

an analysis of the historical and political factors that influenced the development of Canada's premier chemical complex

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Geographers should recognize the importance of history and politics when attempting to analyze the reasons for the selection of a particular industrial location. Too often these factors are overlooked by the geographic researcher in his zealous desire to demonstrate the importance of geographic factors. Geographic elements are important to the choice of an industrial site, but they should not preclude other contingent qualifications which may be equally or more important in the choice of a site selection. The development of Canada's premier petrochemical complex, located in southwestern Ontario in the border city of Sarnia, is a case in point. The evolution of this petrochemical industry occurred as a result of favorable historical and political events in combination with geographic advantages.

The sequence of historical events which in the final analysis determined the location of Canada's largest petrochemical center had their origin in the emergence of the Canadian petroleum industry. Contrary to popular belief, the first commercial oil well dug in North America was not located in Titusville, Pennsylvania and was not operated by Edwin L. Drake. Historical evidence clearly indicates that John Miller Williams' well dug at Oil Springs, Ontario—not far from the present day city of Sarnia—predates the Pennsylvania discovery by almost two years¹ (Figure 1). As a matter of fact, by the time of the Pennsylvania discovery, Williams had already processed over 300,000 gallons of crude oil.

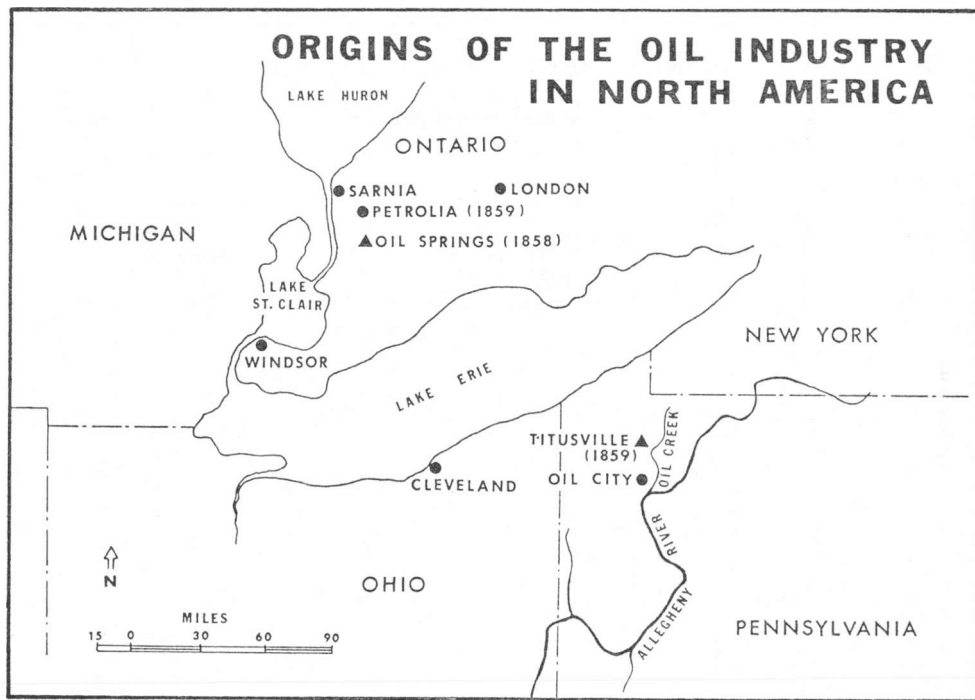
The discovery of oil by Williams prompted others to seek oil in the immediate vicinity of Oil Springs. Despite Williams' success and the ensuing discovery of more petroleum around Oil Springs, the oil industry gravitated to Petrolia—a few miles to the north of Oil Springs—when a discovery of a field of major proportions occurred.²

The Petrolia discovery was of such a scale that it created numerous problems for the oil field producers. Unfortunately, the town of Petrolia had been bypassed by the Great Western Railroad when it was constructed linking Sarnia to London (Figure 2). This bypassing meant that problems involving storage and transportation of crude oil had to be solved. Production at the well head by 1866 was so great that the refineries could not find enough barrels or storage tanks to accommodate the tremendous output. Hundreds of thousands of barrels of oil drained away in the nearby creeks and rivers. As a result, the hulls of vessels moving up and down the St. Clair

1. «Number One Oil Well Was Located in Canada,» Canadian Chemical Processing, 39 (December, 1955), p. 8.

