the localities of oil by 1861. One advertisement claimed that “The above lands are known to contain oil in large quantities, and will be sold at the above prices....” Such claims were common but would have been almost impossible to substantiate.¹²⁸ Recognizing this, some advertisements tried to prove their land’s oil supply by drawing a connection to neighbouring lots that were producing oil. “These lands are adjoining the Springs of Messrs. Adams & Kelly, in the Township of Enniskillen, and are considered to be the best in that locality,” described an advertisement by W. Marshall.¹²⁹ Landholders in neighbouring townships advertised their land as containing oil. One advertisement claimed to have “Oil Land in Plymton,” which the owner wished to lease for oil development. Since oil had not been discovered in Plymton, he possibly wished to see whether the oil field extended that far north, without having to develop the land himself.¹³⁰

With thousands of speculators buying up or leasing land in an attempt to find oil, property prices in Enniskillen escalated between 1858 and 1862. Landowners sold off large chunks of land and some farmers decided to sell off parcels of their land for a quick influx of cash.¹³¹ Burr provides a detailed examination of speculation in Enniskillen from 1835 to 1869, dividing the

¹²⁷ An increasing amount of land was advertised as oil land in the *Sarnia Observer* through the 1860s. Some of the land included in these advertisements were located in areas where oil supplies were not confirmed.

¹²⁸ Denis Cornelius O’Brien, “Oil! Oil!! Oil!!!,” *Sarnia Observer*, May 31, 1861.

¹²⁹ W. Marshall, “Oil Lands to Lease!,” *Sarnia Observer*, May 31, 1861.

¹³⁰ WM. Donnelly, “Oil Lands in Plympton!,” *Sarnia Observer*, May 31, 1861.

¹³¹ “Oil Digging,” *London Free Press*, April 11, 1861.

speculators into three categories: land brokers who made a profit from land with low risk, investors who held land intending to benefit from improvements made on surrounding lots, and people who held land for a short period and sold it for the highest and quickest profit.¹³² Burr examines a total of 108 individuals from the *Abstract Index of Deeds*, with 84.1 per cent securing their property before the oil rush.¹³³ These land owners purchased large tracts of land early on which they aimed to sell off once improvements had been made to the surrounding county. However, the start of the oil industry resulted in large tracts of the land being sold with the discovery of oil and the increasing demand for oil production.¹³⁴ In other cases, speculators struck deals with land owners to lease part of the land for oil development. These deals usually included cash up front for a certain number of years or the owner of the land would instead obtain a share of the profit from the oil that was discovered. Some of these leases were said to last as long as 15 to 20 years, but if they did not involve development of the land, it is unlikely such leases would have held up in court.¹³⁵ The *Observer* noted that the frequency of the lease agreements was at a point where “entire farms, -with perhaps the reservation of a few acres around the homestead- have been let in small lots of from one tenant, solely for oil digging purposes.”¹³⁶

The difficulty in extracting, shipping, and selling oil, combined with anxieties surrounding its supply, culminated in a direct challenge towards the illusion of wealth associated with oil. Skepticism was raised as to whether one could actually get rich off oil. Furthermore, the surface and rock wells that were the only source of oil from 1858 to 1861 continued to require expensive equipment to pump the oil. The *Observer* on August 3rd, 1861, shared an article that poked fun at

¹³² Burr, 32.

¹³³ Burr, 32.

¹³⁴ Burr, 32.

¹³⁵ “A Visit to the Oil Spring,” *Toronto Globe*, May 24, 1861.

¹³⁶ “Oil Digging,” *Sarnia Observer*, April 5, 1861.

the fledgling business in a satirical poem titled “*The Oil Region.*”¹³⁷ The poem, published anonymously by a Wyoming local under the initials J.D.C., captures the difficult reality of developing oil. The first stanza reads,

Enniskillen Oil, as it comes from the soil,
Has conned many men to labour and toil;
But the question arises- will the Oil pay.
For all the work that is done in the way
Of Digging, boring, drilling, and pumping-
At which many person are busily jumping
To make a fortune, they’re inclined to endure
Privations and hardship for the Oil to Procure.

The author clearly doubts that people can make a profit from oil. Instead, they will be driven to endure difficult labour. The second stanza then introduces the elements of uncertainty in the oil business:

While going through Lots, Plots, and Concessions
I heard every man making profound confessions
Of the enormous quantity of precious Oil
Which he seems to have beneath the soil...

Every oil worker, the poet suggests, blindly believes that his land possesses oil. The stanza ends, “But it makes no difference from whence it comes / It is always found at Williams ‘gums.’” Here, the author argues that James Williams is the only winner when it comes to extracting oil, likely as a result of him owning the prime choice of oil lands.¹³⁸ Robb seems to confirm this point in his report, writing, “Mr. Williams seems to have struck the main artery, and indeed the fact of the

¹³⁷ J.D.C., “Oil Region,” *Sarnia Observer*, August 3, 1861.

¹³⁸ Burr, 39.

superficial deposits on his lands are sure indication that here the petroleum existed in the greatest abundance, and nearest to the surface.”¹³⁹ Given multiple sources confirming the success of Williams’ wells, the poem might further suggest that given the dominance of his oil, it is pointless to consider where it originated as it always comes from his wells. The poet then addresses the uncertain supply of and demand for oil. In terms of demand, he writes,

The markets now are rather dull,
Which make so many minds to lull,
For fear there will not be demand
For all the Oil that is on hand.

Even though some speculators have found an abundance of oil, there is no demand and therefore low prospect of wealth. As for supply,

Before many years rolls quickly
That greasy valley will run dry,
As the various gaps and greasy taps
Will draw the oil out of its pipes;...
And a fortune they’d be sure to make,
If through the rock they chance to break.

The author seems to think that all that is needed to strike oil is to drill past the rock. Although some workers had success with rock wells, striking them required expensive steam engines which a lot of speculators could not afford. The poem ends by recommending that the prospectors should instead head to Wyoming, outside of the oil fields, in the hope of finding more valuable land. The author does not specify whether he believes oil can be found on the land, but instead concludes the

¹³⁹ Robb, 316-17.

poem saying that by avoiding the oil fields it would mean that speculators could “always keep in mental health.”¹⁴⁰

Other authors, in assessing risks the oil workers took, also assessed their mental health. In “Ho! For the Oil Spring!” on January 1st, 1861, the *Observer* discussed the danger of catching “oil fever.” It was described as driving men to commit drastic and irrational acts for the pursuit of oil. According to the *Observer*, “oil fever patients may be permitted to brave the fury of the elements, ... camp out in some chinless and plastered log shanty, sleep in a corner on a bundle of wild hay or straw, wrapped in a horse-rug, in the clothing worn during the day, and which is, of course, well bespattered with mud, and redolent with the fumes of oil....”¹⁴¹ At its essence, the criticisms against oil development stemmed from the risks and uncertainty of reward that speculators faced. Not only does the description by the *Observer* provide information as to fears associated with oil development, but it also provides historical researchers with information on the day-to-day conditions of living in an oil region. It should be noted that the *Observer* added a note to preemptively indicate that the provocative image of a speculator’s life that they had illustrated was not an exaggeration.

The *Observer* was further critical of the impact that oil speculation would have on the long-term future of the Township. Because the local settlers were becoming involved in the process of oil speculation through leasing their land, taking up jobs as oil labourers, and attempting to strike oil themselves, they were turning their backs on farming. According to the *Observer*:

The benefit [of oil], however, to the settlers of the Township, will not be so great as people may at first be led to suppose. The speculation will have a tendency to

¹⁴⁰ J.D.C., “Oil Region,” *Sarnia Observer*, August 3, 1861.

¹⁴¹ “Ho! for The Oil Springs,” *Sarnia Observer*, February 1, 1861.

draw their attention from the work of digging the surface and reaping the reward in the shape of fine farms, good crops, and superior stock, for the less certain employment of finding oil in the earth's bowels. And should the supply give out, this result will be productive of far more injury to the inhabitants of the Township, than the whole value of the oil will counterbalance.¹⁴²

The *Observer* was concerned that the oil boom was growing without consideration of the effect that its expansion was having on farming communities. Although the oil boom was not forcing farmers to lease their land for oil, the allure of wealth it provided was enough to attract the attention of the local settlers. The oil industry provided new jobs, it resulted in an influx of capital in the region, and it provided farmers with a secondary source of income. However, the *Observer's* fear would be proved correct when the supply of oil in Oil Springs eventually crashed.¹⁴³

The tide of criticisms changed, however, with the discovery of Canada's first oil gusher, or flowing well, on January 16th, 1862, on lot 18 in Oil Springs by prospector John Shaw of Port Huron, Michigan.¹⁴⁴ Very little is known about Shaw, and in fact, several of the local histories of Enniskillen's oil industry—including Burr's book—have confused Shaw with prominent oil developer Hugh Nixon Shaw. The *Imperial Oil Review* in 1959 attempted to correct the misidentification, but subsequent publications have continued the mistake.¹⁴⁵ When John Shaw bore into the soil, he hit rock at a depth of forty-five feet, but continued drilling into the limestone

¹⁴² Ibid.

¹⁴³ "Ho! for The Oil Springs," *Sarnia Observer*, February 1, 1861. The *Observer's* prediction proved correct in Sarnia and eventually Petrolia. Evidence suggests that land around Oil Springs and Petrolia was sold or leased to oil prospectors. Farmers also engaged in oil development and were known to prefer the quick cash from selling oil over farming.

¹⁴⁴ Johnston, 3.

¹⁴⁵ The Oil Museum of Canada published a report by M.A. student Dana Johnson, who examined multiple sources that confirmed it was indeed John Shaw who struck Canada's first oil gusher. Dana Johnson. *The Shaw Investigation: A Review of Sources to Determine Who Drilled Canada's First Oil Gusher* (Oil Museum of Canada Summer Intern Report, June 3, 2010).

to a depth of 130 to 180 feet where he struck oil.¹⁴⁶ The sheer amount of pressure built up in the ground resulted in oil shooting thirty feet into the air. Shaw had discovered the first great producing oil well in Canada, with an immense supply of oil that allowed him to fill somewhere between 1,000 to 5,000 barrels of oil a day. News of Shaw's find spread quickly.¹⁴⁷

Although Shaw had struck the first flowing well in Canada, the first in North America had been struck by Pennsylvania oil producer Henry Rouse almost a year earlier. Rouse reportedly struck the flowing well when he drilled 300 feet into a pocket of gas and a reservoir of oil. Unfortunately, when the pressure below released gas and oil at a rate that destroyed the drill equipment, which then created a spark to ignite the oil, immediately flaming oil poured out of the ground as high as 60 feet into the air, killing Rouse and his eighteen other labourers.¹⁴⁸ Although this was a tragedy, Black suggests that "the scale of the industry had been completely altered."¹⁴⁹ As the oil industry increasingly boomed in Pennsylvania, it also boomed in Enniskillen with Shaw's discovery.

Hundreds of Enniskillen locals rushed to witness the well paint the surrounding snow-covered landscape in shades of black. The stories of Shaw in the newspapers portrayed him as a man who had been "ruined, helpless, and jeered at by his neighbors, his pockets empty, his clothes in tatters- as our neighbors across the line say- dead-broke." Out of credit, Shaw had a choice to make: was he to pack up and head home to Port Huron, Michigan or should he continue in this hopeless endeavour?¹⁵⁰ Shaw, it is said, decided that if he did not strike oil that day, it would be the last day he spent in the muddy swamps of Enniskillen. "Moodily he took up his drill and sternly

¹⁴⁶ "The Oil Wells of Enniskillen," *Christian Guardian*, February 19, 1862.

¹⁴⁷ Johnston, 4.

¹⁴⁸ Black, 51.

¹⁴⁹ Black, 51.

¹⁵⁰ Sigma, "The Oil Wells of Enniskillen: Oil Springs Village," *Toronto Globe*, January 28, 1862.

struck it into the rock. Hark! What is that? A sound of liquid from the depths below, hissing and gurgling as it escapes from its confinement of centuries. Does it cease?" Shaw's well poured out oil in quantities that had never been witnessed before in Canada. Shaw's men were stunned when they witnessed "a stream of oil ... forced far up into the air, forming a grand oil fountain."¹⁵¹

However, the legend of Shaw as a rag-to-riches story seems to have been an invention of the oil boom. Although the media referred to Shaw as destitute, it would not have been possible for him to purchase the steam engine and employ the labourers necessary for striking the oil well.¹⁵² The stories surrounding Shaw's financial precarity were almost certainly exaggerated. The audience of these papers wanted to focus on and hear about the wealth and prestige that was bestowed upon an average man like Shaw the second he struck his flowing well. For example, the *London Free Press* wrote, "Mr. Shaw is now out of money, out of means, out of clothing, out of credit, and in debt, with a hole 150 feet in the rock, but no oil." However, with the discovery flowing well the *Free Press* argued that "Mr. Shaw is now a rich man, and consequently has any amount of credit, and everyone calls him Mr. Shaw."¹⁵³ The decision by the *Free Press* to emphasize Shaw's destitute status prior to striking oil seems to have been used as a way to demonstrate the stark difference in character he possessed after discovering oil.

The stories about Shaw were used to construct a narrative that anyone could have wealth and prestige bestowed on them if they were willing, picked up a drill, and got to work. The *Globe* continued this pattern of describing Shaw as a new man, writing, "Neither the illustrious but unknown authors of the Arabian Nights or even Alexander Dumas, drew from their imagination a more sudden transformation than this of John Shaw- in the morning a beggar, and in the afternoon

¹⁵¹ "A Promising Trade," Toronto *Globe*, February 5, 1862.

¹⁵² "A Promising Trade," Toronto *Globe*, February 5, 1862.

¹⁵³ "A Freak of Fortune-Enniskillen Oil," *London Free Press*, January 22, 1862.

able to satisfy every want to be reached by money.”¹⁵⁴ Depictions of Shaw as a beggar, despite owning valuable equipment and land, fed into a growing myth of Enniskillen as a land of wealth, transformation, adventure, and opportunity. One reporter in the *London Free Press* suggested that Shaw had “the prospect of being the wealthiest man in Canada.”¹⁵⁵ But this was written only two weeks after Shaw struck oil – far too early to know whether the oil would keep running and so too early to know how wealthy Shaw might become.¹⁵⁶

The myth of wealth in Enniskillen lay with the ability of Shaw’s well to produce large quantities of oil. Shaw’s well was called a “flowing well” because the pressure built up in the reservoirs forced the oil to come to the surface at a rapid rate on its own accord.¹⁵⁷ Before Shaw’s discovery, the majority of oil wells were surface wells or rock wells, which produced at most a hundred barrels of oil per day, and sometimes these wells required expensive machinal pumps to convey the oil to the surface.¹⁵⁸ By comparison, Shaw’s well was capable of producing a couple thousand barrels of oil per day without any added equipment necessary. With the flow of oil being brought up by the natural pressure that had been built up in the earth, Shaw’s workers had only to fill up their barrels.¹⁵⁹

But because Shaw was the first speculator to strike a flowing well, he knew of no way to control, let alone stop the flow of oil. Generally, flowing wells would prove incredibly wasteful because producers lacked the knowledge and sometimes the equipment to properly slow down the flow of oil. Shaw had only been prepared to store a couple hundred barrels of oil, so once he filled

¹⁵⁴ “A Promising Trade,” *Toronto Globe*, February 5, 1862.

¹⁵⁵ “The Great Enniskillen Oil Springs,” *London Free Press*, January 30, 1862.

¹⁵⁶ Some sources suggest that Shaw died penniless in Pennsylvania.

¹⁵⁷ Burr, 51.

¹⁵⁸ “A Visit to the Oil Wells of Enniskillen,” *Hamilton Evening Times*, June 1, 1861.

¹⁵⁹ “A Freak of Fortune-Enniskillen Oil,” *London Free Press*, January 22, 1862.

these, he had no way to store the flow that continued to pour over the surrounding snowfield. As the oil accumulated, ponds of oil began to form in low-lying areas, and once they reached their capacity, rivers of oil flowed into the valley that led towards Black Creek. Once in the river system, the oil connected into the Sydenham River system where it surged to Lake St. Clair and Lake Erie (and from there, diluted, to the St. Lawrence River and the Atlantic Ocean). Oil coated the river, the lakes, and their banks. The sheer quantity of wasted oil attracted spectators from within and beyond the oil region. One reporter wrote, “[T]he wondering spectators, were standing from one to six inches in a black, greasy matter, the mere waste of this extraordinary well, which, in making its way to the creek, covered the surface of the ground for many rods around the oily stream” coming from Shaw’s well.¹⁶⁰ In the majority of the stories addressing the flowing wells, the oil pollution was included as a way to indicate the amount of oil that the well was capable of producing.

It should be stated that the inception of the flowing well in Canada completely changed the early oil industry. Although Shaw struck the hole that freed the oil from the earth, the speculators, reporters, locals, and visitors were also entirely in awe of nature’s ability to provide oil in such a large and consistent manner. One anonymous writer to the *Globe* wrote, “Sir, - You will have heard of the extraordinary well in this township that has recently been discovered. The prodigious quantity of oil that it [the flowing well] is capable of yielding will make it one the remarkable things of our country.” There was clear excitement concerning the well’s capability and significance that it brought to Canadian industry. Accordingly, the writer further praised the “enormous pressure with which this liquid was forced up from the bowels of the earth. ... Within

¹⁶⁰ “The Oil Springs and A Visit from Dresden to the Oil Regions,” Toronto *Globe*, February 20, 1862.

fifteen minutes from the last drill... the oil was overflowing the surface of the earth....”¹⁶¹ The quantity of oil, the self-propelled flow, and the ability of the well to drown the landscape with oil drove spectators to view the flowing wells as distinct and remarkable.

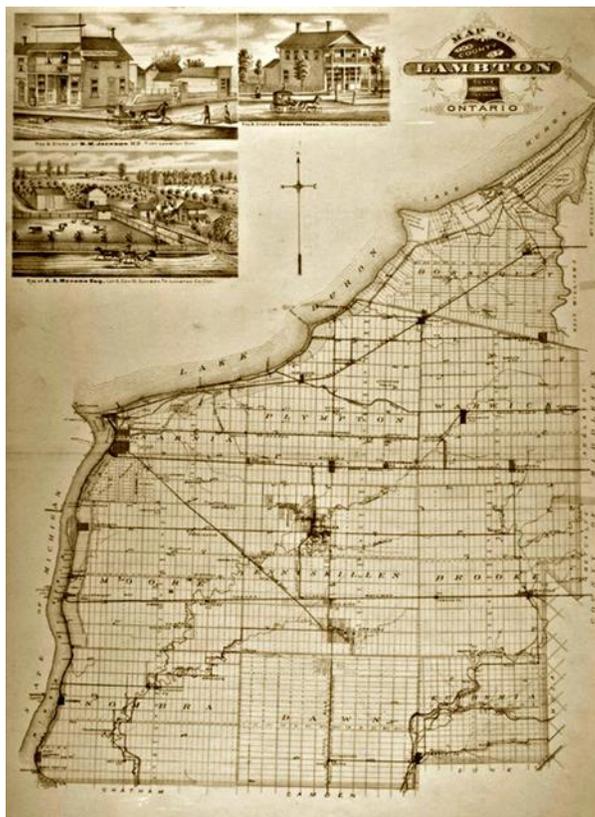


Figure 3: Belden’s Map of Lambton County, with Bear and Black Creeks¹⁶²

Spectators and reporters emphasized the flow and value of the well by its ability to pollute the surrounding landscape. One reporter stated approvingly, “Black Creek has become literally a sewer for oil, and its water are covered over to a depth of fully three inches with the dark green fluid ... from the surrounding wells and springs.”¹⁶³ Some travelers were said to have collected bottles of the liquid to take home as souvenirs or to sell to the local refiners. Others offered counter estimates for the waste of oil that had entered the rivers or had covered the land. An anonymous

¹⁶¹ Sigma “The Great Enniskillen Oil Springs,” *The London Free Press*, January 30, 1862.

¹⁶² McGill University Digital Library, *In Search of Your Canadian Past: The Canadian County Atlas Digital Project*, <http://digital.library.mcgill.ca/CountyAtlas/default.htm>.

¹⁶³ “Another Great Flowing Well,” *London Free Press*, February 19, 1862.

traveller stated that the “spectators were standing from one to six inches in black, greasy matter, the mere waste of this extraordinary wells, which in making its way to the creek, covered the surface of the ground or many rods around with oily stream.”¹⁶⁴ Shaw’s labour had initiated interest in the well, but the labour of the flowing well to produce a consistent supply of oil, without the assistance of pumps, further commanded the attention of spectators.

Interest in flowing wells did not dissipate. Spectators continued to travel to the oil region to witness subsequent flowing wells. When Messrs. Bradley & Co. struck a well, they attracted the same type of attention that Shaw’s well had garnered. Outsiders to the oil region and reporters began to attribute labels like “El-Dorado of Canada,” to accompany the growing myth of Enniskillen as a place of immense wealth for people willing to work.¹⁶⁵ In terms of the flowing wells, people began to animate them by associating the size of production with large animals. For example, people referred to the flowing wells as elephants, or monsters, and even as the former primary source of illuminating oil, whales.¹⁶⁶ The cultural significance of these wells was enough that people throughout Ontario travelled to witness them. Reportedly, “The excitement occasioned by these flowing wells was intense, and thousands came pouring in to see the Elephants, as they were termed, and still, they come in great wondering crowds from all parts of the country.”¹⁶⁷ The growing interest in the flowing wells attracted enough attention that local politician and businessman W. Bowman delivered a lecture in London, Ontario about them. According to the *Free Press*, he was set to talk “on the all-absorbing topic, the Enniskillen Oil Spring.” After paying a visit to the Enniskillen oil fields, Bowman felt confident to talk about the “the process and cost of digging, &., as well the influence which the introduction of Canada oil will have on the

¹⁶⁴ “A Visit from Dresden to the Oil Regions,” *Toronto Globe*, February 20, 1862.

¹⁶⁵ W. McCullough “The Enniskillen Oil Wells,” *St. Thomas Weekly Dispatch*, February 20, 1862.

¹⁶⁶ “Oil News,” *Toronto Globe*, July 23, 1862.

¹⁶⁷ “Another Extraordinary Flowing Well-Great Excitement,” *Hamilton Evening Times*, March 12, 1862.

commerce of this country.”¹⁶⁸ Given the popularity of the topic, the *London Free Press* predicted that the event would result in a full house for Bowman. The increasing flow of oil, the resultant increased the prospect of wealth, and the proximity to urban centres yielded increased attention on the flowing wells.

Shaw’s inability to slow the flow of oil meant that there were multiple estimates as to how much oil his well was producing. The standard estimated range was 1,000 to 5,000 barrels of oil daily. One report noted, “Whether they will be able to control it so as to continue the oil in the well is yet to be tested.”¹⁶⁹ Luckily, for Shaw after a week of oil running in Black Creek, a labourer with experience in the Pennsylvania oil fields reportedly taught Shaw how to slow the flow.¹⁷⁰ The worker demonstrated that by filling up a leather bag full of seeds and placing it on the mouth of the pipe, the flow could be slowed. Shaw estimated that he lost around 5,000 barrels of oil before he was able to get control of the well; however, other sources suggested that he lost a few thousand barrels of oil per day over a three-day period.¹⁷¹ Given the statistics mentioned by the majority of the sources, Shaw’s estimate was too low to be anywhere near accurate. Although there is no clear way to determine the total amount of oil Shaw lost, if the well was producing an average of 2,500 barrels per day, and since there is clear evidence that the first oil spill totalled one week, then that would be around 17,500 barrels of oil spilling from Shaw’s well. However, the estimates of Shaw’s production ranged from 1,000 to 5,000 barrels of oil per day, and this estimate is further complicated by lack of evidence as to how often Shaw had the storage equipment to keep up with the production of the well. When Shaw ran out of barrels, he had to simply allow the oil to continue

¹⁶⁸ “The Enniskillen Oil Springs,” *London Free Press*, February 21, 1862.

¹⁶⁹ Thos. Forsyth, “Extraordinary Oil Development in Enniskillen,” *Toronto Globe*, January 22, 1862.

¹⁷⁰ John McLaurin, *Sketches in Crude-Oil: Some Accidents and Incidents of the Petroleum Development in All Parts of the Toronto the Globe* (Harrisburg Pennsylvania: Self-published, 1898), 225.

¹⁷¹ “The Monster Well,” *Toronto Leader*, February 12, 1862; and “The Extraordinary Flow of Oil at Enniskillen,” *Toronto Leader*, January 27· 1862.

polluting the surrounding landscape. Other flowing well producers did the same. Whenever they ran out of containers the oil was allowed to run off onto the surrounding region.¹⁷²

Further attention was paid to Shaw's well whenever its flow became exceedingly violent or too difficult to control. On January 31, 1862—that is, only two weeks after Shaw had first struck oil—the *London Free Press* reported that Shaw had lost all control of his flowing well, with “the oil shooting up in a stream of six inches thick to a height of thirty feet.” It continued, “Friday, Saturday, and Sunday, and thus many thousands of gallons were discharged... that the whole of surrounding land is flooded with it to a depth of some inches and running off into the adjoining creek.”¹⁷³ The *Christian Guardian* of Toronto also reported on the kickback from Shaw's well, writing, “On Friday last another freak was played. So tremendous was the force beneath that the sandbag was driven upward into the air, and a great column of oil, some four inches in diameter and twenty feet in height played away, for nearly three days and night, wasting even a larger quantity of oil than on the first time...”¹⁷⁴ Consistent emphasis on the saturation of oil pollution became a method for reporters to emphasise the quantity of oil that was being produced. Furthermore, focus on oil pollution became a method of reinforcing an image of Enniskillen as a rich region, because reporters could say that there was so much valuable oil everywhere that the rivers and the land were covered in this valuable black gold. A visitor to the oil region from St. Thomas, W. McCullough, in his letter to the editor, also placed emphasis on the flowing wells by depicting the oil pollution. McCullough wrote, “Indeed. I saw, literally, a river of oil, occasioned by the superabundant flow, and a river of some distance, too, the oil being from six to twelve inches deep on the surface of the ice or water.”¹⁷⁵ Continued emphasis on the rivers of oil

¹⁷² Sigma, “The Oil Wells of Enniskillen: Oil Springs Village,” *Toronto Globe*, January 28, 1862.

