

## AN ENVIRONMENTAL HISTORY OF THE ONTARIO CHEESE INDUSTRY

BUILDING 'A NATURAL INDUSTRY OF THIS COUNTRY': AN  
ENVIRONMENTAL HISTORY OF THE ONTARIO CHEESE INDUSTRY FROM  
THE 1860S TO THE 1930S

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## **Lay Abstract**

This dissertation examines the origins and development of the factory cheese industry in rural Ontario between the 1860s and 1930s. I challenge the belief that cheese manufacturing was a “natural industry of this country” whose development was cooperative and inevitable. Instead I argue that the industry was a deliberate project of rural reform encouraged by elite ‘dairy reformers’ who believed cheese factories could sustain the social, economic, and environmental progress of rural society indefinitely. The industry failed to deliver all the reformers promised, even though it became one of the province’s most significant export-oriented industries by the early-twentieth century and transformed the environment and rural society in the process. Rural people and the environment behaved in more complicated ways than reformers anticipated, and the changing capitalist economy made the industry’s long-term success untenable. This study also contextualizes the twenty-first century resurgence of craft production in Ontario.

## **Abstract**

This dissertation examines the origins and development of the cheese industry in rural Ontario between the 1860s and 1930s from the perspective of environmental history. Scholars have generally accepted contemporary beliefs that cheese was a “natural industry of this country” and that its growth was cooperative and inevitable. This dissertation tests these claims by comparing the rhetoric and actions of the rural elite and state officials against the human and extra-human work involved in manufacturing cheese for export, a method that has yielded new interpretations about the character and development of the industry.

I build on James Murton’s concept of “alternative rural modernity” to argue that rural cheese manufacturing was a project of rural reform encouraged by elite ‘dairy reformers,’ rather than a natural development. Reformers believed cheese factories could support the social, economic and environmental stability of rural society indefinitely. Through cheese, they sought to create a society that was liberal and capitalist, but also cooperative and stable. They also believed that dairying would restore fertility to the region’s soils. In practice, however, their results were mixed. Although cheese became one of the province’s most significant export-oriented industries, transformed the environment, and deepened liberal values amongst rural people, it failed to deliver the alternative rural modernity reformers had envisioned. I provide two reasons why. First, the reformers’ mechanistic vision could not contend with the complexity and unpredictability of the socio-ecological world they sought to control. Second, the industry could not withstand the pressures of the emerging global capitalist food system and,

ironically, facilitated the rise of ‘Big Dairy’ after the First World War, which hastened the industry’s demise. Overall, this dissertation emphasizes the dynamism of rural Ontario, contributes to an environmental history of liberal order in Canada, and contextualizes the resurgence of craft-based rural development in the twenty-first century.

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## **Abbreviations**

CDA	Canadian Dairymen's Association
DAO	Dairymen's Association of Ontario
DAEO	Dairymen's Association of Eastern Ontario
DAWO	Dairymen's Association of Western Ontario
OAC	Ontario Agricultural College
CCC	Canadian Commission of Conservation
CL	Committee on Lands
CMP	Canadian Milk Products Company
CTA	Cow-testing Association
UFO	United Farmers of Ontario

**Declaration of Academic Achievement**

Hayley Goodchild is the sole author of this dissertation.

## Introduction

In January 1894, Daniel Derbyshire took the stage at the annual convention of the Dairymen's Association of Eastern Ontario (DAEO), held that year at the Bradburn Opera House in the heart of downtown Peterborough. Derbyshire was a man of many interests: dairy equipment supplier, cheese factory owner, twice the mayor of Brockville, and future Liberal politician, among others. His opening address came on the heels of Canada's strong showing at the 1893 World Fair in Chicago, where the country (and Ontario's craft producers in particular) nearly swept the cheese competition. With a politician's penchant for rhetoric, he exclaimed: "The cheese industry, I think you will agree with me in saying, is a natural industry of this country....No other business, rural or urban, has gone forward like it."<sup>1</sup>

The rise of export-oriented, factory cheese production in Ontario was undeniably dramatic. Until the 1860s, cheese and butter (but especially the latter) were primarily made by women in farm dairies, both for subsistence use and local commercial sale. Beginning in the mid-1860s, cheese production moved from farm dairies to small, rural factories where the milk from neighbouring farms was pooled and made into cheese by factory craft workers (who were often but not always men). In the next forty years, the number of cheese factories grew from zero to more than a thousand, some so close together you could toss a stone from one to the next. Their patrons—the farmers who supplied the milk and sometimes owned the factories—numbered in the tens of

<sup>1</sup> Dairymen's Association of Eastern Ontario [henceforth DAEO], *Annual Report of the Dairymen's and Creameries' Association of the Province of Ontario 1893* [hereafter 1893] (Toronto, ON: 1894), 6.

thousands. By the turn of the twentieth century, factory-produced cheddar cheese was one of Canada's most valuable export commodities.<sup>2</sup>

But this expansion was not to last. Cheddar exports to the United Kingdom peaked in 1904, just a decade after Derbyshire's address to the DAEO. Factories began to disappear after 1906, either slipping into the maw of emerging corporate, multi-product milk plants, burning to the ground, or withering from want of milk and patronage. Even though the full arc of craft cheddar's decline stretched well into the second half of the twentieth century, the number of factories in Ontario fell by almost half between the early 1900s and the 1930s, and rural cheese manufacturing found itself in a marginal position relative to fluid milk, butter, canned milk, and other highly industrialized dairy commodities produced primarily for urban, domestic markets. To be clear, this was not the end of dairying in Ontario—far from it—but by the Great Depression, Canada's supposedly "natural industry" was quite suddenly *passé*.

Can paying close attention to the 'nature' of the industry and its relationship with the wider environment tell us anything new about the cheese industry and its development? It can. This dissertation argues that the rural cheese industry emerged as part of a plan for 'alternative rural modernity' encouraged by dairy reformers—men like Derbyshire—rather than a natural, inevitable development. They believed cheese

<sup>2</sup> The report on dairying from the 1901 Census of Canada notes, "The value of dairy products in the census of 1891 ranked eighth in the statistics of manufactures, and in the census of 1901 it ranks third." "Dairying," *Fourth Census of Canada 1901, Vol. II Natural Products* (Ottawa, ON: 1904), xlvii. Ontario represented the majority of the country's cheese production during this period. As Robert Ankli and Wendy Millar note, "Ontario produced 85 percent of Canada's factory cheese output in 1880, 74 percent in 1890, 60 percent in 1900, and 68 percent in 1910." See Robert E. Ankli and Wendy Millar, "Ontario Agriculture in Transition: The Switch from Wheat to Cheese," *Journal of Economic History* 42, no. 1 (1982): 209.

factories could support the social, economic, and environmental stability of rural society indefinitely. Yet their results were mixed: cheese production reorganized human and extra-human nature in Ontario during the late-nineteenth and early-twentieth centuries, but it ultimately failed to deliver the cooperative capitalist society that its advocates envisioned.

### *Historiography and Research Questions*

The rise and fall of Ontario's export-oriented cheese industry has occupied the attention of a number of historians, political economists, and geographers over the years.<sup>3</sup> In 1935, Harold Adams Innis identified cheese and butter production in central Canada as examples of the utility of his staples thesis, the theory that Canada's national and regional development can be understood in terms of its dependence on resource extraction and exports. He claimed that export-oriented dairying emerged in the mid-nineteenth century out of farmers' problems with wheat, the end of Reciprocity with the United States, and the importation of U.S. technology, and declined in the twentieth century as a result of urbanization and the rise of domestic demand for fluid milk.<sup>4</sup> But as political scientist Earl Haslett noted in 1969, Innis did not devote as much attention to dairy as he did cod, fur, and other commodities.<sup>5</sup>

<sup>3</sup> In the historiographical sketch that follows I focus mainly on the literature specific to Ontario dairying. I draw on histories of dairy in Quebec, the United States, and elsewhere when they provide intriguing comparisons that illuminate the Ontario story.

<sup>4</sup> Harold Adams Innis, "An Introduction to the Economic History of Ontario from Outpost to Empire," *Papers and Records*, Ontario Historical Society, Vol. 30 (1935), 119–120, <http://www.gutenberg.ca/ebooks/innis-ontario/innis-ontario-01-h.html>.

<sup>5</sup> Earl Haslett, "Factors in the Growth and Decline of the Cheese Industry in Ontario 1864–1924," Ph.D. Thesis, University of Toronto, 1969, 5.

The earliest book-length history about dairying in Canada appeared in 1937. Edited and introduced by Innis, *The Dairy Industry in Canada* once again situated the country's cheese (and butter) production in the context of the staples thesis, arguing that in central Canada, livestock-based agricultural production followed fur, timber, and wheat as key commodities that shaped the trajectory of Canadian development.<sup>6</sup> In a section on dairying's historical development, James Archibald ('J.A.') Ruddick added to Innis's broad context with a more detailed and descriptive account of the people, institutions, and activities that gave rise to the Ontario cheese industry.<sup>7</sup> Although Ruddick noted that some Ontario farm families were already producing significant volumes of cheese commercially prior to the 1860s, he emphasized the role of the U.S.-born Harvey Farrington in establishing the factory system of cheese production in the province. An emigrant from central New York's 'dairy zone,' Farrington moved to Oxford County in the 1860s and began what is believed to have been the province's first cooperative cheese factory in 1864.<sup>8</sup> Unlike in most farm dairies, factories collected milk from a number of local farmers and manufactured it into cheese on their behalf.<sup>9</sup> According to Ruddick, the

<sup>6</sup> James Archibald Ruddick et al., *The Dairy Industry in Canada*, edited by Harold Innis (Toronto, ON: Ryerson Press, 1937), xxiii.

<sup>7</sup> Ruddick was an obvious choice for authoring this section of the book. As the Dominion Dairy Commissioner from 1905 to 1932, he had already authored a number of articles and bulletins about the development of dairying and functioned as the country's informal dairy historian. Furthermore, his experience as a factory cheesemaker in the late nineteenth century allowed him to document the names and actions of various individuals and events for which documentary sources were rare or nonexistent. For a brief biography, see Ruddick et al., *The Dairy Industry in Canada*, 10n9.

<sup>8</sup> Dairy zone was a term used by New York dairymen to describe central New York's dairy and cheese factory landscape in the mid-nineteenth century. On its use and limits in that context, see Sally McMurry, *Transforming Rural Life: Dairying Families and Agricultural Change, 1820–1885* (Baltimore, MD: Johns Hopkins University Press, 1995), 12–15. I have adapted the phrase for use in terms of Ontario, as I explain in greater detail in chapter 1.

<sup>9</sup> There were a few commercial cheese enterprises that pooled milk in Ontario before the importation of the New York system, but in these instances, cheesemakers bought the milk from the farmers



New York model was so popular that the movement of cheese manufacturing from farms to factories “was practically complete in a few years[.]”<sup>10</sup> The progressive, Farrington story soon became the dominant narrative of the industry’s origins.<sup>11</sup>

*The Dairy Industry in Canada* was more than just a historical exercise. Its authors were equally concerned about the state of dairying in the context of the Great Depression. Hence the majority of the book was dedicated to understanding challenges facing milk producers and dairy product manufacturers at the time, such as the difficulties of managing price controls and the effects of fluid milk markets on the structure of the industry. The diagnostic character of *The Dairy Industry in Canada*—combined with the continued decline of rural cheese manufacturing after the Second World War—set the tone for many of the subsequent studies of the industry.

Until the 1960s, most rural geographers focused on delineating the parameters of agricultural regions through descriptive, empirical studies, which Allan J. Scott describes as the “regional description and synthesis” approach.<sup>12</sup> Whether Ontario’s areas of dairy concentration should be included within the North American dairy and hay belt was the dominant question.<sup>13</sup> In the 1960s, the focus of geographers shifted more toward a search

outright, whereas in the New York factory system the farmers (patrons) retained ownership of their milk as cheese. See chapter 1 for a more complete explanation of the system as adopted in Ontario.

<sup>10</sup> Ruddick et al., *The Dairy Industry in Canada*, 44. For another example of this claim, see Iona Joy, *Cheese Factories of Rideau Township* (North Gower: Rideau Township Historical Society, 1990), 2.

<sup>11</sup> For example, Robert Leslie Jones, *History of Agriculture in Ontario 1613–1880* (Toronto, ON: University of Toronto Press, 1977 [1946]), 254, leans heavily on the work of Innis and Ruddick in his explanation of cheese factory development.

<sup>12</sup> Allen J. Scott, “Economic Geography: the Great Half-Century,” *Cambridge Journal of Economics* 24 (2000): 485–486.

<sup>13</sup> For two examples of the “regional description and synthesis approach” to Ontario dairying, see Lloyd G. Reeds, “Agricultural Regions of Southern Ontario 1880 and 1951,” *Economic Geography* 35, no. 3 (1959): 219–227; and J.R. Whitaker, “Distribution of Dairy Farming in Peninsular Ontario,” *Economic Geography* 16, no. 1 (1940): 69–78.

for economic laws to explain regional change over time, which is reflected in the dairy historiography.<sup>14</sup> For example, in 1966, D.G. Cartwright published part of his PhD thesis in an article that sought to explain the changes in the distribution of cheese factories in southwestern Ontario, long considered to be one of the province's dairy heartlands. Cartwright identified four major factors that caused cheese factories to decline in Oxford, Perth, and Middlesex counties between the 1930s and 1960s: "urbanization, improved transportation, technological innovations and improvements, and the availability of investment capital from large parent companies[.]"<sup>15</sup> In another study, Tonu Tosine found that after an initial period of expansion, cheese production in eastern Ontario entered a period of "saturation and decline" after the 1890s due to "increasing production costs and the increasing demand from Ontario's growing population for dairy products other than cheese."<sup>16</sup>

Geographers were not alone in their investigations of the industry's growth and subsequent demise. In 1969, political scientist Earl Haslett assessed the relative influence of various supply and demand factors (such as marketing schemes, consumer demand in the United Kingdom, the development of creameries, and input costs) on the output of cheese production across Ontario between the 1860s and 1920s.<sup>17</sup> Although he noted that

<sup>14</sup> Scott, "Economic Geography: the Great Half-Century," 485–486.

<sup>15</sup> Donald Gordon Cartwright, "Changes in the Distribution of Cheese Factories in Southwestern Ontario," *The Canadian Geographer* 10, no. 4 (1966): 228. The other major geographical study of dairy in the southwestern Ontario published in the 1960s was William Surtees, "The Dairy Industry of Oxford County, Ontario," M.A. Thesis, McMaster University, 1963.

<sup>16</sup> Tonu Tosine, "Cheese Factories in the Quinte-Upper St. Lawrence Area of Ontario, 1865–1905," M.A. Thesis, York University, 1974, vi–viii.

<sup>17</sup> Haslett mined the limited statistical data available through the census tables and the annual Bureau of Industry reports and supplemented that with analyses of a handful of individual cheese factory account books. Although my approach is less quantitative than his, Haslett's finely grained analysis of a variety of documentary sources, particularly factory account and minute books, has been influential for my own work.

a number of factors influenced the trajectory of the industry, Haslett argued that changes in costs—particularly in milk transportation and cheese manufacturing—were the primary determinants of cheese factory output between 1864 and 1924. These costs fell during the late-nineteenth century, but began to rise in the first decade of the twentieth.<sup>18</sup> Overall, mid-century interpretations of the cheese industry's fortunes were rooted in neoclassical economic models, arguing that the rural cheese factory was (regrettably or otherwise) swept aside in the tide of modernization.

The rise of new rural history in North America inspired another wave of studies about Ontario dairying. In the early 1980s, U.S. agricultural historian Paul Swierenga defined the subfield as the study of rural experience and rural society in its own right, rather than treating 'the rural' as a residual effect of urbanization.<sup>19</sup> In practice, new rural history has drawn on a range of methodologies, but quantitative analysis has been particularly popular due to its capacity to investigate people's lives where traditional documentary sources are often scarce.<sup>20</sup> A few Canadian historians influenced by new rural history began to examine dairying in relation to wheat production, which was

<sup>18</sup> Haslett, "Factors," 145–152.

<sup>19</sup> See Paul Swierenga, "The New Rural History: Defining the Parameters," *Great Plains Quarterly* 1, no. 4 (1981): 211–223; and Swierenga, "Theoretical Perspectives on the New Rural History: from Environmentalism to Modernization," *Agricultural History* 56, no. 3 (1982): 495–502. New rural history was inspired by the general turn toward social history in the postwar era. Swierenga insisted that rural history should stop equating rural with agricultural, thus opening up non-agricultural rural industries, communities and ways of being to historical analysis.

<sup>20</sup> In Canada, new rural history was closely associated with the ten-volume series *Canadian Papers in Rural History*, edited by Donald Akenson and published between 1978 and 1996. While not all contributors necessarily self-identified as new rural historians, these volumes reflect the energy and excitement surrounding rural history during these years. For a reflection on the effect of new rural history on Canadian rural scholarship (as well as some of its limits), see Ruth W. Sandwell, "Rural Reconstruction: Towards a New Synthesis in Canadian History," *Histoire sociale/Social History* 27, no. 53 (1994): 1–32.

ultimately a debate about the utility of the staples thesis.<sup>21</sup> For instance, in 1982, Robert E. Ankli and Wendy Millar examined D.A. Lawr's earlier suggestion that some farm families might have pursued dairying because of its potential stability in comparison with wheat. By looking at the variability in prices for wheat and dairy products between 1880 and 1915, they concluded that dairy was indeed a more stable endeavour than wheat production.<sup>22</sup> Ten years later, Ankli published a chapter in *Canadian Papers in Rural History Vol. VIII* that situated the goal of stability within a somewhat broader context. Nuancing the earlier argument made by himself and Millar, Ankli framed the period between 1880 and 1920 as one of "tentative and prolonged" change from wheat to dairying (and other livestock-based mixed farming systems).<sup>23</sup> Ankli's chapter also raised important questions about the cheese industry that have not been adequately considered. Why, for instance, did farm families switch to a form of agricultural production that was arguably more labour intensive than wheat?<sup>24</sup> He also questioned (but did not attempt to correct) the diversion thesis, the argument that cheese factory decline was hastened by the growth in domestic demand for fluid milk and butter, since the number of milk cows in

<sup>21</sup> See D.A. Lawr, "The Development of Ontario Farming, 1870–1914: Patterns of Growth and Change," *Ontario History* 64, no. 3 (1972): 239–251; and R. Marvin McNnis, "The Changing Structure of Canadian Agriculture, 1867–1897," *Journal of Economic History* 42, no. 1 (1982): 191–198. For a review of the staples debate as it pertained to wheat in Ontario, see Peter A. Russell, *How Agriculture Made Canada: Farming in the Nineteenth Century* (Montreal, QC: McGill-Queen's University Press, 2012), 96–141.

<sup>22</sup> Ankli and Millar, "Ontario Agriculture in Transition," 207–208.

<sup>23</sup> Robert E. Ankli, "Ontario's Dairy Industry, 1880–1920," in *Canadian Papers in Rural History VIII*, edited by Donald H. Akenson (Gananoque, ON: Langdale Press, 1992), 261.

<sup>24</sup> Ankli, "Ontario's Dairy Industry," 263.

the province fell between 1907 and 1914. If demand was up, he reasoned, farmers should have been investing in more cattle.<sup>25</sup>

Perhaps the most productive line of inquiry opened up by the turn toward new rural history has centered on the gendered dynamics of the shift from farm-based to factory-based dairy manufacturing in the late-nineteenth and early-twentieth centuries, an area of study that has parallels in U.S. and European dairy historiographies.<sup>26</sup> In 1988, Marjorie Griffin Cohen argued that the shift toward factory production of cheese in Ontario exemplified the more general process of dispossession and marginalization of farmwomen within commercial agricultural production in the mid-nineteenth century.<sup>27</sup> Cohen's defeminization thesis has been critiqued and nuanced since. Margaret Derry, for example, argues that Cohen's analysis overlooks how men and women perceived, drew upon, and challenged gender norms as women's relationships to dairy work changed,

<sup>25</sup> Ankli, "Ontario's Dairy Industry," 273. Economic historian R. Marvin McNinn recently took up this particular concern in an unpublished conference paper on the cheese and hog industries in Ontario and Quebec in the first decade of the twentieth century. I address McNinn's arguments and contributions in greater detail in chapter 4, but briefly, he suggests that the primary driver of export cheese production in the first decade of the twentieth century was the high cost of labour; families appear to have actively *left* dairying for other (rural and urban) pursuits. See R. Marvin McNinn, "The Declination of Canada's Cheese and Bacon Export Industries, 1900–1910" (paper presentation, Canadian Network for Economic History Conference, 2009), accessed 29 January 2014 at <http://qed.econ.queensu.ca/faculty/mcinnis/>.

<sup>26</sup> In the context of the United States, see McMurry, *Transforming Rural Life*, who argues that in New York State, the cheese factory helped resolve gender tensions with farm households in the nineteenth century. Deborah Fink undertakes a comparative analysis of gender dynamics in dairying between Denmark and the U.S. Midwest in the mid-twentieth century, finding that in both places, women experienced the modernization of dairying in varying ways, while Sally Shortall's sweeping analysis of dairy development in nineteenth- and twentieth-century Europe and North America has found that the changes across these very different national contexts were surprisingly similar. See Fink, "Not to Intrude": A Danish Perspective on Gender and Class in Nineteenth-Century Dairying," *Agricultural History* 83, no. 4 (2009): 446–476; and Sally Shortall, "In and Out of the Milking Parlour: a Cross-national Comparison of Gender, the Dairy Industry and the State," *Women's Studies International Forum* 23 (2003): 247–257.

<sup>27</sup> Marjorie Griffin Cohen, *Women's Work, Markets, and Economic Development in Nineteenth-Century Ontario* (Toronto, ON: University of Toronto Press, 1988), 93–117. Similarly, see Marjorie Griffin Cohen, "The Decline of Women in Canadian Dairying," *Histoire sociale/Social History* 17, no. 34 (1984): 307–334.

particularly in terms of butter, which saw a slower (and more contested) movement from female-dominated home production to male-dominated factory production.<sup>28</sup> In a 1995 article in *Ontario History*, Heather Menzies argues there was more continuity between women's farm production and the development of Ontario cheese factories than Cohen and others have acknowledged. She examines a handful of women cheesemakers who produced large volumes of cheese for commercial sale and developed innovative technological solutions to the challenges of factory scale production in the early- to mid-nineteenth century. By adopting a women-centered approach to technological history, Menzies challenges women's lack of agency in Cohen's analysis, and the more general claim in the historiography that factory cheesemaking technologies and innovations were imported almost entirely from New York. Although the women she describes were likely exceptional in terms of the scale of their production, their stories do underline the importance of treating "farm economics as something infinitely more sophisticated than the crude dichotomy of subsistence or large-scale staples production."<sup>29</sup> Ultimately, neither Derry nor Menzies dispute Cohen's overall characterization of the late nineteenth

<sup>28</sup> Margaret Derry, "Gender Conflicts in Dairying: Ontario's Butter Industry, 1880–1920," *Ontario History* 90, no. 1 (1998): 31–47. Meredith Quaile has further developed this debate. Her Ph.D. dissertation shows cream separation and butter production largely remained the responsibility of Ontario farmwomen (although some butter production moved to factories toward the end of her period of study), even though they lacked access to improved technologies and their work was devalued. See Meredith Leigh Quaile, "Sisters in Toil: The Progressive Devaluation and Defeminization of Ontario Dairywomen's Work and Tools, 1813–1914," Ph.D. Thesis, Memorial University of Newfoundland & Labrador, 2010, [http://research.library.mun.ca/view/creator\\_az/Quaile=3AMeredith\\_Leigh=3A=3A.html](http://research.library.mun.ca/view/creator_az/Quaile=3AMeredith_Leigh=3A=3A.html).

<sup>29</sup> Heather Menzies, "Technology in the Craft of Ontario Cheesemaking: Women in Oxford County circa 1860," *Ontario History* 87, no. 3 (1995): 301.

and early twentieth centuries as a period when women lost significant control over cheese production, but their analyses of the pace and extent of that process differ.<sup>30</sup>

Rural cheese production has also inspired a number of popular studies of dairying. Veronica McCormick's *A Hundred Years in the Dairy Industry* was one of the earliest of these and remains the only explicitly national history of dairying published since *The Dairy Industry in Canada*. Published by the Dairy Farmers of Canada in 1967, it frames the growth of the national industry within a sweeping narrative of progress, especially in terms of institutional and governmental effort.<sup>31</sup> Most other commemorative studies have differed from McCormick's in terms of scale. They tend to focus on individual townships or counties where cheese production was especially integral to historical development and these accounts implicitly mourn the disappearance of the small cheese factory as a rural institution.<sup>32</sup> As a whole, commemorative histories of Ontario's cheese production have been instrumental for documenting local variations of the industry across the province. They have often drawn extensively on oral testimony from individuals with firsthand

<sup>30</sup> The gender dynamics of Ontario cheese production are not the primary focus of this study, but I do build on the work of these scholars to show how the factory cheese industry reproduced normative gender roles (tying men and masculinity to scientific, factory cheese production and women with 'haphazard' farm dairy production) even as it continued to rely heavily on the work of women within and beyond the factories themselves.

<sup>31</sup> Veronica McCormick, *A Hundred Years in the Dairy Industry: A History of the Dairy Industry in Canada and the Events that Influenced It, 1867–1967* (Ottawa, ON: Dairy Farmers of Canada, 1968).

<sup>32</sup> See Gerald Ackerman et al., *The History of Cheesemaking in Prince Edward County* (Milford, ON: Black River Cheese Company, 2001); Joy, *Cheese Factories of Rideau Township*; Edward Moore, *When Cheese was King: A History of the Cheese Factories in Oxford County* (Norwich, ON: Norwich and District Historical Society, 1987); Rosemary Rutley, *Of Curds and Whey: A History of the Cheese Factories in Stormont, Dundas & Glengarry* (Ingleside, ON: Old Crone Publishing & Communications, 2005).

experience of the industry, whose voices would otherwise be lost to the historical record.<sup>33</sup>

Finally, one of the most recent studies of Ontario cheese production is also the most difficult to situate in the foregoing historiographical sketch. Part commemorative oral history, social history, and political analysis, Heather Menzies's *By the Labour of Their Hands: The Story of Ontario Cheddar Cheese* is a sweeping account of craft cheesemaking in Ontario since the eighteenth century that seeks to understand "why Ontario cheddar got so small and weak that it couldn't defend itself and keep going."<sup>34</sup> For Menzies, the answer can be found in rural communities' lack of sufficient power to challenge the techno-scientific, centralizing logic of the Ontario Milk Marketing Board and other modernizing influences. Yet small cheese producers and their patrons did not go down without a fight: her analysis of their political organizing (including the 1970s Kraft boycott) challenges the association of rural society in the postwar era as passive recipients of modernization and restructuring in a period of rural decline.<sup>35</sup> *By the Labour of Their Hands* also stands out from other accounts for its focus on the daily work of craft production and the relationships between and amongst craft cheesemakers, factory patrons, and marketers.<sup>36</sup> She also identifies, more than previous historians, points of contention and struggle within the factory cheese industry, such as tensions between

<sup>33</sup> For example, Edward Moore's *When Cheese Was King* compiles information about 160 of Oxford County's cheese factories, many of which operated for only a handful of years. My provincial scale of analysis has been strengthened by these careful, detailed studies.

<sup>34</sup> Heather Menzies, *By the Labour of Their Hands: The Story of Ontario Cheddar Cheese* (Kingston, ON: Quarry Press, 1994), 11.

<sup>35</sup> Menzies, *By the Labour of Their Hands*, 125–159.

<sup>36</sup> Menzies, *By the Labour of Their Hands*, 69–70.



patrons who supplied milk to the factories and the cheesemakers who transformed it into cheese.<sup>37</sup> Although she does not identify as an environmental historian, the close attention she pays to materiality highlights the potential for a more in-depth environmental analysis of the provincial industry.

This dissertation necessarily builds on the scholarship described above. I, too, am compelled by the longstanding question of why rural cheese production lost its central place in the rural economy and, like the new rural historians before me, I am interested in the dynamism of rural Canadian society in an era of urban ascendance. Menzies's work in particular has opened a number of themes that I develop further below, such as craft labour and its relationships to the environment and industrial production. However, what is most striking about the overall body of literature on Ontario dairy is the implicit assumption that dairying was an inevitable component of the landscape. The scholarship as a whole has *naturalized* the existence and trajectory of dairying in Ontario, much like Derbyshire did for cheese manufacturing in the 1890s. Even the work on gender and dairy—which has challenged presumptions about the inevitability and timing of the shift from farm to factory production—nevertheless stops short of questioning the broader relationship between dairying, land, and society. Dairy may have been 'well-suited' to parts of Ontario, but the capacity of the regional environment to sustain cattle and other

<sup>37</sup> Menzies, *By the Labour of Their Hands*, 83–84. I discuss these tensions further in chapter 3, and also in Hayley Goodchild, "The Problem of Milk in the Nineteenth-Century Ontario Cheese Industry: an Envirotechnical Approach to Business History," *Business History* (2016), doi: 10.1080/00076791.2016.1173031.

milk producing livestock only makes dairying *possible*, not inevitable, nor necessarily desirable.<sup>38</sup>

This naturalizing tendency in the historiography is all the more glaring given the recent efforts of scholars to interrogate the supposed purity, perfection, and naturalness of dairy substances and commodities (particularly fluid milk, butter, and margarine), both within and beyond Canada. For example, Deborah Valenze offers a long history of milk in the Western world to argue that “Though a fact of nature, milk is really a product of culture.”<sup>39</sup> In *Liquid Materialities: A History of Milk, Science and the Law*, Peter Atkins analyzes how techno-scientific and political developments in the United Kingdom have not just shaped *perceptions* of milk, but its very materiality.<sup>40</sup> A number of other historians have examined the social and political construction of margarine and butter as healthful, dangerous, natural, and impure in various times and places.<sup>41</sup>

<sup>38</sup> For example, Haslett, “Factors,” 13, notes that: “The natural resources necessary for dairying were abundant in Ontario. Good soil and a suitable climate provided large quantities of hay, grass and water, and a large numbers of milking cows were already providing milk for the manufacture of butter and cheese on the farm and for human and livestock consumption.” In a discussion of the geographic suitability of southwestern Ontario for dairy production, Donald Gordon Cartwright acknowledges that “Cultural factors and economic conditions are also, of course, considered significant in the search for an understanding of the causes of agricultural distribution and agriculturally-based industries,” but does not devote much attention to these issues beyond mentioning the role of urbanization on consumption patterns and the adoption of various technologies. See Cartwright, “Cheese Production in Southwestern Ontario,” Ph.D. Thesis, The University of Western Ontario, 1965, 19. Ankli, “Ontario’s Dairy Industry,” 263, does question why farmers would pursue cheese factory dairying—even for the purpose of stabilizing farm incomes—when it was evidently a more labour intensive system than wheat farming, but seeks explanations within a narrowly defined economic framework rather than looking for broader reasons.

<sup>39</sup> Deborah Valenze, *Milk: A Local and Global History* (New Haven, CT: Yale University Press, 2011), x. For a study of milk’s sociocultural malleability in a Canadian locality, see Jane E. Jenkins, “Politics, Pasteurization, and the Naturalizing Myth of Pure Milk in 1920s Saint John, New Brunswick,” *Acadiensis* 37, no. 2 (2008): 86–105.

<sup>40</sup> Peter Atkins, *Liquid Materialities: A History of Milk, Science and the Law* (Surrey, UK: Ashgate, 2010).

<sup>41</sup> On butter and margarine, see Benjamin R. Cohen, “Analysis as Border Patrol,” *Endeavour* 35, no. 2–3 (2011): 66–73; Nathalie Cooke, “Spreading Controversy: The Story of Margarine in Quebec,” in *Edible Histories, Cultural Politics: Towards a Canadian Food History*, edited by Franca Iacovetta, Valerie J. Korinek, and Marlene Epp (Toronto, ON: University of Toronto Press, 2012), 249–268; Ruth Dupré, “If

For the most part, these studies have focused on dairy products as consumer goods. E. Melanie DuPuis and Kendra Smith-Howard, however, have each extended this work of unsettling dairy's supposed ahistorical qualities to sites of dairy farming in the twentieth-century United States. DuPuis deconstructs the idea of 'perfection' as it pertained to dairy farming in New York State during the early-twentieth century. She examines an industrial vision of "perfect farming" as articulated by urban public health officials and agricultural economists from Cornell University, who privileged the values of productivity, efficiency, and new standards of sanitation and hygiene in farm organization.<sup>42</sup> In *Pure and Modern Milk: An Environmental History since 1900*, Kendra Smith-Howard catalogues the myriad ways in which rural dairy landscapes, farms, and cows were shaped and reorganized toward expanding (and changing) consumer preferences. These changes did not distance rural producers (or urban consumers) from nature, she stresses, but they did alter the relationships between the human and non-human world. Smith-Howard situates these changes within the broader concept of purity to show how "American's ideals about milk purity shifted over time, in tandem with their changing ideas about nature and modernity."<sup>43</sup> As both of their research shows, neither milk production nor consumption is timeless or straightforwardly natural.

Closely related to the naturalization of dairy's development in the historiography has been a mostly uncritical acceptance of the industry's cooperative basis. Cheese

It's Yellow, It Must be Butter': Margarine Regulation in North America Since 1886," *Journal of Economic History* 59, no. 2 (1999): 353–371; and Kendra Smith-Howard, *Pure and Modern Milk: An Environmental History since 1900* (Oxford, UK: Oxford University Press, 2014), 53–66.

<sup>42</sup> E. Melanie DuPuis, *Nature's Perfect Food: How Milk Became America's Drink* (New York: New York University Press, 2002), 125–143.

<sup>43</sup> Smith-Howard, *Pure and Modern Milk*, 8.

produced in factories was cooperative insofar that farmers pooled their milk together and collectively contracted out the work of transforming it into cheese. They retained ownership of the milk throughout the cheesemaking process. Sometimes the farmers who supplied milk *also* cooperatively owned their local cheese factories, but this was not always the case, as I explain in chapter 1. There is a tendency in the literature to blur the lines between formal, organizational definitions of cooperation and the idea of the cheese industry as cooperative in a more general sense, of rural people working harmoniously toward shared goals in the name of progress. Some historians have acknowledged challenges that faced the cheese industry during this period (such as milk adulteration, or cheese production's marginal profitability), but the overall tendency has been to treat these as minor drawbacks that ultimately *reinforce* the inherent cooperation and prosperity of rural communities during the fifty or so years between the emergence of Ontario's cheese factories and their peak in the early-twentieth century. For example, in *The History of Cheesemaking in Prince Edward County*, Gerald Ackerman writes: "Co-operation among the farmers, never easy, was made doubly difficult by existing conditions. The ultimate success of the industry is not only a tribute to the far-seeing judgement [sic] of its early promoters but an outstanding illustration of successful co-operation in the production of quality dairy products."<sup>44</sup>

Within the wider rural Ontario historiography, the naturalization of dairying and the uncritical acceptance of cooperation have supported the idea that post-Confederation Ontario through to the 1920s was a period of general prosperity and steady progress for

<sup>44</sup> Ackerman, *The History of Cheesemaking in Prince Edward County*, 12–13.

rural families.<sup>45</sup> However, this perspective sits uncomfortably vis-à-vis a body of scholarship that emphasizes the centrality of dissent, tension, and struggle in rural Canadian communities.<sup>46</sup> Is it possible that Ontario's characterization as a region marked by steady economic growth, cooperation, and relative progress in the six or seven decades after Confederation is perhaps overstated, or at least, more complicated?

Finally, I am interested in the relationship between the Ontario cheese industry and the broader transformation toward capitalist agriculture in North America during the late nineteenth and early twentieth centuries. In 1989, sociologists Harriet Friedmann and Philip McMichael introduced the concept of food regimes as a systematic way of thinking about global changes in capitalist food production. They defined the first food regime as the period of settler agriculture between roughly 1870 and 1914, which was destabilized after the First World War and eventually gave rise to a second food regime after the Second World War. They identified a number of key characteristics of the first food regime: production was expansive and primarily geared toward producing grains and meat, and premised on the availability of new spatial frontiers in settler states; it relied

<sup>45</sup> Examples of studies that reflect this view of post-Confederation rural Ontario include Adam Crerar, "Ties That Bind: Farming, Agrarian Ideals, and Life in Ontario, 1890–1930," Ph.D. Thesis, University of Toronto (1999); Ian M. Drummond, *Progress without Planning: The Economic History of Ontario from Confederation to the Second World War* (Toronto, ON: University of Toronto Press, 1987); and Gordon Darroch, "Scanty Fortunes and Rural Middle-Class Formation in Nineteenth-Century Central Ontario," *Canadian Historical Review* 79, no. 4 (1998): 621–659. This rosier view of rural Ontario is something of a response to the debate about whether or not there was a demographic crisis in rural Ontario in the 1850s. For a thorough account of this debate, see Russell, *How Agriculture Made Canada*, 142–167. The suggestion by Ankli and Millar, "From Wheat to Cheese," that dairying was probably not all that profitable does not fundamentally challenge this perspective, though it does hint at the deep contradictions between how the cheese industry was promoted and how it may have actually functioned.

<sup>46</sup> Two excellent examples include Rusty Bitterman, *Rural Protest on Prince Edward Island: From British Colonization to the Escheat Movement* (Toronto, ON: University of Toronto Press, 2006); and Darren Ferry, *Uniting in Measures of Common Good: The Construction of Liberal Identities in Central Canada, 1830–1900* (Montreal, QC: McGill-Queen's University Press, 2008).

very heavily on the family farm—rather than waged labour—as the basis of production; and it encouraged a particular type of nation-state formation.<sup>47</sup>

Environmental historians have contributed to a fuller understanding of this period of agricultural development by examining the ways in which Euroamerican settlers transformed the varied ecologies of the North American continent into the world's "breadbasket."<sup>48</sup> Many of these studies have centered on the transformation of diverse Indigenous social systems and ecologies into spaces for the Euroamerican production of classic capitalist agricultural commodities using techniques of industrialization. For example, William Cronon's *Nature's Metropolis: Chicago and the Great West* shows how the commodification and marketing of wheat, meat, and certain non-food commodities shaped the development of Chicago and its midwestern hinterlands in the nineteenth century.<sup>49</sup> In *Dust Bowl*, Donald Worster argues that an individualist culture underpinned the wholesale reduction of western U.S. grasslands into wheatlands,<sup>50</sup> while

<sup>47</sup> Harriet Friedmann and Philip McMichael, "Agriculture and the State System: the Rise and Decline of National Agricultures, 1870 to the Present," *Sociologia Ruralis* 29, no. 2 (1989): 93–117. For a brief reflection on the developments and debates within food regime analysis in the subsequent decades, see Hugh Campbell and Jane Dixon, "Introduction to the special symposium: Reflecting on Twenty Years of the Food Regime Approach in Agri-food Studies," *Agriculture and Human Values* 26 (2009): 261–265. Food regime scholars and environmental historians have rarely *explicitly* engaged with one another.

<sup>48</sup> Jason W. Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (London: Verso Books, 2015), 246. Moore drives home the revolutionary nature of this development: "This was an extraordinary development in human history; no civilization had relocated its agro-ecological heartland from one continent to another."

<sup>49</sup> William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W.W. Norton & Co., 1991).

<sup>50</sup> Donald Worster, *Dust Bowl: the Southern Plains in the 1930s* (New York: Oxford University Press, 1979). Geoff Cunfer has pushed back against Worster's perspective, using historical GIS methods to argue that settlers were not nearly as rapacious as Worster suggests, and even pursued a system of agricultural production that was relatively sustainable. See Cunfer, *On the Great Plains; Agriculture and Environment* (College Station: Texas A&M University Press, 2005). Although it is possible Worster overstated the extent to which settlers simplified and degraded the existing grassland ecology of the plains, the relationship between increased grain production in the U.S. plains and the global capitalist food system is undeniable. It is difficult to describe this period as sustainable when one takes this broader view.

in *Every Farm a Factory: The Industrial Ideal in American Agriculture*, Deborah Fitzgerald shows how industrialization and its underlying values were extended to farms of the U.S. Midwest in the early twentieth century.<sup>51</sup> Collectively, these and other studies drive home the scale and the scope of the ecological transformations that have taken place since the Euroamerican colonization of North America and the variety of ways in which this was achieved.<sup>52</sup>

On the other hand, environmental historians have also examined moments when settlers have sought to create long-lasting agricultural systems organized around intensive, livestock-based mixed farming principles. In *The Great Meadow: Farmers and the Land in Colonial Concord*, Brian Donahue examines the lives of settler farmers in eighteenth- and nineteenth-century New England, who pursued convertible husbandry as a means of maintaining agricultural production—and their community—across multiple generations.<sup>53</sup> Similarly, Steven Stoll argues in *Larding the Lean Earth: Soil and Society in Nineteenth-Century America* that a small subset of elite rural farmers advocated improvement methods as a means of simultaneously building soil and an ideal American society, in opposition to the expansionist mindset dominant at the time. “Improvement,” he writes, “flourished in the moment between the rise of a capitalist and an industrial

<sup>51</sup> Deborah Fitzgerald, *Every Farm a Factory: the Industrial Ideal in American Agriculture* (New Haven, CT: Yale University Press, 2003).

<sup>52</sup> Other examples include J.L. Anderson, *Industrializing the Corn Belt: Agriculture, Technology, and Environment* (DeKalb, IL: North Illinois University Press, 2009); Mark Fiege, *Irrigated Eden: The Making of an Agricultural Landscape in the American West* (Seattle: University of Washington Press, 1999); Douglas Cazaux Sackman, “‘Nature’s Workshop’: The Work Environment and Workers’ Bodies in California’s Citrus industry, 1900–1940,” *Environmental History* 5, no. 1 (2000): 27–53; and Steven Stoll, *The Fruits of Natural Advantage: Making the Industrial Countryside in California* (Berkeley: University of California Press, 1998).

<sup>53</sup> Brian Donahue, *The Great Meadow: Farmers and the Land in Colonial Concord* (New Haven, CT: Yale University Press, 2004).



society, a brief time in which material progress coincided with an ecologically benign form of agriculture.”<sup>54</sup> What many of these moments had in common was the adoption (or encouragement) of intensive, mixed farming methods in the name of moral, religious, or political goals *and* concerns about what would today be considered ecological, or at least, conservationist issues.<sup>55</sup> These socio-ecological experiments raise the possibility that some Euroamerican settlers were grasping for alternatives to the emerging capitalist order, or at the very least, to the normalization of an agricultural system that threatened soil fertility while thoroughly commercializing farm society. However, it is important to recognize that these alternative visions of rural development were often still deeply and actively implicated in the subjugation of nonwhite and Indigenous people, women, extra-human nature, and the working class.<sup>56</sup>

The primary goal of this study is to reexamine factory cheese production in southern Ontario between the 1860s and 1930s in light of the literatures described above. What drove the growth of the cheese factories? What made southern Ontario ‘suitable’ for dairy production—and specifically cheese manufacturing—in the mid-nineteenth

<sup>54</sup> Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America* (New York: Hill and Wang, 2002), 213. McMurtry, *Transforming Rural Life*, 12–15, makes a similar point about New York agriculturists’ vision for dairying in the mid-nineteenth century. In *Notes from the Ground: Science, Soil & Society in the American Countryside*, Benjamin R. Cohen deepens Stoll’s discussion of improvement by linking it to a ‘georgic’ ethic and the broader ‘scientization’ of nature. Cohen, *Notes from the Ground: Science, Soil & Society in the American Countryside* (New Haven, CT: Yale University Press, 2009).

<sup>55</sup> Many of these ideas were rooted in what Colin Duncan describes as high farming “land stewardship” principles during England’s “light industrial prime.” See Colin Duncan, *The Centrality of Agriculture: Between Humankind and the Rest of Nature* (Montreal, QC: McGill-Queen’s University Press, 1996), 63–71, 80–87.

<sup>56</sup> For example, Benjamin Cohen explains how certain improvement discourses legitimized the systems of slavery that made white farmers’ georgic experiments possible in the first place. See Cohen, *Notes from the Ground*, 155–161.



century? How did the emergence of the factory system alter the environment, and how was the industry itself shaped by human and extra-human nature in turn? Was the industry's growth contested or challenged, and if so, by whom or what? Where does rural cheese manufacturing, with its semi-industrial organization, and support of a livestock-based mixed farming system, fit in this broader schema of agricultural change and global capitalism in the nineteenth and twentieth centuries?