2. R.M. McPherson and R. W. Ford, *A History of the Chemical Industry in Lambton County* (Sarnia: Dow Chemical of Canada, Ltd., 1964), p. 4.

Figure 1



River were often fouled with oil.¹ Hence man's early contact with oil presented some ecological problems very similar to those he faces today.

The waste of the resource was one of the reasons why the Petrolia oil men needed immediate access to a rail line; obviously, it would provide the means of hauling the oil away faster and in greater quantities. In addition, they wished to avoid the necessity of having to haul oil over quagmire roads that all too often looked like shallow surface streams.

Consequently the oil men raised some \$50,000 and built a spur line from Petrolia to Wyoming, the nearest point on the Great Western Railroad, thereby linking Petrolia to the refineries of London, Hamil-

ton, Sarnia and Toronto.² Petrolia itself had become an important refinery center. As a matter of fact, the Home Oil Works of Petrolia by 1870 was processing over 3000 barrels of oil per day thus making Petrolia the largest refinery center in Canada.³

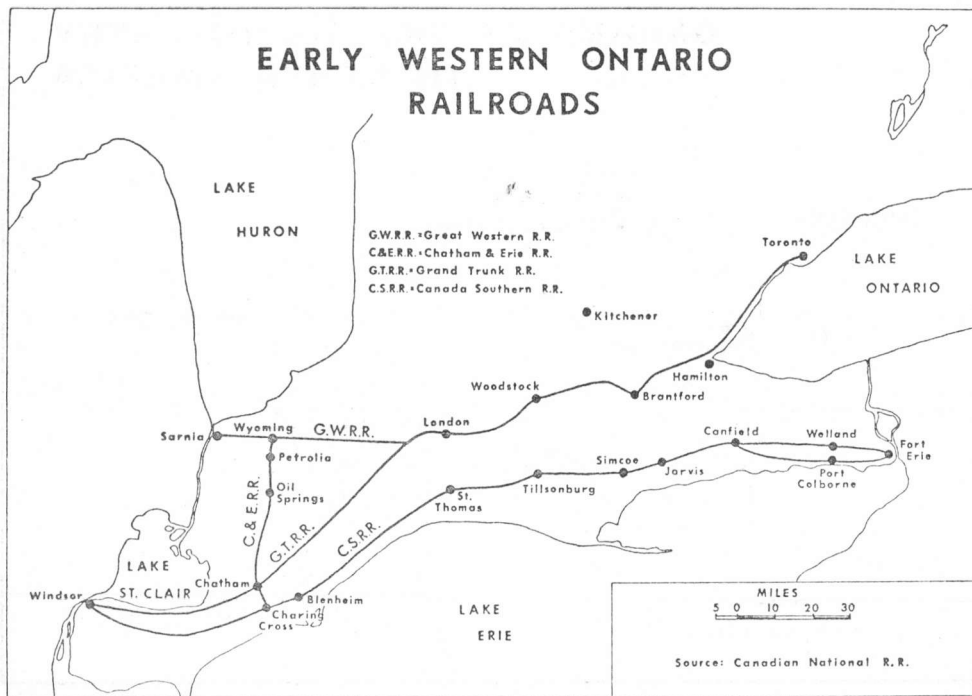
However, Petrolia soon faced another obstacle in its growing refinery operations. Collusion between the refineries distant from the fields and the Great Western Railroad resulted in the railroad charging more for refined crude oil than for unrefined. This effort was designed to put the Petrolia refiners at an economic disadvantage and force them out of the re-

2. C.B. Whipp and E. Phelps, *Petrolia—1866-1966* (Petrolia: Petrolia Historical Association, 1967), p. 8.

3. E.J.C. Kureth, «The Geographic, Historic and Political Factors Influencing the Development of Canada's Petrochemical Industry» (Unpublished Ph. D. dissertation, University of Michigan, 1971), p. 9.