¹⁷³ “Fresh Burst Out at the Oil Springs,” *London Free Press*, February 4, 1862.

¹⁷⁴ “The Oil Wells of Enniskillen,” *Christian Guardian*, February 19, 1862.

¹⁷⁵ W. McCullough “The Enniskillen Oil Wells,” *St. Thomas Weekly Dispatch*, February 20, 1862.

emphasized the abundance and wealth of the region. Instead of streets paved with gold, the rivers were coated with oil.

Resource production requires the active application of human labour for the extraction of the resource. Gold, lumber, and other resources all require human labour so that they can be collected, transported, and repurposed for human markets. However, the flowing wells met the wildest dreams of any prospector, a consistent supply that required only drilling into the ground once; from there, all that was required was to collect the resource. Although oil had an intrinsic value, the flowing well added even more value to the product as it meant that prospectors could spend less for human labour in oil production. The flowing well was distinct from previous wells, in that it offered the ability to produce something of substantial value without the active role of human labour required to extract a natural resource. There is no mine that spits out gold and silver, and even if someone were to discover a mine full of rare and precious minerals, it would require active human labour to extract it. As a result, one of the first reactions to Shaw's well was concern for the threat it posed to other producers. According to a *Globe* correspondent, "It struck us that this extraordinary well is a serious injury to the other proprietors of wells, as friend Shaw can certainly undersell and outsell them all. His yield is spontaneous and continues; theirs is constrained and must be raised at the expense of horse or manual labour."¹⁷⁶ The correspondent recognized that Shaw had an advantage over every other producer because he could appropriate unpaid natural energy while they had to rely on paid human labour. The value of the flowing wells' natural labour could not be ignored.

¹⁷⁶ "The Oil Springs and A Visit from Dresden to the Oil Regions," Toronto *Globe*, February 20th, 1862.

The introduction of Shaw's flowing well altered the fledgling oil industry's idea of success. Previously, success meant finding a surface well that could produce a couple hundred barrels of oil without having to rely too heavily on a pump to bring it to the surface. The flowing wells completely changed the appetite of the speculators, as success was now defined by striking a well that could produce a couple thousand barrels of oil per day that required little human labour to extract. The self-propelled flow of oil was viewed as a way to appropriate labour produced by nature—just as horses, oxen, and the river were already being used—which in turn would lower the cost of production, because there would be no need for paid human labour. As a result, once Shaw's well began to flow, 1862 to 1863 was dominated by the discovery and production of additional flowing wells.¹⁷⁷ Visiting the oil region, W. McCullough from St. Thomas, in his letter to the editor, praised the flow of the flowing wells. He wrote, "It will afford one barrel per minute, without any pumping whatsoever, thus giving a constant flow of crude oil, realizing to the fortunate owner at least 1,500 barrels, if not more, every twenty-four hours." He clearly recognized the value of the well's natural labour. McCullough added that "All the other wells that I observed in operation require to be pumped, just as you would pump water out of your own well. I took the trouble to pump a barrel myself, with my watch in hand, and found that I could fill a barrel in about two minutes – a barrel containing thirty-two gallons."¹⁷⁸ The fact that it took McCullough two minutes to fill a single barrel truly demonstrates the advantage of a flowing well. Even if McCullough pumped the oil at a consistent rate without tiring over a twenty-four hours period, he would have produced 720 barrels of oil, almost half what the flowing wells could produce without paid human labour. As a result, flowing wells were described as "the masterpiece of all oil operations, and apart from the romance that attaches to its discovery, it will form an episode in the

¹⁷⁷ Johnston, 5.

¹⁷⁸ W. McCullough "The Enniskillen Oil Wells," *St. Thomas Weekly Dispatch*, February 20, 1862.

history of seeking, manufacturing, and commerce of earth oil....”¹⁷⁹ The journalist placed significant importance on the discovery of the flowing wells. However, his emphasis on this being an episode in the history of oil development seems to serve as an expectation for greater discoveries and advances to come.

Speculators committed drastic and financially risky actions in the hope of striking their own flowing well. As one correspondent reported, “The well-diggers are willing to sell [an] immense quantity of oil they have in their vats very low, for most of them, besides being hard up, are anxious to dig deeper in order to strike the point where the oil flows upward by natural pressure.” With an increasing number of speculators arriving in the region to replicate Shaw’s discovery, it seems that the established speculators were anxious to sell their oil to obtain the capital necessary to purchase land and equipment to strike their own flowing well. Another correspondent added that the Shaw well had left men “in astonishment... each determined to bore deeper and deeper until the source of the supply should be tapped.” Each oil driller believed they “each possess in his own right, not an oil well merely, but a veritable oil spring which should bubble up spontaneously to the surface.”¹⁸⁰ The speculator’s belief of striking a flowing well is related to the criticism raised by the aforementioned oil poem, that suggested the prospect of oil made everyone believe that they could be the next Shaw.

Speculators began drilling into the earth surrounding Black Creek in search of more flowing wells. Wells that had previously been drilled by the spring-pole method were re-drilled with steam engines, to break through the limestone.¹⁸¹ Around thirty-three wells were drilled

¹⁷⁹ “A Freak of Fortune-Enniskillen Oil,” *London Free Press*, January 22, 1862.

¹⁸⁰ “A Promising Trade,” *Toronto Globe*, February 5, 1862.

¹⁸¹ Johnston, 4.

around Shaw's well, striking the same oil reservoir he had found near Black Creek.¹⁸² There did not seem to be any concern that the close proximity of these wells on the same two-and a half square miles would result in exhausting each other's supply. The area around Shaw's well – on concession 17, 18, and 19, primarily south of Black Creek – was the primary area where speculators were successful in striking flowing oil wells.¹⁸³ These wells were all struck at a depth of between 109 feet to 230 feet in the rock.¹⁸⁴ The depth of rock and flowing wells were either measured by the total depth that was drilled or by the depth that was drilled before striking the limestone and the inclusion of depth afterward drilling past the stone. This was done because the earth and dirt could range in different depths due to hills and flats, but the limestone tended to remain at a consistent depth. The range of production for the flowing wells ranged from 1,000 to 7,000 barrels of oil per day.¹⁸⁵ The largest producing well in the history of the Enniskillen oil industry was discovered in 1862: the Black & Matheson well in the southern part of the Lot 18, in Concession 1, which produced 7,500 barrels worth of oil daily for several months.¹⁸⁶ All of the flowing wells were struck around Black Creek and into the surrounding swampland near Shaw's first flowing well.

Although the owner of the new flowing wells had the benefit of Shaw's experience, they acted just as unprepared to contain the waste from the flowing well. A combination of the growing number of wells and the massive flow of their oil makes it impossible to determine how much oil actively polluted the region's environment in this period. Nevertheless, it seems that by March of 1862, some producers had figured out how to stop the flow of oil from these wells completely.

¹⁸² Sanford Fleming, "Notes on the Present Condition of the Oil Well," *Canadian Institute*, February 29, 1863, 246.

¹⁸³ Alexander Winchell, *Sketches of Creation* (New York: Harper & Brother Publishers, 1870), 443-4.

¹⁸⁴ Fleming, 247.

¹⁸⁵ Selwyn Griffin, "Petrolia Cradle of Oil Drillers," *Imperial Oil Review*, August 1930, 20.

¹⁸⁶ Johnston, 5. Quantity of oil from Alexander Winchell's table of flowing well production. Winchell, 443-4.

Nevertheless, some producers chose to keep the flow going out of fear that the flow would permanently stop. At the well of Messrs. Murdoch & McCaul, “they partially plugged the pipe, but do not care to stop the flow altogether, as it is feared that if the oil were not allowed its present mode of egress, it would find some other channel and disappear in the earth. This appears to be a chimerical fear, but it is said to be warranted by experience in Pennsylvania.”¹⁸⁷ This producer chose to allow an immense quantity of oil to pollute the Creek to ensure the continued production of his well.

The inception of the flowing wells translated to a low price of oil which allowed refineries to hone their refining methods through large quantities of cheap oil. The process of refining oil came in two parts, first removing impurities and then deodorizing the sulphuric odour from the oil. The first process was done for the purpose of eliminating the volatile nature of oil and providing a pure product. A local oil producer and refiner, Hugh Nixon Shaw, defined his process as using a large oil still and then applying heat and benzol to separate the impurities out of the oil. The *Globe* reported,

When this is done by Mr. Shaw’s process, he gains 2 per cent of benzole, 22 per cent. of spirits of petroleum, (another name for the benzole which he saves, and which maybe be used for all purposes to which turpentine is applied), 50 per cent of illuminating oil, 20 per cent of lubricating oil, and the refuse, the remaining 6 per cent. may be converted into asphaltum or be made to render the mauve, magenta, and auzrine dyes it contains.¹⁸⁸

At the conclusion of this process, Hugh Shaw obtained several products that were chemically stable. Because of the abundance of oil from the flowing wells translated to a low price of oil, numerous bootstrap refineries popped up across Oil Springs.

¹⁸⁷ “The Oil Springs of Enniskillen,” Toronto *Globe*, March 13, 1862.

¹⁸⁸ “The Oil Springs of Enniskillen,” Toronto *Globe*, March 13, 1862.

In response to the low price of oil, local producers who had struck out on their attempts to strike a flowing well looked to organize into an association that could control the price. Oil producer Henry Fairbank began this process in 1862 as the Shaw and subsequent flowing wells made it difficult for producers with surface or rock wells to turn a profit. According to Fairbank, “Oil to my certain knowledge has been sold for thirty cents per barrel since I have been here and perhaps for twenty-five. If men are not so selfish ... they could sell just as much at \$1.00 as at any lower price...”¹⁸⁹ On May 13th, 1862, Fairbank and other oil producers created the Canadian Oil Association. The Association would market members’ oil through its appointed secretary; whoever wanted to purchase oil from Enniskillen would have to go to the secretary, who would then provide the orders to the oil producers.¹⁹⁰ As a result, the Association provided an incentive for oil developers who were capable of stopping their flow of oil, as they would only have to pump it to meet requests. However, conflict emerged as certain oil producers aimed to continue producing oil at their well’s maximum volume or were unable to actually stop their flow of oil. Association members allegedly vandalized these wells.¹⁹¹ In one case, an oil worker received a threatening letter from oil men requesting that he refuse to take on any more contracts for a producer who was attempting to sell their oil outside of the Association. The producer reportedly had run out of ways to store the oil and he was unable to actually stop the flow. In a sperate case, a local oil producer named Barnes had violated the agreement with the Association, resulting in men who, according to the local newspaper, “pulled up the pipes, and filled the well with rubbish, completely destroying it.” They also targeted a man named Bush, who had purchased the oil from Barnes at the market price, and “turned the stop-cock, allowing a large quantity of oil to escape.” The Oil Association

¹⁸⁹ Fairbank, March 16, 1862, *Letters of John Henry Fairbank*, 14.

¹⁹⁰ Phelps, *John Henry Fairbank of Petrolia (1831-1914)*, 26-7.

¹⁹¹ Johnston, 6.

also obtained a harsh reputation of using the local *Oil Springs Chronicle* to attack producers unwilling to comply with it.¹⁹² According to the *Observer*, which was not completely objective, the *Chronicle* had become a puppet of the Association.

The cessation of the Pennsylvania flowing wells during the summer of 1862 brought further anxieties concerning the extent of Enniskillen's supply of oil.¹⁹³ In Pennsylvania it was reported that the majority of the flowing wells ceased to convey the oil to the surface, while other wells required pumps to extract the oil. Inadvertently, Pennsylvania answered the critical question as to whether oil was an endless or finite resource. In turn, it further raised questions for developers in Enniskillen as to whether their supply would also run out. According to an article from *Oil Springs Chronicle*, reprinted in the *Globe*, with "the failing supply of Petroleum in Pennsylvania comes a question of grave importance of [whether] the supply of oil is going to last. It is now induced to a certainty, and it is useless to disguise from ourselves the fact, that the supply in particular localities is not inexhaustible."¹⁹⁴ The *Chronicle's* sentiment was shared by Logan: "The experience in Pennsylvania has however shown that the supply from these flowing wells soon diminishes, and eventually fails." The decline of the flowing wells seemed to be in part a result of the number of wells that were all placed on the same area. Logan reported, "Adjacent boring sometimes appear to be connected with the same oil-yielding fissures, and to affect each other's supply; in some cases, air passes down one shaft when the other is pumped."¹⁹⁵ Logan accurately described that nearby flowing wells were likely to be connected to the same reservoir of oil, which in turn meant that the increasing number of wells weakened the pressure that contributed to the valued self-

¹⁹² "Outrage at the Oil Springs," *Sarnia Observer*, September 12, 1862.

¹⁹³ "The Supply of Oil," *Toronto Globe*, July 1, 1862.

¹⁹⁴ "The Supply of Oil," *Toronto Globe*, July 1, 1862.

¹⁹⁵ Logan, *Descriptive Catalog of Economic Minerals of Canada*, 23.

propelled flow of oil. It became clear that producers in possession of a flowing well were in competition with each other.

Ontario oil developers demanded that the Canadian Oil Association investigate the state of the American oil field. The Association appointed a member, identified only as Mr. Richardson, as a delegate to travel to Pennsylvania. In his subsequent report, Richardson acknowledged that the Titusville oil wells had ceased to produce oil and that most wells in Oil Creek required the support of machinery to collect the oil. On the topic of Enniskillen's own supply, Richardson suggested that it was possible that it lay deeper in the ground. However, he ended by stating, "But inasmuch as these are all uncertainties, I would advise that we proceed just as though we knew we had tapped the only body we will ever find, and that it will exhaust within five years at most."¹⁹⁶ Although Richardson entertained the idea of an endless supply, he primarily recommended that developers adopt cautious practices to preserve and capitalize on the current supply they possessed.

Recognizing that oil could be exhausted, condemnation was raised against the wastefulness of Enniskillen's producers. The previously mentioned *Oil Springs Chronicle* article denounced the producers for wasting a fortune that had been provided by nature. Although oil speculation encouraged wealth through oil development, they generally did not care that the development of their wells resulted in oil runoff. For example, speculators attempting to strike flowing wells should have had the necessary storage containers, created ditches to collect the oil, and hired more men to prepare for the flow of oil that would come. Although it was possible to stop the flow, producers allowed it to continue to pour into the surrounding landscape. As a result, the author chastised them by writing that "the wells in Pennsylvania are giving [sic] of a decrease in the

¹⁹⁶ "Meeting of the Canada Oil Association—Mr. Richardson's Report," *Oil Springs Chronicle*, undated, reprinted in Toronto *Globe*, August 19, 1862.

supply, are beginning to open the eyes of the oil men, to the true state of the case, and to show them the vast wealth they have almost given away.”¹⁹⁷ The reporter was not frustrated by the pollution that poured into the river, but rather by the loss of a valuable commodity.

By allowing large quantities of oil to escape, speculators had wasted a commodity that would have brought wealth and a new resource to the markets. As a result, the same reporter complained that from “the reckless way in which oil has been disposed of and wasted, it may seem that the oil-men of this country and Pennsylvania have regarded oil as being plentiful [and] as inexhaustible as water and acting upon tide have rushed it into market glad to sell any price which offered and totally regardless of its intrinsic value.”¹⁹⁸ Part of the criticism was aimed at the overproduction of oil and the decision of the producers to sell oil for a low price. Due to the increase in oil production from the flowing wells, the price of oil took a sharp decline, and in turn, speculators sold at whatever price the market would pay. However, because some producers of the flowing wells could not completely stop the flow of oil, they continued to sell large quantities of oil cheaply, pushing other producers to sell oil at the same low price.

As concerning as the cessation of the Pennsylvanian flowing wells might have been for the *Chronicle*, oil production in Enniskillen continued at the same rate. In fact, the market for oil rebounded slightly after the Pennsylvania flowing wells ceased, and the transition from winter to summer in 1862 meant that producers could transport more oil out of Enniskillen. However, the *Chronicle* argued that “in the New York markets the oil is rapidly appreciating in value, not because of increased demand, nor because of any very slight decrease in the supply, but for the simple fact that there are unmistakable signs that show that the supply is not likely to last as the

¹⁹⁷ “The Supply of Oil,” Toronto *Globe*, July 1, 1862.

¹⁹⁸ “The Supply of Oil,” Toronto *Globe*, July 1, 1862.

abundances as heretofore.” The *Chronicle* hoped that the producers would learn the lesson from the Pennsylvania oil men and “not throw away the first great spontaneous flow of oil, but husband it for the time, which will soon come, when the world will recognize and appreciate its true intrinsic value and are willing to pay its value for it.”¹⁹⁹

By the fall of 1862, the flowing wells began to slow, and the amount of oil that poured from the earth no longer seemed endless. Producers started to notice that the oil was being produced with a mix of sulphuric water. One theory suggested that “The creek, flats, and the swamps were drilled full of holes and cased with stovepipe or basswood, or in some cases nothing at all, and drained into the vein.” The producers would later discover that the water was coming from below the oil in the reservoir.²⁰⁰ Similar to the cessation of the Pennsylvania flowing wells, the wells in Enniskillen began to exhaust one another, proving that all the developers were in competition for the same resource. The two and a half square miles of land that was site of the majority of the oil wells fell prey to the tragedy of the commons—where a shared resource is depleted as multiple independent entities look to extract the resource for their own self-interest at the cost of the common good.²⁰¹ Some of the producers attempted to test the extent of the interconnectedness of the wells. In this test, the Shaw well was plugged, and the neighboring well was allowed to flow, which resulted in a “[f]ull discharge; but when both were allowed to flow, each yielded only partial supply.”²⁰² In this case, both owners decided to settle on a co-partnership. Discovering that all the flowing wells were vying for the same supply resulted in competition and an increase in drilling, in the hopes of extracting more of the oil before it completely ceased.

¹⁹⁹ “The Supply of Oil,” *Chronicle*, undated, reprinted in *Toronto Globe*, July 1, 1862.

²⁰⁰ Johnston, 5.

²⁰¹ Garret Hardin, “The Tragedy of the Commons,” *American Association for the Advancement of Science*, 162, no. 3859 (1968), 1244.

²⁰² Fleming, 248.

Tensions rose as oil workers grew frustrated that neighbouring wells were stealing the production capabilities of their well. One reporter wrote, “The famous Shaw well could be tapped dry by its near neighbor, belonging to Mr. Wilson, of Dundas.” It is not clear what the reporter meant by “tapped dry,” however, it could be a reference to the aforementioned test that was completed by plugging up the Shaw well. The fact that the Shaw well could have its flow slowed “gave rise to much anxious cogitation among the oil-men as to the sources and extent of the supply, and to a great deal of dodging and sharp practice on each other.”²⁰³ Anxious to maintain their flow of oil, producers struck deeper wells around their own and set up new wells around those of their competition. One speculator who owned land between Shaw and Willson’s well attempted to strike his own, with the hope of stealing the production of both oil wells. Luckily for the co-partnership, the speculator only struck sulphuric water.²⁰⁴

The flow of oil stopped in fall 1862, starting up again for a short period that winter, but the flowing wells stopped permanently in early 1863. The Shaw well was the first to stop, followed by more wells around Black Creek. Hope in the flowing wells was reinvigorated when the Hendrick’s well increased production to 700 barrels of oil a day, but its production quickly declined to 30 barrels a day after a week.²⁰⁵ In response, producers had to purchase expensive pumping equipment and rely once again on human labour to extract oil from the earth. The local *Oil Spring Chronicle* claimed, “Never before, perhaps, since rock oil in Enniskillen attracted the attention of the business public, has there been a fractional part of the anxiety and interest manifested in relation to the oil business that exists at present.”²⁰⁶ Panic ensued, and speculators

²⁰³ “An Account of the Oil Regions of Canada West,” *Hamilton Evening Times*, August 21, 1865.

²⁰⁴ Fleming, 248

²⁰⁵ J. T., Henry, *History of Petroleum with Authentic Facts in Regard to its Development in Western Pennsylvania* (Philadelphia: Jas. B. Rodgers Co, 1873), 133.

²⁰⁶ “Weekly Review,” *Chronicle*, January 22, 1863.

tried to dig deeper into the ground for oil. However, the majority dispersed to the surrounding regions of Petrolia, Marthasville, Bothwell, Tillsonburg, and in general, any area where they believed there might be oil. Some producers out of desperation abandoned leases that they held in Oil Springs as the implied promise of striking a flowing well disappeared. Most of the refineries that sprung up in Oil Springs were forced to close their doors because the increasing price of oil meant that only the largest refineries could purchase the small quantity of oil that was sold on the market. Without a supply of oil most of these refineries closed. These refineries had benefited from the low prices of oil which they purchased in large quantities and then sold for a higher price. But the new high price of oil on its own became too expensive for a lot of the small refineries to buy.²⁰⁷

By February only two flowing wells in the entire region were still producing oil—100 metres apart.²⁰⁸ Canadian engineer and inventor Sanford Fleming arrived in Enniskillen in 1863 with the hope of examining the reason for the cessation of the flowing wells. Fleming was the founder of the Royal Canadian Institute of Science, and possessed a background in surveying. He arrived at a moment when the total yield of Oil Springs oil had dropped to around four hundred barrels per day.²⁰⁹ One thing that stood out to Fleming was that the stoppage of the flow began with the deepest wells, even as the shallowest wells continued to flow.²¹⁰ Fleming was not able to ascertain the reason for this occurrence. Despite lacking evidence, he suggested that the problem seemed to stem from striking wells too deep. However, Fleming did not provide any further conclusions on the issue of the continued flow of the shallow wells. His examination then expanded towards the production of oil outside of Oil Springs, in Bothwell, Tillsonburg, and Petrolia. Although oil was flowing in these other localities, there was no evidence that any of them

²⁰⁷ “An Account of the Oil Regions of Canada West,” *Hamilton Evening Times*, August 21, 1865.

²⁰⁸ *Ibid*, 248.

²⁰⁹ *Ibid*, 246.

²¹⁰ *Ibid*, 247.

possessed flowing wells. Fleming did discover that there was a flowing well in Petrolia that was spitting 1,200 barrels per day of a mixture of salt water and oil, of which only “about one percent, or twelve barrels per day, is found to be Petroleum.”²¹¹ Because of the increasing price of oil due to the stoppage of the flowing wells, this well was likely profitable for the producers, as their main expense would have been the relatively inexpensive process of refining to separate the oil from the salt water. Despite the loss in the flowing wells, Fleming noted that the oil men had not given up hope on Oil Springs and were in the process of preparing a test well that would be drilled to a depth of 1,000 feet.²¹²

With the opportunity of the flowing wells lost somewhere in the earth, investments and the number of settlers drastically decreased. With its prosperity tied to Oil Springs, the *Chronicle* stated in 1863, “We do not regard the stoppage of the flowing wells as any indication of an exhaustion of the power which forces oil to the surface.”²¹³ The *Chronicle* could not entertain the idea that the flowing wells had permanently stopped, since they could not continue to be an oil town without oil. The *Chronicle* suggested that a supply of oil could be found if speculators were to “sink a well to a greater depth that has yet been penetrated-if necessary to a depth of 2,000 or more feet, and reaching, if possible, what is by many confidently believed to exist a greater reservoir of oil.”²¹⁴ Uncertainty as to what else lay below the earth, at a depth that no one had attempted, was enough for the residents to be optimistic about the future of the town. The *Chronicle* believed that through collective action, if everyone in town bought a small number of shares in a joint stock company to drill the well, to this imaginary reserve, they could bring life back to their town. However, during an oil depression, no one was willing to take such a substantial

²¹¹ Ibid, 248.

²¹² Ibid, 249.

²¹³ Victor Lauriston, *Lambton's Hundred Years* (Sarnia: Haines Frontier Printing, 1949), 166.

²¹⁴ Lauriston, 166.

risk. Ultimately, the region's shrinking population meant that the number of subscribers to the *Oil Springs Chronicle* shrank to the point that it went bankrupt in 1867.²¹⁵

²¹⁵ "Demise of the Oil Springs Chronicle," *Sarnia Observer*, July 19, 1867.

Chapter Three: First Bust, Second Boom

The cessation of the flowing wells in Oil Springs sent shockwaves through the Canadian oil industry. Although the myth of Oil Springs as Canada's "El Dorado" began to fade, the confidence in obtaining a fortune through oil development remained. Speculators continued to believe that if Enniskillen had provided enough oil to make men rich, then there had to be other localities that possessed the foundation of an oil boom below its soil. With the rising price of oil—due to increasing demand and low production—established oil companies with access to large quantities of capital became more common in the Canadian oil fields. Beginning in 1863, oil companies and speculators expanded their search for oil beyond the confines of Enniskillen. The search for additional supplies of oil in Ontario further expanded by 1865 with the price of oil in 1864-1865 reaching its peak. Furthermore, the end of the American Civil War in 1865 brought American capital and companies that joined the search for other oil reserves in Ontario. According to a correspondent from the *Hamilton Times*, "The many blanks in the oil lottery in Pennsylvania, and the more certain prospects of a return for their money expended in Canada... [resulted in] the latter part of 1864 and the beginning of 1865 Canada was invaded by hosts of live Yankees, determined to conquer for themselves the soil..." The influx of large oil companies with experienced oil workers allowed a correspondent to state that "The year of 1865 is the era of large and wealthy companies, with capital, skill, and any amount of good business management at command."²¹⁶ Companies were viewed as being capable to meet the needs of the growing oil industry. The increase in capital, competition, and demand encouraged attempts to locate oil throughout Ontario.