### *Methodology and Methods*

I address these questions by evaluating what was said and written about the industry by its biggest champions—rural reformers, and later, government-based dairy experts—and reading those beliefs and claims against the *work* involved in making Ontario an environment suitable for dairy production.<sup>57</sup> I focus specifically on work because, as Richard White has so forcefully argued, it is a primary means by which people understand, interact with, and transform extra-human nature. In 1995, White critiqued middle-class environmentalists (and the historians influenced by them) for focusing too much on leisure and 'wilderness' at the expense of the more common and fundamental experience of work in nature, which alienated others from their cause.<sup>58</sup> In

<sup>57</sup> This general approach is inspired in part by Mart A. Stewart's excellent monograph, *'What Nature Suffers to Groe': Life, Labor, and Landscape on the Georgia Coast, 1680–1920* (Athens: University of Georgia Press, 2002). Although Stewart focuses on plantation slavery and postbellum agriculture in Georgia—a context quite different from nineteenth-century rural Ontario—his emphasis on the ongoing tension between white settler visions for Georgia, and the 'vernacular' environment and society shaped largely by African American slaves and their descendants was very influential for my own approach.

<sup>58</sup> Richard White, "'Are You an Environmentalist or Do You Work for a Living?': Work and Nature," in William Cronon, ed., *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W.W. Norton & Company, 1995), 171–185.

*The Organic Machine*, White restored work's central place within nature by treating it as energy, a concept flexible enough to include the extra-human world.<sup>59</sup> Expanding the boundaries of work offers great possibilities for understanding how environments are produced by multiple entities in complex ways since it challenges the dualistic assumptions that separate humanity/culture from the environment/nature.<sup>60</sup> However, some scholars have argued that treating work primarily as a form of organic (and inorganic) energy that shapes the wider environment risks obscuring human labour's social and political dimensions; what historians gain in breadth they lose in analytical clarity.<sup>61</sup> How, they ask, can broad definitions of work acknowledge the influence of the extra-human world while still being sensitive to the complexities of human work?<sup>62</sup>

Here I turn to Jason W. Moore, who argues that an expansive concept of work (which he calls work/energy) can be analytically robust if one is clear about how

<sup>59</sup> Richard White, *The Organic Machine: The Remaking Of the Columbia River* (New York: Hill and Wang, 1995), x. The literature that straddles the fields of labour and environmental history is now extensive. For historiographical overviews of some of this work since Richard White, see Thomas G. Andrews, "Work, Nature, and History: A Single Question, that Once Moved Like Light," in *The Oxford Handbook of Environmental History*, edited by Andrew C. Isenberg (Oxford: Oxford University Press, 2014), 425–466; Stefania Barca, "Laboring the Earth: Transnational Reflections on the Environmental History of Work," *Environmental History* 19, no. 1 (2014): 3–27; Gunther Peck, "The Nature of Labor: Fault Lines and Common Ground in Environmental and Labor History," *Environmental History* 11, no. 2 (2006): 212–238; and John Soluri, "Labor, Rematerialized: Putting Environments to Work in the Americas," *International Labor and Working-Class History* 85 (2014): 162–176.

<sup>60</sup> For an excellent analysis of how White's work destabilizes dualistic categories, see Benjamin R. Cohen, "Escaping the False Binary of Nature and Culture Through Connection: Richard White's *The Organic Machine: The Remaking of the Columbia River*," *Organization & Environment* 18, no. 4 (2005): 445–457.

<sup>61</sup> Gunther Peck, "The Nature of Labor," 219.

<sup>62</sup> Gunther Peck, "The Nature of Labor," 214, argues that alienation is not a good foundation for collaboration because it "means sharply different things to each subfield." Instead, he advocates writing geographies of labour, which include "the spatial, material, and cultural connections between nature and labor[.]" John Soluri encourages a similar approach, with a particular focus on how culture and ideas about environments intersect with the rich materiality of workers' everyday lives. Soluri, "Labor, Rematerialized," 171.

particular types and arrangements of human and extra-human work function *together* to establish, maintain, or expand various modes of production, especially capitalism. “What bears emphasis,” he insists, “is *how* the work/energy of the web of life is incorporated into the relations of power and re/production.”<sup>63</sup> For Moore, there are two main ways that work produces value within the capitalist ‘world-ecology:’ first, work can take the form of commodified labour-power (waged work), the familiar form that constitutes the backbone of most Marxist analyses of capitalism. The second type of work critical to the continued expansion of capital is unpaid, “devalued” work, which includes “Work by humans, especially women; but also ‘work’ performed by extra-human natures.”<sup>64</sup> The meaningful analytical distinction is between how work gets used by capital, not whether it is performed by human or extra-human entities. Moore encourages historians to move beyond debates about whether there is a particular essence to human work to examine how particular forms of work/energy get arranged, reorganized, and appropriated in historically and geographically specific ways to produce value for capital.<sup>65</sup>

Work takes multiple forms in the factory-based cheese industry. Most obviously, it is the craft of making cheese that was usually (though not always) performed by men working for wages, and the work of caring for and milking cows that was performed by farm families. I focus more on the former than the latter in this study, but both were

<sup>63</sup> Moore, *Capitalism in the Web of Life*, 15 [emphasis in original].

<sup>64</sup> Moore, *Capitalism in the Web of Life*, 65.

<sup>65</sup> Such an approach also moves beyond the debate between some labour and environmental historians about the primacy of “labour theory of value” or “nature theory of value,” evidenced most famously in the exchange between William Cronon and his critics in *Antipode* 26, no. 2 (1994). For an excellent appraisal of this debate, see James O’Connor, *Natural Causes: Essays in Ecological Marxism* (New York: Guilford Press, 1998), 109–116.

equally important to cheese production.<sup>66</sup> Work also includes the hauling of milk cans from farms to the platforms of factories one, two, or five miles way and the rhythmic plod of the horses that drew the milk wagons. It is the work bee called to build the factory in a couple of days and the labour involved in spreading cow manure over one's fields. It is the search further afield for elm trees needed to build cheese boxes. It is the tedium of moving those boxes from factory to ship to the merchant's counter in England. It is the extractive coal mining that fueled trains and steamships.

And it is more still. There are two forms of extra-human work I examine in this dissertation that merit further discussion upfront. The first are the efforts of the microbial world, defined here as the bacteria, enzymes, and yeasts that make the transformation of milk into cheese possible in the first place. Although the role of microbial life for cheese production is significant, historians of Ontario have generally ignored its relevance for understanding the development of the industry.<sup>67</sup> Devoting serious attention to how

<sup>66</sup> I am cognizant that in doing so, I am potentially continuing the problem within labour-environmental histories of marginalizing the unpaid, reproductive work often done by women. However, there has been quite a lot of work done in terms of women's relationships to the changing dairy landscape, and (surprisingly) less on the factory craftworkers in the cheese industry. On gender and its continued marginalization in labour-environmental histories, see Soluri, "Labor, Rematerialized," 164.

<sup>67</sup> One exception is Menzies, who notes that some cheesemakers (like interviewee Claude Flood) maintained their own 'starter cultures' for the purpose of preparing milk in the vat for rennet, the enzymatic substance required to coagulate milk into cheese. For Menzies, the maintenance of local, vernacular starter cultures is a sign of the resilience of 'traditional' craft practices in the face of modernizing influences. See Menzies, *By the Labour of Their Hands*, 72, 77–79. For two early examples of "thinking with" microbes, see Alfred Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900* (Cambridge, UK: Cambridge University Press, 1986), 195–216; and Bruno Latour, *The Pasteurization of France*, translated by Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988). Microbes are gaining greater attention within and beyond academia. As Mrill Ingram explains, there is a paradigmatic shift currently underway from what she calls an "antimicrobial" to "promicrobial" worldview. Mrill Ingram, "Fermentation, Rot, and Other Human–Microbial Performances," in *Knowing Nature: Conversations at the Intersection of Political Ecology and Science Studies*, edited by Mara J. Goldman, Paul Nadasdy, and Matthew D. Turner (Chicago: University of Chicago Press, 2011), 99–112. Similarly, Heather Paxson and Stefan Helmreich argue that there has been a shift toward seeing microbes in terms of their possibilities for imagining idealized, "model" futures: "the abundant microbe," they write, "has moved

microbes functioned within the socio-ecological circuits of cheese production challenges simplistic notions of craft labour as the expenditure of human agency over a passive nature.<sup>68</sup> Cheesemakers in the late nineteenth and early twentieth centuries understood the emerging microbial world in more ambiguous ways than their counterparts in sanitation and public health, who—for good reason—often interpreted the microbial world in terms of threats to human wellbeing and thus sought to eradicate germs. Despite the more receptive and complex understanding of yeasts, bacteria, and other small life amongst cheese producers, the industry still ultimately endeavoured to control microbial life, both good and bad, with only partial success. As I show below, the industry shaped the organization and reproduction of microbial communities, but was also shaped by them in turn, sometimes in ways that posed ongoing challenges for cheesemakers, capital, and maintaining social harmony.

The second form of extra-human work central to this study is the (re)productive labour of dairy cows, without whom there would have been no milk to transform into cheese at all.<sup>69</sup> The place of animals in human-nature relations has generated enormous discussion amongst scholars within environmental history, animal studies, and other

from being a sign of peril to being one of promise.” See Heather Paxson and Stefan Helmreich, “The Perils and Promises of Microbial Abundance: Novel Natures and Model Ecosystems, from Artisanal Cheese to Alien Seas,” *Social Studies of Science* 44, no. 2 (2014): 167. Finally, Nancy Langston, “Thinking like a Microbe: Borders and Environmental History,” *Canadian Historical Review* 95, no. 4 (2014): 594, recently argued that “thinking like a microbe” is a means of moving beyond the persistent idealization of nature as wilderness while also compelling environmental historians “to attend to the nature of borders,” (political, human/culture dualisms, and so on).

<sup>68</sup> I outline the debates about craft in detail in chapter 3.

<sup>69</sup> Ontario cheese production in the nineteenth century was primarily cow-centered, even though goats and sheep also produce milk feasible for cheese production. I have not found any evidence that rural Ontarians used goat or sheep’s milk for cheese production before the twentieth century, though it is possible that some families did so privately, in their own farm dairies.

subfields in the humanities and social sciences.<sup>70</sup> One thread—which is often associated with the work of Edmund Russell and the ‘evolutionary history’ approach—focuses on animals as biotechnologies or hybrid beings, meaning dynamic organisms that are neither fully natural nor cultural, and which function as tools for human benefit.<sup>71</sup> A related strand of scholarship has focused on animals’ roles as workers, or at the very least, organisms that expend energy and shape landscapes, however inadvertently.<sup>72</sup> Some of these scholars have examined how animals’ physical labour—and their dead bodies—have been central to the processes of industrialization and capitalist accumulation, since non-human animals (like many human workers) do not retain or control the products of their work.<sup>73</sup> With dairy cows this exploitative relationship to capital is very clear: as milk

<sup>70</sup> For introductions to the literature, see Harriet Ritvo, “On the Animal Turn,” *Daedaleus* (Fall 2007): 188–222; and Brett Walker, “Animals and the Intimacy of History,” *History and Theory* 52, Theme Issue (December 2013): 45–67.

<sup>71</sup> See Edmund Russell, “Introduction: The Garden in the Machine: Toward an Evolutionary History of Technology,” in *Industrializing Organisms: Introducing Evolutionary History*, edited by Susan R. Schrepfer and Philip Scranton (New York: Routledge, 2004), 1–18; and Russell, *Evolutionary History: Uniting History and Biology to Understand Life on Earth* (New York: Cambridge University Press, 2011). A handful of historians have used an evolutionary history approach or a similarly critical technological view to discuss dairy cows specifically. See Cristina Grasseni, “Designer Cows: The Practice of Cattle Breeding Between Skill and Standardization,” *Society & Animals* 13, no. 1 (2005): 33–50; Alan L. Olmstead and Paul Webb Rhode, *Creating Abundance: Biological Innovation and American Agricultural Development* (New York: Cambridge University Press, 2008), 330–360; Barbara Orland, “Turbo-Cows: Producing a Competitive Animal in the Nineteenth and Early Twentieth Centuries,” in *Industrializing Organisms: Introducing Evolutionary History*, edited by Susan R. Schrepfer and Philip Scranton (New York: Routledge, 2004), 167–190; and Smith-Howard, *Pure and Modern Milk*, 86–94. DuPuis, *Nature’s Perfect Food*, 134–139, offers an earlier analysis that describes dairy cows as an “industrial apparatus.” Interestingly, Margaret Derry does not cite much of the literature in evolutionary history, although one could argue her recent study of livestock breeding reflects very similar interests. See Derry, *Masterminding Nature: The Breeding of Animals, 1750–2010* (Toronto, ON: University of Toronto Press, 2015), esp. ch. 4, “New Directions: Artificial Insemination Technology and Quantitative Genetics.”

<sup>72</sup> Alfred Crosby, *Ecological Imperialism*, is a classic in this regard. See also Virginia DeJohn Anderson, *Creatures of Empire: How Domestic Animals Transformed Early America* (New York: Oxford University Press, 2004); Alan Mikhail, “Unleashing the Beast: Animals, Energy, and the Economy of Labor in Ottoman Egypt,” *American Historical Review* 118, no. 2 (2013): 317–348; and White, *The Organic Machine*, passim.

<sup>73</sup> For some examples from environmental history, see Thomas G. Andrews, *Killing for Coal: America’s Deadliest Labor War* (Cambridge, MA: Harvard University Press, 2008), 129–135; William Boyd, “Making Meat: Science, Technology, and American Poultry Production,” *Technology and Culture*

has been increasingly viewed in terms of its exchange value, cows have lost control over the production and use of their milk; they have been alienated from it in traditional Marxist parlance (their work has been “appropriated” in Moore’s framework).<sup>74</sup> From the nineteenth century through the present day, dairy cows no longer able to produce milk efficiently have typically been slaughtered with the intention of wresting any remaining profit from their bodies.<sup>75</sup> I attempt to capture the slipperiness between these multiple roles—animals as agents, disembodied commodities, devalued workers and

42, no. 4 (2001): 631–664; and Gregory Rosenthal, “Life and Labor in a Seabird Colony: Hawaiian Guano Workers, 1857–70,” *Environmental History* 17, no. 4 (October 2012): 744–782.

One of the most animated debates around animals’ relationship to capitalism has been generated by the work of labour and animal historian Jason Hribal, who argues that animals need to be understood (and valued) as part of the working class in addition to beings who generate profit. See Hribal, “Animals, Agency, and Class: Writing the History of Animals from Below,” *Human Ecology Forum* 14, no. 1 (2007): 101–112; and “‘Animals Are Part of the Working Class’: A Challenge to Labor History,” *Labor History* 44, no. 4 (2003): 435–453. Some scholars resist the inclusion of non-human animals as labourers on the grounds that they lack the makings of a self-conscious class, and worry that Hribal overstates comparisons between human and non-human animals. For a summary of their critiques and Hribal’s rebuttal, see Hribal, “Animals are Part of the Working Class Reviewed,” *Borderlands* 11, no. 2 (2012): 1–37.

<sup>74</sup> Two excellent social scientific analyses that examine twenty-first century dairy cows as (alienated) workers include Tiphane Schmitt and Jocelyne Porcher, “Dairy Cows: Workers in the Shadows?” *Society & Animals* 20, no. 1 (2012): 39–60; and Diana Stuart, Rebecca L. Schewe, and Ryan Gunderson, “Extending Social Theory to Farm Animals: Addressing Alienation in the Dairy Sector,” *Sociologia Ruralis* 53, no. 2 (2013): 201–222. Although Richie Nimmo does not use the term ‘alienation’ explicitly, his study emphasizes a similar point through the joint lenses of Foucauldian disciplinary analysis and actor-network theory (ANT). He notes that, “The processing of plant foods into milk, of ‘nature’ into ‘culture’, was no longer merely one aspect of the animal’s life-activity, which happened to be of use to its human owners, but was increasingly the sole purpose of its existence.” See Richie Nimmo, “Auditing Nature, Enacting Culture: Rationalisation as Disciplinary Purification in Early Twentieth-Century British Dairy Farming,” *Journal of Historical Sociology* 21, no. 2/3 (2008): 284.

<sup>75</sup> For example, Derry describes the effect of dumping ‘dairy beef’ on beef markets and beef breeding practices more generally in *Ontario’s Cattle Kingdom: Purebred Breeders and Their World, 1870–1920* (Toronto, ON: University of Toronto Press, 2001), 110–111. I should also be clear that this (structural) relationship is and was not necessarily felt or understood in such callous terms by farmers and other livestock workers. As Katharine Anderson discusses in her M.A. thesis on the relationship between farmers and animals in early twentieth century Ontario, farmers often treated their animals on a continuum of detached to attached “pragmatic stewardship,” and sometimes struggled to relate to their animals in highly commodified ways. See Anderson, “‘Hitched Horse, Milked Cow, Killed Pig’: Pragmatic Stewardship and the Paradox of Human/Animal Relationships in Southern Ontario, 1900–1920,” (M.A. Thesis, University of Guelph, 2014).



biotechnologies—in the discussion of the scientific management of Ontario's dairy cows in chapter 4.

Since I am reexamining the industry through the lens of work/energy, and reading that against the goals and actions of rural reformers, my source base for this study has been quite broad. The published proceedings of the Canadian Dairymen's Association (CDA) and its spin-off associations—the Dairymen's Associations of Eastern and Western Ontario (DAEO and DAWO, respectively)—provide an important window into the world of dairy reformers. The views of reformers and state experts have been further developed using numerous government memoranda and letters, published reports, and the records of the provincial dairy schools in Guelph and Kingston. I have used articles and letters to the editors from the agricultural press, local newspapers, and popular newspapers like the *Globe* to glean further understanding of both the reformers' project and the experiences of cheesemakers and farmer-patrons on the ground. Cheese company records—including minutes of boards of directors, account books, and cheesemakers' contracts—as well as diaries of a few cheesemakers and other key individuals provide a deeper understanding of the work involved in cheese production.

### *The Argument and its Limits*

Ontario had no preexisting destiny as a dairy region; its capacity for dairying and cheese production had to be socially and materially constructed. Establishing a commercial, export-oriented cheese industry required massively expanding the number of cattle in the province and the pasturelands and hay fields required to sustain them. It



relied heavily on the extension of rail transportation into the provincial interior in order to move cheese from the hundreds of decentralized factories to the port of Montreal, where it left for England by steamship. It also hinged on the creation and reproduction of a craft labour force. Moreover, the cultivation of a *material* landscape supportive of dairy production and rural cheese manufacturing went hand in hand with cultural and social constructions of suitability. In other words, the work of making rural southern Ontario suitable for (particular kinds) of dairy production was inseparable from broader social, cultural, economic, and political developments of the time. Specifically, I argue that the factory cheese industry's early development was rooted in a deliberate project of rural reform encouraged by the province's rural and small-town elite.

To better understand the cheese industry as project of reform, I turn to James Murton's *Creating a Modern Countryside: Liberalism and Land Resettlement in British Columbia*, which examines state-led attempts in British Columbia to resettle soldiers upon their return from the First World War. The state's resettlement project "was an exercise in both social and environmental reform." It involved large-scale environmental engineering projects like the draining of Sumas Lake to create new farmland and bureaucrats encouraged the family farm as the basis of these new agricultural communities. The project's success was thwarted, in part, by the influence (or agency) of extra-human nature.<sup>76</sup> Murton explains that the technocrats and improvers who undertook these reforms during the interwar years were driven by a vision of "alternative rural

<sup>76</sup> James Murton, *Creating a Modern Countryside: Liberalism and Land Resettlement in British Columbia* (Vancouver: UBC Press, 2007), 3–4.

modernity,” an idealized rural world that manifested values of republican agrarianism (and its emphasis on the family farm), modern scientific agriculture, and an interventionist model of liberalism.<sup>77</sup>

I borrow Murton’s concept of alternative rural modernity to use as a framework for understanding the rise of the Ontario cheese industry in the second half of the nineteenth century. Like state officials and technocrats in British Columbia, Ontario’s rural reformers—whose ranks included progressive farmers, educators, bankers, politicians, exporters, and small town manufacturers—encouraged factory cheese production as a means of making *their* vision for alternative rural modernity a reality. The alternative rural modernity of Ontario’s mid-nineteenth-century reformers differed from the vision of rural modernity of BC’s twentieth-century technocrats in important ways—reform in BC was fundamentally state-led, unlike Ontario’s cheese industry, for example—but there were also areas of overlap.<sup>78</sup> Men like Derbyshire believed that rural people and agricultural production were in need of improvement, and that cheese manufacturing was an ideal way to achieve a modern, profitable, stable, and harmonious rural society. Overall, the concept of alternative rural modernity usefully captures how Ontario’s reformers tried to build a particular rural *future* rather than defend a traditional rural past.

There were three key elements to the Ontario reformers’ vision of alternative rural modernity. First, it was distinctly liberal in its outlook. Reformers imagined a productive,

<sup>77</sup> Murton, *Creating a Modern Countryside*, ch. 2.

<sup>78</sup> Ontario’s early dairy reformers believed it was liberal *individuals*, not the state, that could and ought to reform rural land and society. This outlook would begin to change toward the late nineteenth century, however. The shifting role of the state vis-à-vis the cheese industry is taken up in chapter 4.

‘civilized’ countryside managed by property-owning individuals voluntarily engaged in mutually beneficial economic arrangements with one another. The freedom of farmers to enter (or leave) contracts with their neighbours for producing cheese was the cornerstone of this vision. Here, property referred to milk (and the cows from which it came), which extended the reach of liberalism to include tenant farmers who owned livestock rather than land. Reformers believed that patronizing cheese factories would instill in rural farmers a respect for particular liberal values, such as the importance of self-improvement and the primacy of property, which they would then apply to the management of their farms and other areas of their lives. In other words, the cheese industry was a vehicle for establishing what Ian McKay and others have called “liberal order” amongst the rural population and within the agricultural environment.<sup>79</sup>

<sup>79</sup> The liberal order framework has been most closely associated with the work of Ian McKay, who, in 2001, encouraged historians to think about Canada’s historical development as a project of liberal rule. How, he asks, have property, individualism, and the rule of law become ‘hegemonic,’ and how has this order been resisted? Ian McKay, “The Liberal Order Framework: A Prospectus for a Reconnaissance of Canadian History,” *Canadian Historical Review* 81, no. 4 (2000): 616–651. The response to McKay’s intervention has been significant. For some reflections on the use and effectiveness of the liberal order framework in general, see Jean-François Constant and Michel Ducharme, eds., *Liberalism and Hegemony: Debating the Canadian Liberal Revolution* (Toronto, ON: University of Toronto Press, 2009), 3–32. Also see Ruth Sandwell, “The Limits of Liberalism: The Liberal Reconnaissance and the History of the Family in Canada,” *Canadian Historical Review* 84, no. 3 (2003): 423–450. One of the most useful responses to the liberal order framework for the purposes of this study is Stéphane Castonguay and Darin Kinsey, “The Nature of the Liberal Order: State Formation, Conservation, and the Government of Non-Humans in Canada,” in *Liberalism and Hegemony: Debating the Canadian Liberal Revolution*, edited by Jean-François Constant and Michel Ducharme (Toronto, ON: University of Toronto Press, 2009), 221–245. Castonguay and Kinsey critique the liberal order framework’s exclusive focus on human activity as though the environment were “a static backdrop before which the constitution of the liberal subject has unfolded” (221). Their case studies on the conservation of Quebec’s fisheries and forests remind us that the liberal order is regularly worked out through the *environment* as much as it is through legal practices and other seemingly non-environmental spaces.

Despite the dairy reformers' celebration of the liberal individual as the basis of rural progress, they were also concerned about the strength of rural society and the cultivation of an ethic of cooperation within rural communities. As Darren Ferry explains in *Uniting in Measures of Common Good: The Construction of Liberal Identities in Central Canada, 1830–1900*, these two goals were not necessarily at odds with one another. Ferry shows how nineteenth-century voluntary associations, like temperance societies and Farmers' Institutes, tried to cultivate a more cooperative alternative to classic individual liberalism.<sup>80</sup> He emphasizes four main elements of “liberal cooperation” expressed in the structure and rhetoric of these organizations, all of which were contested in practice: inclusivity (particularly in terms of class, gender, and ethnicity); attempts to curb “politico-religious conflict” within organizations; the valorization of class harmony and “individual diligence and hard work”; and the promotion of respectable leisure activities.<sup>81</sup> It was the third of these elements that is the most apparent in the words and actions of organizations like the CDA. Reformers believed potential class conflict between dairy farmers (factory patrons), cheesemakers, exporters, and merchants could be overcome by a commitment to work honestly and diligently with one another. Cooperation *through* self-improvement and the development

<sup>80</sup> Ferry, *Common Good*, 7. For other analyses of how liberalism was cultivated through rural society, see Daniel Samson, *The Spirit of Industry and Improvement: Liberal Government and Rural-Industrial Society, Nova Scotia, 1790–1862* (Montreal, QC: McGill-Queen's University Press, 2008), esp. 250–283; and Catharine Anne Wilson, *Tenants in Time: Family Strategies, Land, and Liberalism in Upper Canada, 1799–1871* (Montreal, QC: McGill-Queen's University Press, 2009), esp. 4–9, 24–29, and 190–193.

<sup>81</sup> Ferry, *Common Good*, 16–18.

of an individual work ethic was at the heart of much of the work undertaken by the CDA and its successor associations in relation to the cheese industry.

The second pillar of alternative rural modernity was the cheese industry's semi-industrial, cooperative model of economic production. Reformers believed it was possible to create a rural industry that could tame the worst of capitalism's volatility while still delivering profits to farmers and others. To this end, they selectively adopted elements of industrial production and encouraged the construction of cheese factories along the lines of New York State's 'associated' factories that were becoming popular around mid-century. In this system, rural farmers scaled up cheese production by pooling the milk of multiple, neighbouring farmers at central locations, where it could be transformed into cheese more economically than in smaller farm dairies. Although the 'factory system' relied heavily on highly skilled craft labour, their goals were industrial in the sense that they sought to produce uniform cheeses for a distant market (the United Kingdom), and they incorporated elements of mechanization and standardization into their methods. Furthermore, the factory system was organized so that farmers retained control over their product—milk—as manufacturers as well as suppliers. Instead of selling milk to factories, farmers contracted out its transformation into cheese and thus retained ownership of it throughout the manufacturing process.<sup>82</sup> Extending farmers' control of milk further into the production process was meant to give them greater leverage vis-à-vis buyers and the market. Ontario's cheese factories were not large corporate enterprises, but

<sup>82</sup> Sometimes farmers owned the cheese factories in *addition* to the milk/cheese, but not always. I explain the arrangements of milk/cheese and factory ownership in greater detail in chapter 1, but for now it is sufficient to note that the ownership of milk and the ownership of factories were two distinct questions.

neither should they be reduced to mere remnants of a traditional (and romanticized) rural past. The industry was an attempt to create a modern, capitalist alternative to both urban manufacturing (which was beginning to draw young men and women to Canada's emerging cities) *and* producing raw materials for volatile global markets.<sup>83</sup>

Finally, the dairy reformers' alternative rural modernity expressed a nascent conservationist ethic.<sup>84</sup> In particular, they were concerned that generations of extensive wheat cropping would—if it hadn't already—exhaust the soil of its fertility. However, their anxieties about soil fertility were more about the risks of social unrest and the progress of the young Canadian nation than a concern that settler agriculture might be doing irredeemable damage to the environment. For reformers, the maintenance of a strong rural society was rooted, quite literally, in stable, fertile farms.<sup>85</sup> The establishment

<sup>83</sup> Historians have struggled to accept this somewhat ambiguous, contradictory state of affairs. For example, in her study of the development of New York state cheese production in the nineteenth century, Sally McMurry explains that she reluctantly uses the term 'factories' because it was common to the time, even though "Early cheese 'factories' resembled modern cooperatives more than large-scale industrial capitalist ventures." McMurry, *Transforming Rural Life*, 237–238n6. In a recent memoir and manifesto on the commons, Heather Menzies further downplays the industrial elements of cheese manufacturing by connecting Ontario's factories to "a continuity of commoning practices across the Atlantic on sailing ships at the time of the Clearances: the traditions of self-organization and doing things in shares, pooling knowledge and effort seamlessly, albeit adapted to the new environment." See Heather Menzies, *Reclaiming the Commons for the Common Good: A Memoir & Manifesto* (Gabriola Island, BC: New Society Publishers, 2014), 97.

<sup>84</sup> Most environmental histories of conservation in Canada have tended to focus on forests, fisheries, and wildlife. For an excellent example that analyzes wildlife conservation in relation to state and non-state actors, see Tina Loo, *States of Nature: Conserving Canada's Wildlife in the Twentieth Century* (Vancouver: UBC Press, 2006). Shannon Stunden Bower's *Wet Prairie: People, Land, and Water in Agricultural Manitoba* (Vancouver: UBC Press, 2011), breaks from this pattern by focusing on how conservationist concerns were connected to watershed and prairie management in agricultural communities in Manitoba.

<sup>85</sup> There is overlap between the liberal idea of self-improvement as it played out in rural Ontario and the idea of the "georgic ethic" that Benjamin Cohen examines in his study of the antebellum United States, even though the latter was less industrial in its outlook. The georgic ethic, he explains, "stands as a means to understand the land that relies upon the lived experience of the laboring individual. . . . From lived experience, they [improvers of the early Republic] understood that the improvement of the soil—increased fertility and health—was synonymous with the improvement of society—a healthier, stronger, and more virtuous culture." See Cohen, *Notes from the Ground*, 18.

of a livestock-centered industry like cheese manufacturing would, they assumed, compel farmers to adopt new methods of manure management, establish more pastureland, and experiment with crop rotation, actions that would permit continuous—perhaps endless—economic growth in turn.

In sum, the first argument of this dissertation is that the factory cheese industry was born of a vision of alternative modernity articulated and encouraged by a small subset of Ontario's rural elite. The factory cheese industry was a socio-ecological experiment rather than a natural development: a project of liberal reform, a soil conservation strategy, and an attempt to establish an economically viable, semi-industrial rural manufacturing sector. Taken together, all three elements were meant to insulate rural society from the dynamic upheaval that characterized the nineteenth-century North American economy while still contributing to capitalist development.

Although the industry expanded considerably in its first forty years, its record on a number of fronts was mixed. Patrons and cheesemakers often behaved in ways that challenged the reformers' claims of liberal cooperation, such as adulterating their milk. Moreover, while cheese production offered patrons a steadier income than wheat, it is likely that the majority of dairy farmers made very little beyond their costs of production. As Robert Ankli writes: "dairying was probably not that profitable: the farmer did not count his own labour time, nor did he value the feed which he mostly grew at the market price."<sup>86</sup> The industry was successful in an aggregate sense, but for the individual farmers

<sup>86</sup> Ankli, "Ontario's Dairy Industry," 270. However, Ankli acknowledges that the profitability of dairying for the average Ontario farm family is difficult to substantiate since farmers' costs of production were not systematically studied in Ontario until the twentieth century.

and cheesemakers involved, it did not seem to deliver all the benefits reformers had promised. In the early twentieth century, rising costs of production on farms and factories, broader changes in the organization of the global food system, and the strength of highly-capitalized dairy processors—such as fluid milk companies and multi-product milk plants—all contributed to the decline of the small rural cheese industry in the province.

If the first contribution of this study is to rescue the deliberate, reformist, and experimental character of the cheese industry from historical obscurity, the second is to offer an explanation for *why* the reformers ultimately failed to accomplish all they set out to do. I offer two interrelated explanations for the shape and character of Ontario's dairy zone by the Great Depression. First, the reformers were only partially successful because the environment and society they sought to reform was a far more complex socio-ecological system than they imagined. Their vision was holistic, but it was also *mechanistic*, and they erroneously believed that once the cheese factory system was put in place it would have the desired effects on land and society.<sup>87</sup> At root, the reformers' beliefs about the nature of the relationship between the proposed industry and the wider world rested on a Cartesian, dualistic separation of humans from nature.<sup>88</sup> But the

<sup>87</sup> This part of my argument echoes that of Stoll, *Larding the Lean Earth*, 212, who explains that for nineteenth-century agricultural improvers in the eastern United States, "methods of improvement fit together like the parts of a machine, like the gears of a clock." I discuss the holistic yet mechanistic dynamic in greater detail in chapter 1. And while the industry is not an example of a 'high modernist' project as described by James C. Scott in *Seeing Like a State*, I do adopt his emphasis on the tension between planned societies and complexities of the vernacular to help understand the reformers' partial success. See Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998).

<sup>88</sup> The mechanization nature began in early modern Europe and accelerated in the eighteenth and nineteenth centuries. See Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco, CA: Harper & Row, 1980); and also Merchant, *Ecological Revolutions: Nature, Gender, and Science in New England* (Chapel Hill: University of North Carolina Press, 1989), 198–231.



industry was not an external, human entity brought to bear on a separate sphere of passive nature. It was a socio-ecological *process* that took shape through the environment. For example, what cheese producers gained in efficiency by shipping milk from farms to factories they often lost by inadvertently creating new avenues for microbial contamination that threatened the yield and quality of cheese produced. In other words, the industry did not *encounter* problems of nature; instead, it produced problems that changed the nature (including the social organization) of the dairy zone itself.<sup>89</sup>

The second reason for the partial success of the dairy zone vision was the industry's relationship to broader developments in global capitalism in the late nineteenth and early twentieth centuries. Reformers tried to embed rural Ontario into the emerging global food system on their own terms, by producing a standardized, mass commodity for an overseas market while maintaining social and economic stability at home. They believed liberal cooperation and selective industrialization could temper capitalism's worst effects. The Ontario cheese factory system worked for a time, but ultimately it did not produce cheddar cheaply enough to survive in a food regime—a particular moment of capitalist development—that demanded it do so. This was the case even though the industry relied heavily on the productivity and appropriation of unpaid human and extra-

<sup>89</sup> Hence in a less teleological and Victorian sense I agree with Derbyshire: cheesemaking *did* become “a natural industry” of Ontario precisely because it is inseparable from the environment through which it formed. It *produced* nature. The idea of “producing” nature has a long theoretical history, especially within Marxist geography. Over time the concept of ‘produced’ nature has shifted from a dualistic idea (humans/capital increasingly take over the production/arrangement of the non-human world) to a more co-productive reading influenced by science and technology studies, namely that human organization is simultaneously produced through and produces the wider environment. Jason Moore, for example, calls this ‘web of life’ the ‘*oiekeios*’ in order to get away from the older language of ‘humanity and nature’ altogether. Moore, *Capitalism in the Web of Life*, 1–14. For a more detailed overview of the ‘production of nature’ debate in Marxist thought, see Noel Castree, “Marxism and the Production of Nature,” *Capital & Class* 24, no. 71 (2000): 5–36.

human work (including that of farm families, cows, microbes), and in spite of the gains made by partially industrializing cheese production. Even the push for greater labour productivity on the part of the province's dairy cattle in an attempt to drive down the costs of production (chapter 4), could not maintain cheese factories as the basis of a cooperative capitalist rural system. Here liberalism served a very clear instrumental purpose: to legitimize the exhaustive labour required to produce good cheese. But by the early twentieth century, tensions around the middling returns to factory patrons and the rising costs of production, combined with the competition from large-scale, highly capitalized agribusiness, began to erode the sway that the reformers' vision of alternative rural modernity held over many rural Ontarians.<sup>90</sup>

Despite its ultimate failure, the reformers' dairy zone vision and the subsequent development of the industry did affect the shape and organization of southern Ontario in a number of ways.<sup>91</sup> The construction of factories went hand in hand with the expansion of the railroads into the provincial interior after the mid-nineteenth century, helping to entrench southern Ontario as a 'civilized' agricultural landscape rather than a forested

<sup>90</sup> This is not to suggest that the liberal order was merely strategic, or wielded in a conspiratorial manner. Quite the opposite: liberal values were deeply felt by many reformers and rural people, such that the exploitation and appropriation under this system appeared natural and desirable. This is surely what it means for liberalism to be hegemonic.

<sup>91</sup> It is more difficult to ascertain the effect of the industry on soil fertility during this period, and my dissertation does not attempt a systematic answer to that question. There is currently interesting work being done to assess historical soil nutrient and land management practices through the Sustainable Farm Systems project at the Historical Geographic Information Systems (HGIS) Lab at the University of Saskatchewan. They are working in conjunction with four other institutions worldwide. See Historical GIS Lab, "Sustainable Farm Systems: Long-Term Socio-Ecological Metabolism in Western Agriculture, 1700–2000," University of Saskatchewan, accessed 10 April 2016 at <http://www.hgis.usask.ca/sustainable-farm-systems/>.

‘wilderness.’<sup>92</sup> The need to feed a growing number of cows meant increasing the acreage devoted to pasturage and fodder crops on the province’s farms, since importing the majority of animals’ feed was prohibitively expensive. The industry’s influence also extended beyond the immediate vicinity of cheese factories. The demand for supplies—such as cheese boxes, dyes, and enzymes necessary for coagulation—created new linkages with Ontario’s receding forest lands, upstate New York, central and eastern Europe, and parts of England’s colonial empire. The cheese industry ultimately played an important role in establishing and spreading liberal norms through the Ontario countryside. Many craft cheesemakers, for example, internalized and celebrated the individualist, self-improvement ethic associated with liberalism, even as they criticized labour practices in the factory system.

The failures of the industry unintentionally generated the conditions for capitalist development in other places and industries. For instance, during the second half of the nineteenth century, it created opportunities for the expansion of spin-off industries (in Ontario and beyond) in cheese box production, dairy equipment manufacture, and emerging biochemical industries, and contributed to the production of scientific knowledge that would later allow for a more thorough industrialization of cheesemaking. Perhaps the greatest irony of the cheese industry’s decline was that it generated many of

<sup>92</sup> On the process of “making” Ontario an agricultural landscape before the railway era, see J. David Wood, *Making Ontario: Agricultural Colonization and Landscape Re-creation Before the Railway* (Montreal, QC: McGill-Queen’s University Press, 2000).

the conditions that facilitated the rise of agribusiness in dairy after the First World War, thus setting another wave of capitalist accumulation in motion.<sup>93</sup>

Some caveats are in order. Cheese was not the only dairy commodity produced in Ontario during this period, nor was factory cheese production uniformly adopted across the province, a point I address in greater detail in chapter 2. Farm made butter and home consumption of milk and cream remained extremely important functions of dairying throughout the period examined here, even though reformers encouraged the movement of buttermaking to factories (called creameries) beginning in the 1880s.<sup>94</sup> In fact, Haslett estimates that milk for cheese manufacture never represented more than sixty per cent of the overall provincial supply, and was only the dominant outlet for milk for five years during the industry's height in the early 1900s.<sup>95</sup> Fluid milk production for commercial sale—in both fresh and condensed forms—also began to grow in the early twentieth

<sup>93</sup> Here I am applying the insights of Don Mitchell and Jason Moore, both of whom are interested in how environments, broadly defined ('landscapes' in the former's case, and the 'oikeios' in the latter's) simultaneously produce the opportunities for and constrain the ability of future capitalist growth. See Moore, *Capitalism and the Web of Life*, 151, for a particularly succinct expression of this argument as developed throughout the book. On the development of Mitchell's recent thinking about the function of landscapes for capitalism, see Don Mitchell, "Labour's Geography and Geography's Labour: California as an (Anti-)revolutionary Landscape," *Geografiska Annaler: Series B, Human Geography* 95, no. 3 (2013): 219–233; Mitchell, "New Axioms for Reading the Landscape: Paying Attention to Political Economy and Social Justice," in *Political Economies of Landscape Change: Places of Integrative Power*, edited by James L. Wescoat Jr. and Douglas M. Johnston (Dordrecht, Netherlands: Springer, 2008), 29–50; and Mitchell, *They Saved the Crops: Labor, Landscape, and the Struggle over Industrial Farming in Bracero-Era California* (Athens, GA: University of Georgia Press, 2012).

<sup>94</sup> On the development of the creamery butter industry in Ontario, see Derry, "Gender Conflicts in Dairying," 31–45; and Haslett, "Factors," 110–133. On butter production in Canada as a whole, see Ruddick et al., *The Dairy Industry in Canada*, 25–44.

<sup>95</sup> Haslett, "Factors," 2, and Appendix A, 160. David Hume et al. note that the proportion of provincial milk for cheese fell to just over 14 per cent by 1950. See Hume et al., *The Livestock Industry in Ontario: A Century of Achievement, 1900–2000* (Brampton, ON: InfoResults Ltd., 2007), chapter 3, page 6. Also see R. Marvin McNnis, "The Changing Structure of Canadian Agriculture," 193 [Table 1]; and Drummond, *Progress Without Planning*, 371 [Table 3.4], for patterns of milk use in Ontario between 1920 and 1940.

century. Cheese production is nevertheless a compelling lens for analysis because it was the first of the dairy commodities that contemporaries attempted to industrialize and the particular one around which reformers framed their utopian vision. Although cheese only represented a small portion of the province's overall agricultural output, it did become one of the country's most valuable exports by the turn of the twentieth century.

Moreover, many contemporaries *imagined* that cheese manufacturing would become more critical to Ontario agricultural production than it did, so its failure to do so is interesting in its own right.<sup>96</sup> However, I do discuss other forms of dairy production and processing to the extent that they are relevant for understanding the cheese industry between the 1860s and 1930s.

My choice to end this study in the 1930s rather than following the full arc of cheese factory decline also warrants explanation. One reason is pragmatic: the space required to effectively reassess the industry's origins and analyze dairying throughout the twentieth century would have exceeded the bounds of a standard dissertation. But I would also argue that the 1930s mark a clear break between two competing modernist ideas for how dairy could function within rural Ontario. The rural elites, dairy experts, and agricultural bureaucrats abandoned their emphasis on the small rural cheese factory as the central pillar of rural reform by the end of the 1930s in exchange for a more rationalized, industrial, and atomized vision of agricultural modernity.

<sup>96</sup> I am inspired here by Philip Scranton and Patrick Fridenson's call for business historians to turn their attention toward failure as a valuable line of historical inquiry. See Philip Scranton and Patrick Fridenson, *Reimagining Business History* (Baltimore, MD: Johns Hopkins University Press, 2013), 108–113.

This dissertation is not a study of shifting consumption patterns or the politics of dairy consumption in their own right, even though environmental historians such as Kendra Smith-Howard, Kathryn Morse, and John Soluri have capably shown what combining questions of production and consumption can do for historical analysis.<sup>97</sup> And I am cognizant of James Murton's reminder that questions of production and consumption are connected through institutions like markets, which "in general are not natural or inevitable, but rather had to be built out of ecological conditions, farming practices, culture, and state policy[.]"<sup>98</sup> I do not ignore questions of consumers (or markets), but these play a supporting role in the following study.

Finally, this analysis should not be understood as representative of changes in dairying or agricultural development throughout Canada, even though many reformers, such as James W. Robertson (chapters 3 and 4), believed quite deeply that the factory system in Ontario and Quebec could serve as a useful model for further expansion.<sup>99</sup> Dairying in Prince Edward Island, Nova Scotia, and the prairie provinces underwent parallel (but not identical) transformations as central Canada in the nineteenth and twentieth centuries, but just as the dairy zone vision did not play out as expected within

<sup>97</sup> For instance, Kathryn Morse's excellent environmental history of gold moves back and forth between questions of production and consumption (of food, of gold, of transportation methods) in such a way that highlights their deep interconnections. See Kathryn Morse, *The Nature of Gold: An Environmental History of the Klondike Gold Rush* (Seattle: University of Washington Press, 2003). See also John Soluri, *Banana Cultures: Agriculture, Consumption & Environmental Change in Honduras & the United States* (Austin: University of Texas Press, 2005), 1–17; and Smith-Howard, *Pure and Modern Milk*, 6.

<sup>98</sup> James Murton, "John Bull and Sons: The Empire Marketing Board and the Creation of a British Imperial Food System," *Edible Histories, Cultural Politics: Towards a Canadian Food History* (Toronto, ON: University of Toronto Press, 2012), 227.

<sup>99</sup> The industries in Ontario and Quebec were not interchangeable, but they developed around the same time and shared many similarities. See Ruth Dupré, "Regulating the Quebec Dairy Industry, 1905–1921: Peeling Off the Joseph Label," *Journal of Economic History* 50, no. 2 (1990): 339–348.

Ontario, it would be problematic to assume that developments elsewhere in Canada necessarily followed a similar trajectory. A new national synthesis of Canadian dairying is indeed overdue, but this remains an area for future work. Rather, my focus is on the relationship between a specific region and wider changes in the development of a global capitalist food system.

### *Roadmap*

Chapter 1 introduces the reformers and their ‘dairy zone vision,’ the idea that cheese manufacturing was an ideal vehicle for improving the rural economy, conserving soil fertility, and transforming rural people into liberal individuals. This elite vision took shape in the context of multiple spheres and scales of influence: the context of mid-nineteenth-century wheat production in rural Ontario, the emergence of a parallel industry in nearby New York State, the shifting terrain of techno-scientific knowledge (particularly the rise of germ theory and debates about soil fertility) and finally, the dynamic upheaval of nineteenth-century economies, especially the effect of an emerging global food system geared toward feeding the expanding working classes in the United Kingdom. The dairy zone vision did not have the coherence of a state-driven project of reform, but the CDA and the agricultural press offered reformers avenues for disseminating their cheese-centered goals of rural reform while also solidifying the vision itself. Understanding the goals and parameters of the dairy zone vision is critical to understanding the subsequent development of the industry as an intentional but contested

socio-ecological project because it functions as a benchmark against which landscape and societal change in the late nineteenth and early twentieth centuries can be measured.