1. E.R. Rowzee, «Sarnia, The Birthplace of Canada's Petrochemical Industry,» *Chemistry and Industry*, 33 (December 1949), p. 863.

FIGURE 2



fining business. Since the consuming market was some distance from the Petrolia refineries, this increase in transportation costs could force the local refineries out of business, if it did not eliminate them entirely. As John D. Rockefeller was to demonstrate in his Cleveland operations, transportation rates are vital to the success of the oil industry.¹ This premise was basic to his selection of a water site for his Standard Oil Refinery.

For a time it appeared as if the Home Oil works and the other refineries in the Petrolia area would be forced out of the refinery business. However, with the arrival of a railroad from the south, the transportation monopoly of the Great Western Railroad

was ended and by 1884 Petrolia was the unquestioned oil capital of Canada. North America's first oil exchange was opened for business and investors in oil made the area prosperous.²

By 1885, oil prices were so high in the North American Market that it was now profitable to market oil in the United States despite the American protective tariff.³ This added market was a significant factor in the prosperity of the Petrolia oil industry.

Meanwhile, American oil companies had become increasingly interested in the southern Ontario oil fields. The US oil giant, Standard Oil, had been growing slowly in Canada and in 1889 had purchased the Bushnell Refinery Company Ltd. of Sarnia. The Rockefellerian power play was about to go into

1. H.F. Williamson and A.R. Daum, *The American Petroleum Industry* (Evanston: Northwestern University Press, 1970), p. 689.

2. Whipp and Phelps, *Petrolia—1866-1966*, p. 40.

3. *Imperial Oil Review* (Toronto: Imperial Oil, 1970), p. 7.

action in Canada. His first move—acquiring a refinery location on water, just as he had done in Cleveland—provided his company with a site with considerably better growth potential than the inland site of Petrolia. The advantage of economic routes of transportation were there, and as Rockefeller had demonstrated before and as the Petrolia oil men knew, transportation costs can be a significant factor in success or failure of any industry—particularly the oil industry.¹ This fact was instrumental in the Rockefeller choice of the St. Clair River site in Sarnia.

With the arrival of Standard Oil in Ontario and a subsequent reduction of the Canadian tariff on imported oil—a political move considered by the Canadian oil men to be very drastic for their industry—the Canadian oil companies were faced with the prospect of attempting to compete with the US oil industry. Since the American refineries were much larger than those of Canada they had the advantage of economy of scale. Therefore, if Canadian refineries wished to remain competitive they faced the problem of costly expansion.

Imperial Oil, the largest Canadian owned oil company, was located in Petrolia. The company had been incorporated and originally located in London; however, as the result of a fire, plus an offer by the Petrolia city fathers of no taxes for five years, the company had been encouraged to locate in Petrolia. There the company constructed the most modern oil refinery in Canada.²

This problem of expansion created severe economic problems for Imperial Oil; the company did not have enough funds to provide the needed facilities. After an intensive search to find the additional capital in Canada and Great Britain, the company was forced to reconcile itself with the facts as they existed at that time. The only available source of funds was in the US and in this case that source was Imperial's rival, Standard Oil.

On July 1, 1898 an agreement was reached whereby Standard Oil would supply the capital needed for expansion of Imperial Oil in exchange for controlling interest in the company.³ With this acquisition, Standard now had 75% of the oil business of Canada. Within a few months, Standard moved the Imperial Oil facilities from Petrolia, where they had been located for a number of years, to Sarnia and the St. Clair River.⁴ The move to Sarnia made the Sarnia

refinery of Imperial Oil the largest in Canada and so it remains to this day.

To maintain the refinery at Sarnia, Imperial constructed a pipeline from Petrolia to Sarnia and eventually supplemented this source of petroleum with oil from Ohio, because by 1912 the demand for petroleum products had exceeded the capacity of the local Ontario oil fields. This crude oil from Ohio came by barge by way of the Great Lakes system. The river location of Imperial was already proving to be an asset. By utilizing local crude oil and supplementing this with imported crude, the Sarnia refinery was able to produce the 900 barrels per day considered adequate to meet the market demand.⁵ However, Canada, the nation where crude oil was first commercially produced, was now partially dependent upon a foreign source for this resource.