²¹⁶ M, "The Oil Regions of Canada West: The Oil Wells Between Chatham and Oil Springs, Camden, Dawn, and Euphemia," *Hamilton Evening Times*, February 17, 1866. John Henry Fairbank, *Petrolia Canada 1862-1908: its advantages as a commercial and residential centre*, 1908, 1.

The 1863 cessation of the flowing wells produced mixed results for the oil industry. On the one hand it resulted in a loss of confidence in oil development. On the other hand, producers who were in possession of rock and surface wells profited from the supply shortage of oil. As a result, those who were still active in the oil industry were doing well.²¹⁷ However, the future of the oil industry was set to be defined by the supply of oil.

The expanding search for oil in Ontario attracted the opinion of scientists and geologists. Experts began to provide public lectures, release books, and dedicate sections in their scientific publications claiming where speculators could find oil. Scientists from both Canada and the United States would come to be heavily involved in the search for oil in Ontario. One of the more common methods for American scientists to assist with the search for oil was through public lectures, as a way to spread knowledge, obtain publicity, and receive payment for their research. For example, geologist Charles Wilber of Chicago offered a lecture on the subject in the City Hall of London. The lecture was broken up into two sections, the first addressing the locations of oil and the second focusing on the history of oil development in Southwestern Ontario. He started by addressing the type of oil-bearing rocks that can be found in Canada West and East and where they existed in abundance. Wilbur placed specific emphasis on coniferous limestone as the primary geological condition required for oil.²¹⁸ Based on the findings of the Geological Survey of Canada, Wilbur suggested that oil-bearing rocks occurred in Essex, Kent, Lambton, Middlesex, Elgin, Huron, Bruce, Perth, Oxford, Norfolk, Brand, and Haldimand counties. Wilber further suggested that a greater abundance of oil could be found along streams and river basins, because these areas possessed disturbed rock, which in turn indicated oil trying to escape from the earth. He concluded

²¹⁷ M, "The Canadian Oil Region: Petrolia," *Hamilton Evening Times*, November 26, 1866.

²¹⁸ "The Oil Regions: Professor Wilber's Lecture," *Hamilton Evening Times*, November 13, 1865.

the first section of his talk by stating that the western boundaries of the oil region included “The shores of Lake Huron, Lake St. Clair, River St. Clair, and Lake Erie.”²¹⁹ Objectively, this suggestion was rather unnecessary given that these boundaries included the entirety of Western Ontario at the time.

The second section of Wilbur’s lecture focused on the history and potential of oil development in Canada. He began by praising the discovery of oil by Williams and the start of the flowing well period initiated by Shaw. A key part of his talk emphasized the wealth that Williams and Shaw obtained by engaging in oil speculation. Like earlier sources mentioned, Wilbur measured the success of the flowing wells by the extent of pollution they created. When referencing the highest producing oil well, Messrs. Black & Mathieson’s, he stated, “The quantity of oil which flowed could not be measured. The supply was so enormous that forty acres of ground were covered with it about five feet or six feet deep.” Wilbur’s emphasis on the fortune of oil struck in the past was used to encourage the future of oil development. On the future of Ontario oil and on the loss of wasted oil in Pennsylvania, Wilbur said, “But this is only one of the great reservoirs, and no person can tell how many there are in Canada West. Judging from this and other facts, I have no doubt that Canada West will prove to be the richest petroleum field on the face of the earth (Applause.)” It is unclear whether Wilbur truly believed that additional reserves of oil could be found in Ontario or whether he was simply telling the crowd what they wanted to hear: that they could strike a fortune in their own backyard. He reportedly concluded his lecture by stating, “The thickness of the oil-bearing rock increases towards London, from the west to the east, and it is a safe rule – that with the increase of the rock follow the increase of oil itself.”²²⁰ Given

²¹⁹ Lecture on the Petroleum Regions of Canada By Prof Wilber, of Chicago,” Toronto *Globe*, November 17, 1865.

²²⁰ “Lecture on the Petroleum Regions of Canada By Prof Wilber, of Chicago,” Toronto *Globe*, November 17, 1865.

the stories of Williams and Shaw striking it rich, the audience of Londoners likely left the lecture believing that they could trade their water well for an oil well.

Dr. Sterry Hunt of the Geological Survey continued to provide scientific information that could be adopted by speculators in their pursuit of oil. Because the cessation of the flowing wells caused panic and contributed to an increased price for oil, speculators were searching for wells across Ontario. Numerous attempts to strike oil across the province provided Hunt with access to the geological conditions of these respective regions. As a result, in the 1866 *Progress Report of the Geological Survey of Canada*, Hunt was able to provide an in-depth analysis of the conditions where oil occurred and where it was absent. From this data, he was able to ascertain the conditions necessary for the greatest production of oil. Places beyond Enniskillen where oil had been found were Adelaide, Bosanquet, Bothwell, Flamborough, Thamesville, Tillsonburg, and Manitoulin Island.²²¹ Unsuccessful drilling had been attempted in London, Leamington, Warwick, St. Mary's, Milton, and Goderich. Hunt added, "the numerous borings, chiefly in search of petroleum, which have been made in nearly every township west of London, have furnished data, which show the existence of several subordinate anticlinal folds to the northwest of the Thames...."²²² Supported by further evidence, Hunt was confident enough to suggest, "It follows that we should expect, in a somewhat disturbed district, to find oil-wells like mineral springs, along the anticlinal."²²³ The river system West of London seemed to suggest the ideal conditions necessary for a supply of oil. Hunt further determined that "Petroleum, depends upon a combination of many circumstances: (1) the proper attitude of the strata, (2) the existence of suitable fissures, which may act as reservoirs,

²²¹ Geological Survey of Canada, *Report of Progress for the Year 1863-1866* (Ottawa: George E Desbarats, 1866), 247-9.

²²² Geological Survey of Canada, *Report of Progress for the Year 1863-1866* (Ottawa: George E Desbarats, 1866), 247.

²²³ Geological Survey of Canada, *Report of Progress for the Year 1863-1866* (Ottawa: George E Desbarats, 1866), 256.

and (3) such an impermeability of the surrounding and overlying strata as will prevent the outflowing and wasting of the accumulated oil.”²²⁴ Overall, Hunt argued that the ideal conditions for oil were in the limestone where an anticline could be found in the shape of a hill or ridge.

Hunt’s contribution to the search of oil was further expanded when he was requested by the Commissioner of Crown Lands to examine the capabilities of the oil springs in Gaspé.²²⁵ Even his report of work there offered a detailed examination of the conditions that made Enniskillen ideal for producing oil. Hunt suggested that because of the movement of the earth’s crust, fissures have “given rise to what are called anticlinal lines or axes of evaluation.” These anticlines were ideal for the flow of oil to rise to the surface and become trapped in the crown of anticlines.²²⁶ Also, he hypothesized as to why Enniskillen produced so much oil as opposed to a place like Tillsonburg, which produced relatively little. Although Tillsonburg contained oil-producing limestone, Hunt suggested that Enniskillen possessed limestone covered with “200 feet of fissured shales, which in their turn are covered by beds of gravel and clay, all helping to retain the oil, well wells sunk to various depths in the shales yielded in little over a year (1861-1862) about 4,000,000 of gallons of Petroleum...” As a result, Hunt placed emphasis on the oil potential of Enniskillen so long as speculators focused on locating oil on anticline formations by examining the hills in the region. From there, it would be necessary to examine the contours and outcrops of rocks in order to determine if the conditions were sufficient for producing oil.²²⁷ To justify his conclusion, Hunt pointed to wells in Enniskillen where two anticlinal folds existed to the “north of the main

²²⁴ Geological Survey of Canada, *Report of Progress for the Year 1863-1866* (Ottawa: George E Desbarats, 1866), 261.

²²⁵ Owen, 82.

²²⁶ Dr. Sterry Hunt, *Petroleum: Its Geological Relations Considered with Especial Reference to its Occurrence in Gaspé*, (Quebec, G.E Desbarats, 1866), 6.

²²⁷ Hunt, *Petroleum*, 8.

anticlinal, at Oil Creek, and at Petrolia.”²²⁸ From this, Hunt suggested that the anticlinal theory was correct, because these areas had been where the largest quantities of oil had been found.

Despite the interest in having science answer the vital question of where to find oil, when science failed to provide an answer, “witches,” “wanderers,” and “magic,” would have to suffice. What reporters from the *Observer* referred to as witches were actually the arrival of dowsers in 1864. It is not clear whether dowsers were present in the region before the decline, but they were mentioned consistently through 1865. Some sources suggest that the dowsers arrived from the Pennsylvania oil fields, where they learned to read surface conditions necessary for locating oil. Hearing about the cessation of oil in Enniskillen, they might have seen an opportunity. It is not clear whether the dowsers were from Pennsylvania, but given the transnational relationships between both region’s oil fields, it is possible new arrivals to Enniskillen saw an opportunity in selling their knowledge from the American oil field.²²⁹ According to the *Globe* Correspondent on April 1865, they described a man known as the “Witch of Oil Springs,” “who will take a willow branch in his hand, and by its action tell a certainty where oil will be found, if the ground be bored....” Dowsing practice was viewed with considerable skepticism because it was criticized by the scientific community and relied on superstitious practices from Europe. However, some oil workers swore by the ability of the Witch of Oil Springs to locate oil, “There are plenty ready to testify strictly to the truth of the facts set forth. They know it ... they have experienced its benefits and would no more think of commencing a well without first consulting a man-witch and his ‘cany’ stick....”²³⁰ The desperation to find oil drove enough men to try any means at their disposal.

²²⁸ Hunt, *Petroleum*, 9.

²²⁹ Henry, *History of Petroleum with Authentic Facts in Regard to its Development in Western Pennsylvania*, 133.

²³⁰ “Enniskillen Oil Territory: Its Past and Present Locations,” *Toronto Globe*, April 14, 1865.

By 1866, attempts to find oil extended to less than ideal locations, which was a sharp contrast to the first oil boom around Oil Springs. The *Observer* reflected that whereas speculators used to believe “that only a few hundred acres in extent was worth trying for oil, ... no one can pretend to believe that there are yet untapped oil reservoirs of imagined extent, either below or near to those that furnished the great flow of 1862.”²³¹ Because oil had been discovered outside of Oil Springs in Petrolia and Bothwell, speculators were in no rush to limit themselves again to such a small area. However, journalists were becoming critical of speculators who were attempting to strike oil in areas that made no sense whatsoever. One reporter suggested that speculators were misinterpreting scientific information in their attempt to find oil. “Of course, the teaching of geology is not that oil is to be found in every place where disturbances of the rock exist, but merely that, in a region where oil is, the localities of greatest disturbance in the rock below are those in which to look for it.” The reporter suggested that one was more likely to find oil in “the township of Moore and Sombra to the westward, and in Brooke to the eastward, of the county lying between Dresden and Oil Springs,” because these locations possessed the gum beds. Considering that Williams and several early producers struck oil in Oil Springs by digging through the gum beds, the reporter's suggestion is warranted. As a result, the reporter seemed frustrated that “the wildest schemes are started and proceeded with, to bore for oil in numerous localities where geology forbids as to hope for finding of oil, with how much more reason may those who have the means risk a portion of the same in a district of country where scientific probability is so much in their favor.”²³² One example would be in 1866 when business Samuel Platt of the Goderich Petroleum Company attempted to strike oil in Goderich and instead found salt.²³³

²³¹ “Extent of the Oil Basin,” *Sarnia Observer*, May 11, 1866.

²³² M, “The Oil Regions of Canada West: The Oil Wells Between Chatham and Oil Springs, Camden, Dawn, and Euphemia,” *Hamilton Evening Times*, February 17, 1866.

²³³ M, “The Oil Regions of Canada West: Petrolia,” *Hamilton Evening Times*, February 28, 1866.

Petrolia's population had risen to a couple hundred by 1862 because of the discovery of oil, but its growth suffered from the rise of the flowing wells in Oil Springs. A reporter for the *Hamilton Times* later that decade wrote, "Though it was known that a small yet steadily continued yield of oil had been in the course of being obtained there ever since 1861, from a few wells, the locality was neglected, the supposed superior attractions of Oil Springs... drawing the main current of speculation away from Petrolia." The flowing wells were closer to Oil Springs, so it prospered. However, the cessation of the Oil Springs wells in 1863 meant that prospectors returned to the shanty village of Petrolia with capital, experience, and equipment.²³⁴ Petrolia was still a remote swampland village in 1865, with a main street consisting of just six log houses, but within a year the population increased to 2,300, with the discovery of flowing wells in Petrolia.²³⁵ The consistent supply of oil and the discovery of flowing wells also attracted investment in refining and in servicing the oil industry. Petrolia further benefited from the construction of an extension from the Great Western Railway in 1866.²³⁶

The prospect of the Canadian oil fields attracted the eyes of American investors, but the threat of the Fenian Raids quickly slowed down growth. By 1866 the Canadian oil fields had benefited from American capital and labour since the early beginnings of the of the oil industry in 1858. With the end of the American Civil War in 1865, many American investors saw opportunity in Canada. The cessation of the Canadian flowing wells in 1863 had brought a bit more stability to the oil trade as the prices of oil remained high enough to make a profit. Furthermore, no one was successful in discovering a supply of oil that had rivaled the Oil Springs flowing wells. As a

²³⁴ Ibid.

²³⁵ Lauriston, 168.

²³⁶ "The Canadian Oil Region: Petrolia," *Hamilton Evening Times*, November 26, 1866.

result, American capital and labour poured into Canada in 1864.²³⁷ The small oil town of Petrolia benefited substantially from American investment as their continuously producing surface and rock wells caught the attention of investors. It is not clear as to how much American capital was invested in Canada, but an article in *Scientific American* felt confident enough to suggest that “no less than twelve million dollars’ worth of American gold had already been expended in developing the resources in the Canada oil region...”²³⁸ The accuracy of the claim is not clear, especially considering that the article later suggests that Canadians were not willing to invest in their own industry because it went against their nature to avoid new risky industries. However, other sources corroborate the claim that between 1864 and 1867 Americans were heavily involved in Canada’s oil industry.²³⁹ However, when some of the American received word that Fenian leader Gen. O’Neil had landed in Canada, a large number of Americans ceased operation. Some even went as far to sell their oil assets in Canada and return to the United States.²⁴⁰

The discovery of a flowing well by Benjamin King on November 23, 1866, brought on the second wave of the oil boom. King was a manager for the Great Eastern Oil Company of St. Catharines, who decided to attempt to strike a well in an unconventional area. Unlike the majority of the oil speculators who tried to strike oil on the flats of Black Creek, King sought oil about one and a quarter miles away, in the wooded swampland just west of present-day Eureka Street, Petrolia. When King struck oil, it reportedly shot fifty feet into the air and threw “out volumes of gas and water with a roar that could be heard a distance of 2 miles.” The gas that poured out of the well was enough nearly to suffocate the workers near the derrick who had to move away to avoid

²³⁷ M, “The Oil Regions of Canada West: The Oil Wells Between Chatham and Oil Springs, Camden, Dawn, and Euphemia,” *Hamilton Evening Times*, February 17, 1866.

²³⁸ J.D.C, “The Oil Districts of Canada,” *Scientific American*, Vol. XV No. 21 (December 8, 1866): 384.

²³⁹ Fairbank, *Petrolia Canada 1862-1908*, 1.

²⁴⁰ J.D.C, “The Oil Districts of Canada,” *Scientific American*, Vol. XV No. 21 (December 8, 1866): 384.

passing out.²⁴¹ As at the Shaw well, the workers were unable to contain or slow the flow of oil. King's discovery brought a second wave of oil prospectors who flooded into the swamp.²⁴² A number of oil gushers resulted in massive flooding—and so, massive pollution—into Bear Creek and the surrounding landscape.²⁴³ In an attempt to capture the flow, oil workers began the process of erecting tanks above and below ground.

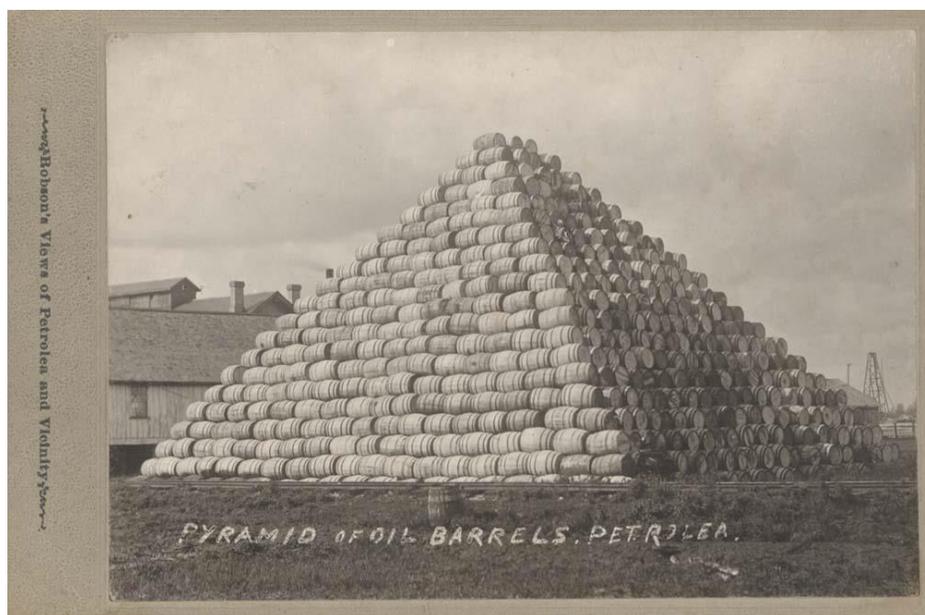


Figure 4: Pyramid of Oil Barrels²⁴⁴

From 1870 to 1885, Petrolia continued to grow as an oil centre defined by its consistent supply of oil and its refineries. Although there were further booms and busts concerning the supply of oil, the community of Petrolia had grown out of its shanty town roots to become not just an established town, but Canada's primary oil centre—until 1898, when Standard Oil acquired Imperial Oil and transferred the refining operations to Sarnia.²⁴⁵ Oil Springs suffered a harsher fate. Although several oil towns were suffering from the boom's bust in 1864, Oil Springs, in the

²⁴¹ Burr, 92.

²⁴² Lauriston, 169.

²⁴³ Edward Phelps and H. Belden & Co, *Belden's Illustrated Historical Atlas of the County of Lambton*, 12.

²⁴⁴ "Pyramid of Oil Barrels at Petrolea," (Provided by Lambton County Archives)

²⁴⁵ Burr, 189.

words of one newspaper, “especially, had fallen from a state of apparent prosperity, into ruin and decay.”²⁴⁶ It experienced a declining population and a loss in investment. By 1880, *Belden’s Atlas* provided a harsh but accurate portrayal of Oil Springs: “In a remarkably short space of time, it rose from the forest and ranked as a leading centre of trade and commerce; in a still shorter, it tumbled from its zenith of prosperity to a counterpart of the Deserted Village.” Without notable supplies of oil, Oil Springs was once again perceived as a simple rural town in Ontario, no longer the El Dorado of Canada. *Belden’s Atlas* wrote, “The cause of its inception was the discovery of oil; the cause of its prosperity was the development of the oil-trade; and the cause of its collapse was the suspension of that industry, consequent on the discovery of the article at points nearer to lines of transportation.”²⁴⁷ Although a new supply of oil would be found in 1881, the days of Oil Springs as a major centre of oil production were far behind.

Into the 1870s the oil industry in Petrolia was in a precarious position. Oil refineries had already expanded into the cities of London, Hamilton, Toronto, and Montreal, as the railway system could not handle the export of both unrefined and refined oil from Petrolia.²⁴⁸ Refineries in London became especially influential, forcing Petrolia producers to sell oil at a low price. At the same time, refineries in Petrolia were undermining local producers by purchasing cheap American oil which they then refined and sold for a higher price. Producers and refiners made several attempts to work together to ensure a stable and profitable price for oil. However, most were unsuccessful. The Canadian oil industry also had to cope with the loss of the British market, because (as will be discussed in Chapter Six) of the bad odour and higher price of Canadian oil as compared to American oil. To alleviate the pressure from the American market and from the

²⁴⁶ M, “The Oil Regions of Canada West: Petrolia,” *Hamilton Evening Times*, February 28, 1866.

²⁴⁷ Edward Phelps and H. Belden & Co, *Belden’s Illustrated Historical Atlas of the County of Lambton*, 12.

²⁴⁸ Burr, 111.

London refiners, Petrolia's oil industry pushed for favourable railway fees in 1877 and encouraged the construction of new refineries.

The price of domestic oil rose drastically in 1879. This was largely the result of policies passed by the Federal Conservative government in its Petroleum Inspection Act of that year. The act required both Canadian and foreign oil to pass a heat test without "flashing." Canadian oil was given a distinct advantage as it only had to pass the test at 105°F while foreign oil had to pass the test at 130°F. What's more, Canadian producers were charged only 10 cents per barrel to have their oil tested, whereas foreign oil was charged 30 cents per barrel. As a result, Canadian oil became more competitive within Canada and producers had the option to charge more for their oil to match the price of foreign oil. Producers further benefited from the cheap price of refined and unrefined oil throughout the 1870s, which stimulated demand.²⁴⁹

Petrolia's producers used their newfound financial security to restructure the oil trade in their favour. On September 22, 1884, a meeting of seventy-five producers was held to discuss a way to secure a greater share of the oil profits for themselves. Oil producer John D. Noble recommend the creation of a Petrolia stock exchange, which would implement a brokerage system to facilitate higher prices for oil. On December 23, 1884, the Petrolia Oil Exchange opened with the support of thirty-four producers and refiners. The exchange provided a public place for refiners and producers to sell and buy oil, which cut down on people trying to manipulate the price of oil or shortchange other oil-men.²⁵⁰ As a result, Canadian producers and refiners were able to push for higher oil prices.

²⁴⁹ Burr, 115.

²⁵⁰ Burr, 118.

Yet the future of the Canadian oil industry still looked uncertain in the 1880s. Oil producer John D. Noble reflected his concerns in an interview to the 1890 Royal Commission on the Mineral Resources of Ontario. He noted that Canadian producers could not compete in the British market with the Americans, whose wells possessed a higher production capacity and whose refining techniques were producing a very high-quality illuminating oil. Noble warned that “For these reasons we are confined entirely to Canada, and were the American oil allowed free into this country our industry would be completely wiped out.” With clear limitations placed on the degree to which producers and refineries could expand, the prospects for the Canadian oil industry looked grim. Noble recognized that one of the impediments was the inability of Canadian producers to “compete with their [Americans’] flowing wells.”²⁵¹ While Canada possessed flowing wells, the expansion of the Pennsylvania oil fields and the discovery of oil in Ohio and Indiana resulted in an increase in the number of American flowing wells. Ultimately, a single Canadian oil field could not hope to compete with an ever-increasing number of American oil fields.

With Petrolia’s oil industry cornered inside Canada, U.S.-based Standard Oil was preparing a full invasion of Canada. Even by 1890, Standard Oil had already purchased a number of Canadian oil companies, including Eastern Oil, Bushell, Queen, and British Columbia Oil. With these subsidiaries alone, Standard Oil had a presence in Saint John, Halifax, London, Montreal, Toronto, Ottawa, and Sarnia.²⁵² It then proceeded to complete its control of Canada’s oil industry by taking over companies in Petrolia and Sarnia. In 1895, Standard Oil began negotiations to buy out the Petrolia-based giant, Imperial Oil. In the background of these negotiations, Standard Oil, through its subsidiary Bushell Company, purchased the refining operations of Fairbank and Rogers and

²⁵¹ *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*, 166.

²⁵² Burr, 121.

Company in Petrolia. Bushell then purchased the Alpha Refinery to centre the refining industry of Southwestern Ontario in Sarnia. Imperial Oil agreed to its sale to Standard Oil in June 1898.²⁵³ The dominance of Standard Oil meant the demise of Petrolia's central role as Canada's primary centre of oil development and refinement.

Over the course of the second half of the nineteenth century, Petrolia had dominated Canada's oil industry. At first, the flowing wells of Oil Springs had seemed a death sentence to Petrolia, as prospectors anxious of missing out on all the excitement decided to abandon Petrolia in hope of greater rewards. But with the loss of the flowing wells in 1863, oil exploration spilled out all over Southwestern Ontario. Prospectors turned to science to assist them in their search – and when failed to produce definitive or simple answers, they turned to the supernatural. Once a flowing well was struck on the outskirts of Petrolia, prospectors focused more of their attention back in Enniskillen. By 1867, Petrolia was the centre of Canada's oil industry, although it was continually forced to fight to maintain the position in the years that followed. Eventually, the discovery of new oil fields, competition from other localities, and larger companies based elsewhere ended Petrolia's dominance. But even after Standard Oil transferred Petrolia's refining operations to Sarnia, Enniskillen locals continued the proud tradition of oil development: some men followed the refineries to Sarnia, while others found work in foreign oil fields, far from the polluted creeks of home.

²⁵³ Burr, 122.

Chapter 4: Water Scarcity and Oil Spills

By the end of 1885, Enniskillen was a far different place from the land that the first oil prospectors had observed in 1858. Over the course of twenty-seven years, correspondents from multiple Canadian newspapers travelled throughout Enniskillen in their pursuit of documenting all things related to the economic state of the oil industry. Consequently, their thorough reporting on most things touched by oil meant that reporters documented environmental change and oil pollution. These articles made it possible to track the extensive changes caused by the oil industry, and the subsequent reactions to the local population. Drastic change through oil spills, the loss of forests, and air pollution redefined how locals conceptualized and interacted with their environment. As traditional spaces transformed, they acquired new meanings, offering new rules and choices of how to live in Enniskillen. For instance, with large parts of the river system, especially Bear and Black Creeks, continuously polluted by oil runoff, the river system became an unreliable source of drinking water. As a result, consumption of contaminated water became a very legitimate concern.