Chapter 2 moves from the dairy zone as a vision of alternative rural modernity to its construction. More than a thousand factories were built between 1864 and the peak of the industry in the early 1900s. Scholars have tended to treat this growth as an automatic, almost natural process, but building the industry was far from smooth or straightforward. Human and extra-human nature converged with the circulation and disruption of capital and the preexisting environment to transform rural Ontario into a landscape suitable for factory-based cheese production, but it nevertheless looked much different than reformers had imagined. The rise of the industry also created and deepened linkages between Ontario and other landscapes—such as England, Central Europe, and the Caribbean—since the industry relied on a steady supply of salt, annatto, and other inputs in order to expand cheese production. Ultimately, chapter 2 argues that Ontario's dairy zone was a deeply transformative process that produced nature rather than a clearly demarcated or stable place.

Chapter 3 asks whether the cheese factory system *operated* as reformers expected. Although the reformers' vision was holistic in the sense that they linked society, culture, economy, and the land, their understanding of the relationships between these elements was still deeply mechanistic. Producing standardized, uniform cheese for export proved extremely difficult because the industry operated ecologically, not mechanically. Despite the aggregate success of Canadian cheese exports and the celebratory rhetoric of reformers, I argue that the industry at the turn of the twentieth century was characterized



by dysfunction and struggle, which becomes clear when you examine the daily work of transforming milk into cheese. Overall, chapter 3 examines the growing dissonance between the reformers' vision of liberal rural cooperation and the reality on the ground, and suggests, more generally, that industries are socio-ecological processes, rather than entities easily separable from the environments in which they operate.

Despite these challenges, reformers in the late nineteenth century hung tenaciously to the vision of an alternative rural modernity. Chapter 4 documents the reformers' attempts to stabilize the industry by reinforcing liberal "bonds of cooperation" between and amongst cheesemakers, patrons, and buyers.<sup>100</sup> In particular, I examine the rise of permanent, seasonal dairy schools (geared toward the province's cheese and buttermakers), and a program of scientific cattle management led by the Dominion Dairy Branch.<sup>101</sup> These two reformist strategies had much in common—both were educational in focus but began to take on more disciplinary, state-based characteristics around the turn of the century—but the rise of scientific cattle management in particular signaled a shift amongst dairy reformers and state experts away from the holistic model articulated in the dairy zone vision to a more atomized, growth-centered plan for rural development.

Chapter 5 shifts focus to the first three decades of the twentieth century, when rural, export-oriented cheese factories began to decline in Ontario.<sup>102</sup> Between the First World War and the Great Depression, the number of cheese factories in the province fell

<sup>100</sup> The phrase "bonds of cooperation" is drawn from Ferry, *Common Good*.

<sup>101</sup> References to both programs in the literature on Ontario dairy are often made in passing, alluded to as an obvious sign of the industry's 'progressive development,' but these programs have not been critically examined to date.

<sup>102</sup> The second wave of decline, beginning after the Second World War, is the period that most interests Menzies in *By the Labour of Their Hands*.

significantly, with overall cheese exports declining as well. At the same time, on-farm milk production continued to increase, as did the variety of outlets for farmers' milk, including urban dairies, creameries (which produced butter), and multi-product milk plants that manufactured all manner of highly industrialized dairy products (including condensed and evaporated milk, skim milk powder, and eventually, processed cheese). Chapter 5 shows how 'Big Dairy' was able to consolidate its control over Ontario's dairy zone during this period—largely at the expense of the rural craft cheese industry. By the Great Depression, the nineteenth-century dairy zone vision, with its goal of an alternative rural modernity, was all but dead.

Finally, the conclusion summarizes the major arguments made throughout the dissertation and details its contributions to debates about Canadian rural history and liberal order, and environmental histories of North American agriculture. I also briefly discuss the significance of this study for understanding the current, twenty-first century resurgence in craft cheese production in Ontario.

## Chapter 1: The Dairy Zone Vision

There is a large amount of first class arable land in Canada, and our climate being well adapted for the production of cereals, coupled with high prices, has led to a severe run on the great Bank of Nature. But we fortunately have the means of renewal within our reach, if we choose to avail ourselves of the same; and if dairying turns out to be a paying affair, as I have no doubt it will, we shall make the means of resuscitation of over-cropped fields a means of profit in itself.<sup>1</sup>

### *Introduction*

In September 1864, George Buckland left Ontario (then Canada West) for a tour of the eastern United States, returning eager to share his “deep impression of the vast resources” with readers of *Canada Farmer*.<sup>2</sup> Rather than outline all he had seen, the English-born professor of agriculture limited his description to central New York’s Mohawk River valley. In particular, he extolled their “factory system” of cheesemaking, in which farmers pooled together their cows’ milk at local factories and then contracted the production out to one or more specialized cheesemakers. Contemporary New York agriculturists called this region the ‘dairy zone,’ a place believed to be naturally suited for cheesemaking because of its ample cool water, good pastures, regular rainfall and a seasonal climate. Its perceived specificity is a critical point: locals believed it “possess[ed] definite natural limits,” but by 1880 it had been “extended” so much that the term was nearly “meaningless.”<sup>3</sup> New York’s most vocal cheese factory advocate, Xerxes Addison (‘X.A.’) Willard, acknowledged that, “the old districts [in New York] did not

<sup>1</sup> “Dairy Farming versus Manuring with Turnips [Letter to the editor],” *Canada Farmer*, 16 March 1868.

<sup>2</sup> “Cheese Factories [Letter to the editor],” *Canada Farmer*, 1 October 1864. *Canada Farmer* was the product of the 1863 acquisition of the *Canadian Agriculturist* by George Brown, publisher of the *Globe*. For a discussion of the development of the agricultural press in Upper Canada, see Fred Landon, “The Agricultural Journals of Upper Canada (Ontario),” *Agricultural History* 9, no. 4 (1935): 167–175.

<sup>3</sup> McMurry, *Transforming Rural Life*, 12, 172.

anticipate the widespread adoption of their system.”<sup>4</sup> Buckland was part of that extension process by virtue of exploring New York’s dairy zone with the future of Ontario in mind. He stressed the system’s efficiency, the uniformity of the resultant cheese, and the relief it ostensibly brought farmwomen supposedly no longer burdened by heavy equipment and the long hours required for cheesemaking.<sup>5</sup> “Without attempting a dogmatical [sic] decision, in some of the central and eastern parts of Canada, where the soil is naturally adapted to grass and grazing, and where cheese is to some extent already made, the [factory] system is certainly entitled to full and favourable consideration,” he concluded.<sup>6</sup>

As “brilliant borrowers and synthesizers,” Buckland and other rural reformers envisioned a dairy zone for southern Ontario in the mid-nineteenth century.<sup>7</sup> This chapter explains the development, nature and spread of that vision. Through dairying—but particularly rural cheese manufacturing—reformers sought to establish liberal order, restore fertility to the soil, and promote stable, harmonious capitalist growth in the countryside. Advocates of this holistic vision saw cheese factories as ideal vehicles for implementing rural reform for a few reasons. They believed factories would sustain and

<sup>4</sup> Canadian Dairymen’s Association [CDA], *Report of the Canadian Dairymen’s Association...for the Years 1867 and 1868....*[hereafter *1867 and 1868*] (Toronto, ON: 1869), 45. X.A. Willard was a progressive New York farmer who became one of the most vocal supporters of the factory system of cheesemaking. For a biographical sketch of Willard, see Milton C. Sernett, *Say Cheese! The Story of the Era when New York State Cheese was King* (Cazenovia, NY: self-published, 2011), 29–36.

<sup>5</sup> “Cheese Factories [Letter to the editor],” *Canada Farmer*, 1 October 1864. Buckland immigrated to Canada from England in the 1850s. For a discussion of his geological and botanical work, see Suzanne Zeller, *Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation*, 2<sup>nd</sup> ed. (Montreal, QC: McGill-Queen’s University Press, 2009), 202–203, 206–208; for his work with the University of Toronto’s agricultural program, see D.A. Lawr, “Agricultural Education in Nineteenth-Century Ontario: An Idea in Search of an Institution,” *History of Education Quarterly* 12, no. 3 (1972): 337–341. For his tenure with *Canadian Agriculturist*, see Landon, “Agricultural Journals,” 172–173.

<sup>6</sup> “Cheese Factories [Letter to the editor],” *Canada Farmer*, 1 October 1864.

<sup>7</sup> The quoted phrase is borrowed from Ian McKay, *Rebels, Reds, Radicals: Rethinking Canada’s Left History* (Toronto, ON: Between the Lines, 2005), 54, who uses it to describe elite liberal British North Americans generally.

expand farmers' investments in land and livestock; that their management would pattern and instill liberal values within the rural population; and that their semi-industrial orientation would capture the benefits of manufacturing without devaluing rural labour. Although reformers occasionally disagreed about the extent to which cheese production could underpin these changes throughout the province, overall they shared a deep faith in the possibility of science and industry to reform rural people and the wider environment. Ultimately, by framing the industry as a deliberate project of rural reform, this chapter challenges the perception of Ontario dairying as an inevitable, 'natural' development.

### *The Vision as Reform*

The decades before the rise of the cheese industry were uncertain ones for Ontario's farmers. Upper Canada was rocked by depression in 1857 as global wheat prices fell, which followed previous slumps in 1834, 1843, and the early 1850s.<sup>8</sup> The ongoing volatility of wheat prices added to the more general instability within the British colonies since the Rebellions of 1837 and 1838.<sup>9</sup> In the early 1860s, the impending end of the Reciprocity Treaty with the United States worried farmers who had taken advantage of the expanded market access the treaty had given them since 1855. Many farmers—especially in eastern Ontario along the St. Lawrence River—had developed a significant trade in dairy cattle to the United States during the U.S. Civil War. As *Canada Farmer* noted, "For some time past, everything in the shape of a cow has been eagerly bought up

<sup>8</sup> Douglas McCalla, *Planting the Province: The Economic History of Upper Canada, 1784–1870* (Toronto, ON: University of Toronto Press, 1993), 181.

<sup>9</sup> John McCallum, *Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario until 1870* (Toronto, ON: University of Toronto Press, 1980), 19–20.

by drovers from the other side.”<sup>10</sup> When the Reciprocity Treaty ended in 1866, it seemed inevitable that at least some of the demand for Canadian wheat and other agricultural commodities would slow.<sup>11</sup>

Threats to agricultural stability extended well beyond markets and prices. Throughout the 1850s and 1860s, pests and diseases like the midge, Hessian fly, and blight moved steadily westward from Lower Canada and the northeastern United States, bringing with them the capacity to severely constrain decent wheat yields.<sup>12</sup> Observers also feared that soil “exhaustion” was contributing to a decline in yields over time, although geographer Kenneth Kelly notes that it is difficult to know for certain whether parts of older European settlements in Ontario were suffering from soil exhaustion by the mid-nineteenth century, since many of these claims drew on evidence from the eastern U.S. seaboard and Europe.<sup>13</sup> Nevertheless, in 1871, Buckland echoed the concerns of a generation of European-born gentlemanly travellers critical of the extensive ‘wheat-fallow-wheat’ system of agricultural production common to Upper Canada when he claimed that in his twenty-four years in British North America, he had seen the wheat

<sup>10</sup> “The Cheese Trade,” *Canada Farmer*, 2 April 1866. Similarly, see “Save the Heifer Calves,” *Canada Farmer*, 2 April 1866. On the steady sale of livestock from Upper Canada to the United States in the 1850s and early 1860s, see Jones, *Agriculture in Ontario*, 192–194.

<sup>11</sup> However, McCalla, *Planting the Province*, 240, argues that the Reciprocity Treaty’s overall influence on the economic development of Ontario was probably more subtle than contemporaries (and some historians) have claimed.

<sup>12</sup> Jones, *History of Agriculture in Ontario*, 203; and Zeller, *Inventing Canada*, 215. Native and non-native weeds also became a considerable problem for Upper Canadian farmers. On Ontario farmers’ problems and responses to weeds, see Clinton Lorne Evans, *The War on Weeds in the Prairie West: an Environmental History* (Calgary, AB: University of Calgary Press, 2002), 53–69.

<sup>13</sup> Kenneth Kelly, “Wheat Farming in Simcoe County in the Mid-Nineteenth Century,” *Canadian Geographer* 15, no. 2 (1971): 98–99.

yield fall from “15 to 30 bushels per acre” to “scarcely any winter wheat whatever.”<sup>14</sup> Similarly, James Thompson Bell (often referred to as ‘Professor Bell’ for his position at Albert University in Belleville in the 1870s) deplored the practice of growing “a succession of crops of wheat, wheat, wheat,” until the land was exhausted and families moved on to the “freshness of virgin soil” further west to repeat the process.<sup>15</sup> Although historians have suggested in recent years that wheat was not nearly the bulwark of Upper Canadian production that the staples thesis suggests, many of the province’s rural elite nevertheless believed that wheat’s declining fortunes signaled real threats to rural progress in central Canada.<sup>16</sup> Their anxieties were amplified throughout the late nineteenth century in light of the context of western expansion in the United States and the Northwest territories, where the continued dispossession of Indigenous land and the efforts of a steady stream of Euroamerican settlers converted complex prairie ecosystems into seas of wheat and corn punctuated by “fields, fences, and firebreaks.”<sup>17</sup> Reformers expressed little concern about the moral and political goals of such violent nation building, but they did worry about the effect that massive influxes of cheap wheat and meat might have on farmers in central Canada. The revolutionary transformation of large

<sup>14</sup> CDA, *Report of the Fourth Annual Meeting of the Canadian Dairymen’s Association for the Year 1871* [hereafter *1871*] (Toronto, ON: 1871), 108.

<sup>15</sup> DAO, *Annual Report of the Dairymen’s Association of Ontario...for the Year 1874* [hereafter *1874*] (Ingersoll, ON: 1874), 63. Bell was an English-born gold rush assayer turned college professor at Albert University in Belleville. See Gerry Boyce, *Belleville: A Popular History* (Toronto, ON: Dundurn, 2009), 113; and W. Brice McVicar, “Genealogy search leads to local link,” *Belleville Intelligencer* [online], 22 October 2008, accessed on 20 November 2013 at <http://www.intelligencer.ca/2008/10/22/genealogy-search-leads-to-local-link>. A comparable critique of westward emigration and exhaustive farming practices emerged somewhat earlier in the eastern United States, particularly the late eighteenth and early nineteenth centuries. See Stoll, *Larding the Lean Earth*, 19–25.

<sup>16</sup> For an extended discussion of the historiographical debate about wheat and its place in Upper Canada and Ontario, see Russell, *How Agriculture Made Canada*, 142–167.

<sup>17</sup> Cronon, *Nature’s Metropolis*, 101.

parts of North America into the “breadbasket of capitalism” in the nineteenth century challenged Ontario’s role as a wheat producer within the emerging global food system.<sup>18</sup>

In response to the troubling and dynamic conditions facing rural Ontarians, Bell, Buckland, and a handful of other elites in Ontario argued for a different model of development for rural Ontario, a variant of what geographer Kenneth Kelly has called “the conceptualization of new, ideal or efficient agricultural landscapes” in the mid-nineteenth century.<sup>19</sup> I call these men dairy reformers because their solution to the problems facing rural society centered on agricultural improvement through convertible husbandry and pairing that with factory-based cheese manufacturing. Buckland and Bell were both European-born professors with interests in agricultural improvement and other Victorian sciences, but supporters of the dairy zone vision were drawn widely from the ranks of the provincial elite, including prominent small town manufacturers, progressive farmers, men with ties to the lumber industry, educational reformers, politicians, bankers, and others. In 1867, these reformers established the Canadian Dairymen's Association (CDA), whose objective was “the mutual improvement in the science of cheesemaking and more efficient action in promoting the general interests of the dairy community.”<sup>20</sup>

<sup>18</sup> Moore, *Capitalism and the Web of Life*, 246–249.

<sup>19</sup> Kenneth Kelly, “The Impact of Nineteenth Century Agricultural Settlement on the Land,” in *Perspectives on Landscape and Settlement in Nineteenth Century Ontario*, edited by J. David Wood (Toronto, ON: McClelland and Stewart, 1975), 64. The expression of idealized, efficient landscapes was not limited to British North America. McMurtry, *Transforming Rural Life*, 12, explains that beginning in the 1830s, New York’s “terrain and land were evaluated in terms and for purposes different from those the earlier Euro-American residents had employed. Most intriguing was the emergence of the idea of a Dairy Zone, an optimistic reevaluation of the landscape in keeping with new necessities.”

<sup>20</sup> CDA, *1867 and 1868*, 4.



The CDA and its successor institutions became the primary vehicles for the development and communication of the reformers' vision of an alternative rural modernity.

In wheat's stead, reformers advocated a system of dairy-focused mixed farming buttressed by a rural cheese manufacturing industry. Their logic was relatively straightforward: farmers should shift toward keeping more livestock and adopt methods of agricultural improvement like crop rotation and manure management, while rural cheese factories (organized around making cheddar for England) would offer them a profitable outlet for their cows' milk, one more stable than wheat markets. Their vision was holistic, but mechanical. They imagined farms and factories working in concert, like cogs in a machine, to improve the quality of rural land while also enabling steady economic growth.<sup>21</sup> This holistic yet mechanical approach to rural reform was expressed most clearly by provincial Deputy Minister of Agriculture Charles Canniff James, who highlighted the interconnections between cheese, land, and society in a lively address to the DAEO in 1892:

This is the *Soil*  
That grew the food  
That was fed to the cow  
That gave the milk  
That went into the cheese that Jack built.<sup>22</sup>

James's adaptation of *The House that Jack Built* made the switch from wheat to dairy sound simple, but in reality, the dairy zone vision entailed a fundamentally different

<sup>21</sup> For instance, factories produced large volumes of whey (a liquid by-product of the cheesemaking process), which could be returned to farmers as feed for young livestock.

<sup>22</sup> DAEO, *Annual Reports of the Dairymen's and Creameries' Associations of the Province of Ontario 1892* [hereafter 1892] (Toronto, ON: 1893), 27.

relationship between farmers and the land than the extensive wheat farming system that was dominant in parts of Ontario in the early twentieth century, where farmers alternated their fields between wheat crops and periods of fallow.<sup>23</sup> The dairy zone plan depended upon making labourious improved farming techniques commercially viable in a context where it was cheaper and less arduous to abandon land after a certain number of years in search for the “freshness of virgin soil,” as Bell put it.<sup>24</sup>

Reformers suggested two forms of livestock management and agricultural production that Ontario’s farmers could adopt in place of the wheat-fallow-wheat method, both of which were rooted in English models of improved husbandry.<sup>25</sup> The first was the practice (popular in parts of England) of establishing permanent pastures of perennial grasses and plants that could sustain cattle (or sheep) over the long term. The dung saved from livestock stabled during the winter could then be used to fertilize arable land (land designated for crops), which allowed farmers to do away with the practice of leaving certain fields in fallow. In this system, pastures and arable land were separate but interdependent components, and the relative proportion of each within individual farms

<sup>23</sup> Kelly, “Wheat Farming in Simcoe County,” 95–96. Managed pasturage and convertible husbandry were rarely adopted in Ontario before the mid-nineteenth century. Even those who did experiment with livestock and crop rotations rarely did so completely or profitably; Kenneth Kelly has shown that even Ontario’s few experimental, ‘gentlemanly’ farmers in the early-nineteenth century tended to rely, to some extent, on “woodlot foraging” for their livestock in lieu of establishing well-maintained pastures. See Kenneth Kelly, “Notes on a Type of Mixed Farming Practised in Ontario during the Early Nineteenth Century,” *Canadian Geographer* 17, no. 3 (1973): 209.

<sup>24</sup> DAO, 1874, 63.

<sup>25</sup> Borrowing from English improvement practices and literature was not unusual in the U.S. and Canada. As environmental historian Brian Donahue explains, Euroamerican settlers could draw on a dizzying variety of English methods of husbandry developed for very specific environments over hundreds of years when they confronted the realities of eastern North America’s more extreme climate and different ecologies. Donahue, *The Great Meadow*, 55–60.

could vary considerably.<sup>26</sup> Yet differences in climate between England and Ontario were impossible to ignore. The province's harsh winters could kill many of the perennial grasses so central to permanent pastures, while late summer droughts—a fairly common occurrence—could quickly constrain the amount of fresh grass available to cows in the peak of the cheesemaking season, which affected the volume of milk they produced.<sup>27</sup> Hence Buckland acknowledged that, "We labor in this country under some peculiar disadvantages with regard to the raising of grasses; and I might say cattle, butter, and cheese, owing to our climate."<sup>28</sup> For Bell, climatic disadvantages made the possibility of extensive permanent pasturage in Ontario debatable:

it is still an undecided question, whether, with our long, cold winters, and hot, dry summers, permanent pastures can be established in this country, equal to those of the British Islands, with their more humid climate, longer open season, and more equal temperature, or whether it will be the more profitable practice to lay down our tillage land in grass for a few years, and then break it up for grain and other crops[.]<sup>29</sup>

Bell's suggestion to regularly rotate pasture and crops points toward the second option that Ontario's dairymen had for reorganizing their farms toward dairy production, namely a form of convertible husbandry.

Convertible husbandry first emerged in England in the sixteenth century, and flourished in the context of the English enclosures of the seventeenth and eighteenth centuries. The basic idea is to rotate one's land through different purposes—including pasturage (referred to as 'artificial' pastures or semi-permanent pastures), cover crops

<sup>26</sup> John Broad, "Alternate Husbandry and Permanent Pasture in the Midlands, 1650–1800," *Agricultural History Review* 28, no. 2 (1980): 81–84.

<sup>27</sup> CDA, 1871, 73. Reflecting the popular theories of the time, one speaker worried Ontario's "tree slaughter" would intensify drought by changing rainfall patterns.

<sup>28</sup> CDA, 1871, 110.

<sup>29</sup> CDA, 1871, 91–92.

(particularly leguminous ones like clover), roots and grain crops—in order to restore or maintain the fertility of the soil. In other words, convertible husbandry collapsed the distinction between permanent pasturelands and permanent arable lands to make agricultural production even more intensive.<sup>30</sup> Although there have been many specific arrangements of crops and livestock established under convertible husbandry, most of those described in the agricultural press and farming treatises in Ontario in the mid-nineteenth century involved four- or five-year rotations, with corn, clover, roots (like turnips or mangels), and grasses (in pasture and/or meadow) breaking up grain production.<sup>31</sup> At the annual conventions of the dairymen's associations, reformers often discussed which combinations of grasses were best suited to temporary pastures for dairy cattle. Most agreed that a diverse mixture was best. For instance, in 1875, Bell reflected the opinion of many when he said “we ought to imitate nature by mixing together such

<sup>30</sup> On the shift within England, see Duncan, *The Centrality of Agriculture*, 64. Moore explains the rise of convertible husbandry in terms of a “double movement” in capitalism in the seventeenth century more generally, namely the combination of “an ‘inner’ conversion of nitrogen-rich pasture into arable land, opening a nitrogen frontier internal to England. The second was an ‘outer’ conversion of the English Caribbean into sugar plantation monocultures. English, then British, capitalism thrived on the basis of this double movement. The industrial revolution took shape on its basis, the first movement issuing labor surpluses; the second, capital surpluses.” When the gains from convertible husbandry began to slow, it was not ‘natural limits’ in an absolute sense that limited growth, but the unwillingness of capital to return mass amounts of labour to agricultural production. See Moore, *Capitalism and the Web of Life*, 245–246; and for convertible husbandry in the context of the eastern U.S., see Stoll, *Larding the Lean Earth*, 55–57.

<sup>31</sup> For examples of rotations that were commonly encouraged, see Egerton Ryerson, *First Lessons on Agriculture; for Canadian Farmers and Their Families* (Toronto, ON: 1871), 113–122, at <https://archive.org/details/firstlessons71west00ryeruoft>; and Charles Edward Whitcombe, *The Canadian Farmer's Manual of Agriculture*, (Toronto, ON: 1874) 64–76, at <https://catalog.hathitrust.org/Record/005709803>. McMurry, *Transforming Rural Life*, 26–28, notes that New York dairymen shifted in the nineteenth century from trying to maintain permanent pastures to a more rotational system. She notes that ‘artificial’ grass pastures were fairly common by the mid-nineteenth century across the U.S. Northeast.

sorts as are likely to grow well together, and ripen at different intervals, so as to afford the cattle a succession of succulent bites.”<sup>32</sup>

If crop rotation was one cornerstone of convertible husbandry, the other was manure. Dairy cattle had two jobs according to reformers: producing milk and manure, both of which could contribute to the farm as an ecological *and* economic unit. Spreading well-rotted dung on one's fields before planting grain and fodder crops was a means of restoring the capacity of the soil, which would allow for greater economic production in turn. However, debates within agricultural chemistry about the nature and problem of soil fertility had broadened the types of fertilizers available to farmers by the 1860s. Sir Humphrey Davy's older vitalist school of thought—which attributed soil fertility to the presence and reproduction of organic humus from animal and vegetable manures—was, by mid-century, under siege by Justus von Liebig, whose mineral-based, inorganic theory reinterpreted fertility as a mathematical and mechanical problem. For Liebig, soil fertility was a question of adding the correct proportion of inorganic elements (nitrogen, phosphorous, and potassium) to a given piece of land.<sup>33</sup> The result of these debates was that improvement-minded farmers in Europe and North America began experimenting

<sup>32</sup> DAO, *Eighth Annual Report of the Dairymen's Association of Ontario...1875* [hereafter 1875] (Ingersoll, ON: 1875), 92–93.

<sup>33</sup> Most discussions of Liebig's contributions to agricultural chemistry have taken place outside the Canadian context. See Richard P. Aulie, “The Mineral Theory,” *Agricultural History* 48, no. 3 (1974): 369–382; Cohen, *Notes from the Ground*, esp. 82–83; Mark Finlay, “The Rehabilitation of an Agricultural Chemist: Justus von Liebig and the Seventh Edition,” *Ambix* 38, no. 3 (1991), 155–166; Erland Mårald, “Everything Circulates: Agricultural Chemistry and Recycling Theories in the Second Half of the Nineteenth Century,” *Environment and History* 8, no. 1 (2002): 72–74; and Pat Munday, “Liebig's Metamorphosis: From Organic Chemistry to the Chemistry of Agriculture,” *Ambix* 38, no. 3 (1991): 135–154. Liebig's mechanistic interpretation reflected an ongoing shift toward mechanical understandings of nature underway since the sixteenth and seventeenth centuries. See Merchant, *The Death of Nature*, esp. 192–235.

with a wider range of fertilizers, some of which were sourced from well-beyond local environments.<sup>34</sup> Charles E. Whitcombe's 1874 *Canadian Manual of Agriculture*—a six-hundred page tome of practical farm advice—devoted more than sixty pages to the topic of manures alone, explaining that possible sources ranged from cow dung, sheep dung, horse dung, and hen dung, to guano, night soil, swamp muck, gypsum, bones, blood, soot, sawdust, seaweed, lime, house slops, clover and turnips.<sup>35</sup>

But if farmers were no longer theoretically limited to materials sourced from their own farms to improve soil fertility, manure was still the most readily available source of fertilizer, and thus reformers spared no opportunity to drive its importance home: "To obtain the full benefit of dairy farming as a restorer of fertility, the farmer ought not to rely solely upon the increased quantity of barnyard manure that it furnishes; he ought also to pay great attention to its quality."<sup>36</sup> Manure was not merely a by-product of dairying; it was a cornerstone of the reformers' entire plan. As Steven Stoll explains, "Improving farmers did not simply keep the stuff—they invested in it....Manure required land enough for pasture, fields for 'high feed' like turnips, buildings for keeping animals over the winter or all year and to store the pile inside, labor to take it from where the animals made it to where it needed to be applied."<sup>37</sup> On the other hand, reformers also drew on insights from Liebig to augment their recommendations to Ontario's farmers. Both Buckland and

<sup>34</sup> Guano, the excrement of Pacific sea birds, is the classic case of a fertilizer imported from the Global South. On the relationship between guano and agricultural chemistry, and farming in the nineteenth century, see W.M. Mathew, "Peru and the British Guano Market, 1840–1870," *Economic History Review* 23, no. 1 (1970): 112–128; and Richard Wines, *Fertilizer in America: From Waste Recycling to Resource Exploitation* (Philadelphia, PA: Temple University Press, 1985).

<sup>35</sup> Whitcombe, *Manual of Agriculture*.... 94–96,

<sup>36</sup> DAO, 1874, 66.

<sup>37</sup> Stoll, *Larding the Lean Earth*, 53.

Bell advised that manure and leguminous crops alone might not be adequate to maintain the fertility of certain soils. They both extolled the use of ground bones, calcareous lime, and other inorganic materials to tinker with the precise necessities of different types of land, since “it must not be understood that dairying, or the raising and fattening of cattle, does not take anything from the soil.”<sup>38</sup>

Reformers were particularly concerned about *how* farmers pursued agricultural improvement. They expected farmers to approach tasks systematically and experimentally, rather than blindly adopting one or another system without reason. They encouraged what Benjamin Cohen calls “georgic science,” a way of engaging in scientific study and agricultural improvement by experimenting on one’s own land, which took shape in the sociocultural and political context of the antebellum U.S. Georgic science associated lay, “praxis-oriented” scientific activity with particular “virtues consistent with the celebrated moral order of the early national period, among them hard work, diligence, industriousness, and individual experience.”<sup>39</sup> Ontario’s dairy reformers encouraged farmers to take a georgic approach by insisting they needed to approach the task of agricultural improvement systematically and share their results with the wider dairying community. “No man need expect to succeed in the dairy business, unless he is willing to make the wants, the well-being, the productiveness of his cows, a constant study,” warned the Reverend William F. Clarke at the 1871 CDA convention.<sup>40</sup> Similarly, the banker and first president of the CDA, Charles Eli Chadwick, insisted that georgic science would

<sup>38</sup> CDA, 1871, 109.

<sup>39</sup> Cohen, *Notes from the Ground*, 30–32.

<sup>40</sup> CDA, 1871, 72.

benefit institutions like the dairymen's associations: "Practice with science is what the dairymen need to fully develop the resources of the farm and dairy, and one great measure for attaining this object is by such associations as these, where each member brings his experience, knowledge and science for the benefit of all[.]"<sup>41</sup> However, reformers sometimes treated average farmers with enormous contempt. In practically the same breath that Chadwick extolled the benefits of lay experimentation, he disparaged the "thorough going, old fashioned, self-sufficient farmer, whom you could as readily convince that he was his own plough horse, as to persuade him that the smut on his wheat was a parasitical plant[.]"<sup>42</sup>

Chadwick's patronizing tone points to the importance of the dairy zone vision for reforming not just land, but rural *people*, too. Reformers believed a systematic approach to agricultural improvement would cultivate liberal values amongst supposedly 'backward' farmers. For example, after delivering his version of *The House that Jack Built* to the DAEO, C.C. James insisted that improving dairymen was the key to a robust and productive landscape: "upon his [the farmer's] ambitions and determinations, upon his education and training, all will depend....There is a possibility of development in connection with our soil and our cows that we little dream of, and it must be done by first improving the men and women who are engaged in the dairy industry."<sup>43</sup> The dairy zone vision emphasized the importance of liberal values of rationality and industriousness as

<sup>41</sup> DAO, 1875, 134.

<sup>42</sup> DAO, 1875, 136. Equally telling is the title Chadwick's address: "Elevating the Intellectual Character of the Dairy."

<sup>43</sup> DAEO, 1892, 30. That James was still insisting on the *potential* of dairy in the 1890s is a sign of the cheese industry's ongoing difficulties in the nineteenth century (see chapters 2 and 3).



they shaped systematic scientific practice. Bringing farmers into closer interaction with one another through collective patronage and management of local cheese factories would help spread these values throughout the rural population and develop a feeling of classlessness between farmers, cheesemakers, and merchants.

Just as reformers advocated the reorganization of farms along particular lines, they also preferred certain organizational arrangements at the factory level for the potential effect they would have on rural society. First and foremost, reformers encouraged a type of manufacturing system where the suppliers of milk—patrons—retained ownership over their milk, even after it had become cheese. They did not sell milk to cheese manufacturers. Instead, patrons were typically paid the selling value of the cheese (based on the proportion of milk they supplied) minus a fixed manufacturing rate that they were charged for each pound of cheese produced. To ‘cooperate,’ then, meant to pool milk with one’s neighbours and contract out its transformation into cheese as property owning individuals in voluntary association with one another.<sup>44</sup> This arrangement was an alternative to anti-capitalist collectivization *and* classic models of individual market exchange. The cooperative pooling system appealed to reformers because it reinforced liberal values—like the idea of milk as property and the freedom of farmers to engage in the market without interference from the state—while offering them a modest way to increase their control over the chain of production. The pooling system was, in essence,

<sup>44</sup> Ruddick explains: “Practically every type of cheese factory organization in Ontario contains the germ of cooperation, but in many the only cooperative feature is that of making the cheese in one place for a number of farms. There is no profit-sharing on the part of suppliers, nor have they any voice in management except such indirect influence as may be brought to bear by the patrons of any establishment who may withdraw their trade if they are dissatisfied.” See Ruddick et al., *The Dairy Industry in Canada*, 48.

the organizational embodiment of reformers' moral critique of unrestrained liberal capitalism.

The ownership of factories was a separate question from the ownership of milk/cheese. If patrons almost universally retained the ownership over their milk/cheese, the ownership of factories could take a number of different forms: proprietary, joint-stock or co-operative (see Table 1).<sup>45</sup> The first option was proprietary, where an individual or individuals owned the buildings and equipment used to manufacture cheese and were contracted to do so by local farmers. In many cases the owner was also the cheesemaker, but in others, the owner(s) hired cheesemakers on monthly or seasonal bases. To be clear, these proprietary companies did not purchase the milk from patrons; they merely engaged in a contract to produce cheese at an agreed upon rate (usually expressed in terms of a number of cents per pound of cheese manufactured). Proprietary owners had to strike a balance between offering a rate that was low enough to compete with neighbouring factories for a limited supply of milk but high enough to cover their costs of production and make a profit.<sup>46</sup> The second possible model was a joint-stock corporation, where a

<sup>45</sup> For other descriptions of factory arrangements, see Haslett, "Factors," 15; Menzies, *By the Labour of Their Hands*, 40–42; and Ruddick et al., *The Dairy Industry in Canada*, 48–49. Haslett claims that most proprietary factories purchased milk outright, but I believe he is mistaken in that regard. The only clear reference I have found of an instance where farmers sold their milk directly to a factory for cheese manufacture was at the Dunchurch Cheese Association in Muskoka, Ontario at the turn of the twentieth century. The factory, previously a joint-stock effort, was sold to Alex Anderson of Rosseau. The former secretary notified the patrons by letter that "a contract has been entered into with Mr. Alex. Anderson, of Rosseau, to run the factory for this season on the following terms: He buys the milk outright, paying 60c. at the factory[.]" See F.N. MacFie to patrons, n.d., File 1: Dunchurch Cheese Association, 1898–1900, Dunchurch Cheese Association fonds, MU 4551, Archives of Ontario.

<sup>46</sup> Some factory owners established combinations or chains of small factories within a given area or region (particularly in parts of eastern Ontario), in an attempt to deter the development of competing factories while eliding the problem of shipping milk from a wide area to one central factory. See Ruddick et al., *The Dairy Industry in Canada*, 54–56; and Menzies, *By the Labour of Their Hands*, 40–41.

number of patrons and occasionally non-patrons bought up shares of capital stock to finance an operation. Non-shareholders (sometimes referred to as ‘outsider patrons’) could supply milk to these factories, but they were usually levied a higher manufacturing rate than those holding shares. Company stockholders typically elected a board of directors who were then tasked with hiring the cheesemaker and other managerial duties. The final model was cooperative in the more formal sense of the word; in this arrangement *all* of the patrons supplying milk collectively owned the factory, elected representatives, hired the maker(s), and so on.<sup>47</sup>

**Table 1.** Common factory ownership arrangements in the Ontario cheese industry until the early-twentieth century

Company type	Milk-cheese ownership	Factory ownership	Labour arrangements	Profit distribution to patrons	Responsibility for capital investments
<i>Proprietary</i>	Patrons (farmers who supply the milk)	Individual(s)	Factory owner is often the maker, or may hire maker(s) and assistants, usually on monthly or seasonal salaries (but occasionally by piece rate).	Patrons receive the selling value of cheese based on proportion of milk supplied, minus a manufacturing rate per pound of cheese established by factory owner each season.	The owner(s) of the factory, from whatever profit remains after covering wages and other operating costs.

<sup>47</sup> Ruddick et al., *The Dairy Industry in Canada*, 48–49. Ruddick noted that most of the initial factories in Ontario were proprietary, but his claim was based largely on his personal involvement in the industry as a cheesemaker and the country’s second Dairy Commissioner.

<i>Joint-stock</i>	Patrons (farmers who supply the milk)	Company stockholders, who are usually—but not necessarily—patrons too.	Board of directors hires maker, usually by piece-rate, (but occasionally by salary). ‘Head’ maker is responsible for hiring assistants as required.	Non-stockholding patrons receive selling value of cheese based on proportion of milk supplied, minus manufacturing rate per pound of cheese.  Stockholding patrons receive selling value of cheese based on proportion of milk supplied, minus manufacturing rate per pound of cheese.  Arrangements for paying dividends varied.	Stockholders (via an elected board of directors), drawn from whatever profit remains from manufacturing rate after paying wages and other operating costs.
<i>Cooperative</i>	Patrons (farmers who supply the milk)	Patrons	Board of directors hires maker, usually by piece-rate, (but occasionally by salary). ‘Head’ maker is responsible for hiring assistants as required.	Patrons receive the selling value of cheese based on proportion of milk supplied, minus a manufacturing rate per pound of cheese established by board of directors or by vote.	The patrons (via elected board of directors or by vote) drawn from whatever profit remains from manufacturing rate after paying wages and other operating costs.

*Note:* Contemporaries generally used the term ‘patrons’ to refer to any farmer who supplied milk to a factory, regardless of their formal relationship to that enterprise. I have preserved this admittedly ambiguous usage in the following discussion, clarifying what kind of patron I mean when necessary.

Overall, these arrangements differed in terms of the degree of formal control that farmer-patrons retained over decisions about the cost of manufacturing and other issues of factory management. Reformers especially encouraged the cooperative or joint-stock

models of ownership as the preferred means of starting a well-sized factory because it spread the responsibility (and risk) of capital across a number of people, but also because it would compel farmers to get involved in the daily management of factory affairs, which would, like the management of intensive mixed farms, instill in them a healthy respect for the value of property. Proprietary factories were less ideal in this respect, but many reformers tolerated them (and in a number of cases, owned and operated proprietary factories themselves).<sup>48</sup>

The possibility of more or less cooperation in factory ownership arrangements points to the malleability of liberal ideas in nineteenth-century Ontario. Cooperation and liberal individualism were not at odds for mid-nineteenth century reformers, who used ‘cooperation’ in a broad sense to encourage a collective liberal identity that would unite rural individuals across divisive political and class lines in the name of economic growth and progress.<sup>49</sup> In this sense, cheese factories were expected to function as miniature voluntary associations that instilled “liberal bonds of mutualism” as a means of overcoming dissent and political instability.<sup>50</sup> For example, the president of the CDA in 1871, James Noxon, explained that it “is a fallacy to suppose that there are antagonistic interests existing between the patrons of factories and factory men, as that which is for the pecuniary interest of one is for the interest of all[.]”<sup>51</sup> When James W. Robertson, a

<sup>48</sup> This was particularly the case in eastern Ontario. For example, Ruddick notes that Ketchum Graham (who he mistakenly calls Ketchan Graham)—vice-president of the CDA, first president of the DAEO, and politician—began one of the first (and largest) factories in eastern Ontario with the Hon. Robert Reid. Ruddick et al., *The Dairy Industry of Canada*, 47; and “The Sidney Cheese Factory—The Profits of the Trade,” *Canada Farmer*, 15 February 1867.

<sup>49</sup> Ferry, *Common Good*, 234–240.

<sup>50</sup> Ibid., 6–7, 15.

<sup>51</sup> CDA, 1871, 122.

cheesemaker who eventually became Canada's first Dairy Commissioner, claimed that "The cheese factory is a model of co-operation—the model upon which most co-operative associations for farmers can best be based and organized," he was extolling a liberal way of organizing rural society, not a radical, populist measure.<sup>52</sup> This perspective was further reflected in the organization of the CDA and its successor institutions. In *By the Labour of Their Hands*, Heather Menzies argues that the founders of the CDA missed a key opportunity to "become a local counterweight to the [English] importers' clout" by making the association a cooperative marketing organization. She implies that their decision to eschew the "local solidarity" option was an unfortunate lack of foresight, but within the framework of liberal capitalism their choice makes perfect sense; the founders of the association—or at least a majority of them—considered a marketing association too direct an interference into the workings of the market; they preferred to support producers indirectly, through education.<sup>53</sup> In other words, the dairy zone vision was not an expression of anti-modern, romantic agrarianism, but an attempt to fashion a collective liberal agrarian identity that, like George Henderson writes of Californian 'rural realism,' "totaliz[ed] the ideals of the liberal capitalist market" at the same time that it expressed a belief that "the rural" could redeem capital, making it "less crisis ridden (temporally, socially, spatially), or at least make it seem so."<sup>54</sup>

<sup>52</sup> DAWO, *Annual Report of the Dairy and Creamery Associations of the Province of Ontario, 1888* [hereafter *1888b*] (Toronto, ON: 1889), 63-64. Note that the titles of the association reports for the conventions held in January of 1888 (about the season of 1887), and the conventions held January 1889 (about the season of 1888) were both titled '1888.' To avoid confusion, I have designated the former as *1888a*, and the latter as *1888b*.

<sup>53</sup> Menzies, *By the Labour of Their Hands*, 55.

<sup>54</sup> George Henderson, *California & the Fictions of Capital* (Philadelphia, PA: Temple University Press, 1998), xiv.

### *Why Cheese?*

Cheese was not the only agricultural commodity upon which reformers might have based their vision of alternative rural modernity. There were other options for livestock and horticultural production that required fewer inputs and less labour than dairying for cheese production, including sheep rearing, beef raising, fruit culture, and honey production. Even *Canada Farmer*, a pro-cheese publication, acknowledged that dairy was not the *only* path to rural salvation.<sup>55</sup> So why was cheese so critical to the reformers' vision? A cynical interpretation might suggest that reformers merely advocated cheese for their own benefit—and some likely did—but cheese factories satisfied the desire of rural elites to incorporate elements of industrialization into the countryside and appeared to be the most viable option for a stable rural manufacturing sector in the 1860s.

Reformers toed a fine line between reform and boosterism. A few of the CDA's initial members did stand to gain from the industry's development. Adam Oliver, a mill owner and investor in the 1866 Ingersoll 'Mammoth' cheese (see below), manufactured cheese boxes, and James Noxon, an executive member of the CDA and a prominent agricultural implements manufacturer, produced cheese hoops at his factory in Ingersoll.<sup>56</sup>

<sup>55</sup> "The Cheese Trade," *Canada Farmer*, 1 March 1864. The author notes that the high price of wool made sheep rearing enticing, but they nevertheless placed their bets on 'cheese dairying.' It is possible they were aware of the periodic collapses of the wool industry in the United States, which might have seemed too similar to the risks they took with wheat. For a discussion of the 'boom and bust' of wool farming in the United States, see Stoll, *Larding the Lean Earth*, 108-115.

<sup>56</sup> On Adam Oliver, see George Neil Emery and Glenna Oliver Jamieson, *Adam Oliver of Ingersoll, 1823–1882: Lumberman, Mill Owner, Contractor, and Politician* (Ingersoll, ON: Ingersoll & District Historical Society, 2002), 22. On James Noxon, see George Neil Emery, *Noxons of Ingersoll, 1856–1918* (Ingersoll, ON: Ingersoll Historical Society, 2001), 13.

Yet many reformers without direct ties to the industry also believed that the economic benefits of rural cheese manufacture would be widespread—that those who began cheese factories on the “cooperative principle” would see hard cash for their efforts. When the Reciprocity Treaty with the United States ended in 1866, *Canada Farmer* argued that making cheese in the factory “would be found more profitable than wheat growing, *even were the Reciprocity Treaty continued.*”<sup>57</sup> In the very same issue, the editors reminded readers that in 1865, Canadian consumers imported 2,530,650 lbs. of cheese from the United States, which amounted to \$381,891 in value foregone by local farmers.<sup>58</sup>

Reformers’ collective enthusiasm for cheese manufacturing rested on the erroneous belief that the United Kingdom’s appetite for cheddar was insatiable as long as Ontario produced a high quality article. “[A] really fine article never goes begging for customers,” claimed one speaker at the CDA convention in 1872.<sup>59</sup> Responding to concerns that they might overproduce cheese if Canada went “*en masse* into [its] manufacture,” editors from *Canada Farmer* responded that, “were we producing a surplus however large, Great Britain furnishes an ample outlet for it.”<sup>60</sup> Similarly, in 1874, Professor Bell tried to assuage farmers’ concerns that the sudden drop of cheese prices in the early 1870s were an anomaly, offering letters he received from English merchants as evidence that, “the cheese-producing capability of Canada will not be equal to overstock such a market for generations yet to come[.]”<sup>61</sup> If farmers and cheesemakers worked

<sup>57</sup> “End of the Reciprocity Treaty,” *Canada Farmer*, 2 April 1866 [emphasis mine].