As of 1914, Imperial Oil was the only large scale refiner of oil in Sarnia. Between 1914 and the beginning of World War II in 1939, the only changes of significance to the Sarnia industrial community occurred when Imperial modified its facilities from time to time.⁶ However, the crescendo of Japanese bombs on Pearl Harbor, and the rapid conquest of the rich rubber plantations of S.E. Asia by the armies of Japan, moved the Canadian government to take steps to solve the problem of an impending shortage of rubber.

The rapid industrial metamorphosis of Sarnia was initiated by a federal decision to build a fully integrated synthetic rubber plant in the area. Of particular importance to the rationale to build in Sarnia was the location of Canada's major oil refining complex, Imperial Oil.

Imperial Oil was the largest producer of hydrocarbon feedstocks, i.e. ethylene, isobutylene and butadiene—vital to the manufacture of synthetic rubber. No other refinery complex in Canada could produce these products in the volume needed to manufacture synthetic rubber. Thus, historically, the site of the plant to manufacture synthetic rubber was in essence predetermined by the location of Canada's largest petroleum complex. Here then we see the historical importance of the oil industry and the prominent role the petroleum industry played in terms of site selection for the government synthetic rubber project.

As indicated earlier, political factors also played a key role in the development of the «chemical valley» as this complex of Sarnia was to become known. The decision to create a crown corporation for the production of synthetic rubber was a very important factor in the eventual creation of a Canadian petro-

1. Earl Gray, *The Great Canadian Oil Patch* (Toronto: MacLean-Hunter Ltd., 1970), p. 42.

2. Whipp and Phelps, *Petrolia—1866-1966*, p. 36.

3. *Imperial Oil Review*, p. 7.

4. C.H. Caesar, «Contributions of the Petroleum Industry to the Sarnia Petro-Chemical Complex.» Paper given at Third Annual Conference of Canadian Research Management Association, Sarnia, Ontario, November 2, 1965.

5. *Imperial Oil Review*, p. 8.

6. *Ibid.*, p.

chemical industry.¹ A crown corporation is an institution with corporate form brought into existence by the action of the Government of Canada to serve a public function.² It was this company, known as the Polymer Corporation, that was to have a vital bearing on the post war development of the «chemical valley» in addition to acting as the industrial magnet which would attract industry to the area. A fully integrated rubber plant requires numerous supporting satellite industries.³

Thus at the very onset, Polymer was responsible for bringing Dow Chemical into Canada. Dow was incorporated in Canada, at the request of the Canadian Government, to design, build and operate a styrene plant for Polymer on property adjacent to Polymer.⁴ This was the beginning of a series of industrial moves into the Sarnia area by numerous chemical industries.

However, any analysis of the «chemical valley» that does not indicate the role of the government in promoting post war development of the region would fail to assess the key role of political decisions and their impact on the post war growth.

At the conclusion of World War II, the Polymer facility was producing over 41,000 tons of synthetic rubber per year and an analysis of the economics of the plant indicated that the complex would have to continue to produce this quantity of rubber in order to achieve financial stability. This would require export sales of about half the total production because the Canadian domestic market could not absorb more than one half.⁵ At this time it seemed doubtful that synthetic rubber products could withstand competition from natural rubber in terms of either price or quality.⁶ The future of the Polymer Corporation and the «chemical valley» did not appear to be too bright.

The problems facing the government facility were numerous. Should the plant be sold to private interests? Should the facility be dismantled and shut down? Should the plant be retained by the government and production continued on a peacetime basis? The challenge was to prove to industry that synthetic rubber was not simply an item developed to meet

wartime emergency, but was a viable product able to withstand the competitive resurgence of the natural rubber industry.

The position of the Canadian Government and the Board of Directors of Polymer was that the Corporation should remain in Government hands and that post war production should be continued. The implication of such a decision on the post war growth of the «chemical valley» can not be overestimated.