The oil pollution of the flowing wells in Oil Springs and Petrolia exacerbated environmental change, on a scale that few humans anywhere had ever witnessed. Because the pollution created sudden and extensive change, locals struggled to adapt to the limitations imposed by a continuously changing environment. The spike in the quantity of oil pollution combined with the growing size of the oil industry translated into rampant water scarcity, as rivers and water wells became contaminated. Since humans regularly require water for drinking, cooking, and cleaning, normalizing the loss of water was not an option. Instead, locals had to create solutions to provide themselves with a consistent supply of water to survive in the transformed environment of Enniskillen.

As early as 1859, the infant oil industry was leaving signs of environmental change. The assumption amongst speculators that oil could be found along river and creek beds meant that Black and Bear Creek were the ideal locations for development, and therefore the most notable area impacted by oil pollution. On May 24, 1861, two travellers by the names of Messer James, R. Serfinger and George Wallace of Galt travelled through Enniskillen, stopping at Oil Springs and Petrolia; afterwards they submitted a summary of their travels to *Globe*. In their journey, both men testified that they witnessed 100 oil wells all erected along Bear Creek of Petrolia and 40 wells on Black Creek of Oil Springs. Despite the higher number of reported wells on Bear Creek, it was Black Creek that showed the signs of oil pollution, because the Oil Springs region had higher producing wells between 1858 and 1864.²⁵⁴ Oil Spring was the centre of oil development in 1861, while Petrolia was an isolated rural community with a smaller oil industry. As a result, producers in Oil Springs were capable of polluting the environment to a far greater extent than was possible with the wells at Petrolia. For example, a rock well on the leased property of Bilila & Co released about 40,000 gallons of oil into the Black Creek.²⁵⁵ This type of wasteful developing practice was already altering the environment in Oil Springs. Serfinger and Wallace reflected on the differences between the two towns, preferring Petrolia because it was “comparatively a pretty place.” The travellers further portrayed the difference by pointing out that “Bear Creek, upon the banks of which the wells are situated, does not smell of oil, and is as clear a stream as Black Creek is a dirty one.”²⁵⁶ By 1861 outsiders were drawing preferential distinctions between two towns based on the way the environment was changing.

²⁵⁴ “The Oil Region,” Toronto *Globe*, September 12, 1861.

²⁵⁵ “The Oil Region. No. III,” Toronto *Globe*, September 6, 1861.

²⁵⁶ “The Oil Region,” Toronto *Globe*, September 12, 1861.



Figure 5: Postcard depicting wells along Black Creek near Oil Springs²⁵⁷

While oil made up most of the pollution, chemicals and waste from the refineries were also deposited into the creeks as early as 1862. According to a *Globe* correspondent, “No use is made of the benzol which is allowed to escape, and the refuse oil finds its way into the creek.”²⁵⁸ The disposal of refining acid and oil into the creek was a consistent occurrence, beginning with Oil Springs, and becoming a persistent nuisance to the locals of Petrolia in the 1880s.²⁵⁹ The continued growth of the oil industry translated to an increase in the size of the refinery industry in Enniskillen. However, refinery pollution was not as thoroughly documented as oil pollution because reporters kept track of oil spills to determine the production capabilities of a specific well, while refinery waste was considered a useless by-product.

Oil pollution in Oil Springs escalated with the discovery of the 1862 flowing wells. Alexander Winchell, a geologist who conducted research during the 1860s in Oil Springs, reported that oil “floated on the water of Black Creek to the depth of six inches and formed a film upon the

²⁵⁷ “Postcard showing a landscape covered with oil derricks at Oil Springs, Ontario,” Provided by Lambton County Archives.

²⁵⁸ “The Oil Springs of Enniskillen: Adam’s Refinery The Cost of Boring...,” Toronto *Globe*, March 13, 1862.

²⁵⁹ “Drainage,” *Petrolia Topic*, November 6, 1879.

surface of Lake Erie.”²⁶⁰ Because of his frustration concerning the waste of valuable oil, Winchell dedicated time to determine the amount of oil caused by the flowing wells. According to his estimate, “no less than five million barrels of oil floated off upon the water of Black Creek.”²⁶¹ Other estimates on the quantity of wasted oil seem to reflect the immensity of Winchell’s own. *The Merchants' Magazine and Commercial Review* estimated that “one-half the entire quantity of oil brought to the surface has been lost in this way [into the river].”²⁶² Determining the accuracy of both estimates is largely impossible, but they both offer a useful illustration as to how different sources imagined the extensiveness of oil pollution required to pollute the environment of Oil Springs as it did.

Nevertheless, the extent of the pollution from the flowing wells in 1862 was enough that Lake Erie, Lake St. Clair, and the River St. Clair all experienced it.²⁶³ Oil in the waterways was described as thick enough that boats leaving Detroit for Sarnia would have the base of their boats painted black.²⁶⁴ This actually attracted interest in the Enniskillen oil industry: oilman John D. Noble later spoke of being drawn to the region by the polluted Lake St. Clair.²⁶⁵ While a “vessel overseer” in Kingston, Noble was shocked when a schooner returned to the port entirely covered in oil from stem to stern. Asked what had caused this mess, the captain replied that “they had struck oil at Sydenham and could not stop the wells flowing, and that it was coming down the river a foot thick on top of the water.” The curious tale of the oil-covered schooner was enough to prompt Noble to set out to Sarnia and then Enniskillen to examine the affairs of the oil industry.

²⁶⁰ Winchell, 287.

²⁶¹ Winchell, 287.

²⁶² “The Oil Wells of Canada,” *The Merchants' Magazine and Commercial Review*, Vol 48, No 4 (April 1, 1863): 344.

²⁶³ Winchell, 287.

²⁶⁴ Johnston, 4.

²⁶⁵ *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*, (Toronto: Warwick, 1890), 165.

Once he arrived, Noble recognized that “What the captain referred to was caused by the flowing wells of Oil Springs.”²⁶⁶ Others were likely just as attracted as Noble to the region by its pollution.

In the case of Oil Springs, the immediate reaction to oil pollution was a mixture of confusion and disinterest. One primary concern emerged as to whether the water in Black Creek could be used for human and animal consumption. According to a correspondent from the *Chatham Planet*, the oil pollution from the flowing wells had a drastic impact on Black Creek throughout the winter and into the spring of 1862.²⁶⁷ The reporter wrote, “The quantity of oil that has been wasted from several wells and poured into the creek here has so affected the water 15 or 16 miles from this place, that the cattle will not drink it, and farmers are obliged.... to dig wells to supply their stock with drinking water.”²⁶⁸ As a result, the environmental change brought new restrictions that recommended that the creek was no longer a viable space for obtaining drinking water. Although the *Chatham Planet* does not explicitly specify if the farmers could use the water, the amount of oil pollution in the river suggests that they would not have been able to persuade their cattle to consume the polluted water. Another source notes that a local farmer struck a sulphuric water well which he used to supply his horses and cattle with water.²⁶⁹

Traditional problems like flooding became much more devastating when the river also contained oil. When the creeks overflowed, and when the waters receded, it left behind a film of oil on top of the soil. If a layer of hydrocarbons forms, then the soil suffers from hydrophobicity—a condition where water cannot penetrate into the ground and instead collects on the surface—which prevents plant growth, increases soil erosion, and halts the infiltration of water into the

²⁶⁶ *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*, 165.

²⁶⁷ “Oil Springs,” *Chatham Planet*, March 6, 1862.

²⁶⁸ “Oil Springs,” *Chatham Planet*, March 6, 1862.

²⁶⁹ Mary Louse Doyle Parsell, “Tweedsmuir History of Oil Springs: Some Pioneers of Enniskillen-Mary Louse Doyle Parsell.” *Women’s Institute of Oil Springs*, 4.

soil.²⁷⁰ While people did not understand the science behind the damage caused by oil pollution, they knew it was adversely affecting their soil. A concerned reporter from the *Sarnia Canadian* noted, “The oil nuisance has become so great to those along the creek that unless some means be taken to lessen it, the Bear Creek flats, which used to be considered some of the most productive parts in the county, will be useless either for cultivation or for pasture.”²⁷¹ Farmers grew concerned about the possibility of floods.

The polluted rivers raised some questions for a curious *Globe* correspondent as to the implications of oil pollution on the fish populations. He mused whether the oil might actually improve their habitat. The reporter stated, “Whether the Fish like or dislike this natural addition to their aquapura is not reported. Perhaps they use it for medicinal purposes, as dogs sometimes eat grass and cows chew leaves of hemlock out of condition.”²⁷² Uncertain about the implications of oil filled rivers, the pollution captured the attention of an outsider who was unsure how to conceptualize oil pollution. Although the reporter provides a suggestion based on a comparison to other animals, the reporter clearly implied that he lacked the understanding as to the implications of oil to the fish. Although the *Globe* correspondent was writing of Black Creek, years later a Petrolia resident wrote that “Oil slopped over the sides and into nearby Bear Creek polluting it to the extent that even the fish caught there tasted of oil.”²⁷³ It is not clear whether the pollution resulted in long-term declines in the local fish population—whether because they died or swam to another part of the river system—but there is no further mention of fish from 1858 to 1890 in Black and Bear Creeks. When a *New York Times* reporter visited Oil Spring in 1865, he provided a

²⁷⁰ Gabrielle Gordon, et al., "Oil Spill Effects on Soil Hydrophobicity and Related Properties in a Hyper-Arid Region." *Geoderma* 312 (February 2018): 114-15.

²⁷¹ “Canada,” *Sarnia Canadian*, undated, reprinted Toronto *Globe*, July 19th, 1870.

²⁷² “The Oil Regions,” Toronto *Globe*, August 27, 1861.

²⁷³ Isla Smith, *A Small Town Affair: A History of Wyoming, Ontario* (Petrolia: Petrolia-Advertiser, 1873), 95.

detailed account of the different type of meat that could be purchased in the region and the type of meat that was brought in from outside sources. For whatever reason, he made no mention of fish, except to say that they could be obtained from Lake Huron.²⁷⁴ Although the absence of fish does not suggest their complete disappearance, with the knowledge of oil pollution pouring into Black Creek and Bear Creek, and with the suggestion that the closest supply of fish could be found in Lake Huron, it may well be that population declined substantially—or that people were unwilling to eat them.

Oil pollution in the rivers and the land offered cunning speculators a unique opportunity. Although the Creeks were no longer spaces that provided clean drinking water, the altered environment offered people the opportunity to collect waste oil to sell to the refineries. When there was ample oil on the river, workers skimmed it off, in both winter and summer.²⁷⁵ In winter, workers collected the oil that gathered on top of the ice. In summer, men would dam the creek with trees, so the oil could be collected in the dam, allowing them to skim it off the water in greater quantities.²⁷⁶ These men collected the oil not out of any concern for the environment, but rather because it allowed them to engage in the oil trade without having to purchase land. In one case, a local worker skimmed the oil off the creek for twelve hours straight, removing thirty barrels of oil.²⁷⁷ In the journal of prominent oil producer Henry Fairbank, he even engaged in the practice by sending his labourers to the river for the purpose of “dipping oil from creek.”²⁷⁸ Even the locals in Enniskillen became involved in collecting oil and selling it. Whenever a new flowing well was struck, locals would come from far and wide to witness the discovery, but also to collect the excess

²⁷⁴ Oleum, “The Canada Oil Question,” *New York Times*, January 28, 1865.

²⁷⁵ “Commercial Enniskillen Oil Wells,” *Toronto Globe*, February 13, 1862.

²⁷⁶ Smith, 95.

²⁷⁷ “The Oil Regions,” *Hamilton Evening Times*, September 16, 1861.

²⁷⁸ Fairbank, February 1864, *Journal of John Henry Fairbank*, 15.

oil that poured over the landscape. The legality of collecting oil runoff is not clear. In the case of flowing wells, the sheer volume of escaping oil meant that locals were free to collect it.²⁷⁹ Just as Fairbank sent men to collect excess oil on the river, so other oilmen had their workers collect excess on land. In the case of the “Deluge” well in 1873, a driller drunk on the job who had taken a nap woke up in the middle of the night to the sound of a loud blast.²⁸⁰ As he looked around, he realized that the “oil from the blowout [drastic increase in pressure, resulting in an explosion and a release of oil] flooded the countryside.” After the oil continued to flow, “an enterprising American showed up with long-handled ladles and, with some hired help, scooped up hundreds of barrels of it.”²⁸¹ Although skimming for oil in the rivers and on the land was financially motivated, it is one of the earliest records of humans actively cleaning up an oil spill.

Enniskillen has never been known for its abundance of fresh water: ironically, the first oil well has been suggested to have been an attempt to dig for drinking water.²⁸² Finding drinking water before the inception of the oil industry in 1858 meant using the river system or setting a water well. However, the increase in oil pollution brought on by thousands of speculators meant less water and more people to consume it. The loss of freshwater from the rivers and unreliable water tables ensured that water scarcity would be a common characteristic of life in the oil region. Drinking water contaminated with oil was an option, but it was known to possess a horrible taste that prevented people from consuming it. A traveller to the oil region by the initials of C.R.B. offered criticism of the water in Oil Springs, writing that the “water is of a brackish description, and to one accustomed to use Montreal water, rather unpleasant.”²⁸³ By 1861, years of oil

²⁷⁹ “Commercial Enniskillen Oil Wells,” *Toronto Globe*, February 13, 1862.

²⁸⁰ Allan Anderson, *Roughnecks & Wildcatters: Hundreds of first-hand exciting stories by Canadian Rig-builders...* (Toronto: MacMillan Canada, 1981), 47.

²⁸¹ Anderson, 45.

²⁸² May, 33-4.

²⁸³ “Oil Diggings,” *Toronto Globe*, August 2, 1861.

development had already polluted the water supply in Oil Springs, translating to visitors raising complaints. Beyond the taste, consumption of polluted water was known to cause serious health concerns. In the later-published *Journal of the Oil Producer Henry Fairbank*, he described himself suffering from pain in his bowels, which was “a common complaint attributed to the water supply.”²⁸⁴ Fairbanks’ description seems to be a local belief that consumption of oil was the cause of these negative effects.

Given that the creeks could no longer be counted on as sources of drinking water, locals turned to strike water wells. However, when locals attempted to strike water, they also had a high chance that they would strike oil or a sulphuric water vein. As a result, obtaining a water well on one’s own property proved to be a complicated matter. To improve the chance of striking water some oil workers used their drilling equipment to search for water at a deeper depth, but there was still a low chance of success. The story of Thomas Grey, the owner of the Principal Hotel in Oil Springs, accurately reflects the difficulty and the importance of striking a water well. In the hopes of supplying his patrons with fresh water he dug a well behind his hotel. Instead, he struck oil, and he was forced to search for an alternative source of water.²⁸⁵

Outside reporters used the scarcity of water and the unpredictable nature of striking a water well to portray Enniskillen as a land possessing nothing other than oil beneath the soil. A *Globe* reporter wrote, “within that district [Enniskillen] so much favoured of petroleum that it is impossible to sink a well without finding oil.” Like Grey of the Principal Hotel, “He dug a hole in his yard, hoping, foolish man, to get the ‘aquapura,’ but found oil instead. Whenever he gets short of money he has only to pull the lid from off his well, dip down his buckets, draw forth his oil, pay

²⁸⁴ Fairbank, October 16, 1865, *Journal of John Henry Fairbank*, 7.

²⁸⁵ “The Oil Region,” *Hamilton Evening Times*, September 16, 1861.

what he owes and keep the rest.”²⁸⁶ Although the abundance of oil in Enniskillen provided the owners with money, it also forced them to find alternative sources of water for their customers.

The pursuit of water was a constant concern in Enniskillen. In the early 1900s, when Annie Adamson-Gale recollected her early life in Oil Springs, she devoted a couple paragraphs to water scarcity. She clearly saw this as a significant and defining trait of life in this oil town. According to Adamson-Gale, “Many people put down wells hoping to get water. Dusty Fletcher put down one quite close to his kitchen door and got a good oil well. He had to board that door, and I remember so well that part of the house was black with oil.”²⁸⁷ Striking a well rarely seemed to be rewarded water.

The complexity involved in striking a water well meant that there were limited locations where people could obtain water. Resident Ken Macgregor and his family, who arrived from Scotland in 1890, struggled to come to terms with the polluted environment of Enniskillen. When MacGregor and his family moved from Petrolia to the declining town of Oil Springs in the 1890s, they had to complete extra labour to deal with the water scarcity. According to him, “Oil Springs was far worse off than Petrolia for good drinking water.”²⁸⁸ Moving from the more developed town of Petrolia meant that the family would face additional complications in their search for a reliable supply of water. “We had to draw our water into a barrel from the Bright Well near Robert McLister’s farm, two miles from home. The same distance in another direction was the Burroughs Well, where we sometimes went for variety,”²⁸⁹ MacGregor noted in his diary. The laborious

²⁸⁶ “Enniskillen Oil Territory: Its Past and Present Condition,” Toronto *Globe*, April 26, 1865.

²⁸⁷ Annie Adamson-Gale, “Tweedsmuir History of Oil Springs: Sketch of Oil Springs 1863,” *Women’s Institute of Oil Springs*, 2.

²⁸⁸ Ken MacGregor, *Journal of Ken MacGregor*, 47.

²⁸⁹ MacGregor, 47.

reality of procuring water from different locations meant that locals were cognizant of the time spent collecting water.

When people recognized the presence of oil pollution, they used their senses of taste, smell, and sight. One of the greatest nuisances for people visiting the oil region was the constant presence of oil pollution in spaces that were supposed to be separate from the oil fields. Yet the odour of oil found its way into the rooms and the taste of oil found its way into the water and food. A frustrated correspondent from the *London Free Press* noted that oil was so extensive that “One tastes it in the beer, and even whisky fails to kill it out. The flavor is detected in the bread, you eat bacon, but you taste oil. You smell it and taste it in the air and hold your nose to lessen its ungracious influence upon the olfactories.”²⁹⁰ Dissatisfied with the omnipresence of oil, the reporter encouraged visitors to stay only for a short time.

By the summer of 1866, Canada’s oil industry was increasingly centred in Petrolia, resulting in ramped up oil development and accompanying pollution. As Petrolia experienced continued economic growth, the town witnessed the construction of new refineries, the development of new oil fields, and the construction of a rail system, all supporting the expansion of the oil industry. The immense size and permanent nature of Petrolia’s industry translated into extreme forms of environmental pollution, especially when oil development encroached onto land near towns. For instance, the working-class neighbourhood of Pithole—on the northwest outskirts of Petrolia—had wells producing oil within the vicinity of the people’s shanties.²⁹¹ The wasteful practices of oil development in and around Petrolia became increasingly apparent on February 20th, 1866, when bewildered firefighters were unable to understand why dousing a fire with water

²⁹⁰ “A Visit to Oil Springs,” *London Free Press*, February 19, 1862.

²⁹¹ Burr, 100.

was feeding the flames. The next day the firefighters examined the contents of the well only to find it contaminated with oil. According to the locals, the whole ground was “fairly saturated” with oil.²⁹² After examining several of the wells across town, the locals found that most of Pithole’s water wells were now full of oil. To test the extent of the contamination, a local man dug a small water well in the ground only to discover oil. The sudden loss of water immediately became a cause for concern. At the United States tavern, the loss of water resulted in the boarders organizing a strike until there was water. Concerned about their water wells, business owners throughout town sampled their water to determine if they were uncontaminated. Unfortunately for the locals of Pithole, the taste and aroma of oil suggested that most of the water was unsafe for consumption.²⁹³

The immediate contamination of Pithole’s water supply induced a series of diverse actions. A local washerwoman, Mrs. Socket, was offered \$5,000 dollars for a lease to pump oil from her water well.²⁹⁴ However, Mrs. Socket was “a cleaner of gentlemen’s cotton, &c., instantly declined, as her business would be ruined without water.”²⁹⁵ Recognizing the value of her water, Mrs. Socket chose to avoid a decision that might have eliminated any fresh water she had left. A *Globe* correspondent acknowledged that “The water wells turning into oil wells has given a value to water it never before possessed in the regions of oildom, where the most oil and least water obtained was always considered best of luck.” In Enniskillen, oil was considered the most valuable liquid, but with water scarcity reaching its peak, the remaining proprietors of uncontaminated water wells made “a good thing out of retailing pure water.”²⁹⁶ However, there was not enough water for the town, leading to no fresh water for drinking, cooking, cleaning, and bathing. The situation became

²⁹² “The Latest Oil Sensation,” *Toronto Globe*, February 20, 1866.

²⁹³ “A Spasm at Pithole,” *Sarnia Observer*, February 23, 1866.

²⁹⁴ “The Latest Oil Sensation,” *Toronto Globe*, February 20, 1866.

²⁹⁵ “A Spasm at Pithole,” *Sarnia Observer*, February 23, 1866.

²⁹⁶ “The Latest Oil Sensation,” *Toronto Globe*, February 20, 1866.

dire as the town ceased to function properly. The *Observer* revealed that “All the employees were at Pithole. Vegetables could not be served at dinner for the want of water wherewith to cook them. Every spring in town was yielding oil.”²⁹⁷

After the initial shock of losing their water wells, locals attempted to determine what caused the loss of fresh water. Some locals suggested that an oil well nearby leaked oil into the water supply. Other theories suggested that the water wells had exhausted the water in the soil to such an extent that it gave way to oil.²⁹⁸ In at least one of the theories, locals suggested that there was a connection between the oil industry and the contamination of the ground water. Although the locals lacked the scientific background to definitively determine the cause of the water pollution, at least some of the locals recognized there was possibly a connection between oil development and the ground water.

Understanding that freshwater was rare in Enniskillen, locals came to rely on their own system of cisterns, and storage tanks to collect rainwater for cooking, cleaning, and drinking. In her recollections of mid-nineteenth century Oil Springs, Adamson-Gale notes, “Of course, everyone had a cistern and used rainwater for everything they could.”²⁹⁹ The cisterns were vital enough that “Even the hotel keeper of the Exchange [hotel] is obliged to mix his tea and coffee, his gin and molasses, with filtered rainwater in default of anything better.”³⁰⁰ With locals relying on rain to supply their drinking water, they built a close relationship with the environment; they became conscious of changes in the seasons and the weather, as these factors influenced their supply of water.

²⁹⁷ “A Spasm at Pithole,” *Sarnia Observer*, February 23, 1866.

²⁹⁸ “The Latest Oil Sensation,” *Toronto Globe*, February 20, 1866

²⁹⁹ Adamson-Gale, 2.

³⁰⁰ “Enniskillen Oil Territory: It’s Past and Present Condition”, *Toronto Globe*, April 26, 1865.

During prolonged periods without rain, locals turned to alternative solutions. Since water scarcity was a consistent problem in Enniskillen, the business of water vendor arose. Background information on the water vendors of Enniskillen are scarce, with information suggesting that they were active between the 1870s and 1890s.³⁰¹ The only water vendors name that has come up through research is that of William Snively, who was active in Petrolia between the 1880s and 1890s.³⁰² To transport their water, vendors relied on a horse-drawn water cart—a long-wooden cylinder made of wood. Some water vendors were known to go door to door every morning to sell water. “We used to buy it [water] from a man who came around every morning with a tank of water and you would say so many pails and he would carry it into your barrel—at two cents a pail,” Adamson-Gale reported in her recollections of Oil Springs.³⁰³ Beyond supplying drinking water, vendors sold their water at the scenes of fires, due to pervasive issue of unreliable water wells. “With no water works system, firemen were always handicapped having to lay long lines of hose to the nearest underground water storage tank, During this lull one old fellow used to have his water-tank pulled by two white horses, arrive at the scene where he sold water for a penny a pail,” Petrolia local Ken MacGregor noted in his diary.³⁰⁴ With a whole region lacking in water, there was opportunity for those that had a reliable supply. The reliance on individual water vendors

³⁰¹ It is unclear how many water vendors were active in Enniskillen and where they obtained their water.

³⁰² Charles Whipp and Edward Phelps, *Petrolia, 1866-1966* (Petrolia, Ont: Petrolia Advertiser-Topic, Petrolia Centennial Committee, 1966), 5.

³⁰³ Annie Adamson Gale, *Tweedsmuir History of Oil Springs: Sketch of Oil Springs*, 1863, 2.