<sup>58</sup> “The Cheese Trade,” *Canada Farmer*, 2 April 1866.

<sup>59</sup> CDA, 1871, 122.

<sup>60</sup> “Dairy Farming in South Oxford,” *Canada Farmer*, 1 February 1864.

<sup>61</sup> DAO, 1874, 61.



cooperatively, honestly, and with the goal of ever increasing the quality of their make, Canada would always have a place in English markets. Reformers *naturalized* the stable growth of the UK cheese market at the same time they critiqued market volatility for other commodities.

Their initial optimism was not entirely misplaced. As Richard Blundel and Angela Tregear have shown, agricultural improvement, transportation systems, and urban growth combined to create large commercial cheese markets in England by the mid-nineteenth century that domestic production alone struggled to meet.<sup>62</sup> However, in order to establish a solid presence in the English market for cheddar, Ontario producers needed to make cheese that could compete in terms of quality and type to what was already available. They did so by treating cheese production as a system that could be standardized and improved by building factories. Even though factories relied on many of the same craft techniques and similar technologies that women cheesemakers used in farm dairies, reformers stressed that this was not your mother's cheese. *This* was a science. "My poor mother," Buckland recalled in 1871, "used to make pretty good cheese, though sometimes but indifferent, by this system of guessing[.]" while in the factory "a better and cheaper article, far more uniform in quality, is made[.]"<sup>63</sup> As Marjorie Cohen suggests, women's achievements in dairying were explained as coincidence or habit rather than intentional improvement.<sup>64</sup> Likewise, the dairy instructor J.B. Harris explained that pre-factory cheese, or "good, old-fashioned Dunlop," varied too widely in terms of size, texture, and

<sup>62</sup> Richard Blundel and Angela Tregear, "From Artisans to 'Factories': The Interpenetration of Craft and Industry in English Cheese-Making, 1650–1950," *Enterprise and Society* 7, no. 4 (2006): 709–715.

<sup>63</sup> CDA, 1871, 112.

<sup>64</sup> Cohen, *Women's Work*, 115. See also McMurry, *Transforming Rural Life*, 168–169.

flavour, such that the “accumulated results of the...neighbourhood or township was a sight to behold—all manner of circular blocks, of concentrated error, large and small, thick and thin[.]”<sup>65</sup>

Although reformers tended to exaggerate the differences between farm and factory cheese production, to a much greater degree than the farmwomen who preceded them, the factory cheese industry harnessed craft toward not just commercial, but industrial ends.<sup>66</sup> The purpose of craft in the factory system was to make a uniform, consistent product that downplayed the environmental differences between Ontario and the United Kingdom—such as the predominance of different grasses and seasonal patterns—while also producing a uniform commodity that could withstand the long oceanic journey. Reformers expected factory cheesemakers to expend (highly-skilled) energy toward “counter[ing] two ever present aspects of nature: entropy and difference,”—as Douglas Sackman has described the industrial impulse in Californian agriculture—in order to perfect nature for profit and distance Ontario’s cheese from its ecological roots.<sup>67</sup> Makers were expected to alter their practices to account for temperature, the variability of milk and other inputs, and the myriad combinations of microbial or other factors that appeared—sometimes quite suddenly—as cheeses developed.<sup>68</sup>

<sup>65</sup> J.B. Harris, *The Cheese and Butter Maker’s Handbook: A Practical Treatise on the Arts of Cheese and Butter Making* (Glasgow, UK: 1885), 44. The specific quotation is drawn from a chapter that reproduced an address given by Harris at the 1884 DAWO meeting in London, Ontario.

<sup>66</sup> McMurtry, *Transforming Rural Life*, 169, makes a similar, but more muted argument about New York factory cheese.

<sup>67</sup> Quotation is adapted from Sackman, “‘Nature’s Workshop’,” 44.

<sup>68</sup> Somewhat ironically, Ontario producers also endeavoured to carve an identifiable niche for Canadian cheese within British markets. Buy Canadian, they argued, *because* of its interchangeability with English cheddar. Yet striking this balance was no easy task. In the early 1890s, for instance, a speaker at a dairymen’s convention wryly congratulated Ontario’s cheese producers for the problem they were having with overseas merchants who relabeled Canadian cheeses as English in origin, “thus acknowledging that

The reformers' industrial cheese of choice was cheddar—in part because of its relatively low moisture content, which made it a better fit for long-distance trade, but especially because it had already displaced many other regional varieties of cheese within England. Cheddar production had been subjected to intense scientific study and systematization since the early nineteenth century due to the highly publicized work of Joseph Harding, a dairy farmer and agricultural educator in Somerset who sought “a chemical knowledge” of the steps involved.<sup>69</sup> What appealed to nineteenth-century reformers about cheddar was Harding's emphasis on acidity as the fundamental principle that determined each stage of the cheesemaking process.<sup>70</sup> As Carolyn Merchant explains, such a mechanistic view of nature was not new, but “the merger of mechanistic science with technology and capitalism during the first half of the nineteenth century sculpted an American instrumental mentality,” that we can extend to Ontario's reformers.<sup>71</sup> The goal of the factory cheesemaker, one contemporary explained, was to emulate the process of digesting milk in the stomach by manipulating the heat of the vat to mimic the digestive

our cheeses were better than their own.” See DAWO, *Annual Reports of the Dairymen's and Creameries' Associations of the Province of Ontario 1891* [hereafter *1891*] (Toronto, ON: 1892), 112. James Murton has described these sorts of production and marketing dilemmas for Canadian apple producers in the early twentieth century. See Murton, “John Bull and Sons,” 232–236.

<sup>69</sup> Blundel and Tregear, “From Artisans to ‘Factories,’” 715; and John G. Davis, “Cheesemaking in Britain: The Past and the Future,” *International Journal of Dairy Technology* 34, no. 2 (1981): 48–49. The technique that distinguishes cheddar from other varieties is not necessarily its systematization—for many varieties are systematized today—but the ‘cheddaring’ step, which refers to piling the curd up against the side of the vat until it begins to ‘mat’ into slabs, which are then cut into blocks and turned over periodically to further develop acid in the curd and expel more whey. Hence Davis, “Cheesemaking,” 51, argues that, “all methods should be regarded as fluid rather than as fixed procedures.”

<sup>70</sup> In the 1860s, X.A. Willard travelled to England to study the particularities of cheddar so that North Americans could adapt the process to their factory system. See “Cheese Mission to England,” *Canada Farmer*, 1 June 1866. However, the transition to and adoption of systematic cheddar techniques was far messier than their reformers' rhetoric suggests, a point discussed further in chapter 3.

<sup>71</sup> Merchant, *Ecological Revolutions*, 230; and Merchant, *The Death of Nature*.

system's acidic conditions.<sup>72</sup> Yet once milk had been turned into cheese, it was time to halt nature's course by dropping the temperature of the vat to avoid the potential for unwanted microbes to enact putrefaction and waste in the final product. Willard explained it as such:

We now know that...the trouble in cheese making also arises from another class of fungi, more or less vicious in character, which get possession of the milk, and curds, or the cheese upon the shelf, overmastering the first-named organisms, which are the cheese makers' real friends....[U]nder the hand of intelligence, [microbes] will do our bidding in the cheese vat and upon the cheese shelves, if we understand and apply the law which the All-Wise Creator has laid down for the government of its being.<sup>73</sup>

That they often struggled to achieve this level of control over the cheesemaking process does not negate the industrial outlook of the dairy zone project.

#### *Extending the Dairy Zone Vision*

The reformers' plan to build an alternative rural modernity through cheese and dairy emerged primarily out of southwestern Ontario. There were certainly its eastern Ontario advocates in the early years—Professor Bell is one example—but many of the system's most vocal supporters hailed from in and around Oxford and Middlesex counties. Their ideas, assumptions, and actions tended to be rooted in the southwest even while they advocated a provincial vision, perhaps because the depression of the late 1850s reverberated the strongest as it travelled along the rails of the Grand Trunk.<sup>74</sup> The local centrism of some reformers was also reflected in the CDA, which was formed in the

<sup>72</sup> Harris, *Handbook*, 21.

<sup>73</sup> CDA, *Report of the Canadian Dairymen's Association, with Transactions...for the Year 1872* [henceforth 1872] (Toronto, ON: 1872), 21.

<sup>74</sup> Jones, *Agriculture in Ontario*, 207.

southwestern town of Ingersoll and hosted the initial conventions.<sup>75</sup> In the early 1870s, eastern Ontario representatives began to complain about the time and cost of travelling to attend the annual convention, and attempted to move the meetings periodically to Belleville, but were soundly defeated despite the begrudging support of western Ontario's highly influential Harvey Farrington. "The Association professed to be provincial," he criticized, "but was in fact local."<sup>76</sup>

For many contemporary observers, Oxford County in southwest Ontario served as a microcosm that reformers could point to as evidence of the vision's merits. The fact that Harvey Farrington emigrated *from* New York's dairy zone to set up the province's first cooperative cheese factory in Oxford was taken as a sign of the region's natural suitability for the system. Buckland enthused about the county's capacity for improved agriculture in 1866: "I think I never saw a more uniformly better soil than is to be found in the County of Oxford. The surface is beautifully undulating, admitting, therefore of easy drainage, and the woods are characterized by those species of deciduous trees that infallibly denote first class land for general agricultural purposes."<sup>77</sup> He was likely

<sup>75</sup> On settlement and town development in Oxford County, including Ingersoll, see Nancy Bouchier, *For the Love of the Game: Amateur Sport in Small-Town Ontario, 1838–1895* (Montreal, QC: McGill-Queen's University Press, 2003), 9–30; Emery, *Noxons of Ingersoll*; and Emery and Jamieson, *Adam Oliver of Ingersoll*, 22–24.

<sup>76</sup> CDA, *1869 and 1870*, 59. Similarly, see CDA, *1872*, preface (n.p). These disagreements eventually led to the establishment of separate—but complementary—associations: the Dairymen's Association of Western Ontario (DAWO) and the Dairymen's Association of Eastern Ontario (DAEO). After the dissenting eastern Ontario reformers failed to have the CDA's meetings moved to Belleville, they created their own organization, the Ontario Dairymen's Association, but in 1874, after the provincial government refused to give financial support to two separate provincial organizations (the Ontario Dairymen's Association in the east and the Canadian Dairymen's Association in the west), they amalgamated briefly as the Dairymen's Association of Ontario and held the first eastern-based convention in Belleville. However, the two split again in 1877, hosting two separate conventions, a week apart, with the locations rotating within each jurisdiction annually. See Haslett, "Factors," 23–24; McCormick, *A Hundred Years in the Dairy Industry*, 144.

<sup>77</sup> "Agricultural Notes of Oxford," *Canada Farmer*, 15 January 1866.

referring to the Oxford till plain that encompasses much of the county, an area of deep, loamy soil with few rocks and generally good drainage.<sup>78</sup>

In 1866, a handful of Ingersoll-based reformers created the Ingersoll Cheese Company to produce a mammoth factory-made wheel of cheese that would cement Oxford's identity as a preeminent dairy county and advertise the merits of the factory system of cheesemaking to other communities in Ontario. Once completed, the cheese weighed 7,300 lbs. and had a diameter of nearly six feet. Producing the 'Mammoth' was a complicated affair. It required the coordination of a thousand or so cows, a couple hundred farmers, one local agricultural implements company, and nearly a dozen cheesemakers working in three different factories.<sup>79</sup> Once it finished curing in early August, a handful of reformers set out on a tour of Ontario and New York with the cheese in tow, ultimately destined for England. When the Mammoth arrived at the New York State Fair in Saratoga later that fall, X.A. Willard commended the Canadian company for making such an enormous cheese "perfect in shape and well preserved," especially since the task of "putting together...a mass of curds to undergo the curing process without decay or serious damage to flavor, is not without difficulties."<sup>80</sup> There were numerous opportunities for contamination since it was difficult to remove all the whey from such a large cheese, but the reformers attributed their success to the precision and planning of the cheese making process—the *systematization* involved in factory production—

<sup>78</sup> On the physiography, soils, and climate of Oxford County and southwestern Ontario more generally, see Donald Gordon Cartwright, "Cheese Production in Southwestern Ontario," 1–19; L.J. Chapman and D.F. Putnam, *The Physiography of Southern Ontario 3<sup>rd</sup> edition* (Toronto, ON: Ministry of Natural Resources, 1984), 143–144; and Surtees, "The Dairy Industry of Oxford County," 4–26.

<sup>79</sup> See Menzies, *By the Labour of Their Hands*, 42–50.

<sup>80</sup> "Canada as a Dairy Region," *Canada Farmer*, 16 September 1867.

including a trip on the part of the cheese makers to Harvey Farrington's factory in Oxford County to "inspect every particular of [his] new venture[.]"<sup>81</sup> Local poet James McIntyre later explicitly connected the Mammoth to Oxford County's ideal dairy landscape:

In barren district you may meet  
Small fertile spot doth grow fine wheat,  
There you may find the choicest fruits,  
And great, round, smooth and solid roots.

But in conditions such as these  
You cannot make a mammoth cheese,  
Which will weigh eight thousand pounds,  
But where large fertile farms abounds.

Big cheese is synonymous name,  
With fertile district of the Thame,  
Here dairy system's understood,  
And they are made both large and good.<sup>82</sup>

But reformers who celebrated Oxford County as the dairy zone ideal had to confront the fact that much of the rest of Ontario was *not* Oxford County. Indeed, southern Ontario is a remarkably diverse ecological and geological region. Part of the region encompasses the Canadian Shield, the series of Precambrian rock that spans much of Canada and is characterized by thin soils and occasionally bare rock. In southern Ontario, the Shield stretches from the eastern shore of Georgian Bay to the Ottawa River valley, but juts sharply southward to meet the St. Lawrence River near Kingston, a geological trait known as the Frontenac arch. The remainder of the southern province is

<sup>81</sup> James Crawford, "The Story of Canada's First Mammoth Cheese," n.p., Facey Family Files, University of Guelph Archives, Guelph, ON. Just over a year later, *Canada Farmer* reprinted a letter from the cheese's British buyer, John T. Davies, noting that the cheese was drawn from the Liverpool docks by handsome grey horses and accompanied by a marching band and six carriages carrying the "gentlemen importers." » Speeches and a formal tasting followed, before the entrepreneurs put the 'Mammoth' on display for the public at the price of sixpence admission. See Letter to the editor, *Canada Farmer*, 1 January 1868.

<sup>82</sup> James McIntyre, "Fertilelands and Mammoth Cheese," *Poems of James McIntyre* (Ingersoll, ON: 1889), e-book edition [Canadiana.org].

defined by the advance and retreat of the Wisconsinian glacier, which left behind different combinations of softer rocks, sand, and clays that created the various ‘tills’ that have since sustained southern Ontario’s forest growth and eventually, agricultural production.<sup>83</sup> Southern Ontario is further distinguished by a number of significant landforms, including the Niagara escarpment, which reaches from Bruce Peninsula to Niagara and separates southwestern Ontario from the rest of the province. In eastern Ontario, the St. Lawrence lowlands stretch from the Frontenac arch to the Ottawa River. In all, southern Ontario consists of fifty-five accepted physiographic regions that reflect various arrangements of soil types, rockiness, and drainage patterns.<sup>84</sup>

Buckland’s provincial agricultural tours were important for assessing the capacity of other parts of the province for the factory system. Between 1864 and 1867, he traversed the province to ascertain and describe the general state of each area’s soils, the progress of agricultural development, and the crops and forms of husbandry most suitable to each.<sup>85</sup> If Oxford’s till plain and other choice regions, like such as the St. Lawrence lowlands, were considered ideal for dairy because of their soils, other areas raised concerns for Buckland and other reformers. He noted that southern parts of Peel County (southwest of Toronto) were worrisomely “sandy and broken,” while large portions of

<sup>83</sup> Chapman and Putnam, *The Physiography of Southern Ontario*, 1–4.

<sup>84</sup> *Ibid.*, 113.

<sup>85</sup> See “Jottings by the Way [Letter to the editor],” *Canada Farmer*, 15 August 1864; “Agricultural Notes of Oxford [Letter to the editor],” *Canada Farmer*, 15 January 1866; “A Week in Peel [Letter to the editor],” *Canada Farmer*, 16 April 1866; “A Fortnight in Western Canada [Letter to the editor],” *Canada Farmer*, 1 May 1866; “An Agricultural Tour Eastward [Letter to the editor],” *Canada Farmer*, 15 August 1866; “A Week in Halton,” *Canada Farmer*, 15 October 1866; “Increase and Improvement of Agricultural Implements &c. [Letter to the editor],” *Canada Farmer*, 1 January 1867; “A Fortnight in Simcoe [Letter to the editor],” *Canada Farmer*, 1 March 1867; “A Fortnight in Lennox and Addington [Letter to the editor],” *Canada Farmer*, 15 June 1867; “A Tour Through Norfolk [Letter to the editor],” *Canada Farmer*, 1 August 1867; and “Agricultural Tour in Elgin [Letter to the Editor],” *Canada Farmer*, 15 August 1867.



Renfrew County near Ottawa were “exceedingly rocky...rendering cultivation forever impracticable.”<sup>86</sup> Other potential challenges to the widespread adoption of the factory system were less regionally specific but no less significant. Regular access to water was indispensable for cheese manufacturing, and many places had either too much or too little. Buckland expressed concerns about the “want of water” in some areas where farmers intended to build cheese factories, worrying that droughts would affect the milk supply—cows stop producing milk without adequate food—but also because of water’s importance for heating and cooling vats of milk. The ideal site for a factory was situated on the bank of a river or stream, which would allow the maker to divert water easily and “with some force” through pipes and into the factory as needed.<sup>87</sup> On his tour through Lambton County in 1866, Buckland commented that parts of the county were “favourable for dairy purposes,” but “the want of good spring water was...a serious, if not fatal objection to the successful working of cheese factories” planned for areas inland.<sup>88</sup> Could the vision be applied evenly throughout the province, in spite of its regional differences? Although most contemporaries agreed with New York’s outspoken dairy booster X.A. Willard that the “natural home of the milk-producer” included “a part of the Canadas,” particularly regions that fell between the 40<sup>th</sup> and 45<sup>th</sup> parallels, even he admitted that, “probably not more than a third of the land is adapted to dairying...[and] if represented on a map, would have the appearance of islands.”<sup>89</sup> In addition to being

<sup>86</sup> “A Week in Peel [Letter to the editor],” 16 April 1866, *Canada Farmer*; and “An Agricultural Tour Eastward [Letter to the editor],” *Canada Farmer*, 15 August 1866.

<sup>87</sup> “The New York Cheese Factories [Letter to the editor],” *Canada Farmer* 1 July 1867.

<sup>88</sup> “A Fortnight in Western Canada [Letter to the editor],” *Canada Farmer*, 1 May 1866.

<sup>89</sup> CDA, 1869 and 1870, 19–20.

practical issues for the spread of the dairy zone, these were also racial anxieties about the capacity of white British-Canadians to 'civilize' and build a nation from the North American 'wilderness.'<sup>90</sup> If the success of a factory-based cheese industry was a sign that British North Americans had not degenerated in their distant homes," as Bell put it, what did it mean if parts of rural Ontario could not sustain the very system of fertile pasturelands to which they attributed the rich, sharp flavour of cheddar cheese?<sup>91</sup>

The reformers' reservations were ultimately no match for their hubris. Bell reasoned that Canada's "soils produced by the decomposition of the Laurentian gneisses, porphyries, and other granite rocks, are, indeed, very rich in the elements of fertility," and would offset the province's disadvantages in terms of climate.<sup>92</sup> Buckland saw promise for cheese production in Renfrew's rockier lands even if he preferred the undulating hills of Oxford, writing that these areas of "bare rock...mostly contain patches of good and sometimes deep soil, so as to admit at some future time, when population and markets justify, not only a limited cultivation, but extensive ranges of pasturage for sheep and cattle."<sup>93</sup> Under the editorship of Reverend Clarke, *Canada Farmer* made the boldest claim of all: "there is a scarcely a farming neighbourhood, where within a radius of from four to six miles, a cheese factory could not be sustained."<sup>94</sup>

All of these claims reflect the modernist faith amongst reformers that Ontario could be transformed into a dairy zone capable of producing exceptionally high quality

<sup>90</sup> Zeller, *Inventing Canada*, 122–123, and 258–268. On the cultural association between milk and racial superiority in the Americas, see DuPuis, *Nature's Perfect Food*, 11, 117–118.

<sup>91</sup> DAO, 1874, 80.

<sup>92</sup> DAO, *Ibid.*

<sup>93</sup> "An Agricultural Tour Eastward [Letter to the editor]," *Canada Farmer*, 15 August 1866.

<sup>94</sup> "Save the Heifer Calves," *Canada Farmer*, 2 April 1866.

cheese. However, neither the CDA nor individual reformers were interested in dictating the specific locations of individual cheese factories themselves. There was no systematic attempt on their part to determine the capacity of different regions of the province for factories. Reformers wanted rationalization of the environment to come from *within* a self-disciplined, liberal rural society rather than institutions like the state. They expected farmers to take on the work of determining the ideal location and concentration of cheese factories within their communities. However, they did caution farmers that factories would only be profitable if they were begun on a reasonable scale. Reformers insisted that a hundred ‘standard cows’ was the minimum capacity required to make a factory a worthwhile investment. Far from an embodied, individual creature, the ‘standard cow’ was a shorthand measurement for a volume of milk, expressed as the seasonal milk yield of an average dairy cow. Just how much milk one standard cow represented varied, but two thousand pounds was a common estimate.<sup>95</sup> In New York, the general belief was that “cheese making cannot be advantageously carried on as a specialty...with less than 400 cows[.]” but in Ontario, most reformers usually recommended two or three hundred.<sup>96</sup> *Canada Farmer* reported in 1867 that “an extensive factory” in Hibbert (near Stratford, in southwestern Ontario) would most likely procure “three hundred cows...enabling the firm to make a successful start.”<sup>97</sup> Thus in one township, a six-mile radius might support a

<sup>95</sup> For instance, in a report on dairy cows to the Ontario legislature in 1885, Thomas Shaw cited a claim from D.M. MacPherson (a reformer and important factory proprietor in eastern Ontario) that the standard for a cow in Glengarry had increased from 2000 to 3000 pounds in the fifteen years since the factory system had been adopted there. See “The Possibilities of the Dairy Cow,” *Ontario Sessional Papers Fifth Parliament, Second Session*, No. 73 (Toronto, ON: 1885), 11–12.

<sup>96</sup> “Cheese Factories [Letter to the editor],” *Canada Farmer*, 1 October 1864.

<sup>97</sup> “New Cheese Factories,” *Canada Farmer*, 1 March 1867.

handful of factories because of the density of livestock, while in another it might only support one.<sup>98</sup> If an area did not appear to have enough dairy production to sustain a factory at a certain point in time, reformers hoped that farmers would patronize an existing factory with unused capacity rather than creating a competing affair, or at least invest in enough livestock to sustain a second factory. By encouraging rural people to think about space and the environment in terms of yields, reformers attempted to rationalize nature by re-imagining Ontario's geography as topographic space.<sup>99</sup>

### *Conclusion*

In the mid-nineteenth century, a number of Ontario's liberal elite imagined rural southern Ontario as a harmonious, liberal, conservationist, semi-industrial society anchored around cheese factories and agricultural improvement. Here was a nascent 'green capitalism' in which the conservation of soil fertility could go hand in hand with sustained economic growth.<sup>100</sup> Reformers insisted that cheese manufacturing and dairy farming would usher in progress for rural Ontario that would be difficult to undo. In 1869, five years after the earliest factories appeared, Chadwick addressed the CDA about the "durability" of this progressive system, dismissing the claims of naysayers who believed farm-based cheesemaking would eventually reappear: "this is contrary to all the

<sup>98</sup> Even as a rationalizing measurement, the standard cow suffered for want of precision. For instance, changes in dairy cattle populations over time meant that particular areas might be able to sustain more factories at a later date.

<sup>99</sup> On the rationalization of nature through measurement, see Scott, *Seeing like a State*, 25–33.

<sup>100</sup> While it would be anachronistic to claim that Ontario's dairy reformers were *environmentalists* in the modern sense of the word, their vision attempted to address the central problem for many of today's advocates of sustainability, namely how to maintain economic growth under capitalism without destroying its environmental basis.

teachings of history, as the factory system is a progressive step, and progress being one of the laws of nature, this step once taken it is difficult to retrace.”<sup>101</sup>

By highlighting the reformers' deliberate role in establishing the factory cheese industry in the mid-nineteenth century, I have begun to challenge the perceived naturalness of Ontario as a dairy landscape. The cheese industry was historically produced, not inevitable, and reformers played a key role in its emergence. But recognize, too, that the dairy zone described above was a normative vision. Debates amongst and between rural people and reformers about the placement, scale, organization, and construction of factories, as well as the unanticipated complications of extra-human nature, meant that translating their utopian vision to the preexisting world of settler Ontario proved much more difficult than reformers anticipated. In chapter 2 we take a closer look at these complications by examining the zone's actual construction.

<sup>101</sup> CDA, *Report of the Canadian Dairymen's Association...for the Years 1869 and 1870....* [hereafter *1869 and 1870*] (Toronto, ON: 1871), 45.

## Chapter 2: Dairy Zone Construction

### *Introduction*

Although many farmwomen produced cheese and butter in private farm dairies before 1864, the industry as reformers envisioned it did not exist. It had to be constructed, a point inadvertently downplayed when its development is explained as an inevitable development. In her centennial study of the dairy industry in Canada, Veronica McCormick explains that “cheese factories soon began to spring up like mushrooms and by the end of October 1867, there were over 200...reported in Ontario.”<sup>1</sup> Construction continued unabated until the early twentieth century when the number of factories in Ontario peaked at 1,237.<sup>2</sup> While fungal growth is a fitting metaphor for capturing the sense of speed with which factories were built, its overall effect has been to explain the industry’s development as though dairy was a latent condition of the Ontario countryside waiting for the right conditions before unfurling itself as part of a grand drama of modernization.<sup>3</sup> Instead, this chapter describes the rise of Ontario’s dairy zone as a historically contingent ‘organic machine,’ an environment built by the energy of human bodies, extra-human nature, and the distribution and circulation of capital.<sup>4</sup> I examine how rural communities financed and built factories, the obstacles they faced, and the

<sup>1</sup> McCormick, *A Hundred Years*, 72. In the English context, one scholar describes how the factory system *failed* to mushroom there. See David Taylor, “Growth and Structural Change in the English Dairy Industry, c1860–1930,” *Agricultural History Review* 35, no. 1 (1987): 51.

<sup>2</sup> Ontario Bureau of Industries, *Annual Report of the Bureau of Industries for the Province of Ontario 1907* (Toronto: Ontario Department of Agriculture, 1907), 43. The number of factories peaked in 1906.

<sup>3</sup> For an excellent critique of how biological metaphors are used to legitimize myths of Western modernization and linear development, see Gilbert Rist, *The History of Development: From Western Origins to Global Faith*, Trans. Patrick Camiller (London: Zed Books, 1997), 25–46.

<sup>4</sup> White, *The Organic Machine*, esp. x, 109.

ramifications of this process for the shape and nature of rural Ontario by the turn of the twentieth century. Ontario's dairy zone is best understood as a dynamic and historically contingent process that transformed human and extra-human relationships within and beyond its shifting boundaries.

Reformers observed this process unfold with a mix of exuberance and anxiety. While they celebrated rural people's apparent enthusiasm for cheese production, a number of emerging patterns gave them pause: factories were unevenly distributed throughout the province, and numerous farmers dismissed the reformers' advice about factory construction, which these elite men understood as evidence of deeply-rooted 'backwardness' and illiberal values amongst the rural population. By the end of the nineteenth century it was clear that factory cheese production had transformed large parts of the southern Ontario environment, but not always in the ways that reformers had anticipated.

### *Building a Factory*

Building a single factory was not a herculean task; the largest were roughly 4000 to 5000 square feet, while the average was probably closer to about 1250.<sup>5</sup> The vast majority were technically *manufactories*, small-scale industrial establishments employing five or fewer employees. These functional, unadorned structures were typically organized into three main sections based on the cheesemaking process: a 'make room' and receiving

<sup>5</sup> See Henry Hoshel Dean, "Plans of Building and Methods of Conducting Cheese Factories and Creameries" (Toronto: Ontario Department of Agriculture, 1897), 16–32, for a range of floor plans of actual cheese and butter factories in the province.

area, where the cheese vats were located and the milk was transformed into curd; a ‘press area,’ where curd was pressed into wheels of cheese; and a ‘curing room,’ where cheeses were stored while they aged. The far corner of a factory often housed the boiler. In a single story structure the presses usually separated the making and curing areas, but if a factory was two stories tall, the second floor often functioned as a curing room, and sometimes also the cheesemaker’s home. Occasionally the making and curing areas were in housed separate buildings. Until the 1890s, nearly all factories were built cheaply and of wood, prompting Daniel Derbyshire to scold others for “th[o]se old shanties you are making cheese in.”<sup>6</sup> Early cheese factories were a far cry from both the towering architecture and billowing smokestacks of contemporary urban factories and the “industrial sublime” of large-scale rural manufacturers in the northeastern United States.<sup>7</sup>

Factory construction nonetheless required the coordination of supplies, energy, labour, and capital. Farmers and proprietors who set out to build a new factory often did so between November and April, loathe as they were to impinge on any potential profits while their cows were in milk. During the off-season, farmers and prospective proprietors organized and attended meetings to gauge community interest and support, and canvassed their neighbours by wagon or sled to secure their commitment in the form of shares and cows. They weren’t always successful. “Canvassed Second con[cession] of charlotte not much encouragement coming down the glen had promise of 50 cows on that line [sic],”

<sup>6</sup> DAEO, *Annual Reports of the Dairy Associations of Ontario for the Year 1888* [heretofore 1888a] (Toronto, ON: 1888), 51. Note that the titles of the association reports for the conventions held in January 1888 (about the season of 1887), and the conventions held January 1889 (about the season of 1888) were both titled 1888. To avoid confusion, I have designated the former as 1888a, and the latter as 1888b.

<sup>7</sup> David Nye, *American Technological Sublime* (Cambridge, MA: MIT Press, 1994), 109–115.



wrote proprietor David Murdoch ‘D.M.’ MacPherson in February of 1874.<sup>8</sup> Beginning companies in the winter also meant that many embarked on construction in the late winter and early spring, a situation that was less than ideal. If the procurement of supplies went smoothly and there were not too many weather related interruptions, a small factory could be constructed in a matter of weeks, but that was not always the case. Drawing building supplies to construction sites by wagon or sled sometimes required enormous feats of strength on the part of men, their horses, and their oxen, as the constant thaw and freeze of the ground often made Ontario’s poor quality roads a quagmire of mud.



**Figure 1.** Maple Home Cheese Factory. Note the steep path leading from this factory to the road, which was probably difficult to navigate in wet or snowy weather. (Photo by Harry Hinchley. File 41, Box 5, Ontario Dairy Industry records, University of Guelph Archives, Ontario.)

<sup>8</sup> Diary entries, 2–4 February 1874, MacPherson Family collection, University of Guelph Archives, Ontario.

In March of 1874, MacPherson began construction on his third cheese factory in eastern Ontario. It is unclear just how much sweat he personally contributed to the building process, since his diary doubled as a record of the work completed by the men he hired: “Commenced square timber for factory. John drew 4 loads of rails from below the road for line fence. A Scott W Carter, and Alex Madleu worked all day,” explained the first related entry.<sup>9</sup> As a tinkerer and experimenter who liked to work with his hands, MacPherson might have built alongside them occasionally, but most of his time was probably spent supervising and travelling back and forth to the nearest town to purchase supplies needed to outfit the factory, a task he was quite familiar with by virtue of his years of cheesemaking alongside his stepmother. To some extent, then, MacPherson constructed factories indirectly by purchasing the energy—labour—of other people’s bodies.<sup>10</sup> This was almost certainly the case by the late 1880s, when he owned more than eighty factories in Ontario and Quebec, which were known as the ‘Allangrove combination,’ the largest of its kind in the country.<sup>11</sup> MacPherson’s hired men knew the trials of construction in the damp cold of late winter firsthand. Their relationship to extra-human nature was above all muscular: they dug the factory’s foundations, raised the

<sup>9</sup> Diary entry, 5 March 1874, MacPherson Family collection, University of Guelph Archives, Ontario.

<sup>10</sup> I am thinking here of the distinction Kathryn Morse makes between miners who either ‘produced’ (i.e. arrived largely by foot) or ‘consumed’ (by train and steamship) their way to the Klondike, depending on their wealth and status. See Morse, *The Nature of Gold*, 43.

<sup>11</sup> Hence MacPherson’s nickname as the Ontario’s ‘Cheese King.’ On MacPherson and the Allangrove combination, see Royce MacGillivray and Ewan Ross, *A History of Glengarry* (Belleville, ON: Mike Publishing Company, 1979), 409; Menzies, “Technology,” 299–300; Ruddick et al., *The Dairy Industry in Canada*, 54–58.

frame, hung the windows and doors, built a roof, laid the floor, and constructed a set of stairs, all with cold and probably calloused hands.<sup>12</sup>

Individual factories were built using photosynthetic means: through the brute strength of people and animals whose energy was drawn from the biological world. Of course, just how laborious the process was depended on a variety of factors, such as the number of men available, whether the site was up or downhill from the road, their distance from supplies, legal obstacles, and so on. Some companies—usually joint-stock or cooperative ones—called ‘work bees’ to spread the effort across their patrons rather than spending money on expensive waged labour.<sup>13</sup> The Riverbank Factory hosted one such event in February 1882 “for the purpose of drawing stone and digging the foundation,” although it appears they contracted out the actual design and the frame construction to others by tender.<sup>14</sup> Similarly, twenty-three of the initial thirty-four patrons of the Roblin Cheese Factory in Hastings County contributed their time either drawing materials to the site (including brick, gravel, lumber, lime, siding, shingles, pump logs, and lath), or doing general labour in the spring of 1872.<sup>15</sup> Work bees also called upon rural women to expend their energy to produce the food and refreshments required at such large, convivial events.<sup>16</sup>

<sup>12</sup> Diary entries, 18 March 1874 to 18 April 1874, MacPherson Family collection, University of Guelph Archives, Ontario.

<sup>13</sup> Menzies, *By the Labour of Their Hands*, 43.

<sup>14</sup> Minutes, 2 February 1882, Riverbank Factory Minute Book, MU 9, Wellington County Archives, ON.

<sup>15</sup> Ledger, Roblin Cheese Factory Cash Book 1 (1871–1907), pp. 7–10, File 1, Roblin Cheese Factory Collection, University of Guelph Archives, Ontario.

<sup>16</sup> Catharine Anne Wilson, “Reciprocal Work Bees and the Meaning of Neighbourhood,” *Canadian Historical Review* 82, no. 3 (2001): 12–13.

Securing a factory's access to clean, ample water could prove especially difficult. Factories located near a strong stream or river, as Buckland and other reformers recommended, could rely on kinetic energy by routing some of it through pipes with minimal effort. Others instead expended significant human and animal muscle to draw it against the force of gravity. The Blanshard and Nissouri factory in Oxford County waged a struggle with the water table beneath their feet, having to re-drill in a new spot to find a suitable supply after their first attempt only yielded "2.42 gallon barrels per hour" with continual pumping, not nearly enough to cover their needs. While they waited for the second well to be drilled, they paid one local man .75¢ a load for the unenviable daily job of drawing water to the factory by wagon.<sup>17</sup> In early 1897, the United Empire Loyalist Cheese and Butter Company in Frontenac County planned to purchase the Platt Cheese Factory and its rights to the local waterway, but when the absentee landowner refused to sell, their plans to begin production that season were thwarted. They spent the next three months finding a new site, purchasing land, building the factory, and digging a well, something they had hoped to avoid.<sup>18</sup> Both situations required photosynthetic energy in the form of human and animal muscular power, but whose and at what cost could vary enormously.

Reformers used stories like these as cautionary tales to encourage communities to heed their advice about where to locate factories and how much to invest upfront to

<sup>17</sup> Minutes, 1 October 1888, 8 August 1888, Minute Book 1880–1891, Box 1, Blanshard and Nissouri Cheese & Butter Company collection, University of Guelph Archives, Ontario.

<sup>18</sup> Minutes, 22 June 1897 to 3 August 1897, Minute Books with Accounts June 1897–December 1915, Reel 1, MF 2124, United Empire Loyalist Cheese Factory Records, Queen's University Archives, Ontario. Their offer to purchase a different parcel of land was contingent on being able to successfully dig a well on the property first.

ensure profitable long term production. Striking a balance between encouragement and critique was hard: they wanted communities to build factories wherever possible, but they also voiced scathing criticisms of companies that built cheap factories in unsuitable locations in the hope of short term gains. In the 1890s, Frank Shutt, a chemist with the Central Experimental Farm in Ottawa, regaled attendees of a dairymen's convention with a story about a company faced with the arduous task of blasting through rock to reach a water supply, rather than locating the factory in a more suitable location. The factory quickly received complaints from buyers about the quality of their cheese. Suspecting the water as the cause of their troubles, they had it chemically analyzed, revealing that the factory floor washings were draining straight into the well supply. They ultimately had to move the factory. For Shutt this particularly extreme example was a lesson about the shortsightedness of locating a factory in terms of convenience rather than suitability.<sup>19</sup>

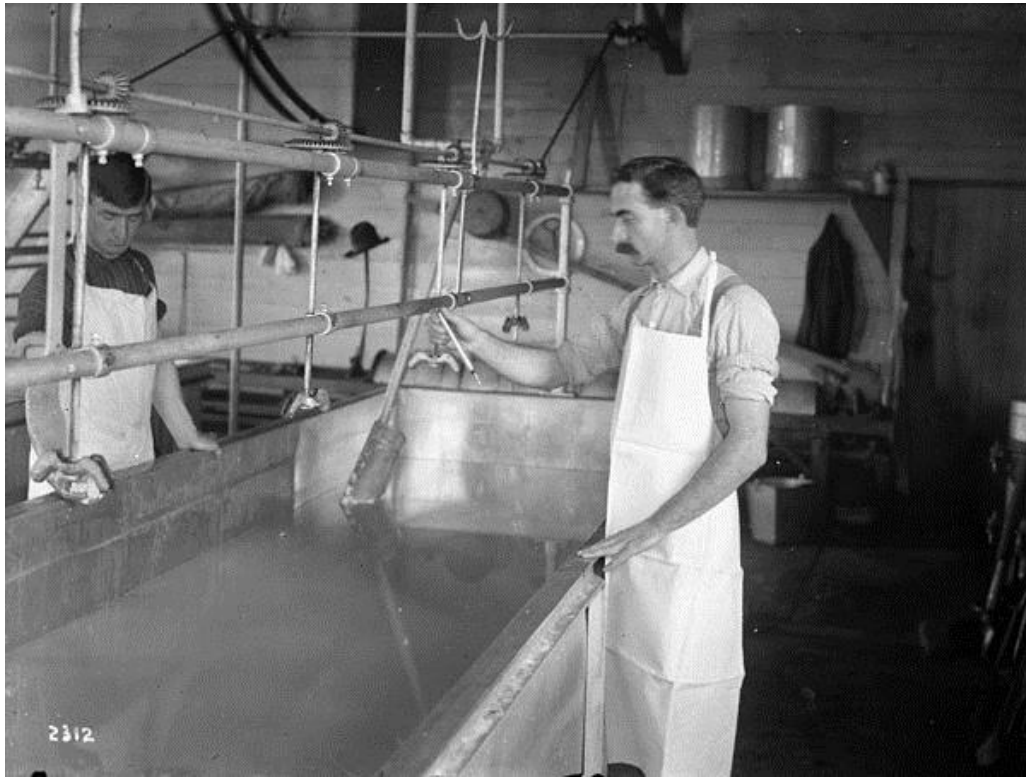
For rural nineteenth-century Canadians, muscular encounters with extra-human nature were the most familiar frame of reference for engaging with the wider environment. But the era of cheese factory development sat on the cusp between an early capitalist economic system enormously dependent on photosynthetic energy to one dependent upon the combustion of fossil fuels. Although cheesemaking remained a primarily handcrafted system of production until the mid-twentieth century, the possibilities of steam captured the imaginations of dairy reformers. In 1867, for example, an article in *Canada Farmer* expressed unabashed enthusiasm for the cheese vats used in

<sup>19</sup> DAWO, *Annual Reports of the Butter and Cheese Associations of the Province of Ontario, 1897* [hereafter 1897], (Toronto, ON: 1898), 133.

New York, whose jacketed construction allowed hot water or steam driven by a boiler to circulate between the inner tin lining of the vat and an outer shell. “By a single motion of the hand,” the writer observed, a maker could control the supply and distribution of heat, rather than tediously building and regulating a fire underneath each vat as was typically required.<sup>20</sup> In 1871, only 11 of the 326 cheese factories enumerated in the industrial census reported using steam power, but by the end of the century, companies nearly always installed steam boilers to help makers regulate the temperature in their vats and agitate the milk. Until the early twentieth century most of these boilers were fed with wood rather than coal, but observers nevertheless delighted at the efficiencies made possible by combustion, a central and distinguishing feature of the fossil fuel capitalism.<sup>21</sup>

<sup>20</sup> “The New York Cheese Factories,” *Canada Farmer*, 1 July 1867.

<sup>21</sup> There is an emerging literature within and beyond environmental history that examines the relationship between fossil fuels and the capitalist mode of production. See Elmar Altvater, “The Social and Natural Environment of Fossil Capitalism,” *Socialist Register* 43 (2007): 37–59; Andrews, *Killing for Coal*, 31–41, 51–86; Stefania Barca, “Energy, Property, and the Industrial Revolution Narrative,” *Ecological Economics* 70 (2011): 1309–1315; Christopher Jones, *Routes of Power: Energy and Modern America* (Cambridge: Harvard University Press, 2014), 17–18; and Steven Stoll, “A Metabolism for Society: Capitalism for Environmental Historians,” in Andrew C. Isenberg, ed., *The Oxford Handbook of Environmental History* (Oxford: Oxford University Press, 2014), 369–397.



**Figure 2.** Taking temperature in cheese factory, n.d. Note that the contents of the vat were heated by steam that traveled through the pipes above. (William James Topley, Library and Archives Canada, PA-010175.)

The cost of building and outfitting a factory varied enormously depending on the scale of production and the means and inclinations of its investors. Reformers always encouraged farmers to build at the larger end of what they could afford without borrowing recklessly or cutting corners. The cost “need not be much, and if put up by the patrons themselves, assisted by one carpenter, it will cost still less,” claimed one writer.<sup>22</sup> *Canada Farmer* played a key role in disseminating information on costs, but the examples they provided tended toward the more expensive end of the spectrum. In an extended description of the construction underway at one Oxford County factory, the owner

<sup>22</sup> “How to Start a Small Cheese-Factory,” *Canada Farmer*, 15 December 1869.



estimated the building and “all the apparatus” would reach “about \$2,000.”<sup>23</sup> Another notice boasted that the Front of Sidney Factory near Belleville cost \$6,318 to build in 1870, though that included a fleet of wagons for drawing milk.<sup>24</sup> A pamphlet published by the Ontario Department of Agriculture in 1897 took a more practical approach by outlining the estimated costs for factories of a range of sizes. They estimated it would cost \$532.50 to outfit a factory of 500 cows, excluding the building itself or any land acquired. That estimate included a 10 to 12 horsepower boiler, two large vats, two cheese presses, a curd sink, a large scale, a weigh can, pipes and conductors, curd knives, a Babcock tester, a curd mill, and steam pipe apparatus.<sup>25</sup> However, even these prices likely reflect the very upper limits of what seemed reasonable to most farmers. Census data provides a rough picture of capital investments in early Ontario cheese factories. In 1871, the median fixed capital invested in cheese factories was \$800.<sup>26</sup> Surviving account books and other documents likewise suggest that many farmers and proprietors tried to build factories as economically as possible. The Maple Leaf Cheese Factory, built in Bonarlaw (north of Belleville) in 1875 cost \$1233.04 including all construction materials, internal apparatus, and labour.<sup>27</sup>

<sup>23</sup> “A Visit to a Cheese Factory,” *Canada Farmer*, 15 1865. The factory in question belonged to George Galloway, who would assist with the Ingersoll Mammoth cheese the following year.

<sup>24</sup> “No Title,” *Canada Farmer*, 15 April 1870.

<sup>25</sup> Dean, “Plans of Building,” 13.