Fortunately for Polymer, the United States—the world's leading producer of synthetic rubber—found itself in an awkward position politically regarding post war development of its synthetic rubber industry. Although the United States had a huge domestic market to absorb a major portion of its production, sale of rubber to Europe could prove to be a problem for the Polymer Corporation in its attempt to establish overseas markets. As usual, the American plants were larger and benefited by the economics of scale and could undersell Canadian rubber.

From a political point it should be noted that the major natural rubber producing areas of the world were in the hands of the American allies of World War II, i.e. Great Britain, France and the Netherlands. The US government had no intention of offending these allies whose natural rubber producing plantations would soon be back in operation. Therefore the US controlled synthetic rubber industry did not appear to offer a challenge to Polymer, if Polymer did seek the European markets which seemed essential to the success of the post war development of the Corporation.

A second factor that had a very significant bearing on the decision of the federal government to continue to operate the Polymer facility was the strong possibility that the plant would be a catalyst for a potential petrochemical industry. Since the government was interested in developing a complex of this type, this reason alone may have sufficed in deciding to continue operations at Polymer.⁷

The federal decision to continue production at Polymer proved to be an excellent one. Canada, normally the sixth largest importer of raw rubber became a world leader in the exporting of rubber and rubber goods. By 1952, Polymer was producing rubber equal to the amount obtained from some 20 million rubber trees of a South Pacific plantation.⁸

The Polymer decision to sell power and chemical by-products was a significant factor in Dow's decision to build an independent plant in Sarnia after the war.⁹ Dow's growth and product diversification

1. C.A. Ashley and R.G.H. Smalls, *Canadian Crown Corporations* (Toronto: The MacMillan Company, 1965), p. 229.

2. Dominion Bureau of Statistics, Ottawa, Canada.

3. L.A. McLeod, «Growth of a Petrochemical Complex,» Paper given at Third Annual Conference of Canadian Research Management Association, Sarnia, Ontario, November 2, 1965.

4. Don Whitehead, *The Dow Story* (New York: McGraw-Hill, 1968), p. 139.

5. Otto Scott, «Polymer of Canada,» *Rubber World* 5 (March 1966), p. 24.

6. E.J. Buckler, «Canadian Case History—Polymer Corporation Limited,» *Research Management* 6 (May, 1963), p. 291.

7. B.B. Hillary, Research Director of Dow Corporation of Canada, Personal Communication, March 25, 1971.

8. «Polymer Makes Rubber and More,» *Canadian Chemical Processing* 36 (August, 1952), p. 62.

9. B.B. Hillary, Personal Communication, March 25, 1971.

were in themselves a basis for other plants to consider selecting Sarnia as a plant site.

Expansion of the «valley» industries was contingent upon the availability of chemicals or various hydrocarbon feedstocks for industrial use. To this end Polymer, Imperial and Dow were vital to the success of the «valley» and they were thus the «corner stone architects» of the chemical complex that dynamically developed in the post war decades to include such companies as DuPont, Allied Chemical, CIL, Ethyl Corporation, Shell of Canada, Sun Oil of Canada, Cabot Carbon, among others.

But the probability of this post war growth would have been in doubt had it not been for the federally sponsored program of the Polymer Corporation.

The success of the «valley» expansion was, in part at least, due to the leadership of the Polymer Corporation which of course had the support of the Canadian government. The chances of a company locating at a site that is sustained by the government are greatly enhanced. This federal influence on the development of the chemical complex was a factor in determining the choice of site selection for many of the companies in the Sarnia region.

In the final analysis then, the historical evolution of Canada's oil industry determined the site of the petrochemical industry and favorable political decisions kept the complex alive and viable and able to compete in the arena of international trade.

And the tragic history of human thought is simply the history of a struggle between reason and life-reason bent on rationalizing life and forcing it to submit to the inevitable, to mortality; life bent on vitalizing reason and forcing it to serve as a support for its own vital desires.

Miguel de Unamuno, *The Tragic Sense of Life*.