³⁰⁴ MacGregor, 46.

is especially shocking considering the population of Petrolia: 2,761 in 1871; 3,465 in 1881; and 4,357 in 1891.³⁰⁵

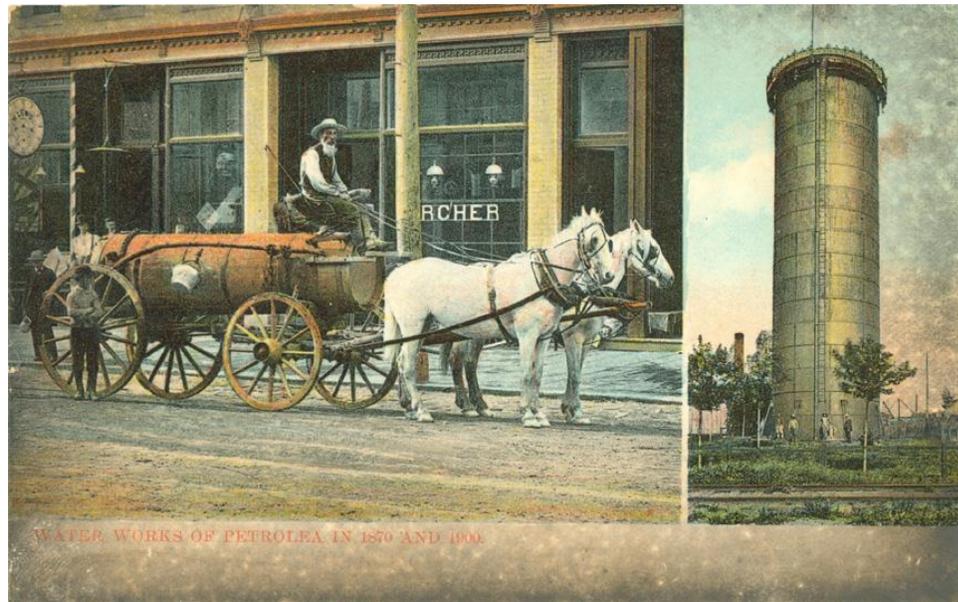


Figure 6: A postcard portraying the difference between Petrolia’s water works system in 1870 and its water system in 1900.³⁰⁶

In January of 1896 the property owners of Petrolia voted to approve the construction of a permanent water works system by a vote of 344 to 118. Petrolia and Lambton County raised \$172,000 dollars to procure the equipment and labour necessary to build a pipeline to convey water from Lake Huron to Petrolia over a distance of twenty-two kilometres. In 1896, the locals permanently solved water scarcity by constructing a water works system to extract fresh water from Lake Huron over a distance of fourteen miles to supply Petrolia and Enniskillen. An unlisted traveller to Petrolia submitted an article to the *Globe*, acknowledging the water scarcity that had plagued this region. He noted that one of the largest obstacles to the comfort of Petrolia “has been till now the want of an abundant supply of potable water.”

³⁰⁵ Burr, 97.

³⁰⁶ “Water Works of Petrolia in 1870 and 1900,” Provided by Lambton County Archives.

Few people who arrived in Enniskillen with the intent of striking a fortune in oil expected the fallout that oil development would produce. Speculators drilled into the bowls of the earth in search of hidden treasure, yet they did not consider the effects their actions were having on the environment until it was too late. In exchange for the wealth acquired through oil development, locals could no longer consider the creek or the water table as reliable sources of drinking water. The loss of Enniskillen's water supply was one of the few types of environmental change that the locals were unable to accept; because the collection of water was a daily and strenuous process. Although oil pollution posed problems for the environment and for farmers, these concerns were eclipsed because the locals' main concern lay with finding a reliable supply of water. Newspapers, diaries, and later recollections, all these sources described water scarcity as a consistent and frustrating reality. As a result, the local population of Petrolia voted in 1896 to construct an expensive water system; the cost was not as important, so long as they had a permanent and reliable source of fresh water.

Chapter Five: Hazards of Life and Labour in an Oil Region

The emergence of the oil industry produced a variety of sudden and extensive hazards that locals struggled to comprehend and consciously be on guard for during the oil boom. Threats came in multiple forms, encompassing the four elements—fire, water, earth, and air. Oil fires, water contamination, soil contamination and abandoned oil wells, and natural gas leaks and explosions were all hazards locals faced. Because no human society had ever dealt with or experienced Enniskillen’s level of oil development, no human society had ever faced this combination of hazards, so locals were forced to create original methods of addressing environmental change. In her book *Sensing Changes: Technologies, Environments, and the Everyday, 1953-2003*, historian Joy Parr writes that when in “risky environments, made dangerous by the presence of potentially toxic technologies, well-honed, unconsciously held reflexes are key to human safety. In order to be effective, these responses to warning sensations must be embodied and automatic.”³⁰⁷ In the context of Enniskillen, locals were forced into a position where they had to develop habits and reflexes to mitigate the high level of risk produced by the oil industry. Avoiding hazards and mitigating disasters also required short-term and long-term strategies to improve safety. Locals laboured to eliminate hazards, set up preventive measures, learn from past disasters, and share knowledge from lived experiences to develop effective ways to react to unfolding crises.

Although locals prepared themselves against potential hazards, there was still a high chance of injury or death due to the originality and diversity of the threats. The oil industry was young—by the end of the nineteenth century the oil industry was only forty-eight years old—which meant there was no standard procedure on how react to these hazards. Essentially, labourers and locals in Enniskillen were some of the first people that developed methodology on how to

³⁰⁷ Jo Parr, *Sensing Changes: Technologies, Environment, the Everyday, 1953-2003* (Vancouver: UBC, 2010), 14.

interpret and react to hazards caused by oil development. In addition to the multitude of hazards labourers faced, those who worked in the oil field and the refineries were known to work up to twelve-hour shifts.³⁰⁸ With the diversity of threats and the prospect of long shifts, it is not a shock that labourers were injured or killed on the worksite. Even though locals learned about the many hazards in Enniskillen, the complexity and unpredictability of these threats thrust people into positions where they stood a chance of being killed.

In the case of successful oil producer and refiner Hugh Nixon Shaw, all his knowledge and experience in the oil industry could not prevent his death. When Shaw was checking the status of his wells, he asked some of his men to lower him inside so he could grab a pipe that had become loose. According to one of the men that was pulling Shaw out of the well, “deceased had taken hold of the pipe, he asked to be hauled up; witness and Mr. Stewart commenced to wind him up by the windlass... heard him drawing several long breaths, or breathing heavily; at that instant he fell back into the oil and disappeared.” Shaw had been an experienced oil producer who was likely conscious of the possibility of death by natural gas, yet he underestimated the strength of the gas in the well.³⁰⁹ Although Shaw’s miscalculation resulted in his death, the precarious nature of oil development played a defining part. In a region with endless hazards, locals were continuously placed in situations where experience, shared knowledge, and the proper equipment were not enough to save their lives. Their deaths were not so much a reflection of their ability, as of the nature of life in Enniskillen.

In a region where towns were named Oil Springs or Petrolia or, like Wyoming, nicknamed the “City of Grease,” oil fires were one of the most severe threats to the local population, in terms

³⁰⁸ Whipp and Phelps, 25.

³⁰⁹ “From the Oil Springs,” from *Chronicle*, undated, reprinted in *The Toronto Globe*, February 18, 1863.

of property damage and risk of life.³¹⁰ Part of the complexity of preventing fires in Enniskillen stemmed from the numerous potential causes, such as human error, lightning strikes, volatile chemicals, and machinery problems. When fires did occur, a land permeated with oil, storage tanks full of oil, and towns like Oil Springs and Petrolia made of wood, guaranteed that fires could be extremely destructive if mismanaged. To survive against the encroaching threat of fires, locals responded by creating preventive measures, purchasing fire equipment, and adopting unique methods to deal with oil fires. However, the complexity of fires and their ability to occur almost anywhere in Enniskillen ensured that they would remain an ongoing threat.

Several notable oil fires acted as a reminder of potential destruction. One such case was the 1862 fire on Black Creek. Due to the vast quantities of oil that poured into the Creek during the production of the 1862 flowing wells, the conditions for a fire were practically guaranteed.³¹¹ Oil pollution had created a film on top of the Creek at a depth of three to eight inches, which also coated the surrounding river banks.³¹² A careless worker from Mclean's refinery made the mistake of placing hot coke too close to the river's edge, and the creek quickly caught aflame. (Other people speculated that the fire was caused by "a fool" who "concluded an unsuccessful experiment test of the burning qualities of the crude floating on the water.")³¹³ The flames raged down the creek where they were described as "rising to the extraordinary height of 100 feet, presented to the amazed and terrified spectators a grand spectacle." Oil workers at the site of the fire feared that the fire would jump to the large number of wells huddled along the river's edge. Despite the size of the fire, there was no reported property damage or human injury. There is, however, some

³¹⁰ Unknown Author, *Canadian Native Oil: It's Story, Its use, and its profits, with some account of a Visit to the Oil Wells* (London: Ashby & Co, 1862), 21.

³¹¹ "The Oil Springs Chronicle, from *Chronicle*, undated, reprinted in *St. Thomas Weekly Dispatch*, May 1, 1862.

³¹² A.J Yates, "Tweedsmuir History of Oil Springs: Early Days in Oil Spring, September 2. 1931," *Women's Institute of Oil Springs*, 1.

³¹³ "The Oil Springs Chronicle," *Chronicle*, undated, reprinted in *St. Thomas Weekly Dispatch*, May 1, 1862.

question as to how the fire was put out, as an 1862 report simply says that the fire burned out after an hour.³¹⁴

Although the fire had occurred without injury to man or property, it was still fresh in the minds of the locals. Influenced by the Black Creek fire, the *Chronicle* for a time became critical of practices adopted by oil workers, whom they believed might set Enniskillen aflame. One practice that stood out was how “On a cold day it is customary for the well diggers to light fires close by the wells to keep themselves warm, and to leave their work at night without extinguishing the fires, which generally continue burning all night.” The main reason for the newspaper’s concern lay in its acknowledgment that the surrounding land had become completely saturated with oil. The altered environment meant that if an oil fire were to be avoided, new guidelines would have to be adopted. However, the solutions developed—like those dealing with oil pollution—were mostly temporary or not far-reaching enough to end the threat. For example, rather than collecting the excess oil that collected in the fields, the *Chronicle* called for the end of fires used to keep the workers warm and the smoking of cigarettes while in the oil field. The *Chronicle* wrote, “Smoking on the part of the workmen should also be strictly prohibited, and we would strongly impress upon the well-owners the importance of at once putting a stop to this dangerous practice, so universal throughout the diggings.”³¹⁵ To the journalist, the concern of another fire breaking out was severe enough to justify encouraging producers to regulate the activities of their workers. Even though labourers knew the risk they took by playing with fire in the oil fields, they seemed unbothered by the threat. However, it is possible workers took caution

³¹⁴ “The Oil Springs Chronicle,” *Chronicle*, undated, reprinted in *St. Thomas Weekly Dispatch*, May 1, 1862.

³¹⁵ “The Oil Springs Chronicle,” *Chronicle*, undated, reprinted in *St. Thomas Weekly Dispatch*, May 1, 1862.

with these practices as there is no evidence of a fire breaking out from a cigarette or a camp fire in Enniskillen.

Six months later, Black Creek was set on fire again. After the previous fire on the creek, the *Chronicle* noted that producers took great precaution to avoid a repeat of the same event. However, William Duffield and his employees made the mistake of heating a refining still to the point that it blew up and set fire to the creek. Unlike the previous fire, this one destroyed the refinery of Way & Son, set fire to oil storage tanks along the creek, and set a nearby surface well aflame. The men on site quickly reacted by throwing earth and wooden board in the creek to create a dam to smother the fire. In turn, the fire was prevented from spreading to the other section of Black Creek, while on the other side the fire burned the rest of the oil.³¹⁶ Mrs. Yates recalled in 1931 that to stop the fire from spreading on the creek as it made its way to Wilkesport, “many trees were felled, fresh sod cut and used with clay to make a barricade, it was put out.”³¹⁷ When it came to putting out the surface well fire, the men replicated the similar strategy applied to the creek fire by suffocating the well with earth and then boards of wood.³¹⁸

Not even two months later, Black Creek caught fire once again. The labourers at the Sun Oil Works made the common mistake of spilling oil around the land surrounding one of the refining stills. The extent of the spill was significant enough that it formed a long stream of dark oil from the Sun Oil Works all the way to Black Creek. When they set the fire below the still to start the refining process, the oil caught fire and spread to the Creek. However, the labourers and the manager of the refinery seemed to have learned from the previous creek fire, and they quickly

³¹⁶ “The Fire at the Oil Springs,” *Chronicle*, undated, reprinted in Toronto *Globe*, October 28, 1862.

³¹⁷ Yates, 2.

³¹⁸ “The Fire at the Oil Springs,” *Chronicle*, undated, reprinted in Toronto *Globe*, October 28, 1862.

built two dams to stop the spread of the fire up or down the Creek.³¹⁹ No loss of life or property was reported.

Whereas locals were expected to learn about the hazards of the landscape, outsiders were considered ignorant as to the threats offered by an oil region. When the *Chronicle* learned of the first major fire on Black Creek, they believed it vital for the safety of the region to set up warning sign because “they [outsiders] are not supposed to be aware of the danger attending it.”³²⁰ The locals were confident that they had a better comprehension of the threats posed by the environment of an oil region. The locals understood the vernacular of the oil trade and the hazards that accompanied it. As a result, the *Chronicle* argued that “there is no excuse for the workmen or the well-owners who would allow” workers to smoke or play with fire. Because the locals knew the threats and dangers offered by their new environment, they were expected to act in accordance with their learned knowledge of the land. A group of investors and scientists from Toronto to Enniskillen made note of the “no smoking signs” when they made their visit to the oil region. According to their travel report, “As we descended from the high land into the plots, our attention was called by the admonition ‘No Smoking allowed here;’ a caution not unnecessary, as a stream of oil has more than once been set on fire.”³²¹

As the oil industry grew, Enniskillen increasingly acquired the characteristics of an oil region, with all the threats and hazards that accompany such a title. The consistency of oil spills, the expansion of the refining industry, and the growth of oil development undermined attempts to prevent oil fires. For example, the expansion of the oil industry over thirty years resulted in the natural forests of ash and elm being replaced by forests of tripod oil derricks. The tallest objects

³¹⁹ “Items from The Enniskillen Oil Region,” *Chronicle*, undated, reprinted in *Toronto Globe*, December 19, 1862.

³²⁰ “The Oil Springs Chronicle,” *Chronicle*, undated, reprinted in *St. Thomas Weekly Dispatch*, May 1, 1862.

³²¹ *Canadian Native Oil*, 18.

in Enniskillen, the derricks became the target of lightning. Although wood in the forests offered fuel for forest fires, derricks and storage containers offered fires the combination of wood and volatile oil as its source of fuel. Because lightning commonly struck derricks and oil storage containers – the highest structures in a flat landscape – there was a legitimate fear of storms.³²² In the diary of Macgregor, he wrote about witnessing lightning strike an oil container, causing it to burst into flames. Lightning did not always result in a fire. For example, when lightning struck an oil rig belonging to oil producer Fairbank, the derrick exploded into thousands of tiny pieces, leaving the men working in the engine house beside the derrick terrified and stunned.³²³ Likewise, in his diary, Macgregor noted that while “Watching a thunder and lightning storm one day from the doorway of a pumping rig, I actually saw lightning strike a three-pole derrick about four hundred yards away, thousands of splinters were flying in every direction. The derrick did not fall over but was now useless and later had to be taken down.”³²⁴ Not every derrick that was struck by lightning was bound to catch fire, but the damage from the strike meant dealing with consistent property damage.

In response to the expanding threat of fires, new techniques and habits were developed. If a wooden oil tank caught fire, a widespread response was to puncture a hole in the tank to allow the oil to escape before the temperature rose high enough to ignite the oil. In cases where a storage tank was not punctured quickly enough, the oil itself would catch fire, eventually breaking the tank apart; this resulted in a wave of flaming oil pouring over the surrounding land and setting fire to anything in its path. When the Ontario Carbon Oil Company’s “Bill Still,” a storage tank containing the equivalent of 2000 barrels of oil, caught fire, labourers were slow in their response.

³²² *Petrolia Advertiser*, June 17, 1880.

³²³ Fairbank, *Journal of John Henry Fairbank*, 1.

³²⁴ MacGregor, 43.

When the storage tank was aflame and the heat increased enough to ignite the oil, it eventually “sprung a leak,” resulting in the surrounding area being consumed by a wave of burning oil. Accordingly, “The fire spread so rapidly that the men narrowly escaped. The still was charged at the time with 1,800 barrels of crude oil which, with everything else combustible about it were burned.”³²⁵

Although the oil towns of Enniskillen purchased equipment to fight fires, they were always dealing with unforeseen complications. Extinguishing fires was never a straightforward process, and different methods were necessary depending on the location of the fire and the quantity of oil involved. When dealing with an 1866 oil fire on Holmden Farm at Pithole, the reporter sarcastically wrote that “the very intelligent community used water instead of sand.” However, the criticism lay more with the fact that “the more water they threw on the flames, with the greater persistency they raged.” The next morning, it was “discovered that the wells from which the water was obtained were alive with oil.”³²⁶ Because they had used water contaminated with oil, they were literally adding fuel to the fire. As a result, criticisms stemmed from the use of ground water because of its likelihood to be contaminated with oil and the lack of foresight to use a different method to put out the fire. It seems that later on local firemen began to rely on “long lines of hose to the nearest underground water storage tank, where engines dropped their suction hose.”³²⁷ In other cases, firemen put out oil fires with sand, mud, and manure in an attempt to suffocate the flames.³²⁸

³²⁵ “Petrolia: A Factory Flooded with Burning Oil- 1,800 gallons Ablaze,” *Ottawa Free Press*, June 14, 1871.

³²⁶ “A Spasm at Pithole,” *Sarnia Observer*, February 23, 1866.

³²⁷ MacGregor, 27.

³²⁸ Anderson, 46.

Petrolia experienced one of its worst disasters in the King well fire of August 3, 1867. The fire's origin can be traced back to an inexperienced labourer—or a young boy—who made the mistake of holding a lantern above one of Lane's 400-barrel oil tanks, so he could see inside. The heat from the lantern was enough to set the surrounding gas on fire, which quickly set the oil tank aflame. Once the fire got started it spread to the surrounding storage tanks and oil wells.³²⁹ The fire alarm was sounded at 11 o'clock, and firefighters quickly arrived on the scene to extinguish the fire.³³⁰ However, the situation still grew out of control.

An anonymous source sent a letter to the *Free Press* describing their experience at the fire. The source recounted, "I arrived at the scene about 12 o'clock, and worked with a will, until the eyes were almost burned out of my head with the heat, which was of the most intense descriptions." While the source assisted the firemen, he tried to prevent the spread of the flames by draining a nearby oil tank to prevent it from feeding the flames. However, the heat from the fire was hot enough that when the oil came in contact with the ground it was set aflame. It quickly became apparent that there was no way to extinguish what the source described as "a mass of flames." The fire continued its rapid advance by setting Black Creek, King's flowing well, and Noble's oil field aflame.³³¹ Although the fire started at Lane's well, the added fuel from King's flowing well drastically increased the destructiveness of the fire, leading people to refer to it as the King well fire.

A separate source referred to as C.W. in the *Chicago Tribune* described that the fire had grown large enough that it looked like a "perfect cataract of fire: and only, perhaps, the conception

³²⁹ "The Fire in Petrolia, *Free Press*, August 4, 1867, reprinted in *Toronto Globe*, August 7, 1867.

³³⁰ "The Petrolia Fire," *Petrolia Valuator*, undated, reprinted in *Chicago Tribune*, Aug 9, 1867.

³³¹ "The Fire in Petrolia, *Free Press*, August 4, 1867, reprinted in *Toronto Globe*, August 7, 1867.

of an ascending Niagara of flame could convey the impression.”³³² The source from the *Free Press* corroborates this claim as he also described the fire as “grand,” “awful,” and “a majestic sight.”³³³ Amongst the chaos of people running from 100-foot flames, the source from the *Free Press* climbed to the top of a nearby derrick to make sense of the chaos. But as soon as he made it to the top, he was almost struck by a piece of debris from a refining boiler that had blown up and subsequently was propelled 75 feet in the air. Recognizing that the fire showed no sign of relenting, he ran to his well where he prepared the water tank to fight the fire in case it spread towards his well. At a safe distance from the fire, the source recounted the subsequent chaos from a large gust of wind fanning the blaze that was sprawled across 15 acres of land. With the wind contributing to the intensity of the fire, it gave off the “appearance of an immense fiery serpent, whirling up about 300 feet in the air.”³³⁴

Reportedly, the King well fire continued burning for two weeks straight. Most of the fire was extinguished by the next day, but it was the oil wells and gas wells that continued burning for two weeks.³³⁵ To extinguish the wells on fire, locals diverted the flow of oil and covered the wells with large quantities of manure to suffocate the flames.³³⁶ The extent of the fire was so immense that some primary and secondary sources have made the mistake of suggesting that there were two fires that occurred at Petrolia. However, all the primary sources suggest that the fire occurred on August 3, 1867. An article from the *Globe* might have spawned this misconception for writing

³³² C.W., “The Petrolia Fire,” *Petrolia Valuator*, undated, reprinted in *Chicago Tribune*, Aug 9, 1867.

³³³ “The Fire in Petrolia, *Free Press*, August 4, 1867, reprinted in *Toronto Globe*, August 7, 1867.

³³⁴ “The Fire in Petrolia, *Free Press*, August 4, 1867, reprinted in *Toronto Globe*, August 7, 1867.

³³⁵ *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*, 166.

³³⁶ Anderson, 46.

“Another terrible fire occurred here on Saturday night in the flowing well district....” The Saturday the *Globe* referenced was the original date that the fire occurred.³³⁷

The destruction caused by the 1867 King well fire proved extensive enough that accurately estimating the damages is impossible. “On the day after, the ground tanks smouldering and belching forth their flame and smoke, appeared like many miniature volcanoes,” recounted C.W. from the *Tribune*.³³⁸ According to the telegram received by the *Globe*, 40,000 barrels of oil had been lost. However, the telegram undermines that estimate by acknowledging that the fire was still raging, making an estimate of the damages and loss too early.³³⁹ Additionally, quantifying the actual loss of oil is impossible, given that an unaccounted number of wells continued burning for two weeks. Local oil producer John D. Noble recounted his experience and the property damage he suffered: the “fire broke out on the adjoining property, extended to mine and burned all my tanks and some 7,500 barrels of oil. The fire extended until it covered twelve acres. It lasted two weeks, the flames shooting up 100 feet.”³⁴⁰ Beyond the loss of oil, producers had supplies to purchase, equipment to replace, and wells that had to be re-drilled. Fortunately, no one lost their life, but six men suffered severe burns from the fire.³⁴¹

When disasters occurred, locals were incentivised to devise ways to prevent these disasters from repeating. In their pursuit of preventing the same hazard from occurring, an understanding of the local environment could provide useful knowledge. After the King well fire, John D. Noble formulated a solution that would prevent the destructive outcome that came from the fires spreading to adjoining oil fields. Understanding what lay below the surface of Enniskillen proved

³³⁷ “Special Telegram: Terrible Fire at Petrolia,” Toronto *Globe*, August 6, 1867.

³³⁸ C.W., “The Petrolia Fire,” *Petrolia Valuator*, undated, reprinted in *Chicago Tribune*, Aug 9, 1867.

³³⁹ C.W., “The Petrolia Fire,” *Petrolia Valuator*, undated reprinted in *Chicago Tribune*, Aug 9, 1867.

³⁴⁰ *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*, 166.

³⁴¹ Anderson 46.

to be beneficial in generating a method of storing oil that eliminated the spread of oil fires. He began to dig, confident that the underlying “clay here is of such a nature that it makes a perfect tank in itself.” Noble and his friend and fellow oil producer Charles Jenkins formed the Petrolia Crude Oil Tanking Co and began selling underground storage tanks to producers concerned with the threat posed by the fire. The tanks were “made about 60 feet deep and 30 feet in diameter, with a capacity of 8,000 barrels of 35 imperial gallons. When we get down 18 or 20 feet to the clay, a wooden sheathing is put around the tank, clay is pounded down firmly, and the wall is brought up about a foot above the surface.” Because of the depth of the storage container and its location in the ground, it was effective at preventing the spread of fire. Through these oil containers and by capitalizing on the clay of the region, the threat of oil fires could be put to rest. There was no need for planking to be placed at the bottom as the “oil is poured on the clay, which continues for about 100 feet.” Noble noted that one advantage of his tank was that “there is no danger from lightning, which is the great cause of fire.”³⁴² Furthermore, by constructing underground pipelines between storage tanks and the refineries, Noble created an efficient and safe method of transporting oil. However, not everyone adopted this method of storing oil, whether due to the cost or an unwillingness to change storage systems.

Arriving in Enniskillen from Scotland and working as oil labourers, Ken MacGregor and his father had to develop personal strategies to prevent fires. The two of them worked and managed oil fields for different producers in Petrolia and later Oil Springs. When MacGregor and his father were managing an oil field, “one of the large receiving tanks was struck by lightning.” Understanding the threat, his father rushed towards the tanks to prevent a more significant fire

³⁴² *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*, 165-6.

from breaking out. On arrival, as MacGregor writes, his father recognized that “Both small lids were blown off, the large cover was raising up and down... After replacing the two small lids and when the large cover came down, Dad jumped on top of it. His weight held the cover down, causing the fire to go out, he knew without air, the blaze inside would quickly suffocate.”³⁴³ Although MacGregor notes that the actions of his father were reckless, they were necessary to avoid the threat to life and property that followed closely behind an oil fire.

Through the time spent with his father, Ken MacGregor acquired tacit knowledge working in the oil fields. On windy days MacGregor got in the habit of keeping the doors of the engine house closed to prevent the spread of fire if one was to break out. Once when working in the same oil field, an engine house at the base of the oil derrick had caught fire. However, MacGregor was prepared, because as “Dad told us, if a rig should ever catch fire to raise the steam safety valve of the boiler and the steam would soon smother the fire.” When MacGregor arrived on the scene of a fire, “two men had already started chopping holes through the roof, to pour in water.” MacGregor instead went into the engine house and used the “poker to open the safety valves, quickly closing the door again. All at once steam came gushing out from every crack in the rig, plus the new holes in the roof. The engine stopped as the fire was completely out.”³⁴⁴ MacGregor’s method of extinguishing the fire with steam was a common tactic employed by labourers to put out fires in the engine room. In this case, MacGregor’s reflexes and his application of existing knowledge were enough to put out the fire before it grew. Although the MacGregor family had emigrated from Scotland, their new space necessitated that they learn how to react to various hazards if they wanted to continue to live in an oil region.

³⁴³ MacGregor, 42.

³⁴⁴ MacGregor, 48.