<sup>26</sup> Cheese factory database derived from the manuscript schedules for industrial establishments from the 1871 census. Canadian Industry in 1871 Project (CANIND71), University of Guelph, Ontario, 1982–2008. Accessed at <http://www.canind71.uoguelph.ca/index.shtml>.

<sup>27</sup> Account Book, File 6 – Financial Accounts, 1874–1885, Maple Leaf Cheese Co. fonds, MU 7263, Archives of Ontario, ON.



Reformers' insistence on the sanctity of the factory system in spite of significant upfront costs obscured some of its unattractiveness to potential investors. Although cheese production was embraced in part for its anticipated stability in comparison to wheat, it shares with other agricultural production a tendency toward slow turnover times that limited the possibilities for profit and sometimes discouraged capitalist investment.<sup>28</sup> One limit was the seasonal cycle of milk production. The milk production of nineteenth-century cows generally dropped off in the early winter, so cheese production stretched, at best, from April or May to November. Cheese factories often lay idle in the fall and winter months, accumulating dust and dirt while depreciating in value. The second cycle that lessened the appeal of cheesemaking for capital was the time needed for cheddar to age. Freshly pressed wheels of cheese were put into curing rooms where they usually aged for at least a few weeks before being shipped via wagon, rail, and ship to England. Although 'curing' required some labour on the part of cheesemakers, who had to turn the cheeses each day and grease their rinds to prevent mold growth, for all intents and purposes, this 'disunity' between working time (the time cheesemakers spent making cheese) and production time (time spent waiting for cheese to cure, reach England, and so on) meant that the number of production cycles in a given season were limited, and thus

<sup>28</sup> Susan Mann and James Dickinson argue that disunity between production time (the total time required to produce and market a crop) and working time (the time in which labour is actively applied to the production process) help explain agriculture's apparent 'barriers' to capitalist development. See Susan Archer Mann and James M. Dickinson, "Obstacles to the Development of a Capitalist Agriculture," *Journal of Peasant Studies* 5, no. 4 (1978): 466–481; and Susan Archer Mann, *Agrarian Capitalism in Theory and Practice* (Chapel Hill, NC: University of North Carolina Press, 1990), 28–46. Some scholars since have critiqued the Mann-Dickinson (M-D) thesis by arguing that it treats non-human nature as fixed and static. For instance, David Goodman, Bernardo Sorj and John Wilkinson, *From Farming to Biotechnology: A Theory of Agro-Industrial Development* (Oxford: Basil Blackwell, 1987), argue that the M-D thesis does not focus enough on the capacity of capital to circumvent such disunities through appropriation and substitution.

so were the possibilities for profit. These were not permanent, intractable limits, but seasonal cycles of dairying and the inability to speed up cheese production dissuaded industrial capital and some farmers from investing in cheese manufacturing directly.

And yet, many rural Ontarians found ways to finance factory construction. Hopetown Cheese Factory in Lanark County provides an interesting example of how farmers cobbled together resources to begin cheese production on a factory scale. At their inaugural meeting in December of 1883, the organizers called on those present to commit themselves to shares and promise a certain number of cows each for a minimum of six years. They decided that all who purchased shares had some responsibility for building the factory. Their small initial capital stock (\$780) suggests they accomplished many of the tasks cooperatively. Moreover, two shareholders—including a lumber company, J.W. Anderson & Sons—were permitted to increase their stock in the company by paying for shares ‘in kind,’ using lumber and shingles that presumably went toward factory construction. The factory’s location in Lanark County—a region dependent on the lumber trade—meant they had plentiful access to supplies of wood.<sup>29</sup>

Some joint-stock and cooperative companies struggled to amass enough capital to begin construction at all, regardless of their attempts to substitute muscle for money. In 1882, the directors of the Riverbank Cheese Factory in Peel County deliberated about whether the 356 shares they had signed (totaling \$1424) sufficed to get construction

<sup>29</sup> Minutes of the founding meeting of a cheese factory in Hopetown, Hopetown Cheese Factory 1883, MG 55/28, No. 51, Library Archives Canada. The company secretary was then tasked with finding “a man who understands the cheese making business” to attend the next meeting, which suggests they were convinced of the reformers’ arguments but had little experience with cheese themselves.

underway, suggesting some ambivalence about the state of their finances.<sup>30</sup> Occasionally companies offered additional shares to raise more capital, while others borrowed money from individuals or banks. (See Appendix 1 for a table outlining the initial shares and outlay of some of Ontario's joint stock cheese factories.) For example, the Blanshard and Nissouri Cheese & Butter Factory borrowed \$1300 in 1880 to finance its first season, including the purchase of a pre-existing factory for \$1100.<sup>31</sup> In 1896, the farmers of another Oxford County joint-stock company tried to secure a loan from the government. They wrote directly to Prime Minister Laurier to explain they had already exhausted their collective investment of \$2500 to outfit a thirty by sixty foot building, including an ice room, and calculated that they had contributed roughly \$500 worth of in-kind labour. Their request was specific: they sought \$500 from the government to equip the factory for winter buttermaking, referring to the government's recent assistance in that direction.<sup>32</sup> In 1908 the Harbor Cheese Factory Cooperative decided to take out a loan from a local bank and have payments deducted off each of their cheques throughout the season to pay back the \$650 they borrowed to buy the former Pine Grove Cheese Factory.<sup>33</sup>

<sup>30</sup> Minutes, 2 February 1882, 4 March 1882, May 1882, Riverbank Factory Minute Book (1882–1893), Wellington County Archives, Ontario. The meeting took place on February 2<sup>nd</sup> 1882, and by March 4<sup>th</sup> they accepted the construction tender from F. Swinderman for \$1922.00. In May of the same year they decided to mortgage their property to get more access to credit.

<sup>31</sup> Bylaw #1 and 2 February 1881 Minutes, Minute Book 1880–1891, Box 1, Blanshard and Nissouri Cheese & Butter Company fonds, University of Guelph Archives, Ontario.

<sup>32</sup> See Letter from the Windham Centre Cheese Company to Hon. Wilfrid Laurier, Images 398-399, 8 November 1896, Laurier Papers C-744, Sir Wilfred Laurier fonds, Library Archives Canada, via Canadiana Héritage at [http://heritage.canadiana.ca/view/oocihm.lac\\_reel\\_c744](http://heritage.canadiana.ca/view/oocihm.lac_reel_c744). It is unknown whether their request was successful.

<sup>33</sup> See J.E. Sadler, *The Story and Record of the Harbor Cheese Factory Company* (London, ON: Northridge Co., 1996), 8.

Still other communities appealed to individuals with capital to open factories they could patronize. Please send “one of your readers, *and at the same time a moneyed man*, to come down and start a cheese factory here in the vicinity of Napanee,” requested one letter to *Canada Farmer* in 1866.<sup>34</sup> Also in eastern Ontario, an exasperated farmer complained that he could not convince his neighbours to form a joint-stock company. Although they liked the idea, the prospect of putting up the money to build a factory and run it for an entire season before seeing any “return” was “quite another matter.” He then itemized West Winchester’s advantages as a base: it was seventeen miles from the railway, they could promise 400 cows within a couple of miles, and building materials were ample. “Could you not,” he asked the paper’s editors, “induce some two or three capitalists to come and establish themselves among us as manufacturers of cheese?”<sup>35</sup>

Whether the farmers of West Winchester found an investor or not is unknown, but such requests were not that unrealistic.<sup>36</sup> Although it is impossible to establish the proportion of proprietary to non-proprietary factories in Ontario given the imprecision of early statistics, J.A. Ruddick claimed in 1937 that “proprietary factories have always outnumbered those that are strictly cooperative,” especially during the early period of factory development.<sup>37</sup> In eastern Ontario the establishment of proprietary combinations or chains was common. In this system a single proprietor built or bought up a number of

<sup>34</sup> “Cheese Factory Wanted,” *Canada Farmer*, 15 September 1865.

<sup>35</sup> “Cheese Factories Wanted,” *Canada Farmer* 15 April 1867.

<sup>36</sup> See “Cheese Factory at Elphin [advertisement],” *Perth Courier*, 31 December 1875.

<sup>37</sup> Ruddick et al., *The Dairy Industry in Canada*, 49. Ruddick claims the balance started to shift more toward joint-stock and cooperative ventures around the turn of the century. In support, Earl Haslett notes in his doctoral dissertation on the early industry that in the late nineteenth century, “only one-third of the 60 factories in Hastings [County] were owned by private individuals.” See Haslett, “Factors,” 16.

small factories within a given area in an attempt to capture greater efficiencies (by hiring only a single, full-time salesman, for example) without needing to ship milk over prohibitive distances to one central, larger factory.<sup>38</sup> MacPherson's Allangrove combination was the largest of such operations. Heather Menzies attributes the predominance of these combinations and proprietorship in the eastern counties to greater economic inequality than in the western and central parts of the province, a point that is strengthened by the letters from eastern farmers requesting assistance from outside investors.<sup>39</sup>

Individual proprietors who owned multiple factories frequently had connections to extractive and merchant capital.<sup>40</sup> For instance, MacPherson also had ties to the lumber industry, and went into cheese box manufacturing in partnership with J.T. Schell from Oxford County, whose family owned a cheese box factory in western Ontario.<sup>41</sup> Another prominent proprietor and reformer was Thomas Ballantyne of Stratford. Born in Scotland in 1829, Ballantyne managed a cooperative store before immigrating to Canada in the 1850s and finding work as a rural teacher. A few years later, he quit teaching and went into dairying. He became an early supporter of the CDA in the 1860s and built the cooperatively owned Black Creek Cheese Factory in southwest Ontario, a large and successful company, and bought up part ownership in another factory. In the 1870s, he

<sup>38</sup> Haslett, "Factors," 17; Menzies, *By the Labour of Their Hands*, 40–41; Ruddick et al., *The Dairy Industry*, 54–56.

<sup>39</sup> Menzies, *By the Labour of Their Hands*, 40–41.

<sup>40</sup> Ibid., 40–41.

<sup>41</sup> John Graham Harkness, *Stormont, Dundas and Glengarry: A History* (Oshawa, ON: Mundy-Goodfellow Printing Co. Ltd., 1946), 300; Macgillivray and Ross, *Glengarry*, 487–492.

returned to the commercial world by starting a cheese export business and (later) constructing a number of cold storage warehouses.<sup>42</sup>

At first glance, the frequent presence of commercial and extractive capital in the formative years of the industry fits somewhat awkwardly with the otherwise liberal, manufacturing aspirations of the vision's advocates. Indeed, the dominance of dairy equipment suppliers and cheese exporters in the CDA and its successor organizations inspired a number of disputes in the 1880s and 1890s because of farmers' longstanding distrust of commercial interests. However, the apparent willingness of some merchants and lumber barons to invest in factories directly suggests that the lines between commercial, extractive, and industrial capital were beginning to blur.<sup>43</sup>

### *The Dairy Zone Takes Shape*

Factories expanded throughout most of southern Ontario in the second half of the nineteenth century, but their development was uneven. The dairy zone 'migrated' across the province in a fashion that challenged the reformers' rationally ordered vision.<sup>44</sup> There were three main regions of cheese factory concentration. The earliest of these emerged in the southwest of the province around Ingersoll and London, considered by many

<sup>42</sup> W.S. Dingman, "The Ballantyne Family in America," Draft of article for the *Stratford Beacon-Herald*, File 2, Ballantyne Family Papers, MU 29, Archives of Ontario; and Menzies, *By the Labour of Their Hands*, 40.

<sup>43</sup> For a typology of merchant capital in Canada in the mid-nineteenth century, see H. Clare Pentland, *Labour and Capital in Canada, 1650–1860* (Toronto, ON: James Lorimer & Company, 1981), 148–151.

<sup>44</sup> The term 'migrated' is drawn from Loyal Durand Jr., "The Migration of Cheese Manufacture in the United States," *Annals of the Association of American Geographers* 42, no. 4 (1952): 263–282. On the centrality of uneven development to capitalist growth, see Neil Smith, *Uneven Development: Nature, Capital and the Production of Space* (Oxford, UK: Basil Blackwell, 1994).

contemporaries to be the natural heart of the industry. By the 1880s, however, the balance shifted to the areas along the Quinte-St. Lawrence corridor, where farm dairying was also common. By 1910, just five counties—Prince Edward, Hastings, Lennox and Addington, Frontenac, and Leeds and Grenville—accounted for 34% of the province’s cheese factories and formed what Tonu Tosine calls a “second hearth” of the industry after Oxford County.<sup>45</sup> A third pocket of concentration is sometimes included within the bounds of eastern Ontario (it fell under the mandate of the DAEO), but is more accurately described as central-east Ontario, particularly the area around Peterborough County.<sup>46</sup>

The poor state of rural roads initially made cheese production for export a daunting prospect in more recently settled inland areas, where narrow, stump settler roads predominated.<sup>47</sup> Rain and melting snow regularly transformed dirt roads into lakes of mud, while toll systems meant it was expensive for companies to haul milk from farms to factories and finished cheese to the nearest rail station. Haslett estimates that in the nineteenth century, the costs of hauling milk represented approximately one-third of the overall costs of manufacturing and selling cheese.<sup>48</sup> The reach and quality of rural roads expanded considerably during the second half of the nineteenth century, but even by the late 1890s, the provincial instructor of road building acknowledged that good roads were scarce: “[I am] convinced that the effect of good roads would be to reduce the average

<sup>45</sup> Tosine, “Quinte-Upper St. Lawrence,” 69.

<sup>46</sup> Menzies, *By the Labour of Their Hands*, 42–43, discusses three separate regions.

<sup>47</sup> McCalla, *Planting the Province*, 132–133; Cole Harris, *The Reluctant Land: Society, Space, and Environment in Canada before Confederation* (Vancouver: UBC Press, 2009), 323–325. On roads and agricultural settlement in Upper Canada more generally, see Thomas F. McIlwraith, “The Adequacy of Rural Roads in the Era before Railways: An Illustration from Upper Canada,” *Canadian Geographer* 14, no. 4 (1970): 344–359.

<sup>48</sup> On the costs and difficulties of milk hauling, see Haslett, “Factors,” 57–59.

cost of manufacture and haulage by one-half cent per pound bringing the total cost [of cheese manufacturing] to one cent, the condition at which dairying would pay[.]”<sup>49</sup> In light of these concerns, many factories were initially located near well-developed roads and within easy access of ports along Lake Ontario or the Upper St. Lawrence River. Another strong deterrent to cheese factory development was urban growth, particularly around Toronto, which was becoming the industrial heart of the province. A handful of cheese factories opened around the outer limits of Toronto and Hamilton in the late 1860s (see Figure 3 below), but by 1891, urban growth was already pushing cheese production further inland, while vegetable production and (eventually) fluid milk began to occupy the high-value agricultural lands surrounding urban centres.<sup>50</sup>

Despite these and other concerns reformers had about the ability to ‘plant’ cheese factories in certain areas of the province, the dairy zone by the turn of the twentieth century extended well beyond the three major pockets of dairy concentration described above. Factories reached northward to the shores of Lake Huron and Georgian Bay, spread along the Ottawa River, and even dotted the rocky Canadian Shield. Tonu Tosine writes that cheese companies in eastern Ontario began to expand into the Shield region throughout the 1880s, although this trend reversed slightly by the end of the first decade of the twentieth century, as companies struggled with a limited milk supply.<sup>51</sup> But in

<sup>49</sup> DAEO, *Annual Reports of the Butter and Cheese Associations of the Province of Ontario, 1897* [hereafter 1897], (Toronto, ON: 1898), 100.

<sup>50</sup> A number of studies have focused on the shifting nature of cheese production vis-à-vis urban centres, but usually focusing on the twentieth century. See Cartwright, “Cheese Production in Southwestern Ontario,” 22–27; Cartwright, “Changes in the Distribution of Cheese Factories,” 230; and Reeds, “Agricultural Regions of Southern Ontario,” 224–225. In the United States, see DuPuis, *Nature’s Perfect Food*, 152–182.

<sup>51</sup> Tosine, “Quinte-Upper St. Lawrence,” 114.



general, neither rock nor forest deterred those who enthusiastically embraced the reformers' vision. As early as 1867, one writer near Fitzroy on the Ottawa River took western reformers to task in a letter he sent to the London-based *Farmer's Advocate*: "We on the Ottawa river appear to live in what; to the majority of Western Farmers is a 'Terra Incognita'....The prevalent idea...appears to be, that all the Ottawa coutry [sic] is one vast forest[.]" How, he asked rhetorically, "[could] we be so far behind the age, when we have actually in course of construction, 'a cheese factory,' when the milk of 500 cows will the coming spring be manufactured into cheese[?]"<sup>52</sup> By the early twentieth century, nearly every county in Ontario had a cheese factory.<sup>53</sup>

Cheese factory development in southern Ontario spread according to the logic and concentration of industrial capital, especially in the form of railroads. Rail's capacity to 'annihilate' space through time dramatically expanded the possibilities for long-distance trade in perishable commodities, which in turn opened up new areas to factory development.<sup>54</sup> The connection between rail and cheese was not lost on reformers. In

<sup>52</sup> Letter to the editor, *Farmer's Advocate*, November 1867.

<sup>53</sup> The only rural census district in the 1901 census without either a cheese factory or creamery was Nipissing. Urban census districts—Hamilton, London, Toronto, Kingston, and Ottawa—did not have any cheese factories or creameries. Unfortunately the 1901 tables do not distinguish between cheese factories and creameries at the census district level, but since creameries represented less than 10 per cent of all dairy manufacturers in Ontario at the time, it can be reasonably assumed that there were very few counties without cheese factories at the turn of the century. Dominion Bureau of Statistics, "Table I.—Industrial Establishments," *Census of Canada 1891 Vol. III*. (Ottawa, ON: 1893), 94–96. Also see Appendix 4 for the number of factories per county in Ontario in 1906.

<sup>54</sup> The discussion of rail as a means of 'annihilating' space and time goes back to Karl Marx. This capacity was expanded further with the emergence of cold storage and shipping. However, it is important to understand that these technologies did not *cause* capitalist development on their own so much as they facilitated the expansion of certain forms of production in new places. See David Harvey, *Spaces of Capital: Towards a Critical Geography* (New York: Routledge, 2001), 242–249; Cronon, *Nature's Metropolis*, 207–259, 324–325; and Altvater, "Fossil Capitalism," 41. Altvater writes: "the local availability of energy resources is no longer the main reason for the location of manufacturing or other industries....Energy supply therefore becomes only one factor among many others in decisions about where production is to take place."

1875, Professor Bell envisioned the eastern Ontario cheese industry spreading further north from Lake Ontario and the St. Lawrence River, if only there was “a system of cheap narrow-gauge railroads, running into the back country, like the projected Belleville and North Hastings, and the Trent Valley Railway, which would afford a cheap and ready transit to the Grand Trunk Railway, and the front of navigable waters.”<sup>55</sup> By the 1880s his wish had been at least partially fulfilled; the “transportation revolution” forged by Canadian Pacific, the Grand Trunk and the post-Confederation state bridged Ontario’s intermittent, preexisting rail network and expanded its reach.<sup>56</sup> The Grand Junction and North Hastings lines linked Belleville with parts of the provincial interior and with that the dairy industry’s ‘second hearth’ was extended and intensified. Figures 3 and 4 suggest that factories were often—though not always—within a reasonable distance of a rail line, especially if they were significantly removed from shipping ports on Lake Ontario and the St. Lawrence River.<sup>57</sup>

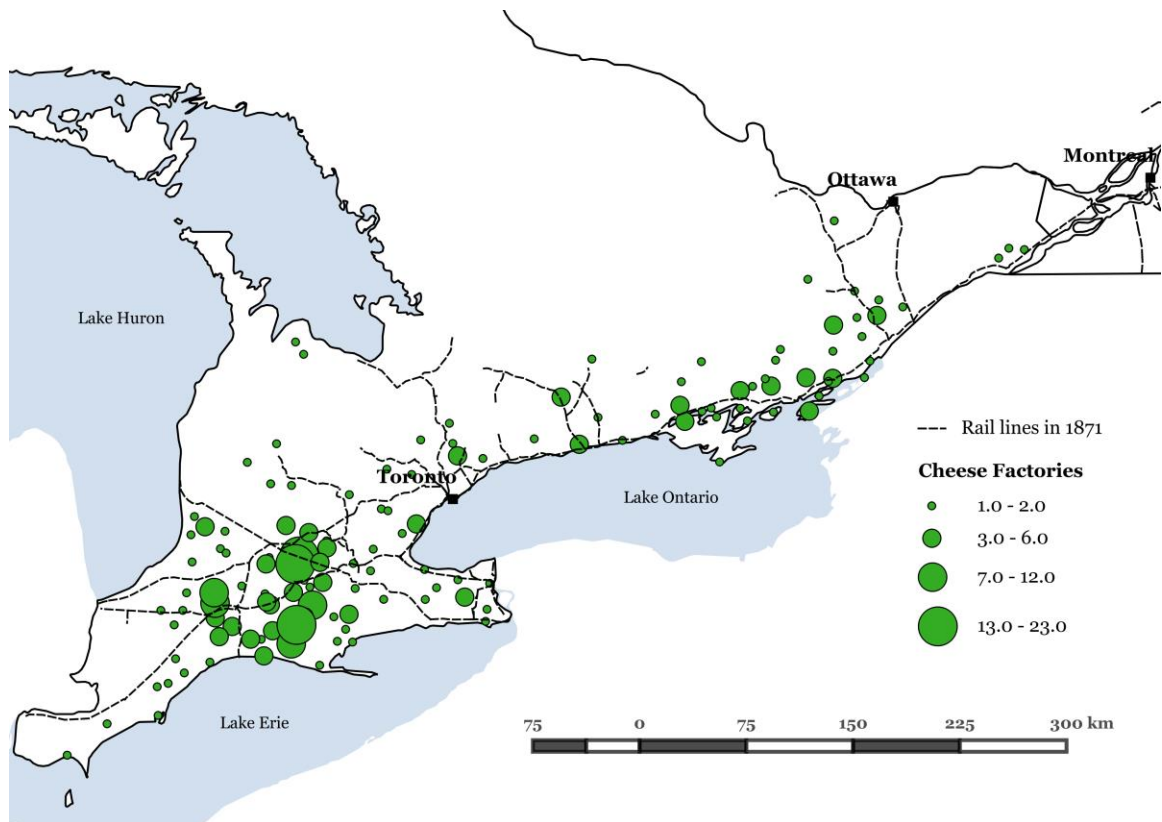
Companies *without* easy access to either rail or the St. Lawrence still built factories, but they struggled to ship cheese to the United Kingdom profitably. In 1899, Alex Anderson purchased the Dunchurch Cheese Association in Muskoka from a local joint-stock company discouraged by their lack of success the previous season. He had reservations about whether he could make it a paying business given the factory’s isolated

<sup>55</sup> DAO, 1875, 94. On the relationship between Belleville, railroads, and urban development (including the role of cheese), see Randy William Widdis, “Belleville and Environs: Continuity, Change and the Integration of Town and Country During the 19<sup>th</sup> Century,” *Urban History Review* 19, no. 3 (February 1991): 181–208.

<sup>56</sup> Ken Cruikshank, *Close Ties: Railways, Government, and the Board of Railway Commissioners, 1851–1933* (Montreal, QC: McGill-Queen’s University Press, 1991), 10–11.

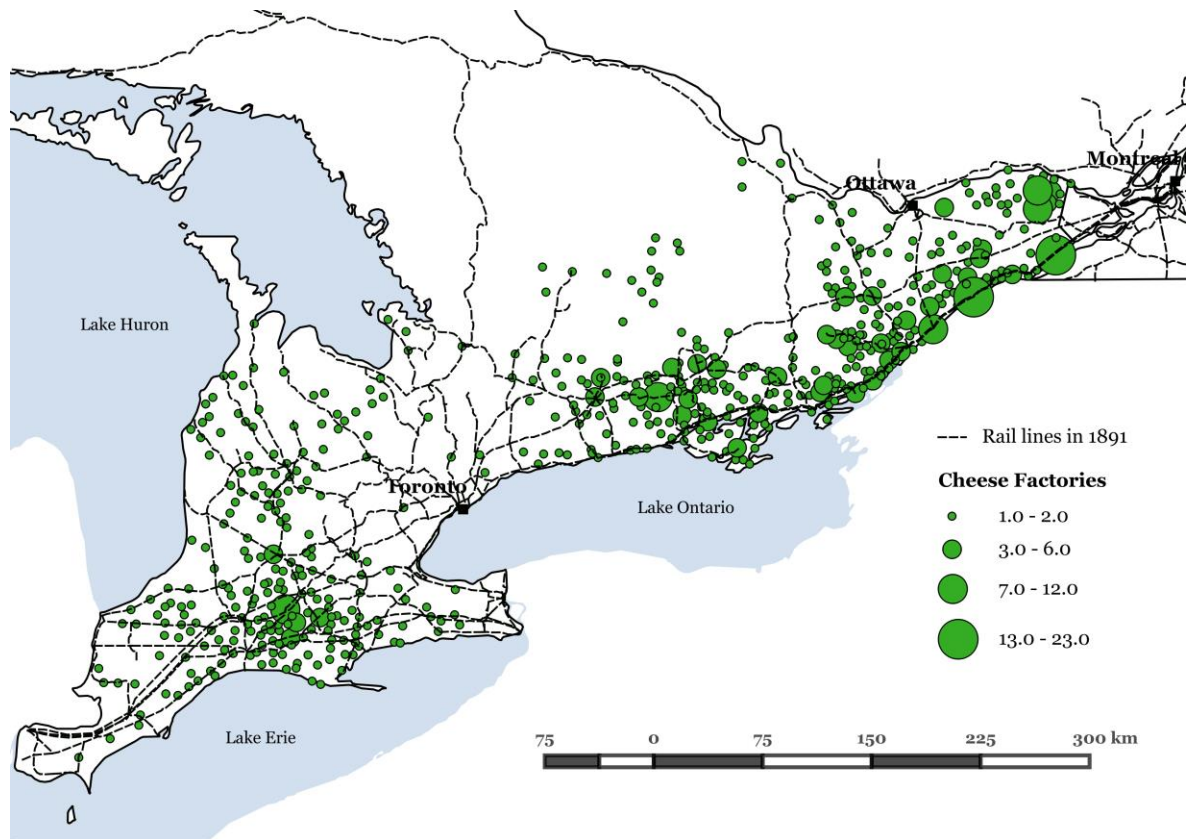
<sup>57</sup> Tosine, “Quinte-Upper St. Lawrence,” 101, briefly mentions the likely relationship between railroads and cheese factory development.

location, inquiring specifically about the rate for moving a hundred pounds of cheese from the factory to the closest rail station in Burk's Falls, a distance of roughly 50 kilometres over difficult terrain, and onto Montreal, where it would be put aboard a ship.<sup>58</sup>



**Figure 3.** Cheese factory distribution in southern Ontario, 1871 [map]. The map represents 325 cheese factories listed in the manuscript schedules for industrial establishments from the 1871 census. See Appendix 2 for an explanation of the mapping methodology and full citations of map data. Generated by Hayley Goodchild, 15 June 2016, using QGIS Version 2.10.

<sup>58</sup> Letter from Anderson to MacFie, 2 May 1899, File 1, Dunchurch Cheese Association fonds, MU 4551, Archives of Ontario.



**Figure 4.** Cheese factory distribution in southern Ontario, 1891 [map]. The map represents the 835 cheese factories listed in the Bureau of Industries, *Annual Report...1891*, 71–83. See Appendix 2 for an explanation of mapping methodology and full citations of map data. Generated by Hayley Goodchild, 15 June 2016, using QGIS Version 2.10.

The birds' eye view of Figures 3 and 4 reveals the overall pattern of the industry's development, but it also obscures the regularity with which factories appeared and disappeared. Rarely did factories remain under the ownership or management of the same individuals for long. Some farmers decided to purchase existing proprietary factories with the hopes that they could manage the business on more efficient lines and secure greater profit. By contrast, farmers who were disappointed in the returns or management of a cooperative or joint-stock factory would often sell to a proprietor hoping to expand their

operations. In many of these latter instances, a former cheesemaker keen to own a small business rather than work as an employee would purchase the company and/or the buildings from the patrons themselves. For example, John Mac Hoover—a maker from southwestern Ontario who temporarily left the province for a factory in Prince Edward Island—began to purchase cheese factories and creameries in Oxford and Brant counties upon his return in the 1890s, sometimes jockeying with others with similar ideas. On one occasion, he attended a meeting of the Bayham and Malahide Factory where the question of selling was on the table. The motion to sell was blocked by one shareholder, Wesley Pound, who held enough shares to prevent the majority required for the motion to pass. Believing (correctly, it seems) that Pound was “working to get it himself,” Hoover bought up shares from the farmers hoping to sell before visiting Pound to hammer out an arrangement for co-proprietorship.<sup>59</sup> Hoover’s experience was a common one: local and commemorative histories are littered with stories of factories that changed hands multiple times.<sup>60</sup> The brisk trade in factories emphasizes the instability of the industry in a way that its aggregate growth does not.

In addition to changing hands frequently, factories’ physical existence could be fleeting too. An economic analysis of cheese factory production in Ontario published in 1933 found that 35 of the 117 factories (thirty per cent of those surveyed with reliable

<sup>59</sup> Diary entries, 2 March 1899 and 11 March 1899, John Mac Hoover Diary (1899–1936), Joyce Hoover Clark Collection, Norwich & District Museum and Archives, Ontario.

<sup>60</sup> A handful of local publications about the factories in specific areas of the province have been enormously useful for obtaining brief ‘biographies’ of individual factories. These often note if and when factories were sold, burned down or rebuilt. See Ackerman et al., *Cheesemaking in Prince Edward County*; Joy, *Cheese Factories of Rideau Township*; Moore, *When Cheese Was King*; and Rutley, *Of Curds and Whey*. This tendency toward turnover may have been more common in areas of high concentration because of the heightened competition.

historical information) had been rebuilt at least once. All but one of the factories requiring replacement was built before 1900.<sup>61</sup> Fire was especially efficient at erasing the careful orchestration of energy and nature that had brought factories into being. On numerous occasions makers awoke to find their businesses in flames.<sup>62</sup> In the cooler months, the need to keep milk and cheese from freezing overnight meant steam boilers were sometimes kept running around the clock, dramatically increasing the potential for fire. In factories that doubled as residences, wood stoves exacerbated the risk. One of Hoover's factories burned down in November 1901 for unknown reasons, taking with it 300 unsold cheeses that were insured for \$2000 (the building was insured separately for \$2500).<sup>63</sup> Factories that escaped the ravages of fire often began to decay within twenty or so years, prompting many companies to tear them down and start anew around the turn of the century. Part of the problem was the combination of wood and whey—an acidic liquid by-product of cheesemaking—which could rot away floorboards or sustain stubborn colonies of mold that were detrimental to the quality and safety of cheese.<sup>64</sup>

Fire and rot were not just natural risks, but financial ones too. On December 13<sup>th</sup> 1883, a fire devastated the St. Marys Union Cheese Factory and an adjacent stable, only hours after the cheesemaker, Mr. Polsey, had closed it up for the season. The company

<sup>61</sup> Department of Agriculture, *An Economic Analysis of Cheese Factory Operations in Ontario* (Ottawa, ON: Department of Agriculture, 1933), 7, accessed at <https://catalog.hathitrust.org/Record/009060840> on 28 October 2016.

<sup>62</sup> Some factory fires might have been arson. Menzies, *By the Labour of Their Hands*, 108–109, describes what one interviewee called “insurance fires,” which were increasingly common during the period of cheese factory collapse in the mid-twentieth century.

<sup>63</sup> Diary entry, 23 November 1901, Diary 1 (1899–1936), Box 1, Joyce Hoover Clark Collection, Norwich & District Museum and Archives, Ontario.

<sup>64</sup> DAWO, 1888b, 43. One of the most frequent complaints of cheese factory instructors in the 1880s and 1890s was the state of decay in many factories.

suspected that an improperly extinguished stove had started the blaze. In any case, the coming weeks saw a merger materialize between St. Marys and the nearby Blanshard and Nissouri Factory; presumably the shareholders and patrons of the former decided it would be more worthwhile to rebuild one larger factory than begin again with their limited insurance payout.<sup>65</sup> Blanshard and Nissouri benefitted from the accident, by absorbing a competitor and likely much of their patronage. Similarly, the directors of the East Zorra and Blandford factory in Oxford County eventually resigned themselves to spending \$4300 for a new well in 1913, after it became clear that the factory wastewater had contaminated the previous one.<sup>66</sup>

Another characteristic of the vernacular dairy zone that differed from the reformers' vision was the tendency for cheese companies to encroach on one another. To some extent, the perishability and bulk of milk were important limiting factors for the location and scale of factories.<sup>67</sup> Without refrigeration and faster, cheaper modes for transporting milk, patrons could only be located as far from a factory as was practicable to navigate by a daily (or twice-daily) wagon trip. Reformers soon began to complain that factories were planted "too thick to thrive" in a number of areas, particularly in the Quinte-St. Lawrence corridor and southwestern Ontario, where few appear to have heeded the suggestion that communities consider patronizing an existing operation before

<sup>65</sup> Even though most factories insured both their buildings and the cheese itself, it was often not enough to cover all the losses sustained. For example, see "Burned to ground – cheese nearly all saved!" Clipping from an unidentified newspaper dated 28 July 1910, St. Marys Museum and Archives, Ontario.

<sup>66</sup> 3 March 1913, Minutes of the Annual Meeting, Minute Book 1897–1922, East Zorra and Blandford Cheese Manufacturing Company collection, Oxford County Archives, Ontario.

<sup>67</sup> Cartwright, "Changes in the Distribution," 117–118. The same general principle held in New York in the mid-nineteenth century. See DuPuis, *Nature's Perfect Food*, 153.



beginning a new company.<sup>68</sup> As early as 1866 in Lobo township near London, J.W. Scott—proprietor of the area’s first cheese factory—called a meeting of the local community to discuss his frustration that others were opening new factories too close to his own. The attendees eventually agreed that five factories, no less than five miles apart, would see Lobo “fully occupied” for the time being.<sup>69</sup> Tonu Tosine attributes the growth of factories within certain areas not to the systematic study of dairying capacity, but a factor far more meaningful to most farmers: whether their neighbours were successful with this new method of cheese manufacturing. When it appeared that the initial factories in an area were thriving, farmers who had been cautiously observing often decided to follow suit. Tosine calls this pattern the “neighbourhood effect.”<sup>70</sup>

Reformers called it shortsighted selfishness. *Canada Farmer* published the Lobo account as a means of reminding readers of best practices when setting up new factories. Yet the problem continued—and deepened—throughout the nineteenth century. “Let us have larger factories,” reminded one reformer in 1888, “where the work can be done better at less expense, and you will have larger amounts of good cheese for shipment.”<sup>71</sup> Daniel Derbyshire was more direct when he railed against this trend at the 1888 western Ontario convention: “There is a tendency in our country to build a cheese factory at every cross-road corners. We hear of some person who never made a pound of cheese in his life...[but] will build a factory within a mile of a first class factory and he may promise to make the cheese for a cent a pound less. Now, that should be put down—trampled right

<sup>68</sup> “The New York Cheese Factories,” *Canada Farmer*, 1 July 1867.

<sup>69</sup> “Cheese Factory Movements in Lobo,” *Canada Farmer*, 15 January 1867.

<sup>70</sup> Tosine, “Quinte-Upper St. Lawrence,” 15–16, 103–104.

<sup>71</sup> DAWO, 1888b, 65.



under foot.”<sup>72</sup> Derbyshire and others worried that many companies did their neighbours a disservice by creating *excessive* competition that would only harm the overall quality of cheese, an issue we will turn to in chapter 3.<sup>73</sup> Overall, reformers interpreted the intense competition between diminutive factories as a sign that many farmers were not engaging in liberal cooperation with one another.

### *The Dairy Zone as Transformation*

If the dairy zone’s boundaries were fluid, its effect on the wider socio-ecological environment—historical nature—was nevertheless transformative. Cows supplanted wheat as the primary symbol of rural improvement, stability and respectability as they spread across Ontario’s expanding countryside. In absolute terms, the number of milch cows in the province increased by 136% between 1861 and 1901, reaching more than a million animals at the turn of the century.<sup>74</sup> Ontario was part of “the kingdom of the cow,” praised John Gould, an agricultural improver from Ohio who spoke at the DAWO convention in 1894.<sup>75</sup> Some farmers with more access to capital invested in purebred

<sup>72</sup> DAWO, *Annual Report of the Dairy and Creamery Associations of the Province of Ontario, 1888* [hereafter *1888a*] (Toronto, ON: 1889), 124–125.

<sup>73</sup> There are parallels between the reformers’ critiques and the rhetoric of the business press in the late nineteenth century as described by Michael Bliss in *A Living Profit: Studies in the Social History of Canadian Business, 1883–1911* (Toronto, ON: McClelland and Stewart, 1974), 33–53. Bliss explains that a wide variety of manufacturers expressed criticisms about ‘unfair’ competition practices, such as price cutting and uneven tax burdens.

<sup>74</sup> Government of Canada, “General Abstract of Agricultural Produce, &c., of Upper Canada for 1861,” *Census of Canadas 1860–61 Vol. II*, 90–95; and “Table III.—Animals and Animal Products,” *Census of Canada 1891, Vol. IV* (Ottawa, ON: 1893), 144. The census category of ‘milch’ cow is far from a perfect measure, because it designated beef cattle in calf as well as those used for dairying, but it offers a rough estimate of the growth of dairy cattle in the province, keeping in mind that the provincial boundaries expanded during this period as well. Derry, *Ontario’s Cattle Kingdom*, 90–91.

<sup>75</sup> DAWO, *Annual Reports of the Dairymen’s and Creameries’ Associations of the Province of Ontario 1893* [hereafter *1893*] (Toronto, ON: 1894), 64.

stock or purebred crosses.<sup>76</sup> But overall, non-purebred animals vastly outnumbered purebreds in the nineteenth century: in 1882, the total number of dairy *and* beef purebreds in the province numbered only 23,297 in comparison to 680,652 “common milch cows.”<sup>77</sup> Reformers were sometimes skeptical about the necessity of keeping purebred cows, though they often advocated crosses between common cattle and purebreds to experiment with herd improvement.<sup>78</sup> Dairy breeding in the nineteenth century was far from reliable. The ongoing struggles of purebred breeders to identify and manipulate the key traits for reproducing high-yielding dairy cows made purebred stock a risky investment—one could easily spend a fortune on ancestry with no appreciable increase in a herd’s milk output. William Weld, editor of the populist *Farmer’s Advocate* and a cautious supporter of the cheese industry, was often suspicious of the claims made by gentlemanly farmers and breeders, and instead extolled native cattle as hardier and more prolific producers of manure than the European breeds favoured by “brazen-faced theorists.” “The ‘scrub,’” he continued, “produces the largest quantity of the richest dung...to maintain the virginity of our native soil.”<sup>79</sup>

<sup>76</sup> William Brown, “Report of William Brown, Professor of Agriculture, on the Herds and Flocks of Ontario,” (Guelph, ON: Ontario Agriculture College, 1883), accessed via QSpace at <http://qspace.library.queensu.ca/handle/1974/9120>. Farmers looking for purebred stock preferred Shorthorns or Ayrshires. Holsteins were the most recent arrivals to the Ontario countryside (they were first imported in the mid-1880s), although their numbers grew quickly, making them the second most numerous dairy-specific breed in the province by 1911. On dairy breeds, see Allan Bogue, “The Progress of the Cattle Industry in Ontario During the Eighteen Eighties,” *Agricultural History* 21, no. 3 (1947): 167; and Ruddick et al., *The Dairy Industry in Canada*, 18.

<sup>77</sup> Brown, “Report,” 30. In the 1940s, Allan Bogue noted that the 1880 Agricultural Commission found “no improved stock whatsoever” in fifty-three of the rural municipalities surveyed. See Bogue, “Progress of the Cattle Industry,” 165–166.

<sup>78</sup> DAO, 1875, 77. See also an address by James W. Robertson, DAWO, 1888a, 130.

<sup>79</sup> “Stock Raising and Grain Growing in Relation to Soil Fertility and Exhaustion [No. II],” *The Farmer’s Advocate* 22, no. 262 (October 1887).

More factories, more cows, more manure: many reformers insisted that the effects of cheese factories on soil fertility and rural development were obvious. “You farmers know that the fertility of your lands has been greatly increased since you went into dairy husbandry,” claimed the former editor of *Canada Farmer* in 1875.<sup>80</sup> Yet simply having more manure at one’s disposal did not necessarily mean it was being used to improve or maintain soil fertility. The benefits of manure were potential, not automatic. For instance, Professor Bell emphasized that mindless treatment of manure would do more harm than good, as its nutrients ran off in the rain and snow and promoted “rank vegetation” to grow in its stead.<sup>81</sup> Only by properly managing manure and incorporating it into a system of crop rotation would dairy reach its full potential. The systematic use of manure for soil fertility required farmers to change how they organized the space and labour of their farms. To capture its fertilizing power farmers needed an efficient means of collecting it, which meant regularly feeding and housing cattle indoors rather than letting them roam loose in pasture at all times. Some farmers designed and built stables better suited to these purposes; Thomas F. McIlwraith describes “the insertion of stables beneath timber-frame English barns” as one of the defining elements of the mixed farming era in late nineteenth century Ontario.<sup>82</sup> Once dung was collected in a central location it needed protection from

<sup>80</sup> DAO, 1875, 37. This claim is echoed by Surtees, “The Dairy Industry of Oxford County,” 54, in his study of the industry’s effects on the county’s agricultural system.

<sup>81</sup> DAO, 1874, 66.

<sup>82</sup> Thomas F. McIlwraith, *Looking for Old Ontario: Two Centuries of Landscape Change* (Toronto, ON: University of Toronto Press, 1997), 179. Most mid-century barns for dairy purposes took the form of the common ‘Central Ontario barn’—large structures with room for hay and machinery on the upper floor, and stables for cattle or other livestock on the lower level. However, state agricultural experts increasingly recommended that dairy farmers build ‘Wisconsin barns,’ which were designed at the School of Agriculture at the University of Wisconsin in the 1890s for the specific purpose of housing cattle. See Peter M. Ennals, “Nineteenth-Century Barns in Southern Ontario,” *Canadian Geographer* 16, no. 3 (1972): 256, 267.

the elements while it aged. Spreading composted manure was an arduous task. What reformers tended to under appreciate when they admonished farmers for being wasteful and shortsighted was how arduous it was to spread composted manure until the early twentieth century, when mechanical manure spreaders first appeared on the market.<sup>83</sup>

Ontario's "cow kingdom" required devoting a larger proportion of farmland to feeding more animals.<sup>84</sup> As a living, breathing milk "machine," a cow "can no more contribute, from her independent resources, than a grist mill can deliver automatic flour, or an apple-press can discharge spontaneous cider," explained Bell in 1875.<sup>85</sup> Many farmers shifted the greater balance of their land away from wheat—although never entirely—toward pasture for grazing, meadows for the production of hay, and fields for forage crops that could supplement grazing during the winter and when grasses were in short supply (see Table 2). By comparison, very few farmers attempted to establish permanent pastures. According to the provincial Agricultural Commission Report in 1880, "no permanent artificial pastures were seen during the whole of the journeys of the Commissioners," with the surprising exception from the relatively northern Muskokas, although the authors included testimonials from a handful of individuals who claimed their pastures had thrived for upwards of ten or twenty years with liberal top-dressing of manures.<sup>86</sup>

<sup>83</sup> Derry, *Ontario's Cattle Kingdom*, 10.

<sup>84</sup> DAWO, 1893, 64.

<sup>85</sup> DAO, 1875, 78–79.

<sup>86</sup> Ontario Agricultural Commission, *Report of the Commissioners* (Toronto, ON: 1881), 286–288.

**Table 2.** Select Ontario crops (total acres planted in 0000s and percentage of total improved acreage)

Year	Wheat		Hay <sup>a</sup>		Fodder corn		Turnips	
	Acres	%	Acres	%	Acres	%	Acres	%
<b>1860</b>	1,386	22.9	—	—	—	—	73	1.2
<b>1870</b>	1,366	15.5	1,691	19.1	—	—	—	—
<b>1880</b>	1,949	17.3	1,796	15.9	207	1.8	—	—
<b>1890</b>	1,431	10.1	2,528	17.9	224	1.6	114	0.8
<b>1900</b>	1,488	11.2	2,606	19.6	511	3.9	—	—
<b>1910</b>	870	6.4	3,262	23.9	245	1.8	76	0.6
<b>1920</b>	851	6.5	3,341	25.4	366	2.8	67	0.5

Source: “General Abstract of Agricultural Produce, &c., of Upper Canada for 1861,” *Census of Canadas 1860–61 Vol. II*, 90–95; and Derry, *Ontario’s Cattle Kingdom*, Table 1.1, 12.

Note: Percentages show proportion of total improved acreage. Percentages for any given year do not total 100 as only select crops are shown.

<sup>a</sup> Includes clover and alfalfa from 1890–1920.

Compared to older practices of allowing cattle to fend largely for themselves during the winter, producing high quality hay was a labour intensive and expensive prospect, which encouraged farmers to rely on feeds that were cheaper to produce and/or those with higher nutritional density that could provide a significant portion of their cows’ diets in the non-grazing months. A common choice of supplementary fodder was the turnip, the number of bushels of which increased by 126% between 1861 and 1891.<sup>87</sup> Yet turnips fueled multiple conflicts between factory directors, reformers, and patrons on account of the supposed bitter, unwelcome flavour they imparted to milk. Numerous companies discouraged the practice by passing by-laws prohibiting their use or imploring

<sup>87</sup> Government of Canada, “General Abstract of Agricultural Produce,” *Census of Canadas 1860–61 Vol. II* (Quebec, 1864), 90–95; and Dominion Bureau of Statistics, “Table II (Field Products),” *Census of Canada 1891 Vol. IV* (Ottawa, ON: 1893).

farmers to only feed turnips *after* milking, but in reality, the responsibility for sniffing out turnip milk rested with the cheesemakers when they inspected the milk each morning.<sup>88</sup>

Some companies took drastic measures. In the early twentieth century, the Roblin Cheese Factory in eastern Ontario passed a motion permitting the board of directors to levy a \$25.00 fine against any patron found to be feeding turnips, and also offered a \$5.00 incentive to patrons who volunteered intelligence about transgressors to the board.<sup>89</sup>

Other advice from reformers and agricultural experts met with even less support amongst farmers, particularly ‘soiling,’ the practice of feeding cows during the summer in their stalls using fresh, chopped up fodder rather than allowing them to graze freely, on the grounds that it was ultimately more efficient and would sustain more cows per acre of land.<sup>90</sup> If cows ate primarily in the stables, reformers reasoned, it would be easier to collect their liquid and solid waste.

However, reformers and farmers found common ground in the use of corn and other crops as ensilage, meaning the winter feeding of fodder plants stored and fermented in silos, while still doing the majority of their summer feeding by pasture. Corn increasingly captivated rural Ontarians in the nineteenth century for its seemingly magical capacity to “restore the flow of milk,” even though it drew extensively on the nitrogen in the soil, and required more effort on the part of farmers to restore it by using cover crops

<sup>88</sup> Minutes from 23 December 1896, 16 January 1897, Blanshard and Nissouri Minute Book 2 (1891–1929), Box 1, Blanshard & Nissouri Cheese & Butter Factory Collection, University of Guelph Archives; “Quality of Cheese,” *Woodstock Daily Sentinel-Review*, 5 March 1901. The Reverend W.F. Clarke recommended that turnips be fed only when “pulped, mixed with cut straw or chaff, and fermented,” which would supposedly erase their flavour in the milk. See CDA, 1871, 80.

<sup>89</sup> Minutes from 7 December 1908, Roblin Cheese Factory record book (1891–1923), File 3, Roblin Cheese Factory fonds, University of Guelph Archives, Ontario.

<sup>90</sup> CDA, 1871, 127–128; Derry, *Ontario's Cattle Kingdom*, 11–12.

like clover, manure, and other fertilizers.<sup>91</sup> “In feeding corn, you are putting sunshine into the cow,” remarked one visiting speaker from Ohio in 1897.<sup>92</sup> Ontario’s farmers built 36,778 tons of capacity in the form of silos by 1891.<sup>93</sup> In Oxford County, the acreage devoted to corn production increased by roughly 600% between 1871 and 1911,<sup>94</sup> while in the province as a whole, the “Acreage devoted to silo corn rose more than five times between 1892 and 1917.”<sup>95</sup> Yet reformers did not advocate replacing pasture and grass feeding with corn altogether. They viewed corn as a supplemental feed rather than a narrow strategy for increasing milk yields.<sup>96</sup>

Cheese production transformed more than just farm management and land use. As the industry grew, it also began to influence the social and economic well-being of rural communities. For instance, contemporary observers often attributed the emergence and growth of second- and third-tier towns and villages to their surrounding cheese factories. “Ingersoll, my little town, was never in a more promising condition than she is now,” wrote ‘Observer’ to the *Farmer’s Advocate* in 1871. “And why is this?....Cheese, yes, cheese; its curious, isn’t it, but its a fact [sic].”<sup>97</sup> Loathe to miss an opportunity to slight

<sup>91</sup> The quotation is drawn from CDA, 1871, 117. On the growth of corn production in Ontario and its effects on farm practices, see Patricia Bowley, “Ontario Agriculture in the 1910s: The Move Toward Regional Specialization in Crop Production,” *Scientia Canadensis: Canadian Journal of the History of Science, Technology and Medicine* 20, no. 49 (1996): 107.

<sup>92</sup> DAEO, *Annual Reports of the Dairymen’s and Creameries’ Associations of the Province of Ontario* 1897 [hereafter 1897] (Toronto, ON: 1898), 9.

<sup>93</sup> Dominion Bureau of Statistics, “Table XVI.—Occupiers of Lands and Lands occupied,” *Census of Canada 1891, Vol. II* (Ottawa, ON: 1893), 272.

<sup>94</sup> Surtees, “The Dairy Industry of Oxford County,” 55.

<sup>95</sup> Ankli and Millar, “The Switch from Wheat to Cheese,” 211.

<sup>96</sup> On the possibilities of corn for ensilage, see Derry, *Ontario’s Cattle Kingdom*, 12; and DAEO, 1893, 41–42. For reservations about corn as a replacement for adequate grass and pasture, see DAO, 1875, 20–23. On the shift to winter dairying, and the twentieth-century industrialization of corn, see Dupuis, *Nature’s Perfect Food*, 126–143.

<sup>97</sup> “A Few Observations” [Letter to the editor], *The Farmer’s Advocate*, 6 June 1871.

the neighbouring town of Woodstock, with which Ingersoll cultivated an ongoing rivalry in the nineteenth century, ‘Observer’ concluded, “We are going ahead of the county town—Woodstock.”<sup>98</sup> In the late 1860s, as the Mammoth wheeled its way through Canada and the United States, the visiting American dairy reformer X.A. Willard penned an article for the *Utica Weekly Herald* noting that Ingersoll “is the principal cheese mart of the country....a bustling, busy place, with a population of about 4,000.”<sup>99</sup> In reality, a variety of industrial and commercial activities underwrote the town’s success in the late 1860s and early 1870s, but as Nancy Bouchier notes, the Mammoth was heralded as a symbol of Ingersoll’s success.<sup>100</sup>

As the industry expanded into other parts of the province, other towns and villages became increasingly associated with factory cheddar. ‘Brockvilles’ and ‘Bellevilles’ were used as shorthand for describing the quality of various cheeses.<sup>101</sup> Western Ontario reformers soon acknowledged the impressive growth of cheese factories in the east. Upon his arrival in Belleville in 1875, Ingersoll’s agricultural implements manufacturer James Noxon remarked that, “coming, as many of us do, from what we may call the older school of dairying in the west, we yet expect to learn something in this newer one in the east....you are keeping up a good school here.”<sup>102</sup> The positivity surrounding cheddar was

<sup>98</sup> “A Few Observations” [Letter to the editor], *The Farmer’s Advocate*, 6 June 1871.

<sup>99</sup> “Canada as a Dairy Region,” *Canada Farmer* [extract from the *Utica Weekly Herald*], 16 September 1867. The reference Ingersoll as a “cheese mart” was also made in “A Few Observations,” Letter to the editor, *The Farmer’s Advocate*, 6 June 1871.

<sup>100</sup> Bouchier, *For the Love of the Game*, 18–25.

<sup>101</sup> Ruddick et al., *The Dairy Industry in Canada*, 49.

<sup>102</sup> Noxon’s use of ‘school’ was figurative, not literal. See DAO, 1874, 22. On the link between cheese and Belleville’s development as a significant Ontario town, see Widdis, “Belleville and Environs,” 191, 206.



occasionally punctured by economic downturns, but even these did little to dampen the widespread enthusiasm for dairy. In his presidential address to the CDA in early 1873, Thomas Ballantyne acknowledged that a fall in prices for cheese the previous summer had shaken the confidence of those who had recently started companies, but he proudly announced that “their fears [of overproduction] were unfounded, and though many new factories have been started, all have profited who have entered judiciously into the business[.]”<sup>103</sup> In a commemorative history of the Cornwall Cheese and Butter Board, Harold M. Stiles wrote that the area’s thriving cheese industry matched the town’s paper and furniture manufacturing industries, a “comparison [that] immediately pricks the bubble of illusion in which Cornwall manufacturing concerns have led people to believe that they were the backbone of the town....It is the farmer and the Cheese Board patron who is and has been the real producer of vital commodities[.]”<sup>104</sup>

Cheese manufacturing also supported the expansion of local trade and services in small town communities. Prospective manufacturers of dairy equipment seemed unfazed by the possibility of overproduction and viewed the early cheese manufacturers’ reliance on equipment manufactured in New York as an opportunity to expand Canadian manufacturing. Local foundries and specialty equipment manufacturers moved into the production of vat, milk can, and other metal-based factory equipment. For example,

<sup>103</sup> CDA, 1872, 63.

<sup>104</sup> Harold M. Stiles, *A History of the Cornwall Cheese and Butter Board: An Historical, Biographical and Descriptive Account of the Dairying Industry in the Cornwall District, with Specially Written Articles by Prominent Dairying Experts* (Cornwall, ON: 1919), 18. Stiles’s effusive praise for the Board glossed over the fact that many cheese factories and creameries were beginning to close around the time of publication (1919), but the sheer volume of cheese sold on the Cornwall board suggests his claim about cheese’s importance for the town’s fortunes was not wildly exaggerated.

Richardson & Co. in St. Marys expanded their original, 5,500 square foot factory (built in 1887) multiple times, tripling its size by the 1910s.<sup>105</sup> Another intriguing connection is that between the cheese industry and the growth of rural private banking. In his study of Ontario's expanding rural banking sector in the late nineteenth century, historian Stephen Thorning drew on a handful of private bankers' accounts to suggest that cheese factories occasionally made up a sizeable portion of bankers' cash deposits, which were then used to offer credit elsewhere, and occasionally, fund speculative investments.<sup>106</sup>

But the factory system's benefits were not strictly economic. Cheese factories also fulfilled critical social and community functions. On at least four occasions local residents petitioned the federal government to open post offices at cheese factories once the volume of postal business in their respective areas grew large enough to warrant regular mail service.<sup>107</sup> Informally, the process of shipping milk each day created opportunities for neighbours to discuss local business and gossip. In a recently published local history about the industry in Stormont, Dundas, and Glengarry counties in eastern Ontario, a former milk drawer explained that although shipping milk to the factory was

<sup>105</sup> By the 1940s the original location was 40,000 square feet, and they also owned factories for cheese box manufacturing in Hopetown and Madoc. See "C. Richardson & Co. Ltd. Celebrate 60<sup>th</sup> Year in Dairy Equipment Field," Reprint of article from the *Canadian Dairy and Ice Cream Journal*, September 1947, Folder 30 – C. Richardson & Co. Ltd., Subseries 28, Series 1, St. Marys Museum and Archives, ON.

<sup>106</sup> Stephen Thorning, "Hayseed Capitalists: Private Bankers in Ontario," (Ph.D. Thesis, McMaster University, 1994), 117, 205, 407–408, 445.

<sup>107</sup> "Petition for the Establishment of a Post Office at Kingsey Cheese Factory," File no. 1878-716, Reel T-2400, R169-71-5-E, Post Office Department, Divisional Inspectors: Reports, via Canadiana Héritage at [http://heritage.canadiana.ca/view/oocihm.lac\\_reel\\_t2400/1?r=0&s=1](http://heritage.canadiana.ca/view/oocihm.lac_reel_t2400/1?r=0&s=1); "Application for the Establishment of a Post Office at Cook's Cheese Factory Marmora Township," File no. 1879-297 and "Application for the Establishment of a Post Office at Naphan Cheese Factory, Tyendinaga Township," File 1881-141, Reel T-2198, R169-71-5-E, Post Office Department, Divisional Inspectors: Reports, via Canadiana Héritage at [http://heritage.canadiana.ca/view/oocihm.lac\\_reel\\_t2198/1?r=0&s=3](http://heritage.canadiana.ca/view/oocihm.lac_reel_t2198/1?r=0&s=3); "Application for the Establishment of a Post Office at Scott's Cheese Factory, Township of Mountain, Dundas County," File no. 1893-794, Reel T-2262, R169-71-5-E, Post Office Department, Divisional Inspectors Reports, via Canadiana Héritage at [http://heritage.canadiana.ca/view/oocihm.lac\\_reel\\_t2262/1?r=0&s=1](http://heritage.canadiana.ca/view/oocihm.lac_reel_t2262/1?r=0&s=1).

slow on account of the bottleneck it created at the factory door, “many a yarn was swapped.” On one occasion, a milk drawer made a show of lifting a 300 lb. barrel of salt onto his milk wagon, “just for something to do.”<sup>108</sup> Factories regularly hosted social events for the wider community, like oyster suppers and holiday celebrations. In 1875, for example, the Sons of Temperance in Perth hosted a picnic near the Tay River and concluded their field trip by visiting a local cheese factory.<sup>109</sup> These and other functions of the cheese industry suggested to many that the reformers’ promises of rural growth and liberal cooperation through cheese production were coming to fruition.

### *Circulating Labour*

One change often overlooked in the history of cheese manufacturing is its effect on labour patterns in the countryside. The growth of cheese factories created greater demand for male craft cheesemakers and assistants, but the province was woefully underprepared to supply such a work force, despite the fact that wage labour was a common means for young rural men to climb the “agricultural ladder” toward farm ownership, a key marker of success in the deeply liberal world of nineteenth-century Ontario.<sup>110</sup> Factory cheesemaking could provide an income that could be put toward purchasing land, but it could also be pursued as a career in its own right, since the reformers’ concept of liberal cooperation associated highly skilled craft labour with

<sup>108</sup> Marland Murray, quoted in Rosemary Rutley, *Of Curds and Whey*, 10.

<sup>109</sup> “Sons of Temperance Picnic,” *Perth Courier*, 3 September 1875.

<sup>110</sup> Catharine Wilson, *Tenants in Time*, 190–213. On the persistence of wage labour in rural Ontario, see Joy Parr, “Hired Men: Ontario Agricultural Wage Labour in Historical Perspective,” *Labour/Le Travail* 15 (1985): 94; and also, Terrence Crowley, “Rural Labour,” in *Labouring Lives: Work & Workers in Nineteenth-Century Ontario*, ed. Paul Craven (Toronto, ON: University of Toronto Press, 1995), 15–16.

respectability. To work as a farm labourer indefinitely was to fail, but becoming a career cheesemaker did not incur the same negative connotations.

In any case, there was a shortage of suitable applicants as factories multiplied in the 1860s and 1870s. The time required to develop a *male* labour pool with the craft skills necessary to make high quality cheese inadvertently opened up limited opportunities in factories for women, who typically had more experience making cheese than their male counterparts. Women continued to work in cheese factories well after 1864, despite the reformers' rhetoric to the contrary. The aggregate manufacturing census records—which likely undercount women's participation—show that women over sixteen years of age represented 33% of the cheese factory labour force in 1871, 17% in 1881, and 8% by 1891 (see Table 3). Women who married male cheesemakers may have worked alongside their husbands in the factories. An article in *Canadian Dairyman and Farming World*, published in 1908, noted that one factory in eastern Ontario was managed by “Mr. R.J. McLaughlin, assisted by Mrs. McLaughlin,” while in another, “Mrs. Broad gave her husband some assistance[.]”<sup>111</sup> That these final examples are drawn from 1908 is even more telling. The defeminization of factory cheesemaking labour was quite real, but it was also protracted.

<sup>111</sup> “Some Nice Factories,” *Canadian Dairyman and Farming World*, 23 December 1908. For examples of the same practice in the state of New York, see McMurtry, *Transforming Rural Life*, 165.

**Table 3.** Number, sex, and age of Ontario’s factory cheesemakers, 1871–1891

	<b>1871</b> ( <i>n</i> )	<b>1881</b> ( <i>n</i> )	<b>1891</b> ( <i>n</i> )	<b>1871–1891</b> (% <i>change</i> )
<b>Men&gt;16</b>	524	1289	1700	224%
<b>Men&lt;16</b>	53	62	55	4%
<b>Women&gt;16</b>	304	278	161	-47%
<b>Women&lt;16</b>	28	9	14	-50%
<b>Total</b>	<b>909</b>	<b>1638</b>	<b>1930</b>	<b>112%</b>

*Sources:* “Table 36–Industries,” *Census of Canada 1871 Vol. III* (Ottawa, ON: 1875), 368–369; “Table 37–Industrial Establishments 2<sup>nd</sup> series,” *Census of Canada 1881* (Ottawa, ON: 1885), 404–406; “Table 1–Industrial Establishments,” *Census of Canada 1891 Vol. III*. (Ottawa, ON: 1893), 94–96.

*Note:* The census almost certainly undercounts the total number of cheese factory workers for two reasons. First, some cheese factory assistants were simply listed as labourers, making it nearly impossible to distinguish them from others in that category. Secondly, many wives of cheesemakers likely assisted with production, but their work was not usually recognized as such.

Of course, women experienced factory work differently than their male counterparts. Many were relegated to the status of assistants, responsible for tasks like scrubbing the cheese vats on account of women’s supposedly fastidious nature.<sup>112</sup> Only occasionally did women garner widespread acclaim as factory makers in their own right. Most notable were the Morrison sisters, who made cheese at the privately owned Newry Factory in Perth County for roughly thirty years in the late nineteenth century. Even then, their skill was explained primarily in terms of their capacity for cleanliness: “You could eat your dinner on the floor of the making house, or in the curing-room, in the vat or in the whey tank,” insisted Stratford MP A.F. MacLaren after awarding the sisters first prize at the inaugural meeting of the Cheese and Butter-makers’ Association of Western

<sup>112</sup> The Ontario experience also parallels cheese manufacturing in New York in this regard. See McMurry, *Transforming Rural Life*, 166.

Ontario in 1899.<sup>113</sup> Gendered ideas about women's skills and capacities were used to explain their successes and their supposed incompatibility with the cheese factory system.

Even when women did not participate in the actual process of making cheese, women in cheesemaking families shouldered much of the burden for reproducing cheesemakers' labour.<sup>114</sup> Thus, factories could be sites of productive *and* reproductive work. Some even contained living quarters, usually on the second floor or in a building adjacent to the factory. When a male cheesemaker did not have the domestic assistance of a family member or a female hired hand, their absence could be notable. The most prominent person in the diary of a young cheesemaker named William Fitzgerald was his neighbour, the widowed Mrs. Cowan, who regularly offered him food, healed a nasty foot injury he sustained in an accident, and gave him a place to sleep when the factory was too cold. In his second season with the Rose Hill Cheese Company he eschewed living alone at the factory in favour of boarding with her across the road.<sup>115</sup>

Men and women found their way to factories through a variety of mechanisms. Advertisements for cheesemakers were usually published in local newspapers, and occasionally, those with a broader reach, like *Canada Farmer* or the *Globe*. In some instances, middlemen brokered jobs between individual makers and factories. Such was the case for Fitzgerald, who found a position at Rose Hill through L.W. Murphy, a

<sup>113</sup> DAWO, *Annual Reports of the Butter and Cheese Associations of the Province of Ontario, 1899* (Toronto, ON: 1900), 155–156.

<sup>114</sup> Cohen, *Women's Work*. A recent review of the status of labour and environmental history 'hybrid' scholarship makes the important point that historians are still neglecting sites of labour reproduction by focusing, perhaps inadvertently, on "'extreme' environments" (such as mining camps, ranches, etc.) more than "ubiquitous spaces." See Soluri, "Labor, Rematerialized," 164.

<sup>115</sup> For instance, see his diary entries from 29 June 1892 and 4 May 1893, William Fitzgerald fonds, Queen's University Archives, Kingston, Ontario.

Kingston-based dairy equipment supplier and merchant, after his attempts at contacting a handful of factories directly proved unsuccessful.<sup>116</sup> Some makers had familial connections as the sons or daughters of factory patrons or shareholders which—combined with informal training at home—provided them with opportunities to work in local factories. Other young men and women were hired directly from New York, suggesting that the Ontario industry drew on a surplus supply of skilled cheesemaking labour in that region.<sup>117</sup> Male cheesemakers could access additional avenues for finding cheesemaking opportunities that were largely inaccessible to women, such as the dairymen's associations and—beginning in the 1890s—the province's three formal dairy schools. In 1888, the head of the Ontario Agricultural College (OAC)'s Dairy Department, James W. Robertson, wrote to one prospective maker that “the best place[s] to find a situation as a cheesemaker” were the annual conventions of the DAWO and DAEO, where recommendations could move “quickly.”<sup>118</sup> Dairy schools also assisted graduates of their winter courses find positions each spring by fielding requests from factories directly, the

<sup>116</sup> Fitzgerald writes that when he arrived in Kingston, he “proceeded at once to L.W. Murphy's as a proof of my return, with whom I had engaged for the coming season as Cheese Maker for another man[.]” The exact pecuniary nature of the relationship between Fitzgerald and Murphy is unclear, although Fitzgerald does appear to have purchased his cheesemaking supplies at Murphy's store. Diary entry, 2 April 1892, William Fitzgerald fonds, Queen's University Archives, Kingston, Ontario.

<sup>117</sup> Newspaper announcements about new factories often identified the origins of the cheesemaker(s) they hired. For an example, see “Cramahe and Haldimand Cheese Factory,” *Canada Farmer*, 1 July 1867. The company “secured for their manager the services of Mr. Thomson, an experienced cheese manufacturer from the State of New York[.]”

<sup>118</sup> Letter from J.W. Robertson to unknown recipient, 5 September 1888, Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC A0601, University of Guelph Archives, Ontario; Letter from J.W. Robertson to C.A. Russell, 24 September 1888, Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC A0601, University of Guelph Archives, Ontario.

assumption being that dairy school graduates would be more likely to act as ‘first class men’ than their non-dairy school counterparts.

Factory cheesemaking might have been considered more respectable than waged farm labour on account of its ties to craft, but it was similarly seasonal and insecure. Until the late nineteenth century, when some factories began to produce butter in the winter months as a solution to both idle capital and an underemployed workforce, most cheesemakers were faced with either a long bout of unemployment, or work in other sectors—sometimes with dire consequences. The *Globe* reported in January 1896 that twenty-one year old James Gale, “a cheesemaker by trade,” died after being crushed in a train accident in his position as spare brakeman with the Michigan Central Railroad, a job he held for only two weeks.<sup>119</sup> Even as late as 1908, the Peterborough-based *Canadian Dairyman and Farming World* explicitly sought out unemployed cheesemakers to sell paper subscriptions in the winter, suggesting many of them still worked seasonally.<sup>120</sup>

Between the rapid growth of cheese factories, the pull of the cities, and the insecurity of seasonal work, a number of cheesemakers moved frequently in search of better options. Sometimes this was just between factories in search of a better contract. William Fitzgerald stayed at the Rose Hill Factory for a second season, but not without first sending out feelers to nearby “Henderson’s” and its proprietor David Nott.<sup>121</sup> Some makers ‘succeeded’ by becoming factory or farm owners, or even taking on government

<sup>119</sup> “Crushed to Death: A Brakeman’s Horrible Death on a Runaway Engine—Caught Between Engine and Tender,” *The Globe* (1844-1936), 6 January 1896.

<sup>120</sup> “Untitled,” *Canadian Dairyman and Farming World* 27, no. 46 (December 1908), 12.

<sup>121</sup> Diary entries 12 December 1892, and 16 December 1892, William Fitzgerald fonds, Queen’s University Archives, Kingston, Ontario.



or commercial positions related to dairying.<sup>122</sup> Others evidently remained wage labourers, either within the cheese industry or beyond. For instance, Thomas B. Sellars, a maker who likely began working in a cheese factory in the 1880s, was employed as a grocery clerk in Nevada twenty years later.<sup>123</sup> Terry Crowley's suggestion that "Rural Ontarians lived in perpetual motion" often held true for cheesemakers, and even more so for their assistants, who were sometimes hired for just weeks at a time.<sup>124</sup> It was transience—not stability—that characterized the labour patterns of many cheese factories and the lives of many cheesemakers, assistants, and their families.

### *Connections Beyond the Dairy Zone*

The smooth function of the cheese industry also required the orchestration of inputs from beyond the dairy zone. Metal vats, boilers, biochemical coagulating agents, salt, dyes, hand tools, and cheese boxes all had to circulate through the countryside at the right time, in the right amounts, and the right prices to keep the dairy zone functioning smoothly. These inputs supported the development of spin-off manufacturing industries within and beyond Ontario, but also deepened farmers' dependence on the fortunes of the global economy. The chains of production that delivered these inputs link the export-oriented cheese industry to other spaces of capitalist production and accumulation, sometimes well outside the dairy zone's ostensible boundaries.

<sup>122</sup> Perhaps the most extreme example is that Canada's first two Dairy Commissioners—James W. Roberston and J.A. Ruddick—both began their careers as cheesemakers.

<sup>123</sup> I have pieced together Sellars's employment history using a series of reference letters dated between 1891 and 1910. (Letters are in the author's personal collection.)

<sup>124</sup> Crowley, "Rural Labour," 18.

In the aggregate, cheese production continued the eighteenth- and early nineteenth-century pattern of denuding southern Ontario's forests in the name of settlement and 'civilization.'<sup>125</sup> In addition to the lumber required to build factories and power them, cheese producers needed an enormous supply of wooden boxes to ship cheeses to the United Kingdom. Not any old tree would do. Cheese box manufacturers required wood that was soft and flexible enough to be molded into a circular shape. They typically used soft elm for the sides, and ash elm, maple, oak, or pine for the bottoms and the lids.<sup>126</sup> Scale boards—the thin sheets of wood that separated wheels of cheese from the bottoms and tops of boxes and helped protect their bandaged rinds—were usually made from basswood or whitewood. Cheese boxes were typically made in small workshops attached to larger lumber mills.<sup>127</sup> One of the earliest operations belonged to Adam Oliver in Ingersoll, who added cheese box manufacturing to his mill's repertoire in the 1860s. By 1867, his factory was producing 20,000 cheese boxes a year.<sup>128</sup> In the east, D.M. MacPherson expanded into cheese box manufacturing through a partnership with the Oxford-born Jacob Schell. Schell arrived in Glengarry in 1882 in order to "overhaul" an old saw mill owned by MacPherson and the Merrill family, but later bought out the Merills' stake. By 1885, their company was making up to a thousand cheese boxes a day as well other miscellaneous cheese-related lumber products. They employed thirty-five

<sup>125</sup> Wood, *Making Ontario*, 22, 58.

<sup>126</sup> Letter from J.W. Robertson to John McCrae, dated 30 April 1888, Dairy Department Letterbooks, Book 1 (1888–1895), RE1 OAC A0601, University of Guelph Archives, Guelph, ON.

<sup>127</sup> The fact that the industrial schedule of the 1871 census only lists three distinct cheese box manufacturers is probably tied to the fact that many of these operations were part of larger lumber mills. See Canadian Industry in 1871 Project (CANIND71), University of Guelph, Ontario, 1982–2008. Accessed at <http://www.canind71.uoguelph.ca/index.shtml>.

<sup>128</sup> Emery and Jamieson, *Adam Oliver of Ingersoll*, 22–24.

people in the factory and another thirty in the bush.<sup>129</sup> Under Schell's direct management the company expanded to employ roughly 300 male workers across multiple plants in eastern Ontario, the Ottawa Valley, and western Quebec by the early twentieth century.<sup>130</sup>

The easy money of cheese box manufacturing faded as the province's tree cover receded, even though Harvey Farrington had boasted to the American Dairymen's Association in the late 1860s that Canada had enough suitable lumber to make cheese boxes "to last half a century."<sup>131</sup> The problem, as far as manufacturers were concerned, was not elm's absolute scarcity so much as the growing economic challenge of locating trees, extracting them, and shipping them south at a profit.<sup>132</sup> A letter from a cheese box manufacturer in Peterborough in 1903 elaborated:

...I have been 50 Miles North to look for elm. There is a lot of elm out there but it is scattered about a good deal. I think the farmers would draw what they have a long way if they could make some money out of it. There is a good many saw mills in that country no trouble to get a place to put a veneer machine in. I am trying to buy a second hand machine here and if I can I will try to put it down in the North somewhere.<sup>133</sup>

The scope of the problem was not lost on attendees at the DAEO convention that same year. One box manufacturer expressed his concerns about the "rapid depletion of the elm

<sup>129</sup> MacGillivray and Ross, *A History of Glengarry*, 487–488.

<sup>130</sup> David M. Rayside, *Small Town in Modern Times: Alexandria, Ontario* (Montreal, QC: McGill-Queen's University Press, 1991), 43. Another cheese box manufacturer in eastern Ontario was the Coulthart Cheese Box Manufacturing Company near Cornwall. It was founded in 1890 and continued production through the First World War, when it employed almost a dozen employees for six months of the year. They produced roughly 60,000 boxes a year in the late 1910s. See Stiles, *Cornwall Cheese and Butter Board*, 90–91.

<sup>131</sup> "American Dairymen's Convention," *Canada Farmer*, 1 February 1867.

<sup>132</sup> Diamando Diamantakos, "Private Property Deforestation and Regeneration and the Clerk of Forestry in Nineteenth-Century Ontario," *Scientia Canadensis: Canadian Journal of the History of Science, Technology and Medicine* 21 (n. 50), 1997: 33. The problem from the cheesemakers' perspective was the escalating price of boxes in conjunction with stagnant wages.

<sup>133</sup> Letter from Robert Arnott to Mr. Woods dated 20 January 1903, Unlabeled File: Misc. correspondence and documents, Woods Cheese Box Factory Collection, Lennox and Addington County Archives.

forests of the eastern portion of Ontario....[I]t is necessary that our elm forests should be given some measure of protection if the dairy industry is to be helped to do its best work.”<sup>134</sup> The following year Henry Hoshel Dean (the head of the Dairy Department at Ontario Agricultural College in Guelph) suggested that elm be shipped south in semi-processed form so cheese companies could make their own boxes during the winter to cut their costs and continue employing cheesemakers during the off-season.<sup>135</sup>

Salt was another important input, without which cheeses would rot rapidly. Ontario cheesemakers salted freely—too freely, some argued—in an attempt to make their cheeses dry enough to keep well on the long journey across the Atlantic. To give a sense of the sheer weight of salt required, consider the following estimate: assuming an average of 2 lbs. of salt per 100 lbs. of cheese curd produced, Ontario factories required roughly 44,593,223 lbs. of the mineral to make the provincial output of cheese between 1883 and 1904.<sup>136</sup> These veritable streams, sacks, and barrels of salt connected Ontario’s cheese factories to industrial heartlands old and new. In the earliest years companies sourced the mineral from the Cheshire region of England (via Liverpool) or to a lesser extent from Syracuse, New York. In Cheshire, entire families worked around the clock under coal-choked skies to ensure that salt pans never stopped boiling. “The salt industry,

<sup>134</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1902* [hereafter 1902] (Toronto, ON: 1903), 141.

<sup>135</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1903* [hereafter 1903] (Toronto, ON: 1904), 159. There is no indication of how his suggestion was received, but his claim that “it does not require any special skill” was misguided.

<sup>136</sup> 1883 is the year that the Bureau of Ontario began keeping records on cheese factory output in the province. 1904 was chosen because it was the year of peak exports of cheese to the United Kingdom. The estimate of 2 lbs. per 100 lbs. curd is drawn from Henry Hoshel Dean, *Canadian Dairying*, 5<sup>th</sup> edition (Toronto, ON: Ryerson Press, 1920), 201, who writes that anywhere between 1 ½ and 2 ½ lbs. per 100 lbs. of curd was common. The estimate also does not account for shrinkage in the curd between the time of salting and the sale of cured cheese.

the coal industry, and the port of Liverpool fed off of each other and together grew prosperous,” writes Mark Kurlansky.<sup>137</sup> Domestic sources became available after salt was discovered in Huron County, but makers continued to favour the finely grained, bone dry ‘dairy salt’ of England until the late 1870s, since Canadian salts had a reputation for being too wet.<sup>138</sup> In Seaforth, Ontario, just three companies invested more than a hundred thousand dollars into the construction and operation of derricks and the pursuit of more efficient mining technologies.<sup>139</sup> But Seaforth paled in comparison to nearby Goderich, on the shores of Lake Huron, where saltworks produced roughly 28,000 lbs. of salt a day. In 1871, they formed a monopoly, dug new wells with impunity, and glutted the market by the end of the year.<sup>140</sup> Whether salt was procured locally or internationally, the demands of the cheese industry contributed to instability and industrialization elsewhere.

Unlike salt, cheesemakers could theoretically do without annatto, the seed of the achiote plant (*Bixa orellana*) used to give much of Ontario’s cheddar its telltale orange hue. Achiote—a small tree native to parts of South America—likely spread to other tropical and sub-tropical areas through colonial encounters in the sixteenth and seventeenth centuries. Long used as a dye and food additive by Indigenous societies, its seeds gained in popularity in England, France, and other European countries as a plant-

<sup>137</sup> Mark Kurlansky, *Salt: A World History* (New York: Penguin Books, 2002), 194.

<sup>138</sup> Kurlansky, *Salt*, 315; CDA, 1869 and 1870, 64.

<sup>139</sup> Isabelle Campbell, *The Story of Seaforth: A History* (Seaforth, ON: Huron Expositor, 1966), 36–38, accessed online at <http://www.ourroots.ca/e/toc.aspx?id=11262>; Dianne Newell, “‘All in a Day’s Work’: Local Invention on the Ontario Mining Frontier,” *Technology and Culture* 26, no. 4 (Oct. 1985): 810.

<sup>140</sup> W.E. Brett Code, “The Salt Men of Goderich in Ontario’s Court of Chaucery: *Ontario Salt Co. v. Merchants Salt Co.* and the Judicial Enforcement of Combinations,” *McGill Law Journal* 38 (1993): esp. 526 (note 26), 550.

based dye that gave butter and certain cheese varieties an orange hue that could cover up inconsistencies in milk.<sup>141</sup> Typically manufacturers used more of it in the early months of the season to improve the “appearance of richness” in the cheese.<sup>142</sup> Many producers and merchants despised its use; contemporary opinions on annatto ranged from a necessary expense demanded by consumers to a crude form of adulteration that would damage the industry. Nevertheless, its use remained common throughout the nineteenth century, and producers were always keen to know whether market preferences about cheese colour had changed from season to season. Dairymen’s associations set aside time during their annual meetings to discuss how ‘coloured’ the coming season’s make should be, although makers rarely received straightforward answers. In 1874, the cheese exporter Edwin Caswell explained that London preferred a “high-colored” cheese, while Manchester a “pale” one.<sup>143</sup>

Converting achiote seeds into a form convenient for cheesemaking involved a considerable amount of processing. An 1863 address by a chemist published in the *Transactions of the Highland and Agricultural Society of Scotland* explained that the seeds had to be soaked for weeks and allowed to ferment before pressing them for their

<sup>141</sup> On its use as a dye and food additive in non-Euroamerican societies, see Andrew Dalby, *Dangerous Tastes: The Story of Spices* (Berkeley: University of California Press, 2000), 96, 145; Marcy Norton, “Tasting Empire: Chocolate and the European Internalization of Mesoamerican Aesthetics,” *American Historical Review* 111, no. 3 (2006): 672; and María Luisa Vásquez de Ágredos Pascual, Antonio Fernando Batista dos Santos, and Dolores Julia Yusá Marco, “Annatto in America and Europe. Tradition, Treatises and Elaboration of an Ancient Colour,” *Arché* no. 4-5 (2010): 97–102.

<sup>142</sup> DAO, 1875, 36.

<sup>143</sup> DAO, 1874, 41. Caswell was always unusually vocal in his support of annatto, possibly because he was one of the province’s biggest dairy input suppliers.

dye, which was boiled until it dried into powder.<sup>144</sup> Never cultivated as a monoculture crop, annatto seeds were generally harvested wherever the trees were found, and tended to fetch a low price on the market.<sup>145</sup> By the nineteenth century, the largest supplies of high-quality annatto in England came from Jamaica, although in the 1890s a British botanical station in colonial Nigeria undertook experiments to produce “flag” annatto, a moist form of the dye considered less suitable than powder for cheese production. The powder was then shipped to England, where it was often cut with all manner of adulterants—including lead, brick powder, and the mercury-based vermilion—which prompted some manufacturers to produce and market ‘guaranteed’ fluid annatto extracts beginning in the early 1860s. In *The Dairy Industry in Canada*, Ruddick reported that early Ontario cheesemakers were responsible for the dirty work of making their own extracts by boiling the seeds in caustic potash (more commonly known as lye), but once dairy supplier Edwin Caswell began to import English liquid brands like Mitchell’s and Nicholl’s in 1868, makers quickly changed their practices despite their high cost.<sup>146</sup>

<sup>144</sup> Highland and Agricultural Society of Scotland, “Proceedings in the Laboratory,” in *Transactions of the Highland and Agricultural Society of Scotland July 1861—March 1863* (Edinburgh, UK: 1863), 61–64.

<sup>145</sup> Royal Botanic Gardens, “Bulletin of Miscellaneous Information,” *Kew Bulletin* No. 43 (July 1890), 141–144; and Botanical Department, Jamaica, “Report of the Director of Public Gardens and Plantations, Jamaica, for the Year Ended 21<sup>st</sup> March, 1892,” *Bulletin of the Botanical Department, Jamaica* 22, no. 39 (Kingston, Jamaica: 1893), 19.

<sup>146</sup> Ruddick et al., *Dairy Industry in Canada*, 61; DAO, 1875, 35–36; also Highland and Agricultural Society of Scotland, “Proceedings in the Laboratory,” 65. Rarely do cheesemakers’ accounts list the exact type of annatto used. However, an 1874 questionnaire distributed by the DAO to prize-winning cheesemakers in Ontario asked respondents to specify what kind of annatto, rennet, and salt they used. Thirty-five of the forty-three cheeses were produced using either Mitchell’s or Nicholl’s liquid annatto, both of which were manufactured in England. See DAO, 1874, Appendix. The fact that Canadian makers tended to import processed annatto through British and American channels is further supported by an 1887 report from the U.S. consul to Jamaica, which noted that only 199 lbs. of annatto was exported from Jamaica to Canada directly between 1885 and 1886, compared to 13,622 lbs. to England, and 352,798 lbs. to the United States. See U.S. Department of State, “Annatto in Jamaica,” *Reports from the Consuls of the United States* 23 (Washington: July–September 1887), 75–76 [Google e-book].

But no input, save milk itself, mattered more than rennet. In the mid-nineteenth century the term referred to the entire dried fourth stomach of a calf, the lining of which contains enzymes (particularly chymosin) responsible for coagulating milk into curds and whey. Although some cheeses can be made using acid instead of rennet (these include ‘fresh’ cheeses like paneer or *queso fresco*) or by using plant-based alternatives (like fig), semi-hard English-style varieties like cheddar are rennet-based. Ontario’s cheesemakers initially procured rennets locally, either directly from patrons or (more commonly) in bulk from local butchers. Occasionally, unscrupulous butchers passed off sheep stomachs—which had poorer coagulating ability—as those belonging to calves. In 1868, Martin Collett, a Toronto butcher, sent a letter to *Canada Farmer* explaining the difference between the two (accompanied with dried specimens of each) in an attempt to correct the “willful ignorance” of cheesemakers, while undoubtedly trying to drum up greater business for himself.<sup>147</sup>

Cultivating the coagulating power of rennet required converting stomach lining into liquid form so it would mix uniformly with milk. Makers took a number of stomachs (sometimes called vells), and once they were dry, cut them into pieces and soaked them in wooden barrels containing either water or an acidic brine like whey. Determining the strength of a given batch of extract could be difficult, and many rennets were poorly cured or tainted. In short, the procurement and maintenance of rennet extracts constituted an integral but troublesome part of a cheesemaker’s craft corpus in the early years of the

<sup>147</sup> See “Rennets—A Caution,” *Canada Farmer*, 15 October 1867; and “Rennet,” *Canada Farmer*, 1 September 1868.



industry. Hence the excitement when a Danish chemist named Christian Hansen put the first factory-made rennet extract onto the market in the early 1870s. Reformers and dairy suppliers lauded its apparent strength, uniformity, and the possibility it offered for cheesemakers “to employ it rationally instead of...empirically.”<sup>148</sup> In 1878, the Chr. Hansen Company built their first North American laboratory at Little Falls, New York, after which Canadian cheesemakers had ready access to the new product.<sup>149</sup> By the late nineteenth century practically all cheesemakers used industrialized rennet extracts produced outside of Canada from the bodies of ‘surplus’ foreign calves. The substitution of non-Canadian calves for local ones disrupted local circuits of supply between farms and factories, and likely intensified the moral unease in Ontario about the escalating numbers of male calves killed at birth, a problem that Margaret Derry explains was closely associated with the dairy industry.<sup>150</sup>

### *Conclusion*

This chapter has outlined a number of the elements of Ontario’s vernacular dairy zone, from the construction of individual factories at the nexus of human and extra-human labour, to changing patterns of land use, to the circulation of capital, labour, and

<sup>148</sup> CDA, *Report of the Canadian Dairywomen’s Association with Transaction & Addresses of the Annual Convention, List of Members, Reports of Factories, and other Interesting Information, for the Year 1873* [hereafter 1873] (Toronto, ON: 1874), 35. However, commercial extracts weren’t foolproof. In 1888, J.W. Robertson warned one cheesemaker that “Rennetine and Rennet Extract and Rennet Tablets by the same makers, seem to vary in strength and quality from time to time[.]” Letter from J.W. Robertson to unknown recipient, 24 July 1888, Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC A0601, University of Guelph Archives, Ontario.

<sup>149</sup> Ruddick et al., *The Dairy Industry in Canada*, 61.

<sup>150</sup> Derry, *Ontario’s Cattle Kingdom*, 113.

other commodities that sustained the industry's growth. Moving cheese production from farms to factories helped transform rural southern Ontario's social and ecological environment—its very nature. In her study of central New York dairying in the nineteenth century, Sally McMurry explains that, "For a short while, at least, it seemed as if central New York cheese dairy farming families had struck an elusive balance: between conservation and destructiveness, and between the independence that subsistence afforded and the prosperity that market participation promised."<sup>151</sup> In a similar sense, the dairy zone vision of Ontario's rural reformers appeared to be coming to fruition. Yet as I have begun to show, the working dairy zone also differed from the reformers' imagined alternative rural modernity in some important ways: farmers rarely constructed factories on the scale that reformers believed would be most profitable, and the dairy zone took a somewhat different shape than they anticipated. In chapter 3 we turn to cheese itself for a closer look at the frustrations that plagued the industry.

<sup>151</sup> McMurry, *Transforming Rural Life*, 42.

### Chapter 3: Dairy Zone (Dys)function

Thou shalt not say one unto another concerning me, Lo! hath not this Philistine of a cheesemaker a soft snap, he getteth big wages and worketh not hard. For verily I say unto you, that is a whopper, he getteth up early in the morning and laboreth until late at night; moreover he worketh on the Sabbath day, for which the Lord hath no mercy on him.<sup>1</sup>

#### *Introduction*

In March of 1892, a young man from eastern Ontario named William Fitzgerald arrived in Syracuse, New York with plans to stay for at least a year. He immediately embarked on a search for work, preferably as a shop assistant of one sort or another, but after two long days of fruitless effort, he returned to his boarding house tired and dejected. “Uncle Sam was a failure,” he confided in his diary. Heeding the advice of an acquaintance, he “somewhat reluctantly” wired a dairy supplier in Kingston, Ontario to inquire about a cheesemaking position he had turned down before leaving. Two weeks later, Fitzgerald found himself back in Canada and en route to the Rose Hill Cheese Factory north of Kingston, no more enthused about the job than before. “I was left to the mercy of strangers,” he wrote later that evening, “to fight my way alone.”<sup>2</sup>

Fitzgerald’s reluctance to return to cheesemaking should give us pause: what about the job did he seek to escape?<sup>3</sup> This chapter examines craft cheesemaking in order

<sup>1</sup> Excerpt from “Cheesemaker’s Commandments,” *The Advance*, 24 July 24 1891, found in Joy, *Cheese Factories of Rideau Township*, 16. The origins of this satirical list are unknown, but variations of it were reprinted in a variety of publications within and beyond Canada in the nineteenth and twentieth centuries. Similarly, see “The Cheesemaker’s Ten Commandments,” *West Gippsland Gazette*, 11 July 1905.

<sup>2</sup> Diary entries, 31 March 1892 through 15 April 1892, William Fitzgerald fonds, Queen’s University Archives, Kingston, Ontario.