Other common hazards unique to the oil region included the threat of natural gas. When drilling for oil, speculators inadvertently released large quantities of natural gas that collected in the bottom of the wells and then spread into the air. Labourers that worked inside of oil wells filled with natural gas were likely to be injured or killed if they were exposed for too long. In one case, an oil worker who was setting up a pipe at the bottom of the well remarked to his coworkers that the odour of the gas was very strong. A fellow co-worker observed him struggling to make his way up the ladder, so he jumped into the well to assist him to the surface. However, having been brought to the surface, the worker began to convulse and passed away. The *Globe* noted, “The men appear pretty cautious of their lives where the poisonous vapour is supposed to exist.”³⁴⁵ With labourers dying from the natural gas in front of their coworkers, it is not surprising that they would be cautious on how they acted around the gas. Montreal engineer Charles Robb in his 1861 examination of the oil region made observations on how labourers interacted with the natural gas. Robb noted, “gas which invariably issues in great quantities with oil... produce a remarkable effect on the men who work in the wells, greatly resembling that caused by the inhalation of nitrous oxide or laughing gas....” Robb added that for labourers to continue working “it is necessary to clear away the gas from time to time by exploding it.”³⁴⁶ Recognizing that natural gas was hazardous to their health, labourers responded by trying to eliminate the threat when possible. Furthermore, labourers developed a caution around gas, as they recognized the threat it posed.

Although labourers worked to lower the threat posed by natural gas, flowing wells complicated matters. In Johnston’s recollections as an oil worker in Oil Springs, he notes that at Shaw’s 1862 flowing well, “The gas was strong enough that the men were blinded and had to be

³⁴⁵ “The Oil Region,” Toronto *Globe*, September 6, 1861.

³⁴⁶ Robb, 317.

taken away.”³⁴⁷ Because natural gas poured out of the earth with the oil at a rapid rate, the workers present at Shaw’s well were unable to prevent or predict the future harm from the gas. A similar event occurred when oil workers at the site of King’s well struck the flowing well resulting in them being blinded by the gas and deafened by the sound of oil gushing from the ground.³⁴⁸ The highest producing flowing well of 1862, the Black and Matheson well, had enough gas that “the men working at the rock were so severely burned in the face and eyes by the strength of the gas.”³⁴⁹ For both sources, there are no further details as to the degree of injury. In general, flowing wells exposed labourers to risks that could prove fatal.

For unsuspecting drillers, striking a gas vein could put them in a situation where their lives were at risk. On the oil property of Col. Shoemaker, a group of labourers were drilling a well at 5’o clock in the morning, “when they struck a large gas vein.” According to the *Topic*, “The gas burst out of the hole in a volume and connecting with the stove in the derrick, ignited and in a ad [sic] almost the entire rig was enveloped in flames.”³⁵⁰ To complicate matters, the labourers struggled to get to extinguish the fire, as the early hour that it occurred meant that people were slow to react to the fire bell. Although the rig burned creating \$200 worth of damages, the drillers escaped uninjured. The inability to expect the release of gas from the earth could result in injury and the destruction of property.

As early as 1862 an article was featured in the *Globe* dismissing concerns that refinery fumes could be hazardous to one’s health. The author, B. Hughes, suggested that the increasing number of refineries resulted in “people having imbibed the idea that the odor arising from these

³⁴⁷ Johnston, 4.

³⁴⁸ Burr 92.

³⁴⁹ *London Prototype*, May 14, 1862.

³⁵⁰ “Fire,” *Petrolia Topic*, November 17, 1879.

refineries is prejudicial to health....” People situated around these refineries were attempting to raise awareness about the adverse health effects that they felt from the refineries. However, Hughes did not entertain the arguments of the locals. Instead, he argued “that throughout the entire oil regions of Pennsylvania and Canada, where some ten thousand people are constantly engaged, and some of them literally drenched in the fluid, a healthier set of men cannot be found in America.”³⁵¹ Hughes’ claim is largely unsubstantiated. In fact, a lot of the men lost their lives in refineries through the inhalation of natural gas or refinery fumes.³⁵² Hughes’ decision to provide an incomplete depiction on the health conditions of refinery workers, as well as his disregard of people who were concerned about their health, demonstrates his unwillingness to entertain the danger of refinery fumes.

Working in an Enniskillen refinery was a hazardous job. The intersection of dangerous chemicals, noxious fumes, and large fires could all together result in injury or death. For example, Ken MacGregor in his journal described the damage the refinery fumes had on his father’s health when he worked as a still cleaner. The process of cleaning the stills involved going inside the tanks as soon as the tank was shut off, when it was still hot, because as the oil cooled it would stick to the sides. As a result, “strong, terrific gas fumes are present as a still cleaner enters the tank at the maximum temperature possible to endure in order to take full advantage of scraping before hardness sets.” MacGregor wrote, “Because of the scorching heat and volatile fumes many still cleaners have been known to lose their lives as a result of this occupation and improper ventilation.” MacGregor soon realized that the work as a still cleaner was deteriorating his father’s health, causing great distress to the family. When a Doctor Dunfield examined MacGregor’s

³⁵¹ “Is Petroleum Injurious to Health,” Toronto *Globe*, July 23, 1862.

father, he recommended that he find a new job, “far away from cleaning refinery stills.”³⁵³ Afterwards he finally quit his job in the refinery to avoid death. Learning from his father’s experience, MacGregor never showed any interest in working or pursuing labour in a refinery.

The endless lists of hazards in Enniskillen were further complicated by the use of machinery. For example, in 1879 a pair of business partners were injured by the explosion of a boiler engine they had been using to strike a well. The partners had not noticed the pressure increasing in the boiler, until it eventually blew and was thrown a distance of 120 feet. This had been eminently preventable, and the *Petrolia Advertiser* argued that “Familiarity apparently breeds contempt for danger, at any rate, as we have had stories related to us by engineers here in regard to hair-breath escapes brought on by their own carelessness, which made us shudder but only provoked a smile from them, and the next day would probably witness a repetition of the same act.”³⁵⁴ Although labourers might have acted carelessly, it is important to note that most of them were dealing with unique hazards and new technology. In the case of the young partners who were injured, they were not acquainted enough with their boiler to exercise the caution necessary to expect the explosion.

With thousands of wells being dug into the earth, natural gas became common in Petrolia beginning in the 1870s. Natural gas was pervasive enough that it had the effect of discolouring houses in Petrolia, while simultaneously making the air difficult to breath for the inhabitants. However, the *Petrolia Topic* focused on writing on the benefits of natural gas as a source of energy for cooking and heating. The *Topic* suggested that “There are many little phenomena attending the use of gas, but while they are common enough to those living around and using the gas, they are

³⁵³ MacGregor, 23-4.

³⁵⁴ “Boiler Explosion,” *Petrolia Topic*, July 17, 1879.

strange and interesting to outsiders.”³⁵⁵ The author believed that the locals, including themselves, had become passively accepting of the natural gas because they were accustomed to its occurrence. But it seems strange that the author failed to discuss the problems stemming from the abundance of the gas. A correspondent for the *Globe* shed some light on this issue by alleging that residents had “become so habituated to it as to suffer little or no inconvenience.”³⁵⁶ Given that both sources acknowledge the passive acceptance of the gas, it seems that the locals normalized both its benefits and its problems.

Although the *Globe* correspondent acknowledged that the locals had ignored the gas, he was curious as to whether the abundance of gas was negatively affecting their health. The correspondent was especially interested in inquiring whether the high number of child fatalities was connected to the natural gas. The correspondent reported, “Several funerals per day of very young people were of ordinary accordance last summer. This, however, is not a necessary result of the peculiar industry of the neighbourhood. Scarlet fever, diphtheria, and typhoid were the chief causes of last year’s mortality, and the neglect of drainage is said to have been responsible.”³⁵⁷ Although the correspondent reports that the deaths were likely caused by an inadequate drainage system, the oil and refinery pollution would have worsened the problem. In an article in the *Topic*, locals raised complaints about oil and refinery pollution in the drainage system.³⁵⁸

The increase in deaths could have also been influenced by the scarcity of fresh drinking water in Petrolia. The previously mentioned *Globe* correspondent moved from discussing the deaths of youth to focusing on the issue of water scarcity. The correspondent wrote, “Water is

³⁵⁵ “The Sun Substitute,” *Petrolia Topic*, October 23, 1879.

³⁵⁶ “Our Oil Fields: Notes from a “*Globe*” Correspondent in the Petroleum ...,” *Toronto Globe*, August 30, 1881.

³⁵⁷ “Our Oil Fields: Notes from a “*Globe*” Correspondent in the Petroleum ...,” *Toronto Globe*, August 30, 1881.

³⁵⁸ “Drainage,” *Petrolia Topic*, November 6, 1879.

exceedingly scarce, there being but half a dozen or so good wells in the town. 'Free as the air we breath or the water we drink,' is an expression which is rarely used even in the pulpits of the town, for to say nothing of the cost of raising the gas[,] water has for years been sold at the rate of one cent a pail full. Water being scarce, the hotels do a good bar business, and whisky is in demand."³⁵⁹ With only half a dozen reliable water wells supporting a population of 3,465 people, it is not a surprise that alcohol was used to supplement water.³⁶⁰ It is not clear whether the youth used anything in place of water, which might have resulted in a higher chance of them consuming contaminated water, and in turn, a higher chance of becoming sick. A drainage system carrying pollution through the town and into the river system would have furthered contaminated the water supply.³⁶¹ However, a lot of this is speculative: it is currently not possible to conclusively say that water scarcity and contamination of the water supply were specifically the cause for the rise in child-related deaths. But it is worth mentioning that water scarcity would have exacerbated scarlet fever, diphtheria, and typhoid.

The forests of oil derricks that popped up across Enniskillen quickly became a hazard. Unlike the shrinking forests of ash, oak, and elm, oil derricks were not bound to the earth by roots. Consequently, a strong enough wind or a large enough storm was all that was required to knock down the thousands of derricks scattered across the oil fields. Given the size and weight of the three poles that made up the derricks, they could pose a serious threat to life and property. For instance, during the summer of 1879, a massive windstorm tore through Enniskillen's oil fields, devastating property and creating thousands of dollars worth of property damage. A total number of 300 derricks and 19 engine houses were utterly destroyed, with a total loss of \$10,000.³⁶² Almost

³⁵⁹ "Our Oil Fields: Notes from a "Globe" Correspondent in the Petroleum ...," *Toronto Globe*, August 30, 1881.

³⁶⁰ Burr, 97.

³⁶¹ "Drainage," *Petrolia Topic*, November 6, 1879.

³⁶² "The Tornado: Over Ten Thousand Dollars Worth of Property Destroyed," *Petrolia Topic*, July 17, 1879.

the same time next year, another massive wind travelled through Enniskillen, knocking over hundreds of oil derricks and injuring several people.³⁶³ The transformation of the environment from forests to derricks created an unexpected hazard for the local populace.



Figure 7: The size and the scope of the derricks was large enough that they could be seen above buildings in Oil Springs.³⁶⁴

For youth growing up in Enniskillen, the oil industry fostered an industrial environment with uncommon hazards. Fires, explosive and flammable materials, water contaminated with oil, and abandoned oil wells were all common hazards that made life dangerous. Since a lot of the hazards were not permanently addressed, these hazards remained a constant part of life. For example, there is no evidence of producers plugging abandoned oil wells, likely because they saw no need to and it was cheaper to do nothing. As a result, youth were known to fall and become trapped in oil wells. A five-year old boy in 1861 fell into an abandoned surface well and had to tread water (and oil). Luckily, he was saved when “the father was enabled to reach him. When

³⁶³ “The Great Blow,” *Petrolia Topic*, July 13, 1880.

³⁶⁴ “Oil Springs, Ontario; Anderson & Murray Machine Shop and Foundry,” Provided by Lambton County Archives.

taken out he vomited a great deal of oil, but sustained no injury from it, and was a few hours afterwards running about as well as ever.”³⁶⁵ The *Globe* reporter who included this story did so in the middle of an overview summary on the oil region, which suggests that he considered this story as indicative of life in the oil region.



Figure 8: The oil fields were massive and sometimes youth would cut through them.³⁶⁶

Something as simple as cutting through an open field could have disastrous consequences in Enniskillen. In May of 1880, a “boy and a companion were running across the old oil territory at Oil Springs, and in the dusky twilight he fell into an abandoned surface well, 70 feet, which had about 60 feet of water in it.” His friend reacted quickly and “ran for aid, and found Mr. Sisk....” Recognizing that he would not be able to remove the boy from the well, Sisk reacted “immediately upon arriving at the well, jumped at the imminent risk of his own life into the hole and sustained the struggling lad above water until both were rescued.” Once help arrived, “Mr. Sisk fainted the

³⁶⁵ “The Oil Region,” Toronto *Globe*, September 1, 1861.

³⁶⁶ “Centre Street, Oil Fields at Petrolia, Ontario,” Provided by Lambton County Archives.

moment he reached safety, the extraordinary exertions necessary to carry out his noble intentions having overtaxed his strength, but he has not entirely recovered.”³⁶⁷ The reporter only focused on this case as a story of heroic action. There was no further expansion on whether this was a systematic problem, just emphasis on the actions of Sisk. Nevertheless, actions such as Sisk’s were necessary when confronting the hazards posed by the oil region.

When confronted by hazards, locals had to make difficult and calculated decisions. Consider the case of Ken MacGregor’s father, rushing to sit on the lids of an oil storage tank to suffocate the blaze inside, or the case of Sisk saving the boy from drowning in an oil well. Although both situations ended in the best-case scenario, MacGregor’s father could have burned to death and Sisk could have been suffocated by natural gas when inside the well. There was no assurance that their actions would succeed, but their inaction could have also resulted in death and injury. In general, the numerous hazards and their unpredictable nature placed locals in situations where they made calculated decisions to mitigate or prevent the chance of death or injury. However, these actions did not always work out. When a refinery labourer referred to as Brownscoombe at the refinery of Frank Smith was told by his foreman to clean the inside of a refining still, the gas inside knocked him unconscious. Co-worker George Cook, observing Brownscoombe’s condition climbed into the tank to assist him, only to succumb to the gas himself. Another man referred to as Mr. McCarren also dived into the tank and retrieved both men. Unfortunately, Cook succumbed to the gas, but Brownscoombe regained consciousness.³⁶⁸ The death of Cook was a tragedy, but it was also indicative of the complicated choices that had to be made when reacting to hazards. Cook understood the risk, yet he made the calculated decision to save his co-worker. The oil region was

³⁶⁷ “Mr. Dal Sisk,” *Petrolia Advertiser*, Thursday May 13, 1880.

³⁶⁸ “Death from Inhaled Gas,” *Petrolia Topic*, December 4, 1879

full of people who understood the risks and hazards of the environment and the oil industry, but sometimes their actions ended with death.

The growth of Enniskillen's oil industry increasingly translated to an environment defined by oil development. Through the oil industry, oil spilled over land and water, natural gas released from the bowels of the earth, and forests of oil derricks dotted the land. Once the environment started to change, it continued to become less welcoming to humans, as the creeks could catch on fire, children could disappear in wells, and natural gas suffocated workers. Beginning with the start of the oil industry in Enniskillen, the local population waged war against the ever-increasing number of threats. They responded by setting up preventative measures, sharing knowledge on how to react to hazards, and they purchased equipment. However, the unpredictable and destructive nature of these hazards meant that even the most experienced people with the proper equipment could find themselves in circumstances that almost assured a high degree of injury or death. The locals were fighting against negative externalities produced by the oil industry, and as the industry grew, so too did the number of hazards. The threats posed from oil development could never be stopped by preventative and reactionary methods alone. The only way to have successfully stopped these hazards would have been to stop producing oil, but such a thought was never entertained.

Chapter Six: The Smell of Air Pollution

On August 26, 1858, the *Observer* released an article praising the discovery of oil by James Miller Williams. Under the title “The Enniskillen Mineral Oil,” the article celebrated the newfound resource and its utility as a potential illuminating oil. Luckily for the *Observer*, a friend of the newspaper had taken the time to travel to Enniskillen for the sake of purchasing a sample of oil which they then shared. With the sample in hand, the reporters tested the quality of the oil by dousing a piece of paper in the liquid and setting it aflame. Although the reporters discovered that the burning of the oil produced a bright white light, one concern lay with the fact that “The substance is of a dark colour and has a strong pungent smell...”³⁶⁹ The pungent odour described by the reporters was a permanent quality of Enniskillen oil, attributed to the high percentage of sulphur in the oil. However, the reporters did not consider the smell to be a serious concern: for the remainder of the article they focused their attention on the financial potential of the bright white light emitted from this newfound resource. But if the reporters were truly interested in evaluating the economic potential of the oil, they would have entertained the idea that people might have been opposed to a form of illumination that was accompanied by a pungent smell. As would become apparent, the odour of Enniskillen oil came to garner a variety of different negative reactions from locals, reporters, visitors to Enniskillen, and people in foreign markets.

When addressing the smell given off by Enniskillen oil, it is worth considering how people in the 19th century interpreted odours. As American historian Melanie Kiechle states in her recent book *Smell Detectives: An Olfactory History of Nineteenth-Century Urban America*, “the act of smelling is biological, but the interpretation of and reaction to odors is socially shaped and the

³⁶⁹ “Mineral Oil,” *Sarnia Observer*, August 26, 1858.

product of one's cultural context."³⁷⁰ Given that the interpretation of odours are socially constructed, it becomes possible to examine the history of oil development with a completely new approach. In this case, by examining reactions to the odour of Enniskillen oil, it is possible to shed light on two important questions: How did the odour of oil influence the oil industry? How did people experience environmental change as the odour of their environment actively evolved?

The unfavourable odour of Enniskillen oil proved to be an obstacle that jeopardized the early success of Canada's oil industry. High quantities of sulphuric compounds in the oil created a potent odour usually described as a mixture of onions and leeks.³⁷¹ To consumers outside of Enniskillen, the aroma of the oil provoked reactions of disgust. As a result, refiners and producers in Enniskillen actively engaged in trying to create successful refining methods that would deodorize oil. While some businesses successfully developed methods of deodorizing, most producers and refiners lacked the proper equipment and scientific background necessary. As a result, refineries capable of deodorizing sold their labour to producers that desired an odourless product. But the focus on selling deodorized oil began to change with the inception of the 1862 flowing wells. With the substantial increase in oil production, producers focused their attentions on selling undeodorized oil to British markets. But this backfired, as people in Britain attempted to prevent the pungent product from being stored near their communities. American oil from Pennsylvania found more success abroad as its product lacked the same sulphuric odour of Enniskillen oil. Although Canadian producers and refiners attempted to improve the reputation of Canadian oil, they were largely unsuccessful. The continued decision by producers to sell

³⁷⁰ Melanie Kiechle, *Smell Detectives: An Olfactory History of Nineteenth-Century Urban America* (Seattle: University of Washington Press, 2017), 7.

³⁷¹ Ball, 192.

undeodorized Canadian oil, and the opening of new oil fields which offered variety in oil selection, worked to maintain negative stigma against it.

When examining how people react to a certain product, it is vital to examine how groups with different backgrounds respond. In the context of this thesis, focus will be placed on the British public's initial reception to oil in 1861-1862, the response of Canadians outside of the oil region, and the reaction of Enniskillen locals. Kiechle argues that the strength in sensory history lies in its ability to tell "how people have perceived their world through their bodies, what role sensory perceptions play in interacting with the world, and how perceptions have varied across time and space."³⁷² By focusing on the olfactory perceptions of oil from people of different backgrounds, it becomes possible to examine how social constructions and background can influence people's reaction to what they smell. As a result, the odour of Enniskillen oil acts as a case study to determine how space, time, background, and bodily senses influence how people react to odour.

Olfactory senses, combined with space, are two factors that came together to determine how locals perceived and interacted with the changing odour of Enniskillen. The local population was influenced by the importance of the oil industry on the local economy. Locals were also unusual in that they were constantly exposed to the odour of oil – they were immersed in it. As a result, their reactions to the odour of oil was quite different than that of others. Many locals showed little concern toward it. To them, the smell of oil faded into the background. However, some locals were unwilling to accept the stench, and either moved away or attempted to eliminate the worst of it.

³⁷² Kiechle, 7.

Williams recognized the problem with bad-smelling oil early on. In 1859, he tried to remove the odour with the assistance of Professor Croft from the Chemistry department at Toronto's University College.³⁷³ According to the *Globe*, Professor Croft was successful in removing the odour of the oil by May, providing Williams with a deodorized oil. However, there are some inaccuracies in the *Globe's* reporting. For example, the first article covering the successful development of the deodorizing method was in May of 1859, yet another article in October of the same year claimed that the method of deodorizing oil had just been produced.³⁷⁴ Part of the reason could be the *Globe's* attempt to stimulate the growth of the infant oil industry. According to the *Globe*, "This [deodorizing] was all that was required before placing the oil in the market. Its illuminating quality are unequalled, but it had an unmistakeable effluvium."³⁷⁵ The *Globe* recognized the obstacle that the odour of oil would have on its sale, so it is possible that the earliest article on the deodorizing method was embellished. The earliest advertisement Williams made, in the *Globe*, for a deodorized oil occurred on July 25th, 1860; fourteen months after the article in May of 1859. The advertisement acknowledged the reputation of oil's odour, replying that "recent experiments have been attended with great success, and have resulted in our obtaining a process by means of which we can now entirely remove the disagreeable odour."³⁷⁶ Although it is impossible to truly determine whether the odour was successfully removed, it is unlikely that Williams would continue advertising his product as odourless, especially since a quick whiff could provide a definitive answer.

There were only a handful of companies that were ever successful in developing a method of deodorizing oil; those in possession of this method charged producers a price to remove the

³⁷³ "The Enniskillen Oil," Toronto *Globe*, May 31, 1859.

³⁷⁴ "Williams' Coal Oil," Toronto *Globe*, October 17, 1859.

³⁷⁵ "The Enniskillen Oil," Toronto *Globe*, May 31, 1859.

³⁷⁶ J.M. Williams & Co, "Canadian Oils," Toronto *Globe*, July 25, 1860.

smell from their oil.³⁷⁷ Although numerous producers and refiners over time tried to develop their own methods of deodorization, many lacked the equipment and scientific background to replicate the methods.³⁷⁸ In general, all refineries were quite secretive about their methods of removing the odour of the oil, resulting in limited information about the process. It is not clear what the actual process of deodorizing entailed, but a correspondent from the *Globe* suggested that deodorization required adding three to four per cent of sulphuric acid and half percent of muriatic acid to a tank full of oil. The liquids were then mixed inside of the tank by an agitator. To remove the acid, the oil is “passed through a ley made of one pounds of caustic of soda to five gallons of water.”³⁷⁹ It is highly unlikely that the description offered by the *Globe* was sufficient to replicate a method of deodorization, given the numerous failed attempts that followed.³⁸⁰

As consumption of oil continued to increase, knowledge about deodorization grew in value. Some refineries even went as far as to place ads for refiners “who understands the deodorizing and treating the Canadian oil thoroughly.”³⁸¹ On the topic of deodorizing, a correspondent from the *Globe* described, “The art of treating petroleum so as to produce a good burning oil free from smell, is but very imperfectly understood by many of those who have engaged in it. The truth is, that to succeed in it requires a combination of scientific knowledge and practical skill which very few possess.”³⁸² With most oil labourers lacking a background in chemistry, their chance of developing a form of deodorization was unlikely. As a result, a lot of producers had to decide whether they would spend the money to deodorize their oil at their competitor's refinery, or simply

³⁷⁷ M, “An Account of the Oil Region of Canada West,” *Hamilton Evening Times*, August 21, 1865.

³⁷⁸ *Ibid.*

³⁷⁹ “The Oil Springs of Enniskillen,” *Toronto Globe*, March 13, 1862.

³⁸⁰ M, “An Account of the Oil Region of Canada West,” *Hamilton Evening Times*, August 21, 1865.

³⁸¹ Great Western Oil Refinery, “Classified Ad 1: Oil Refiner Want,” *The Toronto Globe*, September 27, 1865.

³⁸² “Oil Springs Items, (London News),” *Toronto Globe*, July 17, 1863.

sell the oil with its odour. Many chose to sell it with its scent.³⁸³ Ultimately, Canadian oil acquired a negative reputation as a product with a pungent smell throughout the nineteenth century.³⁸⁴

The 1862 flowing wells spiked production of Enniskillen oil to such an extent that it started outpacing domestic consumption. Producers responded by shipping oil to Britain in the spring of the same year.³⁸⁵ At first, the increasing amount of oil did not pose a problem, partly because British refineries were developing their own methods of deodorization. However, because some of these refineries were located within major British cities, locals complained about the increasingly prevalent smell of sulphur stemming from factories holding Enniskillen oil.³⁸⁶ As a result, locals became increasingly hostile towards the presence of Canadian oil within the boundaries of their cities.

After the spring and summer of 1862, Enniskillen oil was struggling to break into the British market against the practically odourless Pennsylvanian oil. According to Alex S. McCrae, a British oil broker based in Liverpool, the reputation of Canadian oil had become increasingly negative. In a letter to the *Oil Springs Chronicle*, he remarked that “I sold today 1,000 casks of American crude oil at £16 5s, to £16 10s, per ton. I tried today to sell Canadian at £12 to £12 10s, and could not sell a barrel. Now, how is this?” McCrae carried on by asserting, “No equivocation will avail; we must all confess the very repulsive smell attaching to the Canadian and not to the American oil.” Here lay the problem for Canadian oil: people capable of deodorizing were unwilling to share the information for free, while producers were not interested to pay the cost to

³⁸³ Alex S. McCrae, “Liverpool Correspondence (To the Editor of the *Chronicle*, Oil Springs, Canada West.)” *Toronto Globe*, October 22, 1862.

³⁸⁴ Cumbrian, “An Illuminant and a Fuel,” *Toronto Globe*, December 23, 1892

³⁸⁵ “Enniskillen Oil in Britain,” *Sarnia Observer*, April 4, 1862.

³⁸⁶ Alex S. McCrae, “Liverpool Correspondence (To the Editor of the *Chronicle*, Oil Springs, Canada West.)” *Toronto Globe*, October 22, 1862.

refine the oil. The plan for British refineries to deodorize the oil could have worked, but the local population could no longer stand the presence of Canadian oil. According to McCrae, “All our refineries are in populous districts, which becomes completely nauseated by the execrable effluvia arising from the distillation of the former, and the manufacturers is scarcely at work before he is indicted as a nuisance by his neighbour and obliged to succumb.” McCrae proceeded to sketch a grim picture of the future of Canadian oil in Britain. McCrae pointed out that “In Glasgow they have been entirely prevented from using the Canadian, and it has come here [Liverpool] for sale. In London large works were indicted and forced to change last week; and here two manufactures have only escaped legal proceeding by promise not to use the Canadian again.”³⁸⁷ At this point, the notable amount of oil exported to Britain had created a strong aversion to Canadian oil. Offering advice to the Canadian producers, McCrae recommended that they deodorize the oil before shipping it to Britain if they expected their product to be sold.

Although McCrae accurately depicted the harsh reception of Canadian oil, he was unable to capture the depth of the criticisms. A unique characteristic of the British response to the oil is the consistent ways that people across that country reacted to it. For example, Liverpoolians and Glaswegians were equally successful in tracking the odour of oil back to the refineries and storehouses holding it. In Glasgow, the locals had tracked the odour of oil back to its source in the Springtank Chemical Company.³⁸⁸ In Liverpool, locals had determined that the odour was coming from the storage containers at the Birkenhead docks.³⁸⁹ Britons in different cities considered the odour of Canadian oil to be hazardous to health, a threat to property, and a threat to nature—

³⁸⁷ Alex S. McCrae, “Liverpool Correspondence (To the Editor of the Chronicle, Oil Springs, Canada West.),” *The Toronto Globe*, October 22, 1862.

³⁸⁸ “Alleged Nuisance,” *Glasgow Herald*, October 8, 1862.

³⁸⁹ “Cleanings,” *Royal Cornwall Gazette*, November 28, 1862.

animals and vegetation.³⁹⁰ The British population opposed to the odour reacted by pressuring government officials, using the law, creating petitions, threatening financial consequences, and trying to raise awareness through newspapers.

There is no reason to assume that the local population had any reason to specifically oppose Canadian oil, besides the smell. Oil Springs was a far-off corner of the British Empire that meant nothing to the average Brit. That the oil's odour alone was the cause of disgust is evident in the incident of the Liverpool ship, the "Hindoo." In October 1862, the "Hindoo" was transporting 3,000 barrels of oil from Enniskillen across the Atlantic to Britain. A storm incapacitated the ship off the coast of Liverpool and, worse, a fire broke out on board. With a rudderless ship and cargo set to explode, some of the crew attempted the five-mile swim to the shore. Five men drowned trying to swim to the shore.³⁹¹ The ship ran aground, and some survivors, including Captain Murphy, was reportedly "nearly poisoned by [consumption of] the petroleum."³⁹² In Liverpool, the first knowledge of the shipwreck came when the odour of 3,000 barrels of oil, much of it set aflame, floated into town. Even though the fire was "about five miles distant, the town was filled with the disagreeable smell of petroleum."³⁹³ The case of the "Hindoo" wreck demonstrates the distinct reactions possible of people's senses. Although there were significant oil fires in Oil Springs and Petrolia during the late 19th century, there are no records of the locals complaining about the aroma that these fires gave off. The variance in reacting to odours from oil fires can only originate from the background of each respective populace. The primary difference that likely

³⁹⁰ "The Petroleum Nuisance: Meeting at Birkenhead," *Liverpool Mercury*, Tuesday, November 18, 1862.

³⁹¹ "Burning of a Petroleum Ship, and Loss of Life," *Glasgow Herald*, October 27, 1862.

³⁹² "Burning of Vessel," *Lloyd's Weekly Newspaper*, Sunday, October 26, 1862.

³⁹³ "Burning of a Petroleum Ship, and Loss of Life," *Glasgow Herald*, October 27, 1862.

influenced the variety in reactions would be the locals of Enniskillen being more acquainted with the odour of oil.

Although 3,000 barrels of American oil could have also provoked a powerful reaction, there is not enough evidence to suggest that it would have provoked the same reaction as the burning of the Canadian oil. There is plenty of evidence that identifies Canadian oil as the type that produced reactions of disgust from the British population.³⁹⁴ Several British sources made the distinction between American and Canadian, by writing that the Canadian oil possessed the disagreeable odour.³⁹⁵

Although the refineries in Liverpool were the most receptive of the British cities to Enniskillen oil, complaints from the citizens bubbled over in October of 1862. An article by the *Liverpool Mercury* under the headline “Strange Incident,” tried to capture the essence of the revolting nature of Canadian oil. Multiple sources later identify the oil as originating from Canada.³⁹⁶ The article is worth reproducing in its entirety:

The people of Liverpool appear to be pretty generally convinced that the storage of petroleum oil in the crowded districts of the town is one of the most intolerable of nuisances. At the south end, so obnoxious has the annoyance become that a memorial to the town council on the subject was prepared. From the fact that most of the members of the council live in the outskirts, some of our municipal representatives were very incredulous as to the extent of the nuisance, and did not appear at all convinced by the earnest representation of their constituents. The memorialists were determined, if possible, to prove beyond all doubt, and by an olfactory test, the truth of their statement. For this purpose, they procured a gallon of the pure and unadulterated article, and engaged a messenger to convey the same in a two gallon jar to the Town Hall, where the offensive liquid was to be tested and inspected by the members of the council. As good luck would have it, the poster selected the door of the Town Hall, in Exchange street West, by which the members

³⁹⁴ “The Storage of American Petroleum,” *Liverpool Mercury*, October 29, 1862. Several sources in different cities chose not to identify the origin of oil that was attributed as a nuisance. However, I have found no sources that explicitly condemn the American product, while there are several that specifically criticize Canadian oil—from Oil Springs.

³⁹⁵ “Petroleum,” *Liverpool Mercury*, December 9, 1862.

³⁹⁶ “Petroleum,” *Liverpool Mercury*, November 28, 1862.

of the council generally enter. As he ascended the broad flight of steps with his precious burden poised upon one shoulder, his foot *accidentally* slipped, the man and the jar both fell, and the oil, with its delicious and savoury odour, ran down the steps and across the pavement. Passers by, in crowding to learn the nature of the accident, were nearly suffocated by the obnoxious smell which greeted them, and the learned town councillors, who were in a few minutes to discuss the nature of the oil, had, with their hands upon their nostrils, to find access to the building by another route.³⁹⁷

The article captures how the local population of Liverpool perceived the accompanying smell of oil as an unacceptable intrusion into their community. It demonstrates an attempt to permanently connect the relationship between the invisible odour harassing the locals and a physical product—oil. Kiechle demonstrates in her book that the invisibility of odour made it difficult to address a particular smell as people are then required to find the physical source.³⁹⁸ In a way, the decision or accident to break a jar of oil on the steps of city hall was a smart move. With a large crowd and several reputable men having to pass by the oil to enter the town hall, everyone present could not deny the connection between oil and its odour. The breaking of the jar had the added benefit of forcing members of the city council and locals not yet exposed to the oil to form an immediate opinion on the subject. An anonymous source would later acknowledge the jar breaking as a turning point that favoured the prohibition of oil. According to the source, “The disagreeable effluvium arising therefrom [the broken jar of oil] so completely disgusted the olfactory nerves of the few gentlemen assembled that all at once denounced petroleum as a nuisance, and delirious to the public health.”³⁹⁹ Immediately confronted with the odour, members of the city council and other locals reacted to the jar based on their olfactory senses. In the moment those present were likely not thinking the benefits of importing oil, they simply wanted to get away from the stench.

³⁹⁷ “Strange Incident (The Town Council and Petroleum Oil),” *Toronto Globe*, October 2, 1862.

³⁹⁸ Kiechle, 20.

³⁹⁹ “Petroleum,” *Liverpool Mercury*, December 9, 1862.

By the fall of 1862 an increasing stigma was already developing against Canadian oil. An article from the *Journal of Gas Lighting*—shared through the *Liverpool Mercury*—examined the qualities of both American and Canadian oil. Through their analysis they determined that the “low-priced article imported from Canada emits an offensive vapour, of which the fact the members of the Liverpool town council had recently personal experience, when discussing the question whether it was a nuisance or not, by breaking of a large jar containing oil in front of town hall.” The author of the article accused “Canadian rock oil” for all the complaints about oil’s odour in Liverpool. According to the article the odour had become bad enough that potential refineries were not allowed to expand until they removed the nuisance.⁴⁰⁰

In Liverpool, men engaged in the oil trade were struggling to maintain support for the refining business. To address the problem of the odour, one man claimed to have invented an airtight metal cask that would prevent the odour of oil from leaking into the air.⁴⁰¹ However, it is not clear if this invention was a success given the continued complaints of oil’s odour. A further attempt was made inside of the refineries to divert the odorous air back into the furnace by using a giant fan. Ultimately, its not clear whether any of these methods worked given the continued concerns from locals.⁴⁰²

As the expansion of storage and refinery spaces for oil continued, inhabitants of Liverpool continued their opposition. In October 1862, the local population won a major victory against the refining industry by forcing the city to host a town hall meeting to address the issue of the oil’s odour. The townspeople convinced the Assistant Overseer and Inspector of Nuisance to object to

⁴⁰⁰ “The Storage of American Petroleum,” *Liverpool Mercury*, October 29, 1862.

⁴⁰¹ “The Petroleum Controversy,” *The Leeds Mercury*, September 29, 1862.

⁴⁰² “The Safe Keeping of Petroleum,” *Gazette, and General Advertiser for Lancashire, Westmorland, Yorkshire, &c.*, October 11, 1862.

the expansion of the refinery industry because of the nuisance of the odour it produced.⁴⁰³ With support from reputable people and the public, a further townhall meeting was to be held. At this point part of the opposition was focused on limiting the expansion of proposed refineries and storage locations in Birkenhead and surrounding neighbourhoods.

On November 18th, 1862, the meeting on the storage of oil was held in Birkenhead's Townhall. Before the meeting started the citizens opposed to the oil submitted a petition with signatures from 150 property owners and ratepayers in Birkenhead. A curiosity that stands out at the meeting would be the presence of a bottle of oil being brought and presented to the Chairman of the meeting. It is not clear if the opposition brought the bottle, but it is noted that the odour of the oil was "intolerable." Whoever brought the oil likely recognized that words alone could not do the odour justice. Businessmen, land owners, and inhabitants of Birkenhead were concerned about the damage that oil would have on their property. Merchants were afraid that the aroma of oil would negatively impact their products, while also lowering the value of surrounding neighbourhoods. One merchant complained that the odour of oil had attached itself to 100 barrels of his flour, which lowered its value. Businesses were already threatening to pull out of the neighbourhood if the stench of oil was allowed to expand. Landowners were fearful that they would lose reputable tenants as they would join the exodus of inhabitants trying to get away from the odour.⁴⁰⁴

When raising concerns about the effects of the oil's odour on people, citizens opposed to the oil argued that the odour was injurious to health. Mr. D.C Buchanan of Wallsey argued that "guano and salted hides were a nuisance, but they were rose-water and lavender compared to this

⁴⁰³ "Weekly Summary," *Cheshire Observer*, October 11, 1862.

⁴⁰⁴ "The Petroleum Nuisance: Meeting at Birkenhead," *Liverpool Mercury*, November 18, 1862

[oil] horrible stuff.” Buchanan’s comment demonstrates that the local population was conscious of other odours in the city, but in comparison to oil they were nowhere near as repulsive. Buchanan reaffirmed his point, arguing that “Of all the concentration of stinks that ever smelled the olfactory nerves, this petroleum was the very worse he had heard of.” Others present agreed. Other issues were also raised. One man raised concern about the combination of wind and the odour of oil, which culminated in what he called a “petroleum wind,” a gust of revolting odour that made it difficult for him to eat throughout the day. One of the men present reported that one of the local physicians he talked to had reported that many of his patients had been complaining about being affected by the odour. Some men were concerned enough that they were sending their wives and kids away to the country to safeguard their health. With such strong support against oil, a vote was passed on the first motion: “That in the opinion of this meeting the establishment of petroleum stores on the margin of the Great Float will be a serious nuisance and will endanger the health of the inhabitants.” The motion passed unanimously, showcasing that the city council and the locals together all considered oil as a threat to their health. The meeting then continued with further arguments, but it ended with an agreement that there would not be any further expansion of the refining works in Birkenhead.⁴⁰⁵

After the incident with the jar of oil and the town hall meeting, an anonymous citizen under the name of “One who is anxious for the Welfare of the Port of Liverpool,” attempted to offer an alternative solution to banning all oil. They suggested that only the Canadian oil should be prohibited, especially since the Pennsylvania oil was not known to have the same pungent smell.⁴⁰⁶

⁴⁰⁵ “The Petroleum Nuisance: Meeting at Birkenhead,” *Liverpool Mercury*, November 18, 1862

⁴⁰⁶ “Petroleum,” *Liverpool Mercury*, November 28, 1862.

Producers in Enniskillen struggled to rectify their oil's reputation, but it was to some degree too late. By 1864, the Canadian oil industry had lost a large part of its market in England. According to a *Globe* correspondent, the loss of the English market was a result of the poor quality of undeodorized oil sent there. The *Globe* added, "This, in conjunction with attempts made to refine crude oil in England, and the outcry caused by the odour arising therefrom, begot for the Canadian product a reputation which in its present state is most unjust."⁴⁰⁷ The reasoning provided by the correspondent aligns with concerns earlier raised by Liverpool oil broker Alex McCrae.

Although efforts were underway to increase the quantity of deodorized oil, some Canadians believed that not enough was being done to improve its reputation. A *Globe* reporter argued that the standard for deodorizing the Canadian oil was not high enough. Although he did concede that the refineries capable of deodorizing oil had met the necessary standards in odour for the British, he believed that it could be improved upon. In particular, the reporter suggested that "The smell can be temporarily removed without much difficulty, but on the voyage new sulphated hydrogen seems to be created for it resumes all the original odour."⁴⁰⁸ The accuracy of the claim is not apparent, especially given his earlier concession that the British were content with the deodorizing efforts of some refineries. By 1870, Liverpool oil broker Alex S. McCrae wrote to Enniskillen that the Canadian deodorized oil had as promising a future as the American oil. McCrae also noted that undeodorized Canadian oil was still being sold inside of the city.⁴⁰⁹

Despite continuous efforts throughout the nineteenth century to improve the reputation of Canadian oil, it still retained its negative reputation. According to a *Globe* article in 1892:

⁴⁰⁷ "Petroleum Trade," Toronto *Globe*, January 28, 1864.

⁴⁰⁸ "The Oil Interest," Toronto *Globe*, May 28, 1868.

⁴⁰⁹ Alex. S. McCrae, Toronto *Globe*, July 19, 1870.

But I need not say such is not the case, for users of illuminating oil prefer the American article from the Bradford [Pennsylvania] region, notwithstanding the heavy duty and higher price, owing to its freedom from sulphur, while the Lima and Canadian oils are only purchased by those who either must, from their poverty, buy the low-priced illuminants or are indifferent to the smoke and smell from the heavy charge of sulphur with which our native oil is laden.⁴¹⁰

As this quote suggests, it was not just British people who disliked the smell of Canadian oil. Enniskillen possessed large quantities of oil pollution, from the wells, to the oil spills, to the storage containers, and ending in the refineries. In addition, refineries deposited refining chemicals into the local river system. All of these different forms of pollution consistently produced throughout the nineteenth century culminated in the air of Enniskillen being permeated with the odour of oil. Given that most outsiders did not have to deal with the odour of oil on a consistent basis, their reactions to the oil were more critical.

Visiting Enniskillen visitors usually described their first interaction with the odour as an unyielding attack on their olfactory senses. One frustrated *London Free Press* reporter wrote, “You smell it and taste it in the air and hold your nose to lessen its ungracious influence upon the olfactories.”⁴¹¹ The reporter’s emphasis on the consistency of the odour stems from his concern that such a horrendous smell was found everywhere. Many other reporters would follow with similar complaints, all containing the underlying concern that they could never find any relief from the odour so long as they were in Enniskillen.

When a group of Toronto’s leading businessmen and scientists, including Mayor J. G. Bowes, arrived in Wyoming in 1862 to witness a flowing well, they quickly became distracted by the odour. Although Wyoming was not technically an oil-producing region, it was the principal corridor for transporting oil from Oil Springs and Petrolia to the refineries in Hamilton, Sarnia,

⁴¹⁰ Cumbrion, “An Illuminant and a Fuel,” *Toronto Globe*, December 23, 1892

⁴¹¹ “Another Great Flowing Well,” *London Free Press*, February 19, 1862.

London, and Toronto, because it possessed the only railroad in the region. As a result, the Wyoming train station was surrounded by barrels and vats full of oil waiting to be loaded. The Toronto visitors reported that the smell of the region was so powerful, “Travellers sometimes pass the stations at which they wish to stay; but no such mistake ever occurs at Wyoming. The odour arising from the oil prevents it.” The air was so foul that “On the evening in question, the heavily laden air rushed into the heated cars, awoke the sleepers, and provoked expressions of disgust from all and sundry.” The travellers first deduced they had arrived in the oil region by way of its smell. In this experience alone, the travellers had experienced a common characteristic of Enniskillen, being alerted of one’s arrival in the oil region by one’s olfactory senses. In the days that followed, the travellers tried to find ways to escape the smell, but “It was impossible to get rid of the odour. Closed doors were useless. If the pockets of every man had been full of leeks, the scent could not have been worse. Small was the amount of sleep the strangers got Thursday night.”⁴¹²

The growth of the oil industry resulted in the expansion of the refineries across cities in Ontario. These refineries were built in London, Sarnia, Toronto, and Hamilton throughout the remainder of the nineteenth century.⁴¹³ Concerns about the odour oil were raised in all the listed cities that established a refining centre. However, it seems that many newspapers did not follow up or go into a lot of detail about the refinery odour for their respective cities. Furthermore, a lot of the Canadian newspapers adopted vague language when reporting concerns about odour. For example, sometimes newspapers would hint at the odour problem—without actually referring to the odour—from refineries but described them as a producing a “nuisance.”⁴¹⁴ For example, in an 1863 town council meeting in Toronto, one Alderman raised the issue that the “the oil refiners in

⁴¹² *Canadian Native Oil*, 21-2.

⁴¹³ “Canada,” *Toronto Globe*, March 26, 1869. “A Nuisance,” *Toronto Globe*, June 18, 1866.

⁴¹⁴ “A Nuisance,” *Toronto Globe*, June 18, 1866.

the Eastern end of the city were a great nuisance and he hoped action would be taken on the subject.”⁴¹⁵ The nuisance in question does not explicitly state that this was about odour, but given the consistency in other sources of using nuisance as a way to address the smell of refineries, there is a high chance that this was the nuisance in question. Similar to people in Britain, some Canadian’s attempted to address the odour in Sarnia by trying to oppose the expansion of refineries.⁴¹⁶ In 1866 the local population living near a Toronto refinery by the Don River tried to raise awareness about the revolting odour that came from the refineries. However, it is not clear how successful the locals in Toronto were in stopping the refinery. The odour was reported to be bad enough that “With an eastern wind, the air is said to be almost insufferable.”⁴¹⁷

During the summer of 1862, a Toronto refinery was successfully charged as being a nuisance. The oil refinery of James Esmonde was under allegations that it had made the western section of the city unwelcoming to its inhabitants. Several witnesses appeared at the case to profess that the odour coming from the refinery was producing a disagreeable smell. However, the defense argued that “no disagreeable effluvium could arise from the refinery, on account of the nature of the patent process used by Mr. Esmonde in deodorising the oil.” The jury offered a verdict of “not guilty.” Unlike the newspapers in Britain, the *Globe* chose not to pursue interviews or inquiries about the specific complaints from the local inhabitants.⁴¹⁸ Furthermore, the city council and the legal system seemed unwilling take sufficient action to address the citizens concerns.

Whereas outsiders struggled to accept the odours of the region, Enniskillen locals claimed to have adapted to it. One of the factors that helped locals normalize the odour was that most had

⁴¹⁵ “City Council,” *Toronto Globe*, February 24, 1863.

⁴¹⁶ “Canada,” *Toronto Globe*, March 26, 1869.

⁴¹⁷ “City News,” *Toronto Globe*, June 18, 1866.

⁴¹⁸ “Recorder’s Court,” *Toronto Globe*, July 14, 1862.

arrived when the oil industry was starting, so their tolerance grew as the smell grew. One correspondent who spent time with an oil worker became frustrated when the oil worker argued that “everything oily about the territory is beautiful.” The reporter responded that “unless you have some near prospect of getting a share of the profits, it is not beautiful, neither in smell nor in looks, but exactly the contrary.” The reporter argued, “Black Creek ... as it winds its way slowly along its narrow channel, between banks covered with derricks, and vats, and well-charred stumps, piles of barrels filled with the unctuous liquid, ... is beautiful in his eyes; because it smells of petroleum, to his nose.” Consequently, the correspondent wrote, “Is it [oil] not worth 6 cents a gallon with every prospect of being worth twice as much this time next year? What should make it beautiful if that will not?”⁴¹⁹ The oil’s worth justified the odour and presumably the environmental devastation that it caused.

Although the odour of Enniskillen was powerful, the writer for the *Globe* argued that it was possible to normalize the smell. All that was required was “a forty-eight- or ninety-six-hour acquaintance with its odours, and the olfactory nerves become insensible to them.”⁴²⁰ The normalization of the odours of petroleum was not an active choice, but rather a passive consequence of living in the oil region. Another writer from the *Globe* questioned whether the locals of Enniskillen were actually able to take no notice of the smell. This reporter criticized the reservoirs of oil that were used to store a thousand barrels worth of oil at one time. He vividly described the putrid smell as reeking “like a compound of onions and gas tar, and though the residents of the place profess not to dislike it, it well-nigh poisons a stranger.”⁴²¹ Although the

⁴¹⁹ *Canadian Native Oil*, 14-15.

⁴²⁰ *Canadian Native Oil*, 15.

⁴²¹ “The Oil Region,” *The Toronto Globe*, September 2, 1861.

locals claimed the smell did not bother them, the unfamiliarity of the odour was enough to irritate an outsider.

In response to complaints concerning the smell, a correspondent for the *Hamilton Evening Times* argued that people were overreacting. Ladies, he stated, were the only people who could be excused for raising criticisms of the smell of oil. He claimed there was “no sound natural reason why full grown male specimen of the genus homo, with a beard and moustache, or at least the ‘indications’ of such upon his manly face, should either faint upon the spot, or stuff his nose with handkerchiefs upon coming within range of the native article of petroleum....” All the other reporters, by his estimation, “have been all their lives accustomed to such recherche perfumes as the inimitable patchouli or that other fragrant essence patronized by the exclusives of the Paris Jockey Club.” He suggested that the other correspondents were pampered and feminine men, for reacting so negatively to the smell of the region. He ended his criticisms by conceding that although oil “has no very inviting odour at first, but soon [one] gets used to it and after a few days nobody minds it.”⁴²² But the reporter’s defense of the smell was part and parcel of his broader defense of Canadian oil, which was the main focus of his article.

The odour of the oil region and the oil towns were notable enough that reporters noted when the quality of the air improved. The decline of the surface wells in Oil Springs in 1862 and the declining investment in this region weakened the odour. According to a writer from the *Globe*, by 1865 the odour of Oil Springs was improving because of the loss of the surface wells. The writer alleged that the surface wells had been responsible for the strength of the odour in the past. The reporter recalled that an “all-pervading, but concentrated onion and leek smell used to be

⁴²² “O.S.C, “The Oil Regions,” *Hamilton Evening Times*, July 16, 1862.

present. You could not take a breath without the fact being impressed upon your mind that you were in the neighbourhood of coal oil.” However, this era was slowly fading into history, and with it the smell. “The air of the village is much purer; the effluvia no longer penetrate into the interior of the hotels, and only at intervals as the laden teams pass along, or as a well close by the road-side is approached, is it to be smelled in the streets.” The significant improvement in air quality in Oil Springs was notable enough that the reporter felt it necessary to correct the past perceptions: “none need now fear, in making a visit to the springs, that they will suffer from the perfumed state of the atmosphere.”⁴²³ The loss of the oil industry in Oil Springs had resulted in the loss of some of its negative side effects.

Belden’s Illustrated Atlas of Lambton County 1880 offers a review of the environmental changes that occurred within two decades of oil development. The *Atlas* was written by partners Howard Raymond and Ruben Booth of the Belden Publishing Company. The publisher offered a detailed description of the oil towns of Petrolia, Marthaville, and Oil Springs. Depicting the oil region of Enniskillen, the authors argued that even then, in 1880, “Everything smells and even tastes of oil; everybody is covered in oil, thinks nothing but oil, and talks of nothing but oil.”⁴²⁴ The description extended to the other oil centres, too.

The *Atlas’s* claim about the odour was confirmed by Ken MacGregor’s diary. MacGregor, whose family immigrated to Petrolia in 1890 from Scotland, noted the odour of oil in Enniskillen. When he arrived, “With family baggage unloaded on the train platform of Petrolia and speaking for the MacGregor family, the combined odor of petroleum and saltwater aromas were not too impressive.”⁴²⁵ For MacGregor as for other newcomers, the smell of the region was the first

⁴²³ “Enniskillen Oil Territory: its Past and Present Locations,” *Toronto Globe*, April 14, 1865.