<sup>3</sup> Ironically, it seems likely that Fitzgerald remained a cheesemaker after his short hiatus in Syracuse, but I suspect it was never his first choice of career. A cheesemaker by the same name attended the Eastern Dairy School in 1894/1895 season, and a cheesemaker named William Fitzgerald reappears in the Canadian census in 1911 and 1921 on nearby Wolfe Island after a gap in the historical record. See DAEO,

to better understand how the industry functioned in the late nineteenth and early twentieth centuries. I argue that export-oriented cheese production was less harmonious and successful than either the celebratory rhetoric of reformers or aggregate statistics might suggest. The chapter begins with a discussion of nineteenth-century ‘cheesecraft’ as both an engagement with extra-human nature *and* a particular form of labour organization. Next I examine how the shape and character of the dairy zone as described in chapter 2 created unintended consequences for cheese production itself, specifically by making milk more difficult for cheesemakers to know and manipulate when it arrived at their factories, an issue I call the ‘problem of milk.’ As Kendra Smith-Howard makes clear in her recent study of twentieth-century dairying in the United States, milk has never been a pure, natural substance. Like so much of our global environment, it is a “hybrid of nature and culture,” a technology in its own right.<sup>4</sup> When Ontario cheesemakers interacted with milk, it was not unnatural human industry confronting stable, ahistorical nature, but as elements of an organic machine producing (often unanticipated) obstacles to itself. The ‘problem of milk’ was the *effect* of the organizational structure of the industry as an organic machine, and an issue that shaped craft practices in turn.

From the late 1880s to the late 1890s, the difficulties of producing consistent, uniform cheddar from pooled milk were compounded by drought, the agency of the microbial world, the disproportionate power of cheese buyers and exporters, and a global depression. During this decade, the relationships between cheesemakers, patrons, factory

*Annual Reports of the Dairymen and Creameries' Associations of the Province of Ontario 1895* [hereafter 1895] (Toronto, ON: Ontario Department of Agriculture, 1896), 60.

<sup>4</sup> Smith-Howard, *Pure and Modern Milk*, 6–7.

directors, reformers, and exporters became increasingly strained, a reality that challenged the reformers' claims about cheese production as liberal cooperation. Cheesemakers felt many of these tensions firsthand, which may partially explain Fitzgerald's reservations about remaining in the industry. Overall, this chapter uses milk and craft to highlight the growing dissonance between the reformers' goals and the reality on the ground. By the turn of the twentieth century, their project of alternative modernity was evidently at risk.

### *The Nature of Craft*

Craft is an amorphous term, used to describe a wide variety of practices, such as skilled manual labour, recreational activities, and other creative work. For some, its malleable quality is its strength. Sociologist Richard Sennett argues that, "Craftsmanship names an enduring, basic human impulse, the desire to do a job well for its own sake. Craftsmanship cuts a far wider swath than skilled manual labor; it serves the computer programmer, the doctor, and the artist; parenting improves when it is practiced as a skilled craft, as does citizenship."<sup>5</sup> However, reducing craft to a fundamentally human endeavour can easily obscure its historical particularities and political dynamics. Something of this flattening effect can be found in the scanty literature about Ontario's cheesemakers, which smoothes over the industry's nineteenth-century bumps, gradients, and knots like well-sanded wood, rendering cheesemakers in the 1860s, the 1890s, and the 1930s largely interchangeable.<sup>6</sup>

<sup>5</sup> Richard Sennett, *The Craftsman* (New Haven, CT: Yale University Press, 2008), 9.

<sup>6</sup> Few scholars of Ontario dairy have written about cheesemakers as a specific group within the cheese industry. One exception is Heather Menzies, but her analysis of cheesemakers relies too heavily on a romantic and static definition of craft. In *By the Labour of Their Hands*, she writes about factory

Labour historians have examined craft as a particular form of labour organization, often defined in contrast to industrial proletarianization. While industrial capitalism is marked by a “workmanship of certainty” in that it tries to reduce the risk inherent in production through the standardization of labour and materials, craft production is characterized by a “workmanship of risk,” in which the quality of the goods produced are highly contingent on the ability of individual workers and the particularities of materials and processes involved.<sup>7</sup> In the pre-industrial era, craftworkers typically developed their skills through apprenticeship and guild systems and retained some formal control over their work conditions, including the length and pace of one’s workday and decisions about production processes. For capitalists, craft production is risky to the extent that variable materials and ‘unruly’ workers can interrupt the ongoing transformation of materials into commodities, so the tendency has been to marginalize and replace craftworkers with deskilled, interchangeable workers. Capitalists’ power to do so has been uneven for a host of reasons, including the resistance of craftworkers and the techno-scientific challenges of standardizing some areas of production.<sup>8</sup> Moreover, as

cheesemakers in the 1920s and 1930s as though their work was the same as those in the 1860s and 1870s. These makers certainly had more in common than with cheesemakers who worked for large corporate dairy plants in the mid-twentieth century, but it is important to understand how craft changed between the mid-nineteenth and early twentieth centuries too. See McMurry, *Transforming Rural Life*, 148–171, for a discussion of factory cheesemaking work in the state of New York in the mid-nineteenth century.

<sup>7</sup> The terms ‘workmanship of certainty’ and ‘workmanship of risk’ were coined by David Pye in the mid-twentieth century. See David Pye, *The Nature and Art of Workmanship* (Cambridge, UK: Cambridge University Press, 1968), 4–8. I arrived at Pye’s through the work of Heather Paxson, who draws on Pye’s insights to analyze twenty-first century artisanal cheesemaking. See Heather Paxson, *The Life of Cheese: Crafting Food and Value in America* (Berkeley: University of California Press, 2013), 132.

<sup>8</sup> For case studies in the Canadian historiography that emphasize craft resistance and its relationship to the changing production processes, see Craig Heron, “The Crisis of the Craftsman: Hamilton’s Metal Workers in the Early Twentieth Century,” *Labour/Le Travail* 6 (1980): 7–48; Greg Kealey, “‘The Honest Workingman’ and Workers’ Control: The Experience of Toronto Skilled Workers, 1860–1892,” *Labour/Le Travail* 1 (1976): 32–68; Ian McKay, “Capital and Labour in the Halifax Baking and Confectionery Industry during the Last Half of the Nineteenth Century,” *Labour/Le Travail* 3 (1978): 63–108; and Bryan

labour historian Raphael Samuel has argued, industrialization paradoxically expanded craft labour in some industries at the same time it undermined craftsmanship in others. In short, industrialization was marked by combined and uneven mechanization and deskilling of craft practices.<sup>9</sup> Since then, scholars have built on Samuel's work to form the "historical-alternatives approach," a body of work that seeks to understand how craft work functioned—however briefly—alongside 'traditional' models of industrialization.<sup>10</sup>

Nineteenth-century factory cheesemaking occupied a complicated (and dynamic) position between industrial and craft systems. On the one hand, cheesemakers like Fitzgerald can be understood as craft workers in the sense that they produced cheese from start to finish instead of working on assembly lines; they adapted their preferred tools and habits to the characteristics of milk on any given day; they usually learned the trade through apprenticeships and assistantships; and few of their tasks were mechanized. The growth of the factory cheese industry between the 1860s and 1900s went hand in hand with an expansion of craft, bucking the trend of deskilling and standardization in many other sectors. On the other hand, cheesemakers used craft methods for industrial ends, since their energies were geared toward overcoming variability in the materials at hand to produce a uniform, consistent product for urban consumers in the United Kingdom. Despite the industry's dependence on and celebration of craft, reformers and dairy

D. Palmer, "Most Uncommon Common Men: Craft and Culture in Historical Perspective," *Labour/Le Travail* 1 (1976): 5–31.

<sup>9</sup> Raphael Samuel, "Workshop of the World: Steam Power and Hand Technology in Mid-Victorian Britain," *History Workshop Journal* 3, no. 1 (1977): 19–25.

<sup>10</sup> Robert B. Kristofferson, *Craft Capitalism: Craftworkers and Early Industrialization in Hamilton, Ontario 1840–1872* (Toronto, ON: University of Toronto Press, 2007), 4–8. Kristofferson critiques this approach for not going far enough to challenge the declensionist narrative of earlier labour historians.

scientists sought to standardize certain parts of the process. Finally, while cheesemaking did not exactly undergo the dramatic proletarianization common in other sectors at the time, many makers nevertheless bore the brunt of the increasing tensions between patrons and the cheese buyers and exporters, as we will see below. As a sector, craft cheesemaking expanded between the rise of the factory system in the 1860s and its peak in the early 1900s, but it was also eroded and challenged in various ways.

Even analyses that stress the dynamism of craft production still tend to reinforce distinctions between an active, human culture (craft) and a passive, extra-human nature (material). Environmental historians and other scholars remind us that the production of commodities (and other, noncommodified goods) is *always* a process involving both human and extra-human labour.<sup>11</sup> In cheesemaking this is very obviously so: cheesemakers cannot mechanically reproduce the biochemical work required to turn milk into cheese, nor the work of the cows to produce milk from grass.<sup>12</sup> All cheeses are the product of separating milk's constituent parts—water, fat, proteins—and reassembling them into a more solid form (which produces a liquid by-product called whey).<sup>13</sup> Makers rely on interactions within the extra-human, and especially the microbial world—enzymes, bacteria, and yeasts—to complete critical parts of the process. As dairy scientist

<sup>11</sup> Some excellent examples include Andrews, *Killing for Coal*; Morse, *The Nature of Gold*; and White, *The Organic Machine*.

<sup>12</sup> Anthropologist Heather Paxson makes this point in her study of U.S. artisanal cheesemaking, which she describes as an 'ecology of production.' She writes: "Enlisted as microscopic laborers, bacteria and fungi are credited with helping to produce the gustatory value of an artisanal cheese." See Paxson, *The Life of Cheese*, 50.

<sup>13</sup> There are two main substances that cheesemakers use to separate milk's parts and proteins and 'coagulate' them into curd: rennet or acids. Aged cheeses, which almost always use rennet as a coagulating agent, can range from soft varieties (brie, ripened goat cheese, etc.) to very dry ones (such as parmesan). Cheddar is a rennet-coagulated, semi-hard variety of cheese. See Michael H. Tunick, *The Science of Cheese* (Oxford, UK: Oxford University Press, 2014), Table 2.1, 29.



Michael Tunick puts it, cheesemakers are “microbe wranglers who are sensitive to changes in the performance of their tiny little friends.”<sup>14</sup> This process makes any claim about craft as a product of ‘culture’ rather than ‘nature’ untenable.

In the nineteenth century, transforming milk into cheese could take anywhere from a few hours to most of the day, depending on the season, the milk’s preexisting bacterial state, and a host of other factors. Each morning—and sometimes twice a day—makers received milk from their patrons and collected it in large, tin-lined cheese vats. The cheesemaking process could not begin until the milk was suitably warm and slightly soured, because rennet requires a certain level of acidity in the milk to be effective. Once the milk was ready, makers would add their rennet solution and allow the curd to develop. The time it took for the milk to coagulate depended on the strength of the rennet, the milk’s temperature and acidity, and other environmental factors. Once the curd reached the right consistency—knowing when was a difficult craft skill to master—makers cut it into small pieces using vertical and horizontal knives. Next they drained off the whey, the liquid by-product of the coagulation process. Once the whey was removed, makers salted and cooked the curd in the heated vat until it reached an ideal consistency. Next, the curd was piled along the sides of the vats and formed into large slabs that makers would periodically flip over, a process called ‘cheddaring,’ which gives the variety its name.<sup>15</sup> Finally, the slabs were removed from the vats, milled, formed into wheels, pressed using large gang presses, and moved to the curing room, where the aging process would begin.

<sup>14</sup> Tunick, *The Science of Cheese*, 32.

<sup>15</sup> Tunick, *Science of Cheese*, 38. Cheddaring allows the curd to further develop acidity and improve its texture.

Neither the work of cheesemakers nor microbes was complete once cheeses were moved to curing rooms. As the Dairy Commissioner James W. Robertson put it, “When cheese leaves the press-room it is not more than half made.”<sup>16</sup> Curing cheese is the process that separates fresh curd from aged cheddar; it allows microbes to develop flavour and texture, while creating a stable microbial colony that prevents unwanted bacteria and mold from taking over. In the nineteenth century, cheesemakers shepherded the process along by carefully examining cheeses on curing room shelves, turning them daily to prevent uneven ‘rind’ development, and periodically greasing them with lard, grease, or whey butter to develop a less permeable surface. Some wrapped their cheeses in cotton bandages before greasing, which established stronger rinds than grease alone.<sup>17</sup> The temperature and moisture of curing rooms, the care and attention on the part of cheesemakers, and the preexisting condition of the milk all shaped the curing process.

<sup>16</sup> DAEO, 1897, 29.

<sup>17</sup> These are called clothbound cheddars. Strictly speaking, cheddars are a rindless or semi-rindless variety because they don’t have a cultivated, microbial exterior. Paul Kindstedt argues that clothbound cheddars emerged in the United States rather than England, on account of the availability of cheap cotton in the former by the early nineteenth century. Dipping cheeses in paraffin wax largely replaced the clothbound method in the late nineteenth century in the United States. See Paul S. Kindstedt, *Cheese and Culture: A History of Cheese and Its Place in Western Civilization* (White River Junction, VT: Chelsea Green Publishing, 2012), 171–172.

In the early twentieth century the federal Dairy Branch conducted experiments that compared curing, moisture, and shrinkage between waxed and clothbound cheese in a cool curing rooms versus rooms where the temperature was unregulated. Dairy Commissioner J.A. Ruddick and others were impressed by paraffin’s ability to reduce moisture loss, but not entirely pleased with the end result of the waxed cheese and unconvinced that it was an adequate alternative to building cool curing rooms. In any case, Ontario cheese companies don’t appear to have adopted paraffin widely until the twentieth century. For instance, the Blanshard and Nissouri Cheese & Butter Company did not purchase paraffin tanks for dipping until 1933. See DAEO, 1903, 147–151; and Minutes, 20 December 1933, Minute Book 3, Box 1, Blanshard and Nissouri Cheese & Butter Company fonds, University of Guelph Archives, Ontario.

Although curing cheese required less active labour on the part of makers than the initial transformation of milk into curd, it was nevertheless a critical component of the process.



**Figure 5.** Curing room, Thurlow Cheese Factory, Hastings County, Ont., n.d. Note the uniformity of the size and shape of the cheeses, which reflects the attempts of manufacturers to produce a uniform, consistent product. (William James Topley, Library and Archives Canada, PA-010145.)

No two days were exactly the same for a nineteenth-century cheesemaker. One of the most critical variables shaping a maker's day was the ripeness of the milk upon arrival each morning. Ripeness—a term makers used to describe the readiness of milk for cheesemaking—is related to acidity, and depends on the presence of lactic acid bacteria in the milk, which, left to their own devices, will develop over time. 'Setting' the milk with

rennet when it was underripe (lacking lactic acid bacteria, and hence, acidity) or overripe (too much acidity) could produce sweet cheeses with round holes, or highly acidic, poorly textured ones, respectively.<sup>18</sup> In general, it took longer to produce a batch of cheese in the spring and fall than in the summer because the milk needed longer to develop lactic acid bacteria. Summer milk, on the other hand, could easily arrive at factories in an overripe condition, causing makers great stress as they hurried to catch up to the milk. In early June 1892 (after what appeared to be a very warm May), Fitzgerald noted that the milk worked “the fastest I ever experienced[;] in less than two hours after the milk was heated up, it was salted.”<sup>19</sup>

Knowing *when* milk had reached the correct level of ripeness was a craft skill of the highest order. It required extensive “synesthetic reason” on the part of makers, a term that anthropologist Heather Paxson uses to describe the nexus of art and science that twenty-first century artisanal cheesemakers operate within. She writes:

Craft practice moves between what is *sensed* (apprehended through sensory input and subjective evaluation) and what is *being* sensed (the empirical conditions and materials that are manipulated by ‘tweaking’ a recipe and through prior orchestration of the ecologies of milk production). Art and science represent the subjective and objective angles from which cheesemakers triangulate on the moving target of a particular batch of milk’s transubstantiation into cheese on a particular day.<sup>20</sup>

Although dairy scientists recognized in the nineteenth century that acidity was a key element of the process, makers did not have access to instruments that could easily measure milk or curd’s acidity until the acidimeter was developed and put into use in the late nineteenth century. Even then, there was no objective level of acidity ideal for

<sup>18</sup> “As to Cheese,” *Canadian Cheese & Butter Maker*, July 1898.

<sup>19</sup> Diary entry, 6 June 1892, William Fitzgerald fonds, Queen’s University Archives, Kingston, Ontario.

<sup>20</sup> Paxson, *Life of Cheese*, 135.

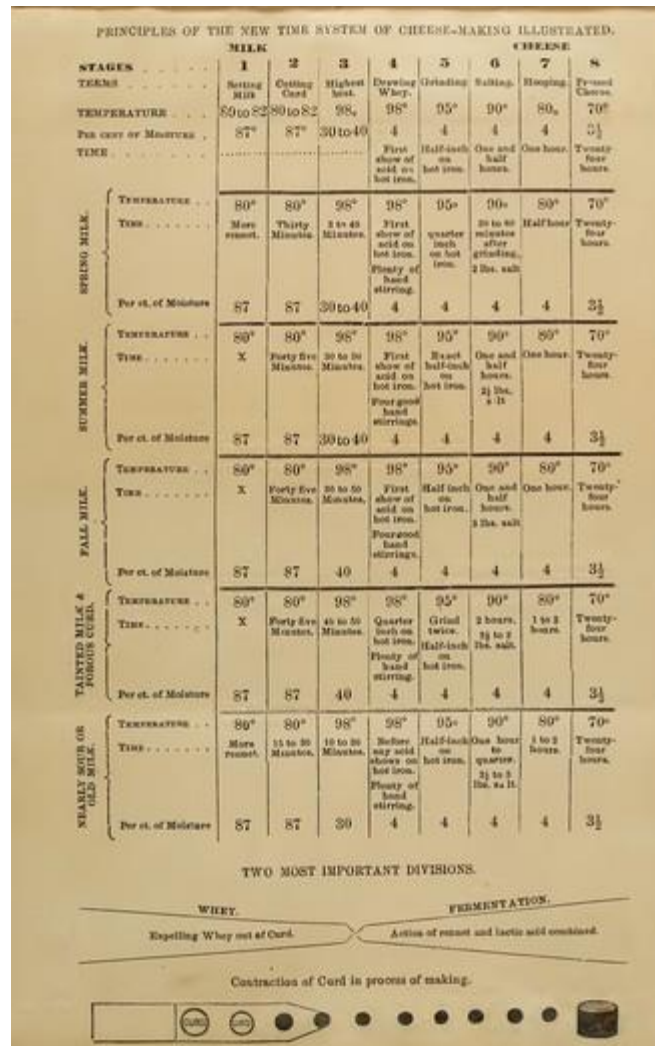
making cheese in all conditions. Rather, makers had to balance their sensory understanding of the milk at hand with objective measurements—such as using thermometers to read the temperature—while also considering the needs of the final product. For instance, sometimes a batch of cheese might call for less ripeness upfront if a cheesemaker was dealing with milk that had a particular smell to it.

Unlike highly industrialized, mid-twentieth century factory cheesemaking—where milk and microbial inputs are standardized as completely as possible so as to limit the effects of any one worker (using pasteurization, laboratory produced starter cultures, and so on)—factory cheesemakers had multiple tools at their disposal for managing the wide variety of milk they encountered. Some strategies were mechanical—makers could use curd knives to process the curd into larger or smaller pieces to obtain a better texture from poor quality milk, for example—while others were microbial tools they put to work in particular ways. Varying the amounts of starter and rennet, or heating a vat to higher or lower temperatures than usual could all produce cheeses of different textures or flavour. But *how* and *why* a maker responded to milk in a particular condition reflected the organizational structure and power dynamics of the nineteenth century industry. To a degree, cheesemakers could manipulate milk and curd toward ends different than those desired by shareholders, buyers, and reformers, all of whom wanted a consistent, high-quality product. In the 1870s, Professor Bell publicly decried a “silly game of braggadocio,” in which cheesemakers published announcements in local papers about the amount of milk they used, on average, to make a pound a cheese—the lower the better—and publicly challenged others to best them. What Bell described as braggadocio was an

extreme expression of a more common tendency amongst cheesemakers to maximize the amount of cheese produced from a pound of milk by “surreptitious means,” meaning the *manipulation* of craft by using more rennet than necessary, incorrectly cooking the curd to maximize yield, and inadequately pressing the cheeses so they retained additional moisture (and thus, weight), which increased the risk of spoilage.<sup>21</sup> For makers who were paid by the pound of cheese produced, the incentive to maximize yields at the expense of quality might have been significant. Makers could manipulate the cheesemaking process for other reasons, too, such as altering craft practices to avoid returning bad milk to patrons, an issue examined in greater detail below.

In short, craft cheesemakers were both a necessity and liability to the industry. Their flexibility in methods and tools worried reformers, who sought to standardize elements of the cheesemaking process without necessarily transforming factory workers into a deskilled workforce. In the 1880s D.M. MacPherson introduced a process he called the ‘time system’ of cheesemaking, in an attempt to standardize a set of best practices for making cheese from milk in various conditions, including summer milk, slightly soured milk, and so on (see Figure 6). The final column in his table, ‘Pressed Cheese,’ shows that the end goal in every case was to produce a cheese with 3½ per cent moisture. However, many of his guidelines would still have required significant interpretation on the part of makers, such as his recommendation that makers do “plenty of hand stirring” when working with spring milk.

<sup>21</sup> DAO, 1875, 86.



**Figure 6.** A visualization of MacPherson’s ‘time system’ of cheese production. (D.M. MacPherson, *Cheese Makers’ Manual* (Lancaster, ON: 1886), 5 [QSpace, 2014].)

Another attempt to introduce standardization into the craft of factory cheesemaking was the development of a ‘rennet test’ for ascertaining the ripeness of milk. In the 1880s, one of Ontario’s first travelling dairy instructors, J.B. Harris, published a handbook on cheese- and buttermaking in which he complained that many makers “seem to have a vague and imperfect understanding” of the role of ripening, treating it as a stage



to be accelerated rather than critical step in the whole process. They “do not seem to appreciate the fact, or rather seem not to know, that this ripeness is not merely to facilitate the action of rennet, but is something which goes farther, influencing the balance of the process, and entering into the composition of the cheese itself,” he wrote.<sup>22</sup> He condemned two common practices: adding rennet when the milk was still sweet (thus ignoring the ripening stage altogether), and using sour whey or a bit of milk from the previous day—called a ‘starter’—to ripen the milk artificially.<sup>23</sup> Harris suggested that makers always conduct a ‘rennet test’ to determine the appropriate moment to ‘set’ the milk with rennet. The test involved taking a small mug of milk from the vat (roughly 8 ounces), adding a drachm of rennet extract, and then stirring it with a match, counting how many seconds it took to coagulate. If the mug’s contents began to congeal within approximately twenty seconds, the milk could be reliably set.<sup>24</sup> The test was not infallible, but it was useful in that it offered a fairly reliable means for determining a window for setting milk that relied on neither standardized milk nor standardized rennet to succeed. The rennet test still required cheesemakers to use synesthetic reason, but it hinted at the attempts by dairy experts to push cheesemaking closer to a series of objective steps based on scientific principles. What the rennet test could not do, however, was minimize the makers’ motivations to “accelerate” the ripening process, especially their desire to control and shorten the length of their workdays.

<sup>22</sup> Harris, *Handbook*, 54.

<sup>23</sup> Harris, *Handbook*, 54. In 1931, J.A. Ruddick claimed both practices were common in the 1880s. See “Fifty Years of Dairying,” *Family Herald and Weekly Star*, 28 January 1931, found in Early History of Cheese Industries—General (File), D.M. MacPherson Family collection, XA1 MS A083, University of Guelph Archives, Guelph, Ontario.

<sup>24</sup> DAWO, 189I, 122.



This section has examined the nature of ‘cheesecraft’ in the nineteenth century and introduced the ways in which it was shaped by the extra-human environment and the politics of cheese factory labour. In the next section, I use this complex notion of craft to reframe the problem of milk as a historically contingent challenge created by the industry, rather than an ahistorical issue inherent in external nature.

### *The Problem of Milk*

Blinded by hubris and preoccupied by questions of scale and efficiency, the earliest reformers assumed milk would simply fall into place once the factory system was in order. One writer for *Canada Farmer* claimed that, “carrying milk from one to five miles in a waggon improves it for cheese as much as it hurts it for butter,” since the cream would be kept from separating.<sup>25</sup> Others were optimistic that the practice of pooling milk would work magic through dilution, rendering any inequalities moot so that even milk “collected from hundreds of cows, differently fed, and differently managed,” would produce a fairly uniform article of cheese.<sup>26</sup> It did not take long for such optimistic declarations to wane. “The manufacturer can no more produce fine goods from *bad* material than can the woollen factory, with the best manipulation, produce fine broad-cloth from *bad wool*,” explained X.A. Willard to the CDA in 1869.<sup>27</sup> Although the point of craft was to compensate for the variability of milk across seasons, vegetation, and more, this was easier said than done.

<sup>25</sup> “Cheese Making,” *Canada Farmer*, 15 January 1864.

<sup>26</sup> “Science in the Dairy,” *Canada Farmer*, 15 June 1864.

<sup>27</sup> CDA, 1869 and 1870, 84–85 (emphasis in original).

Shipping milk was a more complicated process than the short average distances between farms and factories would suggest. Each morning, makers and their assistants would stoke the boilers, collect the day's supplies, and perhaps catch up on other miscellaneous tasks, such as cleaning the whey tank or repairing equipment while they waited for the day's milk shipment to arrive. Meanwhile, farmers, wives, and sometimes their children or other farmworkers milked the cows and transferred the liquid to forty gallon metal cans, which were cumbersome and heavy to move. Some farmers drew their own cans to the factories, while others left them by the roadside to be picked up by teamsters or other patrons contracted by cheese companies.<sup>28</sup> Sometimes the relationships between farmers and milk drawers were tense; the latter often sought to complete their duties as efficiently as possible, which put pressure on farmers to get their milk to the roadside early.<sup>29</sup> Regardless of who was responsible for moving milk to the factories, it was hard work: "The tax upon human time and horse-flesh is considerable," remarked one writer for *Canada Farmer*, especially if roads were muddy or bumpy, a norm more than an exception.<sup>30</sup>

<sup>28</sup> Haslett, "Factors," 57 explains the variety of arrangements factories made for hauling milk. In some cases farmers drew their own milk, while in others the factories contracted out the work to the best local tender (such that the drawers would need to provide their own wagons), and in still others, they purchased wagons and hired local boys and men to haul milk for the season.

<sup>29</sup> The directors of the East Zorra and Blandford Factory decided in 1918 that milk drawers could not begin their routes before six in the morning (standard time) to give farmers enough time to milk and set the cans out by the road. See Minutes, 18 April 1922, Minute Books, East Zorra and Blandford Manufacturing Company, Archives of Oxford County, Woodstock, ON. For other examples of tension, see Haslett, "Factors," 57, and Patrick Leahy, "Driving Forward: The Power of the Horse in Douro Township 1850–1900," MA Thesis, University of Guelph, 2016, 68–70. Leahy writes of a drawer who intentionally crashed through a closed gate when the farmer refused to bring his milk out to the road.

<sup>30</sup> "More About the New York Cheese Factories," *Canada Farmer*, 15 July 1867.

Once the milk began to arrive, there was a rush to weigh and inspect the contents of each patron's can, make note of the liquid's weight and assess its quality, and run the milk from the receiving platform into the vats below. In the earliest years, milk was received at factories twice a day (once in the morning and again in the evening), turning cheesemaking into a twenty-four hour affair. For example, at Thomas Ballantyne's Black Creek Cheese Factory, the first batch of cheese was underway by late morning and the second began just after midnight. Such a continuous effort exhausted the makers, despite the short cheese season. In the late 1860s, prominent maker H. Lossee resolved to find a way to make high-quality cheese only once a day or "give up the business altogether."<sup>31</sup>

One of the most critical responsibilities of cheesemakers was to determine the quality of milk upon its arrival at the factories each morning, since the manufacturing process was bound by the rapidity with which "a small quantity of ferment will taint a large quantity of milk."<sup>32</sup> When a maker removed the lid of a milk can upon its arrival, he or she smelled it for a variety of clues to its suitability for cheese making. An ideal maker had "a good smeller, a good taster, and an eye for cleanliness."<sup>33</sup> In 1875, a maker named Peter Frederick was asked what he "discover[ed] in the milk" which alerted him to the risk of floating curds, and he responded: "the milk has a particular taint about it. I do not

<sup>31</sup> CDA, 1869, 113.

<sup>32</sup> CDA, 1867 and 1868, 26. Although chemical analysts would become increasingly important for policing the purity of milk (especially fluid milk) during this period, responsibility for authenticating the milk supplied to cheese factories was shouldered primarily by the cheesemakers. On expertise and the shifting responsibilities for 'policing' honesty in dairy products, see Atkins, *Liquid Materialities*, 91–113; Cohen, "Analysis as Border Patrol"; and Jacob Steere-Williams, "Milking Science for its Worth: The Reform of the British Milk Trade in the Late Nineteenth Century," *Agricultural History* 89, no. 2 (2015): 263–288.

<sup>33</sup> DAWO, 1893, 211.

know that I could describe it. It has not that sweet nutty smell which is usually found in pure milk.”<sup>34</sup> Indeed, smell was paramount, but taste mattered too, especially to detect a lack of richness that might signal adulteration or bitterness from cows that had been fed turnips. The Blanshard and Nissouri board insisted at the start of the 1897 season that “all feeding of Turnips be stop’d and any milk with turnip flavour *returned* to the patrons sending it,” much to the annoyance of farmers who embraced turnips as a cheap and reliable cattle feed.<sup>35</sup> Given the importance of assessing milk upon arrival, leaving the job to assistants was frowned upon. “The Cheese Maker shall test the Milk thoroughly [sic],” noted minutes from the Royal Street Cheese Factory board of directors, since “the Factory is receiving Milk that is not pure in more respects than one.” The board also insisted that the maker keep “a true record and Statement of the tests made” in the case of disputes.<sup>36</sup>

This point warrants emphasis: separating milk production from cheese production and the milkers from makers made it more important than ever to know the quality and characteristics of each milk shipment, since it was coming from a much wider range of sources and had to be transformed into cheese that was consistent from batch to batch. Paradoxically, the factory system created more opportunities for milk to become spoiled or adulterated *and* made it more difficult to ascertain milk’s quality upon its arrival. The problem of milk was an unintended consequence of the reorganization of cheese

<sup>34</sup> DAO, 1874, 27.

<sup>35</sup> Minutes of the Board of Directors, 16 January 1897 (emphasis mine), Blanshard and Nissouri Cheese & Butter Factory Minute Book Vol. 2 (1891–1929), Box 1, Blanshard and Nissouri Cheese & Butter Factory Collection, University of Guelph Library, Ontario.

<sup>36</sup> Minutes of the Board of Directors, 23 June 1882, Minute and Account Book, Royal Street Cheese Factory fonds, MU 7016, Archives of Ontario. In the case of joint-stock or cooperative factories, boards of directors were sometimes responsible for calling patrons in to deal with adulteration or spoilage, but it was still the responsibility of the cheesemaker to flag the problem in the first place.

production from farms to factories, and cheesemakers found themselves at the heart of the issue. Receiving milk became one of the most contested points in the entire chain of cheese production.



**Figure 7.** Workers outside a cheese factory with horses and barrels, n.d. Note the prominence of the covered receiving platform in the foreground of this photo. The receiving platform was a key point of interaction between cheesemakers and patrons. (Bartle Brothers collection, C2-0-0-0-1637, Archives of Ontario [digitization from glass plate negative].)

The factory system inadvertently expanded opportunities for milk spoilage by creating new routes for the circulation and reproduction of pathogenic bacteria through

the countryside. The cans used to transport milk and whey between farms and factories were ideal conduits for opportunistic microbial life. Each morning, factory workers weighed the contents of each can before running the milk from the receiving platform through pipes into the cheese vats below, where it was pooled with milk from dozens of other farms. Many factories often returned the cans to their owners full of whey—the nutrient-rich, liquid by-product of the cheesemaking process often used to feed young livestock—but this practice was risky because whey was also an excellent medium for microbial growth. Until factories began to pasteurize whey in the twentieth century, the bacteria that lurked in the seams of cans could and often did reinfect the following day's milk with all manner of pathogenic life if cans were not scrupulously scrubbed and scalded—labourious work that almost always fell to farmwomen.<sup>37</sup> Factories also harboured an abundance of microbial life. Leaky wooden floors trapped old milk and whey, while damp curing rooms sustained all kinds of microbial micro-environments.

Whey management was a particularly vexing issue. On the one hand, it was valuable to farmers as a feed, but how to get it to them without contaminating milk or factory surroundings proved challenging. It also had to be stored somewhere until it could be sent home with farmers, so many companies constructed whey tanks on factory

<sup>37</sup> Factories began to pasteurize whey around the turn of the twentieth century. For instance, the United Empire Loyalist Company near Kingston decided to pasteurize and use their whey for making low-quality “whey butter” in 1908, after years of complaints from factory inspectors and neighbours about the presence of whey in a nearby creek. See Minutes from June 1903, May 1907, and March 1908, Minute Books with Accounts June 1897–December 1915, Reel 1 MF 2124, United Empire Loyalist Cheese Factory Records, Queen's University Archives, Kingston, ON. Even once whey began to be pasteurized, the problem of disposing of it was not solved, since farmers were moving away from using it as a feed for livestock. On the problems of whey management in the twentieth century, see Smith-Howard, *Pure and Modern Milk*, 67, and Scott Cameron Loughheed, “An Actor-Network Theory Examination of Cheese and Whey Production in Ontario,” M.A. Thesis, Queen's University, 2013).

premises. When the wooden supports of an elevated whey tank near Harper in Perth County gave out in June of 1894, its contents spilled into nearby ditches and the stench of ferment lingered for days.<sup>38</sup> An alternative to returning whey to farmers in cans was to keep farmers' hogs in a yard next to the factory, so they could be fed the whey without having to move it offsite. But this, too, had its disadvantages, since the hygiene of many pig stys presented another threat to cheese. Before germ theory became the dominant explanation for disease, the concerns were about the smell of the stys. One cheesemaker wrote to *Canada Farmer* in hopes of "hit[ting] on some plan of profitably disposing of the whey without the pig nuisance," which would "do away with the pestilential odour which is the cause of so much bad flavour in cheese."<sup>39</sup> Neither returning whey nor feeding it to pigs on-site was ideal. As Reverend Clarke explained in 1881, "there are two serious evils in connection with our cheese factories. One is carrying the whey home in cans, and the other is in having a hog yard in connection with the factory."<sup>40</sup>

The new spatialized division of labour of the factory system (where milk production was socially and physically separated from cheese production) also increased opportunities to adulterate milk. Adulteration was an umbrella term for a range of activities, including watering down milk, adding substances to improve its opacity, skimming the cream for personal use, or keeping back the 'strippings,' the exceedingly

<sup>38</sup> "Harper [column]," *Perth Courier*, 15 June 1894.

<sup>39</sup> "Profitable Use of Whey," *Canada Farmer*, 16 March 1868.

<sup>40</sup> DAWO, *Fourth Annual Report of the Dairymen's Association of Western Ontario...1881* [henceforth 1881] (Toronto, ON: 1882), 24. The speaker, W.F. Clarke, was introducing an address given by cheese manufacturer and maker H.S. Lossee on "Hog Management." Lossee advocated a novel solution, namely keeping hogs on a rotating field close enough to the factory that the whey could be pumped out to the mobile troughs, but far enough away that it was not a "nuisance" to the cheese itself. However, it is likely that this involved more labour and capital than most companies and farmers were willing to commit.



rich final drops of a milking. As Sally McMurry explains about the industry in New York State, factory cheesemaking offered “incentives aplenty to adulterate milk, and few effective punishments” since payments for milk were based on quantity, not quality.<sup>41</sup> It may have been tempting to some farmers to water their milk in order to bolster their monthly cheques. Some patrons likely took advantage of the anonymity provided by pooling to water their milk just enough to increase their returns without alerting the makers, which created cheeses with poor texture and body. Reverend Clarke railed against these and other “little, petty, pilfering dishonesties” in an 1881 address on ‘honest’ milk, complaining that minor transgressions, when accumulated, “lessen the profits of all honest dairymen.”<sup>42</sup> Once milk was pooled, any problems missed by the makers at the receiving platform were impossible to trace to a particular farmer. Moreover, while sometimes spoiled or adulterated milk was plainly obvious to cheesemakers upon its arrival, often it was not apparent until after the maker applied heat or rennet to a vat of milk, an ideal environment for pathogenic microbes to proliferate. Pooling milk was an attempt to make cheesemaking more efficient and uniform by combining the milk from multiple farms, but it undermined the production of consistent, high-quality cheddar by effectively erasing the connections between a given shipment of milk and its source.

Quantifying spoilage and adulteration in the cheese industry is difficult.

Companies were often reluctant to admit they had problems, fearing that patrons might

<sup>41</sup> McMurry, *Transforming Rural Life*, 169.

<sup>42</sup> DAWO, 1881, 69.



withdraw their investments or their patronage by moving to a competing factory if confronted about the state of their milk. Companies could be vague about these matters in their minutes, using language like “not up to standard” or referring to patrons’ “delinquency.”<sup>43</sup> Even when makers had access to technologies for detecting adulteration, they were not always reliable. It is also possible that the frequency of spoilage and adulteration can be attributed to growing awareness of and concern about purity and cleanliness. One’s senses had long served as the primary means of detecting bad milk, not only because they were practical and ready at hand—many readers can surely recall taking a whiff of milk that has gone sour—but because the popular miasmatic worldview privileged airs, odours, and environments themselves as mechanisms of disease and health.<sup>44</sup> The atmosphere of a rotting manure pile too close to a stable, or a swamp in the middle of a pasture was thought to sicken cows and put milk into a “putrid condition.”<sup>45</sup>

In 1872, members of the CDA were captivated by L.B. Arnold, a visiting professor from Ithaca, New York, who showed the audience fourteen circular images depicting “not more than one five-hundreth part of a drop” of milk as it appeared under a microscope, magnified until “spores” and “ferments” distinguished themselves in looping clusters of various sizes that may have reminded the rural audience of worms.<sup>46</sup> Arnold

<sup>43</sup> For example see 21 June 1887, Minute Book 1880–1891, Box 1, Blanshard & Nissouri Cheese & Butter Factory Collection, University of Guelph Archives, Ontario.

<sup>44</sup> Alain Corbin, *The Foul and the Fragrant: Odor and the French Social Imagination*, Trans. By Berg Publishers (Leamington Spa, UK: Berg Publishers, 1986); Linda Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge* (Berkeley: University of California Press, 2006), 49–81; Conevery Bolton Valenčius, *The Health of the Country: How American Settlers Understood Themselves and Their Land* (New York: Basic Books, 2002).

<sup>45</sup> CDA, 1869 and 1870, 90.

<sup>46</sup> CDA, 1872, 54.

insisted that makers could not rely solely on their senses to determine the suitability or safety of the milk they accepted. Dirt was no longer something discernable without the aid of specific instruments, but something that lurked in milk that might pass the most vigilant and skillful nose, its latent threat waiting for the right combination of heat and time to multiply exponentially. “Chemical cleanliness—i.e., perfect cleanliness,” was the new standard, prompting Professor Bell to suggest that, “every factory should be provided with a microscope of considerable power...and every operator ought to be instructed in its management.”<sup>47</sup> The shift toward a bacteriological understanding of good milk was hardly automatic, but the growing influence of germ theory stoked anxieties about the capacity of cheesemakers to detect spoilage. A protracted debate in 1871 about the reasons for the common problem of ‘floating curds’ in the vat, for example, prompted explanations as varied as the electric energy of thunderstorms, dead animal carcasses, atmospheric changes, odours of the barnyard, *and* germs invisible to the naked eye.<sup>48</sup>

While spoilage and poor quality milk were probably the most frequent problems with milk on arrival, reformers and factory directors spared their harshest criticisms and most scathing vitriol for adulteration, because it signaled a lack of liberal cooperation amongst the patrons. Farmers considered some forms of adulteration to be fairly innocuous—such as scooping a bit of cream from a milk can for tea—but to reformers and exporters, such practices were inexcusable: “The meanest form of dishonesty, this of stealing a little from the milk,” commented one industry member in 1891.<sup>49</sup> The

<sup>47</sup> CDA, 1873, 63.

<sup>48</sup> CDA, 1871, 83–85.

<sup>49</sup> DAWO, 1891, 80.

frequency and prominence of questions about adulteration within the industry reflected society's anxious preoccupation with what was pure and natural in a changing world.<sup>50</sup>

The distance between farms and factories and the expansion in the number of farms supplying milk to factories made it even more difficult to pinpoint the source of any difficulty, effectively deepening the uncertainty of milk as a reliable vehicle of environmental knowledge.<sup>51</sup> When reformers and factory directors could not find 'proof' of patrons' dishonesty and ignorance in milk itself, they turned to the landscape:

As one drives through the country he will see some of the causes [of poor quality milk] on the right hand and on the left. On the right at 3 o'clock in the afternoon stands an old rusty can with whey in it, expecting to be put in shape for the night milk, and further on another not cleaned. On the left the cows trying to quench their thirst by drinking vile water, and as you go on further you see a few children milking in the barn yard or in a foul stable.<sup>52</sup>

Patrons could also marshal the landscape to their benefit by using the time-distance of milk's journey as a means of casting doubt on who was to blame for bad milk. They often countered accusations of sour or suspicious milk by claiming, genuinely or otherwise, that it was in the proper condition when it left their properties, that it was "sent as milk'd."<sup>53</sup> These conflicting accounts about milk's journey often became a source of conflict

<sup>50</sup> See Atkins, *Liquid Materialities*, esp. chapter 6, "Moralizing Milk"; and Cohen, "Analysis as Border Patrol," 66–73.

<sup>51</sup> By environmental knowledge I mean information embedded in milk about the nature of its production. Were certain cows being fed turnips or other crops injurious to the milk? Was localized drought affecting milk's richness? What was the cause of a bitter flavour in milk? On material objects as facilitators and obstacles of environmental knowledge, see Simona Valeriani, "Facts and Building Artefacts: What Travels in Material Objects?" in *How Well Do Facts Travel? The Dissemination of Reliable Knowledge*, edited by Peter Howlett and Mary S. Morgan (Cambridge, UK: Cambridge University Press, 2011), 43–71.

<sup>52</sup> DAWO, 1891, 98.

<sup>53</sup> Minutes of the Board of Directors, 25 August 1891 and 7 September 1891, Minute Book 1880–1891, Box 1, Blanshard & Nissouri Cheese & Butter Factory Collection, University of Guelph Archives, Ontario.

between patrons, cheesemakers, and factory owners and directors. In 1883, the Riverbank Cheese Factory in Wellington County tried to minimize the damage from “certain troubles [that] arose on the Maryborough route, owing partly to an indiscreet remark dropped by the Cheese Maker, partly to the dishonest character of the teamster and partly to the boisterous character of some Patrons on that route.”<sup>54</sup> While the specific conflict in this case is unclear, it pertained to the drawing of milk to the factory, and highlights how the separation between farms and factories could complicate the ability to know milk.

The first attempt to assess the scope of spoilage and adulteration within the industry began with the travelling instruction system in the late 1870s. In 1872, Daniel Phelan (an Ingersoll-based capitalist and investor in the 1866 Mammoth cheese) proposed that a certain number of instructors be employed to circulate between factories in a given area in order to observe and assist cheesemakers with their craft. Citing too many “incompetent” makers “chiefly instrumental in throwing upon the market, second and third-class products,” he framed the potential system as one aimed primarily at the makers, though he also envisioned instructors delivering lectures to patrons about the proper care of milk.<sup>55</sup> His plan was fundamentally educational and reformist. Others advocated more disciplinary, inspection-based strategies inspired by the work of Gail Borden Jr. (the U.S. condensed milk manufacturer), who, in the 1860s and 1870s, notoriously hired a “competent person” to inspect each patron’s farm once a month.<sup>56</sup> The

<sup>54</sup> Minutes of the Board of Directors, 16 June 1883, Minute Books (1882–1893), Riverbank Cheese Factory fonds, Wellington County Archives, Wellington, ON.

<sup>55</sup> CDA, 1872, 101.

<sup>56</sup> DAO, 1874, 87. Combination owners like D.M. MacPherson sometimes hired superintendents to keep tabs on their factories and patrons. MacPherson claimed: “If it cost me a hundred [per factory] I would

idea of hiring individuals to inspect and oversee the work of farmers grated against the liberalism of many members of the CDA. Debates about the ideal system for curbing bad milk and improving craft continued until the 1879, when Thomas Ballantyne hired New York dairy professor L.B. Arnold to visit a number of western Ontario factories to offer advice. Arnold was poorly received by many of the makers, but convinced of the system's merits, Ballantyne insisted on paying him out of pocket to continue the work the next season.