⁴²⁴ Edward Phelps and H. Belden & Co, *Belden’s Illustrated Historical Atlas of the County of Lambton*, 15.

⁴²⁵ MacGregor, 21.

impression, and one of the first signs that this was an oil region. MacGregor made a number of negative comments in his journal about the region's odour. He criticized the neighbourhood's ditches because they were filled with oil and refining chemicals. He found it frustrating that kids would commonly fall into the oily ditch water as it meant that "their clothes were so cruddy that they had to be burned."⁴²⁶ But over time he even grew to accept the odour of oil. When staying in Pithole, for example, the "King Wells became a favourite water-hole where we learned to swim in spite of the constant oil floating on top of the water, but oily water was the least of our worries." Coated in oil, MacGregor made no further negative comments as to the smell. Although MacGregor mentions the odour of oil later in his diary, it is not with the same type of disdain that appears earlier on, but rather a simple acknowledgement of the smell. MacGregor, for example, passively noted the odour of oil writing, "With the smell of crude oil in me nostrils and after taking over the job of running the oil property, my boss turned out to be none other than Loren (Doc) Crasie of Petrolia."⁴²⁷ There is no condemnation of the odour here, just acknowledgement. In general, the local population tended to have the same relationship with oil: it was never about outright ignoring the smell, it was about passively accepting the odour and being aware of its presence.

One of the few cases of locals reacting negatively to the odour came from a group of wealthy oil producers. A reporter from the *Globe* noted that because of the odour "some of the oil-men who can afford it, have therefore purchased land to the west of the Wyoming road, where as yet the odorous liquid has not been found."⁴²⁸ Because the oil producers possessed wealth, they could afford to actively address their concerns of the odours of the region by moving to a part of

⁴²⁶ MacGregor, 23.

⁴²⁷ MacGregor, 43.

⁴²⁸ *Canadian Native Oil*, 24.

the countryside not marked by the smell. Nevertheless, locals rarely raised concerns about the odour of oil throughout the 1860s.

Only when Petrolia grew into a larger and much more established town did locals begin to raise concerns about its smell. As Petrolia started the process of shedding its shanty town roots, it became important to remove the off-putting odour. Townspeople were particularly concerned by the ineffective drainage system because it resulted in salt water, oil, and chemicals from the refineries draining through the town and into the river, which contributed to the worsening smell. In 1879, after locals complained the town council in Petrolia started the search for a permanent solution to the smell. According to the *Petrolia Topic*, “This accumulation of liquid filth has hitherto been carried in open drains through the town and abundant into the adjoining farms or run into the beautiful river which runs through the County with the effect of making every source through which it passes unfit for the use of man or beast.” For the locals of the region, there was clearly concern about the pollution that occurred in the river system and the fact that no one could use it.⁴²⁹ However, it is curious that the *Topic* chose this moment to acknowledge the pollution, given that oil pollution had made the rivers unacceptable for consumption since the 1860s.

The catalyst for addressing the odours and the river pollution likely had to do with Petrolia’s transition from a shanty resource town to an established urban centre. According to Christina Burr in *Canada’s Victorian Oil Town*, Petrolia in the 1870s began to transform into an established economic and cultural centre. Burr defined this transformation in terms of an increase in economic growth, stability in the oil trade, and an increase in cultural organizations for men and women. The omnipresent odours of oil would make it impossible to view the town as space separate

⁴²⁹ “Drainage,” *Petrolia Topic*, November 6, 1879.

from oil development. The *Petrolia Topic* acknowledged that “Ever since oil and salt water were first produced in this neighborhood one of the greatest drawbacks to comfort and pleasure has been and is now the large quantity of mineral water pumping from the wells.” From this, it is clear that the author does not believe that the oil or salt water should remain within the borders of Petrolia, as it had made life challenging. Although they suggested that the odour did not cause any harm to the health of the locals, they did acknowledge that the smell made the air difficult to breathe. For example, the *Petrolia Topic* added that the mineral water was made of “of sulphurated hydrogen and arsenous gases, which discolor paints, varnishes, and silverware, and although not decidedly unhealthy, is ... extremely unpleasant to breathe, when it hangs, like a London fog over the town.”⁴³⁰ The vivid description by the *Topic* reinforces the fact that the presence of the noxious odours had been present for a long time. Yet the *Topic* withheld a full condemnation of oil, in that it did not accuse the resource as being injurious to health.

The people of Petrolia sought to remove the odours of oil development and stop the flow of pollution by constructing a new town drainage system. This did not involve mitigating the problems so much as funnelling them out of sight (and smell). Some locals recommended that the oil should be directed towards the gravel fissures in the ground. It was said that underneath these fissures there was a “Great Salt Water Vein, where at a depth of 500 feet from the surface there is no way to raise or lower the depth of water than 50 feet no matter if one tries pumping or trying to raise the water.”⁴³¹ Because the water could not be raised or lowered, the locals believed that this would be the ideal location to bury all their problem stemming from the odorous liquid which

⁴³⁰ “Drainage,” *Petrolia Topic*, November 6, 1879.

⁴³¹ “Drainage,” *Petrolia Topic*, November 6, 1879.

plagued their town. Having brought oil and sulphuric water to the surface, now that it was making life difficult, they sought to return it to the ground.

The land was purchased for this vital project, and a driller was contracted to drill a hole on Eureka Street down to the salt water vein. The goal was to direct all the waste from the drainage system there. The newspaper supported this plan, stating that it would “effectually remove all causes for continual complaints that reach us.”⁴³² However, having completed the drilling, Petrolia simply abandoned the project. It is not clear what was the outcome of the project, but it could have had something to do with the salt water aromas coming from the new well or an inability to strike the vein.⁴³³ Regardless, locals had attempted to change the odours that had become a characteristic of the oil region, partly because the smells were trespassing on their living space. The locals had planned to create a bubble of fresh air around their town and near the river, but were not looking to address the pollution in other parts of the County, or to stop the cause of the odours. They wished only to alleviate the odour without compromising industry.

A notable description made by the *Petrolia Topic*, in this case, was the description of the local river as beautiful, while simultaneously acknowledging the pollution that was pouring into it. Given that the newspaper was mostly silent on issues of pollution, odour, and environmental transformation, it either passively accepted the changes or they hid it out of shame. Although the *Topic* mentioned the odour of salt water and oil, they only brought it up when they developed a plan to address the pollution. In all the other sources, outside newspapers were essential for examining oil pollution and the environmental change that accompanied it. When the project was first announced, it occupied the front page of the newspaper, but the project’s elimination received

⁴³² “Drainage,” *Petrolia Topic*, November 6, 1879.

⁴³³ “The Well,” *Petrolia Topic*, December 11, 1879.

just three lines. While in Britain the local population seemed quite willing to argue that the odour alone had been a cause of injury for them, Petrolia ultimately continued to avoid a complete condemnation of its oil. The local newspaper was concerned about the reputation of the town and the oil industry, and so only talked about environmental problems when locals were actively dealing with them.

The environmental change created by the oil industry was extensive enough that the air of Enniskillen was marked for most of the latter half of the nineteenth century with the smell of oil. Documenting odours is not simple: people primarily leave historical documents based on what they see and hear. However, the odours of Enniskillen were notable enough that people felt that it was necessary to write about their olfactory experiences. While some locals could passively accept the odours of the oil region, outsiders could not, and they expressed their discontent through news articles and personal journals. Even the locals of Petrolia became irritated enough by the smell that they hoped to bury the mixture of elements that created the smell in the earth.

In Enniskillen, the local population scarcely mentioned the odour of oil. If it were not for outside correspondents visiting the oil region, there would be little to no evidence of Enniskillen's all-pervading aroma. Given that the entire local population was either directly or indirectly involved in the oil industry, the odour of oil was simply something that existed in the background, and they passively accepted its presence. Only when Petrolia began to transition into a proper town did some locals attempt to bury the smell. But whereas locals in Enniskillen were successful in accepting the odour, outsiders were unable to stand it. Because the odour was foreign and unique to them, they were consistently shocked that their olfactory senses could be under constant attack. As a result, some correspondents went into excruciating detail to ensure that their outside readers would understand the revolting nature of the smell. However, even some of those who despised

the odour concluded that it was possible to get used to it – all that was needed was time. The environmental change brought on by oil development came in many forms, and odours were some of the most pervasive. It is not clear when exactly Enniskillen stopped smelling so strongly of oil, but to the uninitiated, it probably could not have come soon enough.

Examining how three different groups reacted to the odour of Enniskillen oil has assisted in explaining how space, time, and background can influence how people interpret their senses. In Canada, outsiders to the oil region raised complaints about the odour that came from refineries within their own cities or the odour of oil that permeated Enniskillen. Canadian newspapers lacked the type of condemnation for the oil industry that was more pervasive in Britain. The local population of Enniskillen was especially quiet about the odour of oil. This might have been influenced by the fact that most people who lived in Enniskillen had arrived after the start of the oil industry. As a result, Enniskillen's natural state to many local inhabitants was one defined by the ever-present odour of oil, which in turn, meant that the odour of oil was a normal part of life. In Britain, the populace's distance from and lack of connection to the oil industry meant that the populace were free to be vocal about their disgust of oil's negative characteristics. The general British populace had little reason to oppose the importation of Canadian oil, yet their bodily reactions to the odour of oil was enough to motivate them to oppose the importation of unrefined oil from Canada. Here the far-reaching importance of sensory history becomes clear as people's interpretation of their olfactory senses resulted in changes in public policy, trade relations, and the developing international oil economy.

Conclusion

The people of Enniskillen have inherited a legacy of oil development. Their interpretation of their town's heritage is reflected in the way they have chosen to celebrate that history. In the towns of Petrolia and Oil Springs, the locals have decided to celebrate, over the twentieth and now into the twenty-first century, the economic and cultural benefits that came from oil development. These towns commemorate the history of the oil industry through heritage sites, occasional outdoor exhibits, and the reproduction of historic oil fields. The Oil Museum of Canada celebrates Williams' discovery of oil by building an exhibit on grounds where he struck oil, and Petrolia's Discovery Site celebrates its heritage by displaying replicas and equipment used in the early oil industry; both help to portray life in the mid-nineteenth century oil patch.

However, if part of the exhibit's focus is on the methods of extraction and the wealth that came from oil development, then nature should receive more recognition. Without the labour of nature, the Enniskillen oil industry from 1858 to 1863 might have ceased production. When oil producers struggled to transport their oil out of the Enniskillen swampland, it was through the labour of horses, ox, and the current of the river that made such transactions possible. When the cost of pumping oil became too high, the flowing wells undercut the cost of human labour required to pump oil. Without the labour of nature, the early oil industry in Enniskillen would have ceased to exist due to its inability to transport and produce oil at a profit.

In general, focus on environmental change in the nineteenth century should receive more attention because it demonstrates how humans tend to conceptualize environmental change and how they choose to adapt. In the case of Enniskillen, oil development perpetuated water scarcity,

polluted the air with the smell of oil and the spread of gas, and created countless hazards that made life in the oil region a grim reality. For those who chose to live in Enniskillen, they were forced to adapt by either passively normalizing the pollution or creating solutions to survive.

However, some problems, especially water scarcity, could not be passively accepted as they posed a consistent impediment to health and comfort. Because water was constantly required for consuming, cooking, and cleaning, locals were cognizant about the time and effort required collecting it. When the water table in Pithole was contaminated with oil in 1866, this change commanded the attention of locals and outsiders. Locals understood that the oil industry was involved, but there was no discussion of slowing, let alone stopping production near the towns. Until 1896, locals in the oil region adopted partial solutions to this devastating problem. These solutions involved using water transported to the town, relying on a small number of water wells, and using replacement beverages such as alcohol. Although it is difficult to determine the extensiveness of health concerns stemming from water scarcity, there is evidence that people were negatively impacted by consuming the polluted water. Only through the permanent and expensive construction of a water system pumping water in from Lake Huron to Enniskillen was the Township liberated from one of the environmental consequences of oil development.

Oil fires and the many other hazards that became commonplace in the oil region required their own solutions. Fire prevention measures, new storage methods for oil, and fire equipment were proactively adopted to deal with the consistent threat posed by fire. Because a small fire could easily transform into a massive oil fire, labourers had to develop methods to fight these fires. However, the application of these solutions and preventative measures could not guarantee the safety of people living in the oil region. Even the most experienced and well-equipped person

could be thrust into a highly-dangerous situation. To permanently stop these hazards, locals would have had to eliminate the oil industry.

Whereas oil pollution became pervasive enough that the odour of oil alerted outsiders that they had arrived in the oil region, many locals grew acclimatized to the smell – or so they claimed. While some locals could accept the odours, outsiders and travellers generally could not. Through travel reports and news articles, visitors to the oil region consistently made comments as to the potent odour that marked the air of Enniskillen. The extent of this odour was strong enough that one reporter noted when the air in Oil Springs had become easier to breathe. Only when Petrolia grew from a shanty oil town to an established settlement was there any attempt to improve the odour. Because the odours were pungent, the locals attempted to bury its cause—oil, refining chemicals, and sulphuric water—back into the earth from whence it came. Although this project was not completed, its formulation demonstrated the concern some people had about the odours that were a defining characteristic of their town.

The reaction of the British populace to the introduction of oil and refineries also demonstrates how background and context can shape how people interpret odour. Unlike people in Enniskillen, the British had little reason to develop a bias for or against Canadian oil—if there were a bias, it would likely be in support of Canadian oil. Consequently, the British did not hold back their condemnation of Canadian oil once they discovered the odour that accompanied it. They became increasingly hostile to the odours stemming from the refineries. People reported that the odour produced a variety of adverse health effects for people living in neighbouring communities. These health complaints were raised in several different cities all across Britain, which resulted in people placing increasing pressure on their municipalities to address the odour. Those opposed to oil wasted no time, they raised awareness, they obtained the support of wealthy individuals and

government officials, and they used the connection of the oil's odour and its physical state to offer a clear solution: a ban on undeodorized oil. The stark difference in the way that people reacted in Canada and Britain shows the importance of sensory history. Because British people interpreted the odour of oil as revolting and toxic, they were motivated to push for laws regulating oil and do anything to stop the expansion of the oil industry. Sensory history proves that information provided by the senses, and in turn, the way humans choose to perceive that information can result in behaviour and actions that influence the state of the world. If locals in Enniskillen had interpreted and reacted to the odour of oil as the British did, they might have abandoned the oil industry. Instead, the locals of Enniskillen adapted to the changing odour of their community.

Today, the environmental impacts of oil development remain. There are still traces of oil in Bear and Black Creeks, the groundwater continues to be contaminated with oil, and there are thousands of undocumented abandoned oil wells across the county. However, because the locals created solutions of a more permanent nature, and because the oil industry practically disappeared from Enniskillen, the environmental consequences from more than a hundred years ago can largely be ignored. One could pass through Petrolia thinking it is like any other small town in Ontario. However, these oil towns offer knowledge beyond a summary of the oil industry in the nineteenth century. As the world continues to become increasingly conscious about the impacts of oil consumption, more uncertainties arise as to how future generations will respond to environmental change. The history of oil development in Enniskillen can offer insight as to how people experience, react, and adapt to environmental change that they have never experienced. In some circumstances people will passively normalize change, in others create short-term solutions, and in others, when the environmental change becomes too much, people will seek out and demand permanent solutions.

Bibliography:

Archival Collections:

Oil Museum of Canada (Oil Springs)

Ken MacGregor Journal.

Women's Institute of Oil Springs. Tweedsmuir History of Oil Springs.

Lambton County Archives (Wyoming, Ontario)

Lambton Oil History Box No 1.

Lambton Oil History Box No 2.

John Henry Fairbank Journal and Papers.

Charles Tripp Papers.

Western Archives (Western University)

Fairbank Collection.

Government Publications:

Canada, Dept. of Indigenous and Northern Affairs, Treaties and Agreements. Treaty Text-Upper

Canada Land Surrenders. <https://www.aadnc-aandc.gc.ca/eng/1370372152585/1370372222012#ucls21>.

-- Geological Survey of Canada. *Report of Progress for the Year 1863-1866*. Ottawa: George E Desbarats, 1866.

- *Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development*. Toronto: Warwick, 1890.
- Report to the Legislative Assembly. *Report of Progress for the Year 1849-50*. Toronto: Lovell and Gibson, 1850.
- Report to the Legislative Assembly. *Report of Progress for the Year 1850-51*. Toronto: Lovell and Gibson, 1852.
- Sir William Logan. *Catalogue of Economic Minerals, &c., of Canada*. Lowell and Gibson, Toronto, 1861.
- Sir William Logan. *Descriptive Catalog of Economic Minerals of Canada*. Montreal: John Lovell, 1862.
- Sir William Logan and Sterry Hunt. *A Sketch of the Geology of Canada: Serving to Explain the Geological Map and the Collection of Economic Minerals Sent to the Universal Exhibition at Paris*. Paris: Hector Bossange & Sons, 1855.

Canadian Newspapers

Christian Guardian

Hamilton Evening Times

Hamilton Spectator

London Advertiser

London Free Press

London Prototype

New York Times

Ottawa Free Press

Petrolia Topic

Petrolia Advertiser-Topic

Petrolia Valuator

Sarnia Observer

St. Thomas Weekly Dispatch

Toronto Globe

Toronto Leader

British Newspapers

Cheshire Observer

Glasgow Herald

Gazette, and General Advertiser for Lancashire, Westmorland, Yorkshire, &c.,

Leeds Mercury

Liverpool Mercury

Lloyd's Weekly Newspaper

Royal Cornwall Gazette

Primary Sources:

Adamson-Gale, Annie. "Tweedsmuir History of Oil Springs: Sketch of Oil Springs 1863."

Women's Institute of Oil Springs.

Fairbank, John Henry. *Journal of John Henry Fairbank 1862-1864*. Provided by Lambton County Archives.

-- *Letters of John Henry Fairbank 1858-1864*. Provided by Lambton County Archives.

-- *Petrolia Canada 1862-1908: its advantages as a commercial and residential centre*. 1908.

Fleming, Sanford. "Notes on the Present Condition of the Oil Well." *Canadian Institute*, February 29, 1863.

Gesner, G. W., "Biographical Sketch of Dr. Abraham Gesner," *New Brunswick Natural History Society* Vol. no. 06025, (1896): 1-11

Henry, J.T. *History of Petroleum with Authentic Facts in Regard to its Development in Western Pennsylvania*. Philadelphia: Jas.B.Rodgers Co, 1873.

Hunt, Sterry. "Bitumen's and Mineral Oils." *Montreal Gazette*, March 1st, 1861.

Hunt, Sterry, *Petroleum: Its Geological Relations Considered with Especial Reference to its Occurrence in Gaspé*. Quebec, G.E Desbarats, 1866.

J.D.C. "The Oil Districts of Canada." *Scientific American*, Vol. XV No. 21 (December 8, 1866).

Johnston J.H. *Recollections of Oil Drilling at Oil Springs, Ontario*. Tilsonburg On: Harvey F Johnston, 1938.

MacGregor, Ken. *Journal of Ken Macgregor*. Provided by Oil Museum of Canada.

McLaurin, John. *Sketches in Crude-Oil: Some Accidents and Incidents of the Petroleum Development in All Parts of the Globe*. Harrisburg, Pennsylvania: Self-published, 1898.

McLeod John. "Tweedsmuir History of Oil Springs: Papers of Revered McLeod." *Women's Institute of Oil Springs*.

"Notes on the History of Petroleum or Rock Oil." *The Canadian Naturalist*, Vol VI. No.4 (July 1861): 1-15.

"The Oil Wells of Canada," *The Merchants' Magazine and Commercial Review*, Vol 48, No 4 (April 1, 1863): 344.

Parsell, Mary Louse Doyle. "Tweedsmuir History of Oil Springs: Some Pioneers of Enniskillen-Mary Louse Doyle Parsell." *Women's Institute of Oil Springs*.

Parsell, Mary. "Tweedsmuir History of Oil Springs: Recollections of Mrs. Parsell in Petrolia Advertiser-Topic March 6, 1958." *Women's Institute of Oil Springs*.

Phelps, Edwards, and H. Belden & Co, *Belden's Illustrated Historical Atlas of the County of Lambton 1880*. Sarnia, Hunter Rose Company, 1973 [1880].

Pickering, Joseph. *Inquiries of an Emigrant*: London: E Wilson, 1832.

Unknown, *Canadian Native Oil: Its Story, Its use, and its profits, with some account of a Visit to the Oil Wells*. London: Ashby & Co, 1862.

Winchell, Alexander. *Sketches of Creation*. New York: Harper & Brother Publishers, 1870.

Yates, A.J. "Tweedsmuir History of Oil Springs: Early Days in Oil Spring, September 2. 1931."

Women's Institute of Oil Springs.

Secondary Sources:

Ball, Norman. *Petroleum Technology in Ontario During the 1860s*. (Master's Thesis: Toronto, Institute for The History and Philosophy of Science Technology, 1972.

Bott, Robert. "Evolution of Canada's oil and gas industry." Canadian Centre for Energy Information, 2004.

<http://www.energybc.ca/cache/oil/www.centreforenergy.com/shopping/uploads/122.pdf>

Burr, Christina Ann. *Canada's Victorian Oil Town: The Transformation of Petrolia from a Resource Town into a Victorian Community*. Kingston and Montreal: McGill-Queen's University Press, 2006.

"Carbon Dioxide Concentration | NASA Global Climate Change." NASA. May 15, 2019.

Accessed June 14, 2019. <https://climate.nasa.gov/vital-signs/carbon-dioxide/>.

Charles, Edward. "John Henry Fairbank of Petrolia (1831-1914): A Canadian Entrepreneur."

Unpublished Master's Thesis in History, University of Western Ontario, 1965.

Cronon, William. *Changes in the Land: Indians, Colonists, and the Ecology of New England*.

New York: Hill and Wang, 1985.

Gordon, Gabrielle, et al. "Oil Spill Effects on Soil Hydrophobicity and Related Properties in a

Hyper-Arid Region." *Geoderma* 312 (2018): 114-20.

- Griffin, Sekwyn. "Petrolia Cradle of Oil Drillers." *Imperial Oil Review*, Vol. XIV (August 1930): 19-24.
- Hardin, Garret. "The Tragedy of the Commons." *American Association for the Advancement of Science*, 162, no. 3859 (1968), 1243-8.
- Johnson, Dana. *The Shaw Investigation: A Review of Sources to Determine Who Drilled Canada's First Oil Gusher* (Oil Museum of Canada Summer Intern Report, June 3, 2010)
- Kiechle, Melanie. *Smell Detectives: An Olfactory History of Nineteenth-Century Urban America*. Seattle: University of Washington Press, 2017.
- "Lac-Mégantic an 'environmental disaster,' says expert," *CBC News*, September 17, 2013.
- Lauriston, Victor. *Lambton's Hundred Years*. Sarnia: Haines Frontier Printing, 1949.
- Little, J.I. "Ox and Horse Power in Rural Canada." in *Powering up Canada*, ed. R.W. Sandwell. Montreal and Kingston: McGill-Queen's Press, 2016.
- Marsden, William. *Stupid to the Last Drop: How Alberta is Brining Environmental Armageddon To Canada (and Doesn't seem to Care)*. Toronto: Alfred A. Knopf, 2007.
- May, Gary. *Hard Oiler: The Story of Early Canadians' Quest for Oil at Home and Abroad*. Toronto: Dundurn Press, 1998.
- McGee, Patricia. *The Story of Fairbank Oil: Four Generations of the Family Producing Oil Longer than Anyone in the World*. Petrolia: Words Unlimited Ink, 2004.
- Moore, Jason W. "Value in the Web of Life, Or, Why World History Matters to Geography." *Dialogues in Human Geography* 7, no. 3 (2017): 326-330.

Morse, Kathy. *The Nature of Gold: An Environmental History of the Klondike Gold Rush*.

Seattle: University of Washington Press, year.

Owen, Edgar Wesley. *Trek of the Oil Finders: A history of Exploration for Petroleum*. Tulsa:

The American Association of Petroleum Geologists, 1975.

Page, Julia, "5 years after Lac-Mégantic Tragedy, Residents Still Waiting to Feel Safe," *CBC*

News, July 4, 2018.

Penfold, Steve. "Petroleum Liquids," in *Powering up Canada*, ed. R.W Sandwell. Montreal and

Kingston: McGill-Queen's University Press, 2016.

Whipp, Charles, and Edward Phelps. *Petrolia, 1866-1966*. Petrolia, Ont: Petrolia Advertiser-

Topic, Petrolia Centennial Committee, 1966.

Zaslow, Morris. *Reading the Rocks: The Story of the Geological Survey of Canada 1842-*

1972. Ottawa: The Macmillan Company of Canada, 1975.

Digital Sources:

McGill University Digital Library. *In Search of Your Canadian Past: The Canadian County*

Atlas Digital Project. <http://digital.library.mcgill.ca/CountyAtlas/default.htm>.

All pictures except for the maps were provided by the Lambton County Archives.

Curriculum Vitae

Robert Armstrong:**Education:****University of Western Ontario**

Master of Arts: History

Thesis: An Environmental History of Oil Development in Southwestern Ontario, 1858-1885

Supervisor: Dr. Alan MacEachern

London, Ontario

Sept 2017–Aug 2019

University of Western Ontario

Bachelor of Arts: Honors Specialization in History and Major in Political Science

London, Ontario
Sept 2013–April 2017**Relevant Professional Experience:****University of Western Ontario: History of Modern China 2601E***Graduate Teaching Assistant*London, Ontario
September 2018–April 2019**University of Western Ontario: History of Business and Commerce 1807E***Graduate Teaching Assistant*London, Ontario
September 2017–April 2018**Conference:**

“An Environmental History of Oil Development in Southwestern Ontario, 1858-1880,” Pathways to the Past Graduate Conference at Western University, April 26, 2019.