Eventually, both the DAEO and DAWO established and managed itinerant instruction services in their respective territories.<sup>57</sup> Instruction was organized along the lines of Phelan's educational, instruction-based model, so instructors had no real authority to insist on testing patrons' milk on the farm, like state-based inspectors would in the twentieth century. Their main responsibility was to identify points of weakness in the craft skill on the part of the makers. Assessing patrons' milk was a secondary consideration. Only factories that paid for the service were visited, although instructors were permitted to offer their services mid-season to those that did not sign up initially. Instruction was a voluntary service meant to dispense advice and take stock of the quality of work in the industry writ large. In practice, however, it was clear that instructors took on disciplinary functions too. They often spent their time testing patrons' milk, and

not sacrifice the benefits I receive from the close inspection of each factory weekly." See DAEO, *1888a*, 87.

<sup>57</sup> The DAEO first hired J.B. Harris in 1881 to circulate amongst eastern Ontario factories, before the DAWO followed suit. Harris worked as an instructor in eastern Ontario for three seasons, before being hired by the DAWO in 1883. A copy of one of his early reports as an instructor is available in Harris, *Handbook*, 152–168. The DAEO hired instructors more consistently than the DAWO during the 1880s.

frequently instigated court cases on behalf of the factories. At the annual conventions each year, instructors submitted reports about their work to the dairymen's associations.

Instructors' reports constitute the clearest picture of adulteration and spoilage in early Ontario cheese factories, although the variation in their style and form makes it difficult to analyze trends in spoilage and adulteration over time. Some instructors offered narrative reports with general remarks about milk quality, while others quantified the problems they encountered. Despite these inconsistencies, they give an overall impression of widespread difficulties with unclean and tampered milk. In 1883, for example, J.B. Harris reported to the DAWO that "Three years' experience as instructor in Eastern Ontario had served to convince me that a system of milk inspection was a thing quite as much needed in the cheese business of that section as general instruction in making, and so...I assumed the character of general milk inspector for my district[.]"<sup>58</sup> Harris insisted on examining the milk in all the factories under his charge even though it involved extra time and effort on his behalf. He estimated that no more than five of the approximately hundred factories he visited received wholly satisfactory milk, "the balance showing anywhere from one to ten [per cent] poor [spoiled in some way], and from one to fifty [per cent] less fat [tampered]."<sup>59</sup> In 1888, the next year for which reports are available, the four instructors hired by the DAWO reported instances of adulteration at ninety-five of the one hundred fifty-two factories visited, or sixty-three per cent. They also claimed that milk was often found in a "tainted" condition.<sup>60</sup> It was generally assumed that the rates

<sup>58</sup> Harris, *Handbook*, 156.

<sup>59</sup> Harris, *Handbook*, 158.

<sup>60</sup> DAWO, *1888a*, 43.

were worse at factories that did not use the services of the associations' itinerant instructors.

Although instruction gave the industry a better sense of the scope of the problem of milk, what could be done? Companies had little legal recourse if they suspected someone was adulterating milk or knowingly drawing a spoiled supply. When provincial legislation to bolster makers' ability to turn away shipments they deemed unfit for cheese was passed in 1868, it was celebrated as a victory for the burgeoning dairy industry, but it proved to be largely ineffectual. Adapted from a similar law in New York, the Act prohibited patrons from "knowingly and fraudulently" sending milk that was diluted (with water or otherwise), stripped of its cream, or tainted, under punishment of a fine and possibility a short stint in a local jail. However, the federal government soon ruled the Act *ultra vires*, arguing that the Province was interfering in their jurisdiction over criminal matters, so many cases were thrown out of court.<sup>61</sup> Attempting to take farmers to court could also open up companies or cheesemakers to accusations of slander, as one case involving the patrons of the Mountain Grove Cheese Factory illustrates.<sup>62</sup> By the late 1880s, industry men commonly acknowledged that the Act rarely punished or deterred dishonest patrons, prompting some, like J.A. Ruddick, to suggest that a private discussion exercised with "a little tact" was a more productive route.<sup>63</sup>

<sup>61</sup> An Act to Protect Butter and Cheese Manufacturers, SO 1868, CAP XXXIII. On the problems with the law, see DAWO 1888a, 168; and Menzies, *By the Labour of Their Hands*, 56.

<sup>62</sup> "At Osgoode Hall: Action Dismissed Against a Toronto Broker Nelston," *The Globe* (1844–1936), 13 August 1901. The plaintiff, a patron who had been accused of skimming the cream from his milk, was ultimately unsuccessful, but it nevertheless reinforced the idea that accusing someone of adulteration was risky.

<sup>63</sup> DAEO, 1888a, 94.

While germ theory and the ‘age of adulteration’ increased concerns about the possibility of knowing and detecting bad milk, it also emboldened faith in science to eventually yield milk’s ‘secrets’ by “peering farther inside substances...away from assessing secondary to primary qualities, from appearance and smell to chemical constituents.”<sup>64</sup> In this cultural and scientific milieu, Ontario’s dairy reformers sought instrumental solutions to bad milk, specifically an instrument that could “ascertain the true character of [milk’s] defect,” as Harris’s handbook put it.<sup>65</sup> They sought a way to overcome the ambiguity of reading milk, of erasing the geographic and social distances that the factory system had created. For a time, that instrument was the lactometer.<sup>66</sup> Invented in the late eighteenth century by an English instrument maker, it measured the relative gravity of fat and water in milk on the premise that the proportion of the two parts would fall within a particular range in pure milk.<sup>67</sup> However, the lactometer did not fulfill its potential as a technical fix for the milk supply problem; if anything, it entrenched disagreements about the possibility of knowing milk. For one, it was only useful for

<sup>64</sup> Cohen, “Analysis as Border Patrol,” 71.

<sup>65</sup> Harris, *Handbook*, 20.

<sup>66</sup> “Look Out for the Lactometer,” *Canada Farmer*, September 15, 1865.

<sup>67</sup> Numerous models and variations of the lactometer flourished, but like in the United Kingdom, many Ontario dairymen used the ‘Quevenne’ model. See Atkins, *Liquid Materialities*, 62–64. The question of whether quality was measurable in terms of fat, rather than other variables, was contentious, but a full account of the debate is beyond the scope of the discussion here. Many, but not all, reformers and dairy scientists believed fat was a reliable measure of the ‘internal’ quality of milk and that cheesemakers would be able to determine dirty or spoiled milk at the factory window without too much trouble. For a select entry into the voluminous literature on the complexities of constructing quality standards and measurable, standard quantities, see Atkins, *Liquid Materialities*, passim.; Cronon, *Nature’s Metropolis*, esp. 114–119, 132–136; Becky Mansfield, “Fish, Factory Trawlers, and Imitation Crab: the Nature of Quality in the Seafood Industry,” *Journal of Rural Studies* 19, no. 1 (2003): 9–21; James Sumner, “John Richardson, Saccharometry and the Pounds-per-Barrel Extract: the Construction of a Quantity,” *British Journal for the History of Science* 34, no. 122 (2001): 233–274; and John Varty, “On Protein, Prairie Wheat, and Good Bread: Rationalizing Technologies and the Canadian State, 1912–1935,” *Canadian Historical Review* 85, no. 4 (2004): 721–754.



discovering fraud or adulteration. It did virtually nothing to measure spoilage. In fact, spoilage could further reduce the capacity of the lactometer to give an accurate reading of milk's butterfat content. Many patrons were understandably concerned that the lactometer would be misused by the makers—intentionally or otherwise—to falsely accuse someone of low quality or adulterated milk. While J.B. Harris called it a “perfect test or measure of the weight or specific gravity of milk” as late as 1885, his three pages of accompanying instructions highlight the difficulties makers could face if the temperature of the each sample of milk wasn't precisely the same or if they weren't careful to record the percentage of cream in each sample before it was removed for the purposes of the test. After thoroughly explaining its proper use, he cautioned makers against buying poor instruments, a problem he acknowledged was rampant in the factories and dairies he had visited as an instructor.<sup>68</sup> The lactometer was a finicky instrument.

Some went further. “The lactometer is a fraud,” snapped one DAWO member in 1888, during the question period that followed his address about the superiority of the new German instruments for testing milk, such as the lactoscope and pioscope.<sup>69</sup> It was a formidable challenge, having been directed at no less than Daniel Derbyshire, former president of both the DAEO and the Creameries Association. Derbyshire had a vested interest in upholding the lactometer's good name—he sold them, after all—so he responded to MacDonald's address with a gruff rebuttal that a correctly tuned lactometer was “all you need.” Derbyshire's argument was bolstered by a handful of others, one of

<sup>68</sup> Harris, *Handbook*, 17–19.

<sup>69</sup> DAWO, *1888a*, 160–167. Whether or not the new German instruments were more reliable, they were undoubtedly less practical in a factory setting, something MacDonald readily acknowledged.

whom worried that undermining the work of the lactometer would “destroy the dairy interest.”<sup>70</sup> If even the most prominent reformers could not agree about the lactometer’s ability to detect adulteration, it is hardly surprising that patrons were wary of the instrument as a gauge of their honesty.<sup>71</sup>

In February of 1888, the provincial government tasked fifteen prominent industry men (including factory owners, merchants, and dairy equipment suppliers) to investigate adulteration in the supply of milk to cheese and butter industries. Although the committee handpicked their witnesses and distributed 300 questionnaires as they saw fit—casting doubts on the impartiality of the whole affair—it was the first attempt by the state to systematically ascertain the extent of the problem. While the completed questionnaires have not survived, the minutes and the final report confirmed what many suspected, namely that adulteration was rampant by the late 1880s.<sup>72</sup> Many contemporaries felt the system of paying for milk was unfair to patrons whose milk was clean and of high quality. In response, the committee urged the government to establish regional butterfat standards so cheese companies could overhaul the pay structure of factories to reflect both volume *and* quality. In their proposed pay-by-test process, patrons would be paid a premium for milk with the ideal fat content, while those samples wanting fat would prompt further investigation (the premise being that milk with unusually low fat content

<sup>70</sup> DAWO, 1888a, 160–167.

<sup>71</sup> For two American examples of the debate about the lactometer and its (in)ability to identify adulterated milk and other dairy products, see Peter Atkins’s description of the court case, *The People vs. Daniel Schrumpf*, in *Liquid Materialities*, 39–45; and Cohen, “Analysis as Border Patrol,” for an analysis of a much-publicized instance of supposed butter adulteration in Pennsylvania in 1885.

<sup>72</sup> 225 completed questionnaires were returned. See Folder 1: Select Committee re Butter & Cheese Proceedings, Feb. 14<sup>th</sup> 1888–March 19<sup>th</sup> 1888, Select Committee on Butter and Cheese, RG 49-97, Archives of Ontario.

was an indication of tampering).<sup>73</sup> There was still no physical way to distinguish whose milk was whose once it was pooled, but paying by quality provided the next best option: maintaining an abstracted identity attached to individual shipments of milk long after the patron or the milk drawer had left for the day. Unlike paying by volume, they hoped paying by quality would eventually improve the overall milk supply by removing the anonymity of each milk shipment throughout the cheese making process. The committee argued further that paying by quality was the only way to treat the owners of milk fairly.

However, the committee acknowledged that many obstacles stood in the way of introducing their new system, including the difficulties of the lactometer:

the short time during the day for delivery, the state in which the milk reaches the factory[,] the imperfect appliances [sic] as yet invented for testing and the additional expense that would necessarily be incurred in order to secure anything like a fair test makes it your Commidies [sic] opinion practically impossible.<sup>74</sup>

The announcement in the spring of 1890 of a new technology for measuring butterfat—the Babcock tester, developed by Dr. Stephen Babcock in Wisconsin—re-energized the debate about pay structure, but in the meantime, the possibility of an instrumental solution to the problem of milk seemed bleak.<sup>75</sup> The main line of defense against adulteration and spoilage remained cheesemakers and their synesthetic reason.

<sup>73</sup> Samples of milk would be collected daily by the cheesemakers, and an averaged reading would be taken once a week to determine each patron's fat 'rate.'

<sup>74</sup> Draft Report, Folder 1: Select Committee re Butter & Cheese Proceedings, Feb. 14<sup>th</sup>, 1888-March 19<sup>th</sup> 1888, D-18, Select Committee on Butter and Cheese No. 1, RG 49-97, Archives of Ontario.

<sup>75</sup> The Babcock tester was invented by Dr. Stephen Babcock at the University of Wisconsin-Madison in 1890. It was a waist-high machine driven by muscular or mechanical power, which held a spinning tray that secured glass test bottles. To make a milk test, one had to fill each of the bottles with small samples of milk, add a precise amount of sulphuric acid, and using centrifugal force, separate the fat from the rest of the milk so that it could be measured in the neck of the bottle. Babcock did not patent the instrument, making its replication swift. It arrived in Ontario via dairy suppliers by the spring of 1891. Although it was described in revolutionary terms, adoption of the Babcock tester and paying by quality was partial and protracted, much like the lactometer before it. (Paying by quality was eventually legislated as a requirement in Ontario in 1922.) For a more thorough description of the invention of the Babcock tester, see

Yet the capacity of individual cheesemakers to manage bad milk decreased as the scale and complexity of the industry grew. Many were extremely reluctant to act on their suspicions of spoiled or adulterated milk, with or without lactometers. Even reprimanding a patron informally for questionable milk could risk one's position as maker the following season. For example, early in his tenure at Rose Hill, Fitzgerald mentioned a "racket with a patron (Mr. Hay) about the want of his milk." Vague on the details, he concluded that Hay "was only Joking," but whether the problem really was a good-natured prank or an attempt on Fitzgerald's part to keep the peace is unclear; with few friends in the area and something of a dependence on his neighbours, he was keen to maintain good relations with all.<sup>76</sup> If the cheesemakers did not have the favour of certain patrons, their likelihood of being rehired was slim. In areas of high factory concentration (recall chapter 2), refusing bad milk could also push patrons to competing factories, so cheesemakers were further discouraged from taking action against patrons whose milk was questionable. "When a farmer furnishes twenty or thirty cows' milk to the factory you must smile and shake his hand whether he furnishes fine milk or not for fear he may go elsewhere," noted one convention speaker in the 1880s.<sup>77</sup>

Instead, many cheesemakers preferred to salvage bad milk as best they could, using whatever microbial and mechanical tools they had at their disposal. If signs of

Eric Lampard, *The Rise of the Dairy Industry in Wisconsin: A Study in Agricultural Change, 1820–1920* (Madison, WI: State Historical Society of Madison, 1963), 200–201.

<sup>76</sup> Diary entries, 12 May 1892 and 6 June 1892, William Fitzgerald fonds, Queen's University Archives, Kingston, Ontario. Fitzgerald sometimes used Mrs. Hay's stove to steep his coffee, for example.

<sup>77</sup> DAWO, 1888a, 122. Smith-Howard, *Pure and Modern Milk*, 38–46, makes a similar argument about the relationship between creamery competition, and the problems of cream purity in the butter industry in the early twentieth-century United States.

spoilage or an undesirable flavour emerged in a vat as the maker worked, he or she might choose to add extra salt to the curd to check putrefaction, which would affect the cheese's texture in turn. Adulteration likewise had detrimental effects, since altering the ratios of water, proteins, and fat in pooled milk made it harder to produce full-bodied cheeses. One maker wrote to the *Canadian Cheese and Butter Maker* to share his or her experience trying to salvage milk with a "very bad flavor of old barnyard, mixed with a dart of peppermint," which was quite pronounced once the curd had finished matting. The maker decided to cook the curd over warm heat for two hours, stirring constantly, to rid it of the smell. Despite the exhaustion it required, the writer was pleased that "the day's work was over at 7 o'clock p.m.," since 'washing the curd'—an alternative option for dealing with tainted cheese—could occupy a maker until well into the night.<sup>78</sup>

Other makers used the itinerant instruction program as a fraud-detection service, calling on instructors to visit when they suspected bad milk in order to avoid managing problems with patrons directly. Whereas before makers had two options for dealing with bad milk—confronting patrons, which could put them out of a job the following season, or taking in bad milk, which would affect cheese quality and/or yield—an instructor could serve as a buffer. In the summer of 1890, for instance, the Blanshard and Nissouri board invited the instructor T.B. Millar to visit because of the large number of suspicious samples flagged by the cheesemaker.<sup>79</sup> The duties of chasing down rogue patrons

<sup>78</sup> "A Practical Experiment in Removing Barn Yard Flavour," *Canadian Cheese and Butter Maker*, September 1898.

<sup>79</sup> Two of the suspected patrons allowed the directors and Millar to enter their farms and compare the samples with milk drawn directly from a cow. When the procession returned to the factory, they concluded that one farm's milk was the same as usual—uniformly poor—but another farm's "was very much superior" to the milk received at the factory. The directors threatened to pull the latter's can "off the

occupied much of instructors' time, suggesting the experience at Blanshard was a common one. For example, Millar explained to the DAWO in 1892: "On account of so much of my time being taken up testing milk, attending court, and quite often very long drives between the factories I did not have as much time to devote to cheese making as I could wish for in some cases."<sup>80</sup> The demand amongst makers for "disinterested" individuals to test milk is perhaps most clearly illustrated by the complaint of an eastern Ontario instructor in 1893 that his work was being undermined by a handful of independent individuals who had bought themselves Babcock testers and "travelled the country, testing on their own responsibility and for a lower fee than that fixed by this Association."<sup>81</sup>

In *Nature's Metropolis*, William Cronon emphasizes how liberating wheat from sacks so it "behave[d] more like liquids" facilitated the reorganization of Chicago's hinterlands along a new logic of capitalist second nature.<sup>82</sup> Pooling milk at local factories was integral to a parallel, if less extreme, process in southern Ontario by allowing for new economies of scale in cheese production for a distant market. However, milk's behaviour as an actual liquid—as well as the social, cultural, economic, and spatial complexities of the dairy zone—transformed the seemingly straightforward task of shipping milk from farms to factories and manufacturing it into a uniform commodity a daunting and

Waggon" if it didn't improve immediately. The Blanshard and Nissouri directors were less successful in pursuing a third patron, who refused to let them see his cows milked or provide a sample for comparison, so they too dug in their heels and refused to accept his milk until he agreed to cooperate. See Minutes of the board of directors, 9 July 1890; 9 September 1890; 10 September 1890, Minute Book 1880–1891, Box 1, Blanshard and Nissouri Cheese & Butter Company fonds, University of Guelph Archives, Ontario.

<sup>80</sup> DAWO, 1891, 97.

<sup>81</sup> DAEO, 1892, 14.

<sup>82</sup> Cronon, *Nature's Metropolis*, 113.

contested practice. Knowing milk's quality and characteristics upon arrival mattered greatly for the subsequent uniformity and consistency of cheese, more than it had in the farm-based, single herd system. Paradoxically, however, the process of distancing milk production from processing, combined with the rapid and uneven development of cheese factories, made it harder for cheesemakers to know and manipulate milk, not easier. Although the problem of milk was the most prominent challenge facing the cheese industry, it was not the only one. In the next section I examine how other grievances illustrate the industry's increasingly fractured nature by the late 1890s.

#### *Heightened Tensions, 1888–1898*

1888 was a disappointing year for the industry. For the second season in a row, a sustained late summer drought in many parts of the province curtailed the milk supply. By the fall, many Ontario dairy families, especially in eastern Ontario, were gripped by a “panicky feeling,” according to the annual report of the Bureau of Industries.<sup>83</sup> Since farmers still grew the majority of their cows' feed, a summer drought not only caused the immediate milk supply to fall, but it also made the possibility of feeding cows throughout the winter a daunting prospect. Families did not necessarily leave dairying altogether, but some sold their cows and bought new ones in the spring, taking a chance that replacing them would be cheaper than feeding them through the winter, while others let them go dry and hoped they would survive on less than ideal rations. Other families likely just

<sup>83</sup> Ontario Bureau of Industries, “Report of the Bureau of Industries. Parts I, II and III,” in *Annual Report of the Department of Agriculture for the Province of Ontario, 1888* (Toronto, ON: 1889), 107.

retained what little milk was left for their own purposes. Factories, on the other hand, implored farmers to continue sending milk. The Maple Leaf Cheese Company in Hastings County threatened to punish patrons who “quit sending their milk to the Factory before the end of the season” by withholding their cheese dividends for October, though it is not clear whether they followed through.<sup>84</sup> Moreover, some worried that drought exacerbated adulteration by encouraging patrons to water down their milk to stretch it further.

Compounding the problems of drought and a possible increase in adulteration was a slip in cheese prices that had begun in the mid-1880s. While prices in 1887 were relatively high (averaging 10.54 cents per pound of cheese), the drop in 1888 to 9.24 was part of a general slide downward since 1883. The Bureau of Industries also found that the average value of the product of 100 lbs. of milk fell 12.1 cents between 1887 and 1888, from \$1.00 to 87.9¢. The authors of the report confirmed what many already knew: “The popularity of cheese factories and creameries was never more severely tested.”<sup>85</sup>

This state of affairs brought long simmering tensions between patrons, buyers, and cheesemakers into the open, particularly at the dairymen’s conventions. Who or what was to blame for the industry’s sluggish performance? Cheese buyers put the blame for low prices squarely on the shoulders of patrons and the makers, claiming it was a problem of

<sup>84</sup> Minutes of the Board of Directors, 24 November 1888, Minutebook 1874–1905, File 5, Maple Leaf Cheese Co. Fonds, F 266, Archives of Ontario.

<sup>85</sup> Ontario Bureau of Industries, *Annual Report...1888*, 107–109. 1883 was the year the Bureau of Industries began keeping track of the average value of 100 lbs. of cheese in their annual reports, but even these were based on returns submitted by only a portion of cheese companies in the province. Furthermore, prices tell us little about the actual profitability of dairying for patrons without knowing their costs of production too, as Ankli and Millar point out in “Switch from Wheat to Cheese,” 212–213. They argue that dairying in the nineteenth century *likely* was not very profitable to the average farmer. Nevertheless, the Bureau’s statistics are the most comprehensive available for a wide swath of Ontario’s cheese factories during this period.



low quality in the stock of cheese available. At the 1889 convention of the DAWO, Edwin Casswell—an Ingersoll merchant and the president of the association that year—accused factory salesmen (and by extension, the patrons they represented) for holding back their cheeses from the market in hopes of a rise in prices. If factories focused more on quality and shipping cheeses regularly, they would have no problems finding a market for their goods, he explained.<sup>86</sup>

Many patrons and factory directors suspected that buyers exaggerated their claims of low quality cheese in order to buy low and turn a greater profit. To some extent, arguments about curing and speculation were the latest in a longer pattern of farmers' distrust of exporters and merchants. In the early years of the industry, buyers travelled around to the factories making individual deals, which allowed them to capitalize on the factories' lack of market information. In the 1870s, factory representatives began to form local cheese and butter marketing boards in areas of high factory concentration to combat the tendency of buyers to play companies off of one another.<sup>87</sup> Their intention was to make the bidding transparent to all and force the buyers to compete with another, thus driving up prices. However, as various contemporaries and historians have noted, cheese boards were soon undermined by buyers who agreed amongst themselves to keep their bids on the board especially low while negotiating other prices 'on the curb' for cheese they thought would garner higher prices abroad.<sup>88</sup> In the context of the farmers' failed

<sup>86</sup> DAWO, 1888b, 12.

<sup>87</sup> These boards met weekly or bi-weekly, attended by factory salesmen and cheese buyers who travelled by wagon, carriage and train. Salesmen listed the number of cheeses they had to sell, and buyers offered to pay a certain price.

<sup>88</sup> On the organization, function, and difficulties of the local cheese boards, see Ruddick et al., *Dairy Industry in Canada*, 158; Menzies, *By the Labour of Their Hands*, 87–88; and Stiles, *The Cornwall Cheese*

attempts at gaining some control over the process of cheese marketing, they were deeply suspicious of the latest complaints from buyers.

Widespread rural discontent in the late 1880s further galvanized the farmer-patrons' frustrations. In the late-nineteenth century, agriculture was becoming a less central occupation in relation to industrial production in urban centres like Toronto and Hamilton, even though the number of farmsteads and farmers remained relatively stable between 1870 and 1930.<sup>89</sup> Some rural communities saw a steady stream of their youth moving to towns and cities in Ontario, New York, and elsewhere in search of better opportunities.<sup>90</sup> Whether this demographic shift constituted a crisis is a matter of debate amongst historians.<sup>91</sup> However, fears about rural decline and farmers' well-being underpinned both the Grange and the Patrons of Industry, the two main farmers' organizations in the province. The latter was beginning to form a strong base of support in Ontario in the late 1880s and into the 1890s. More so than the Grange, the Patrons of

*and Butter Board*. In the case of Quebec, which experienced similar difficulties, see Dupré, "Regulating the Quebec Dairy Industry," 343–344.

<sup>89</sup> Drummond, *Progress Without Planning*, 21. Echoing Drummond, Ruth Sandwell points out that the characterization of Canada as a predominantly rural or urban society depends on how one defines each term. If one uses the census definition between 1871 and 1941, rural Canadians were first "outnumbered" in 1921. However, if one uses a measure based on the population of various communities, the shift does not happen until 1941. See Sandwell, "Notes Toward a History of Rural Canada," in *Social Transformation in Rural Canada: Community, Cultures, and Collective Action*, edited by John R. Parkins and Maureen G. Reed (Vancouver: UBC Press, 2013), 23–24.

<sup>90</sup> Randy William Widdis, "Tracing Eastern-Ontario Emigrants to New York State, 1880–1910," *Ontario History* 81, no. 3 (1989): 201–234; and Widdis, *With Scarcely a Ripple: Anglo-Canadian Migration into the United States and Western Canada, 1880-1920* [E-book edition] (Montreal, QC: McGill-Queen's University Press, 1998), esp. 180–254. Similarly, Joy Parr argues that it was the appeal of urban opportunities that prompted a flood of young rural men and women to the cities, not a lack of wage labour opportunities in the countryside. See Parr, "Hired Men," 100. In this regard, Fitzgerald's jaunt to Syracuse was part of a larger pattern.

<sup>91</sup> Adam Crerar, "Ties That Bind," 9, challenges the crisis narrative, arguing that the "movement from the country to the city was a considerably more vibrant and complicated process than previously imagined."

Industry viewed electoral politics as a viable strategy for increasing farmers' power. In 1894, the Patrons ran forty-three candidates in the provincial election, seventeen of which won their seats, including D.M. MacPherson in Glengarry. Although the dairymen's associations rarely made explicit mention of either organization given their ostensibly non-partisan outlook, the critiques that farmer-patrons and factory representatives made of the buyers and exporters echoed the Grange and the Patron of Industry's emphasis on farmers as the central class of producers, maligned by the disproportionate power of (urban) commercial and industrial capital.<sup>92</sup>

Many patrons also felt that the buyers' admonishments to ship cheeses regularly were hypocritical because buyers could hold onto cheeses in their cold storage warehouses while they waited for prices to rise. Cheese producers also had a right to 'manipulate' the ecologies of cheese curing to their benefit, patrons argued, but lacked the same capacity to do so. One factory representative rebuked Casswell directly: "[factory] salesmen have quite as good right to study the signs of the market and hold on for a rise, as others [the buyer-exporters] have to speculate, using refrigerators and cold storage," alluding to the wave of ice-cooled storage houses constructed by exporters in the late 1880s.<sup>93</sup> These storage units slowed the deterioration of cheeses—especially during the

<sup>92</sup> The Dominion Grange of the Patrons of Husbandry, more commonly known as 'The Grange,' was a Canadian branch of the U.S.-based organization that found its way first to Ontario (via Quebec) by 1874. In the late 1880s, the Patrons of Industry similarly emerged from a U.S.-based predecessor. See Ferry, *Common Good*, ch. 5; Ferry, "'Severing the Connections in a Complex Community': The Grange, the Patrons of Industry and the Construction/Contestation of a Late 19<sup>th</sup>-Century Agrarian Identity in Ontario," *Labour/Le Travail* 54 (2004): 9–47; Russell Hann, *Farmers Confront Industrialism: Some Historical Perspectives on Ontario Agrarian Movements* (Toronto, ON: New Hogtown Press, 1975); and Louis Aubrey Wood, *A History of Farmers' Movements in Canada* (Toronto, ON: University of Toronto Press, 1975 [1924]), esp. 133–146.

<sup>93</sup> DAWO, 1888b, 12. The companies that built ice-cooled storage warehouses around this time included A.A. Ayer and Company in Montreal (1885), J.L. Grant and Company in Ingersoll (1886),

summer months—which allowed buyers to hold onto their stock longer. It was much harder for factories to do this successfully, since many lacked the capital necessary to outfit their factories with cool curing rooms. One risk of holding onto cheeses at factories in hopes of a higher price was that their quality could deteriorate if makers did not have a reliable way to regulate the temperature of their curing rooms. The second major consideration was shrinkage. Over time, the moisture in clothbound cheddars would start to evaporate, which translated into a loss of weight (and ultimately profit) since cheeses were sold at a given rate per pound. (The problem of shrinkage also explains the buyers' frustration with companies that sold their cheeses almost immediately after making in order to secure the highest weight possible, since upon arrival in the United Kingdom they had 'shrunk' to a lesser weight.<sup>94</sup>)

One of the reformers navigating this contentious milieu was James W. Robertson. A Scottish-born immigrant with familial ties to cheese merchants in the United Kingdom, Robertson arrived in Canada in 1875 at seventeen years old and soon found work as an assistant in a western Ontario cheese factory. Before long he became head maker, and by the early 1880s, he owned a handful of cheese factories himself.<sup>95</sup> Evidently not content to remain on the factory floor, and keen to influence the trajectory of Canadian rural

Ballantyne and Sons in Stratford (1888), and the Canadian Pacific Railway in Ingersoll (1887) and London (1892). See Ruddick et al., *The Dairy Industry in Canada*, 62–63. For another example of how technological developments facilitated commodity speculation, see Cronon, *Nature's Metropolis*, 109–147.

<sup>94</sup> For example, see "Defects in Cheese Shipped," *The Farmer's Advocate*, 8 April 1909. The article reports that "Letters direct from importers in Liverpool, Bristol, Manchester and Cardiff are unanimous in denouncing short weights and green shipping....another [importer] said it was not unusual for a cheese to show a shrinkage of 6, 8 or 10 pounds, and it is suggested that 'some swindling is going on on the other side.'"

<sup>95</sup> Edwin John Pavey, "James Wilson Robertson: Public Servant and Educator," M.A. Thesis, University of British Columbia, 1971, 3–5, [https://circle.ubc.ca/bitstream/id/119958/UBC\\_1971\\_A4\\_7%20P38.pdf](https://circle.ubc.ca/bitstream/id/119958/UBC_1971_A4_7%20P38.pdf).

education and development, Robertson obtained the position of head of the OAC's Dairy Department in 1886, while also dabbling in produce brokerage in Montreal. In 1890, at just thirty-three years old, he was selected as the first Dairy Commissioner of the Dominion. He remained Commissioner until 1905 when he embarked on a series of other education-related roles beyond dairying.<sup>96</sup> As head of the Dairy Department at the OAC in the late 1880s, Robertson was responsible for administering the instruction program in the western part of the province and as result, he functioned as a key liaison between individual factories, buyers, and the growing cohort of institutional dairy experts.

During the summer of 1888, Robertson received multiple complaints from buyers about the state of cheese in western Ontario. Writing to J.A. Ruddick, then one of the instructors under his employ, Robertson complained he was "very much disappointed at the quality [of cheese]." He asked Ruddick to visit the Honey Grove factory near

Stratford to "take particular note of how Chalmers folks [sic] handle the curd there."<sup>97</sup>

That very same day Robertson drafted a column for *Hoard's Dairyman* (a popular

<sup>96</sup> In addition to his dairy-related work, Robertson was principal of Macdonald College in Quebec, chair of the Committee of Lands (CL) for the federal Commission of Conservation, a volunteer with the Red Cross, member of the postwar Paris Peace Conference, and chief commissioner of the Boy Scouts of Canada. His long and varied career makes him difficult to characterize. Patricia Bowley describes him as a "romantic agrarian" whose lack of practical farm experience and insistence on a holistic rural vision derailed the work of the CL as part of the CCC. I partially disagree with her portrayal. Robertson was undoubtedly an idealist and an agrarian, but her simplistic separation of 'romantic' and 'realist' agrarianism (a division that is implicitly mapped onto ideas of tradition and modernity, and social versus economic concerns) is off the mark, at least in regard to his work at OAC and with the dairymen's associations. Robertson was not a practical farmer, but he was keenly aware of economic concerns of farmers and an advocate of alternative rural modernity, bringing my portrayal of Robertson closer to that of James Murton's in *Making a Modern Countryside*, 56–57. See Bowley, "The Committee on Lands of the Conservation Commission, Canada, 1909–1921: Romantic Agrarianism in Ontario in an Age of Agricultural Realism," *Scientia Canadensis: Canadian Journal of the History of Science, Technology and Medicine* 21 (1997): 67–87.

<sup>97</sup> Letter from J.W. Roberston to J.A. Ruddick, 24 August 1888 (emphasis in original), Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

American dairy paper with broad circulation in Ontario) disparaging what he called “Careless manipulation, taste to get done for the day, the leaving of too much moisture in the curd...and the insufficient development of acid....I fear that the excellent reputation built upon years of slow progress...will collapse unless a very marked improvement is observable[.]”<sup>98</sup> In another letter, Robertson cautioned a different instructor to respond to a request from the Canboro Factory to investigate potential instances of adulteration, but not at the expense of cheesemaking instruction: “Be sure that you emphasise the need for making cheese solid. A great many complaints are being made about cheese too sweet, too weak and open.”<sup>99</sup> Robertson’s complaints centered around the texture and body of cheeses, over which makers exerted the most control. Much like the dairy landscape, which reformers pointed to as a sign of patrons’ “slovenly” intransigence, an ‘open’ cheese or one retaining too much moisture signaled a lack of honest industriousness on the part of the makers. Robertson’s message was frank: cheesemakers who cared not a whit for the quality of goods they turned out threatened the industry’s wellbeing, and by extension, the reformers’ promise of alternative rural modernity.

According to this line of argument, cheese mania and the rapid development of factories had, by the 1880s, created an excess of men eager to obtain respectable positions as head makers (and the corresponding increase in wages), without taking the time necessary to develop their craft skills in an industrious, self-improving fashion. For many

<sup>98</sup> Draft of column for *Hoard’s Dairyman*, 24 August 1888, Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>99</sup> Robertson to E. Hunter, 1 August 1888 (emphasis in original), Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

reformers, especially Robertson, the apparent decline in craft standards was a symptom of an insufficiently developed liberal ethic of improvement amongst cheesemakers (and the dairy public writ large). At the DAEO meeting in January 1889, Robertson complained that, “the men who run our cheese factories to-day are not men of the same ambition they were ten years ago....We want cheese-makers who are enthusiastic about their work, and will take the pains to make themselves masters of all the details of their business.”<sup>100</sup>

Young, inexperienced assistants who sought out head positions after apprenticing for only one or two seasons received particular scorn. In an 1893 address on “The Future of Cheese and Butter Making,” for example, one speaker warned listeners that, “Many of these young men and sometimes old men are sadly deficient, and this deficiency is encouraged and winked at by those who employ these men, because they will undertake the work and take the risk for less money per 100 lb. of cheese than a fully competent man will do.”<sup>101</sup>

In singling out the makers, reformers like Robertson were not absolving the patrons of blame. For example, in one 1898 article titled “Should the Cheesemaker Be Held Responsible for Bad Flavored Cheese,” J.A. Ruddick explained that if cheeses “are well made and show no other defect than that of flavor, the cheesemaker should not be held responsible, if as I have said before, he has done his part well in the matter of the keeping the factory clean.”<sup>102</sup> However, many reformers also believed that the

<sup>100</sup> DAEO, *Annual Reports of the Dairymen's and Creameries' Associations of the Province of Ontario 1888* [hereafter *1888b*] (Toronto, ON: 1889), 109.

<sup>101</sup> DAWO, *Annual Reports of the Dairymen's and Creameries' Associations of the Province of Ontario 1892* [hereafter *1892*] (Toronto, ON: 1893), 157.

<sup>102</sup> “Should the Cheesemaker be Held Responsible for Bad Flavored Cheese,” *Canadian Cheese & Butter Maker*, August 1898.

responsibility for improving cheese flavour began with the cheesemakers, who ought to educate the patrons to send better milk. In an address to the DAWO in 1892, the dairy supplier John Pearce distinguished three categories of makers: “progressive ones interested in improving their craft, those who make decent products but get left behind in the lurch of agricultural progress, and an immoral, ‘shiftless’ class who ‘have nothing to lose.’”<sup>103</sup> In this liberal schema, progressive, respectable makers not only paid close attention to their craft, but also set a good example in their standards for cleanliness, rejected milk unfit for cheese, and encouraged patrons to hold themselves to similar standards of self-improvement.

Despite the reformers’ frustration with inexperienced craft workers, the liberal distinction between “shiftless” and “progressive” cheesemakers could cut both ways. If reformers and certain factory directors disparaged the former, they treated the latter with far greater sympathy. Many expressed concerns, for example, about the low wages paid to good makers. In the same way that the proximity of factories in certain parts of the province pressured companies to turn a blind eye to spoiled or adulterated milk, cheesemakers in areas of high factory density were often compelled to lower their tenders or accept lower wages lest they lose their positions to others willing to make cheese for less. By the 1890s, the standard rate for manufacturing cheese—particularly in eastern Ontario—had fallen to a cent per pound, which was meant to cover the wages of the maker, the cost of supplies, and any profit. Reformers and exporters alike worried that these cost cutting measures were more reckless than economical; many of the DAEO

<sup>103</sup> DAWO, 1892, 157.



members at the 1890 meeting agreed that, “No man can make good cheese if he is paid only a cent a pound.”<sup>104</sup> The dairymen’s associations, but especially the DAEO, echoed the concerns of many Canadian manufacturers who felt that “illegitimate” practices like competitive price-cutting had a “demoralizing effect” on business in general.<sup>105</sup> Indeed, companies reluctant to match the rates of their nearby competitors operated in fear of losing patrons and milk. The Big Springs Cheese Factory in Hastings County appears to have been formed by a handful of patrons who defected from the nearby Maple Leaf Cheese Factory. Big Springs, perhaps not coincidentally, charged a cent per pound during the 1890s.<sup>106</sup> A partner at another eastern Ontario cheese company—a relatively large, well-capitalized operation—admitted that holding their manufacturing rate at one and an eighth when all of the surrounding factories charged a cent a pound was “uphill work,” though they had not lost many patrons.<sup>107</sup>

Wages were paid according to the type arrangement between the patrons and maker.<sup>108</sup> One system was by contract or ‘tender.’ If a maker owned his own factory, or if he or she were contracted by the company by tender, they earned a certain rate per 100 lbs. of cheese produced, which was usually expected to cover all supplies and the wages of any assistants, although contracted makers sometimes negotiated with companies to

<sup>104</sup> DAEO, *Annual Report of the Dairymen’s and Creameries’ Association of the Province of Ontario 1890* [hereafter *1890*] (Toronto, ON: 1891), 8.

<sup>105</sup> Bliss, *A Living Profit*, 44–45.

<sup>106</sup> Account Book (1893–1900), Big Springs Cheese Factory fonds, F 4348, Archives of Ontario; Financial Accounts, 1874–1885, Maple Leaf Cheese Co. fonds, MU 7263, Archives of Ontario. The patrons who left Maple Leaf include J. McComb, J. Eastwood, G. McComb, John Webb, Wm. Potts, and Wm. Scrimshaw.

<sup>107</sup> DAEO, *1890*, 9.

<sup>108</sup> Unfortunately, census data on cheese factory wages is of little use because the average wage provided in tables doesn’t distinguish between wages for head makers and assistants.

supply boxes and other supplies. Submitting a tender was highly strategic: it had to be low enough to appeal to the factory directors, who sought to keep as much of milk's value for the farmers, but high enough to cover the unpredictable costs of rennet, boxes, and other inputs. In 1882, for instance, an applicant at the Blanshard and Nissouri Cheese & Butter Factory furnished references from two former factories, and offered to make at a rate of 85¢ per 100 lbs. of cheese on the condition that at least sixty tons were made over the season—88¢ for a smaller make. He clarified that he wouldn't "keep the books" either.<sup>109</sup> If the factory produced 100,000 pounds of cheese in a season, the applicant would have realized an income of \$850—no small sum in comparison to farm labour at the time—although we would need to deduct the costs of supplies and the wages of any assistants, if necessary, to determine his actual earnings. The other option was to hire a maker by salary, which could be weekly, monthly, or seasonal. Usually in these instances the maker was not expected to furnish supplies or provide his own assistants. This system was especially common in the proprietary branch system, where one individual or company owned a number of small factories. For example, an account book belonging James Arthur James—either the owner or director of a series of factories in western Ontario—appears to have usually hired male factory hands at \$10.00 a month and women at \$8.00 in the early 1870s.<sup>110</sup>

<sup>109</sup> He did not get the job. They kept on their existing maker (at 90¢ per 100 lbs.) for a number of years even though this applicant proposed 85¢—a significant undercut—but even their maker accepted a cut to 85¢ a few years later. Minutes, 19 January 1882, Minute Book 1880–1891, Box 1, Blanshard and Nissouri Cheese & Butter Factory collection, University of Guelph Archives, ON.

<sup>110</sup> James Arthur James Daybook and Business Register, F 4390, Item 1, No. 2, Archives of Ontario. These wages were much closer to what would be expected in contract farm labour. For instance, Terry Crowley estimates that, "By 1870 male farm labourers averaged a monthly income of \$13.50." See Crowley, "Rural Labour," 46.

Systematic data on wage rates in the cheese industry is scarce. In 1895, a questionnaire distributed by the DAWO found the wages for piece work (for 100 lbs. cheese) in western Ontario varied from 70 to 92¢, the average being 80.64¢ (when makers provided their own supplies). When makers supplied only their labour, the average was 38.75¢ for piecework or \$43.25 a month if paid on a salary.<sup>111</sup> The rates in western Ontario were typically higher than in the east. The modest Big Springs Factory in Hastings County, for instance, was paying a standard rate of \$16.20 a month for cheesemakers, which at seven months a year, amounted to \$112 for the entire season—well below the \$300 that the average western Ontario maker might expect. Yet wages were low in some western factories as well. In 1899, for example, John Mac Hoover hired George Ecker for \$20.00 a month when he was making butter, and \$24.00 when he was making cheese in Hoover's combined factory.<sup>112</sup> Appendix 3 suggests that the piece rates offered to contract makers at a handful of factories fell between the 1870s and 1900s before climbing after the First World War.

Reformers worried that downward pressure on manufacturing rates—and thus cheesemakers' wages—would further contribute to the decline in cheese quality by pushing the remaining “progressive” makers out of the business. “What encouragement is it for a man [who wants to make high quality cheese]...if he finds that the patrons are running one year to one place and next year to another, willing to go anywhere if they

<sup>111</sup> DAWO, *Annual Report of the Dairymen's and Creameries' Association of the Province of Ontario 1895* [hereafter 1895] (Toronto, ON: 1896), 81. The numbers were based on 113 survey responses.

<sup>112</sup> Accounts 1893–1900, Big Springs Cheese Factory Fonds, F4348, Archives of Ontario; and John Mac Hoover Accounts 1899–1902, Box 1, Joyce Hoover Clark Collection, Norwich & District Museum & Archives, Ontario.

will get one-tenth of a cent off the maker?” asked Daniel Derbyshire in 1888, referring to the tendency for some cheese companies to simply accept the lowest tender offered by a cheesemaker, regardless of experience or skill.<sup>113</sup> Derbyshire went as far as to suggest that the makers form a union: “We have a carpenters’ union and a bricklayers’ union, and the men have united to obtain higher wages it need not be at the expense of the employer [sic].”<sup>114</sup> Robertson’s support for a union was more muted. While he encouraged cheesemakers to begin their own association, he was careful to condemn what he considered to be coercive organizing efforts like going on strike, a supposedly uncouth mechanism not fit for a class of respectable tradesmen in a cooperative industry.<sup>115</sup> In general, the reformers’ support for makers was borne of the ideals of stable, rural, liberal capitalism more than any radical, anti-capitalist sentiment. More often than not, reformers called on patrons, shareholders, and proprietary factory owners to see the economic wisdom of increasing makers’ wages while also being more discriminatory in their hiring practices. For instance, Henry Hoshel Dean, Robertson’s successor as head of the Dairy Department at OAC, cautioned one prospective factory proprietor in 1891 to “Get a good maker & pay him fair wages. It does not pay to hire a poor maker because he can be obtained cheap – as you can easily lose \$500 on a seasons [sic] make of cheese owing to inferior quality[.]”<sup>116</sup>

<sup>113</sup> DAEO, 1888a, 50.

<sup>114</sup> DAWO, 1888b, 47.

<sup>115</sup> DAWO, *Annual Report of the Dairymen’s and Creameries’ Association of the Province of Ontario 1890* [hereafter 1890] (Toronto, ON: 1891), 64.

<sup>116</sup> Letter from H.H. Dean to unknown recipient (emphasis in original), 18 March 1891, Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC A0601, University of Guelph Archives, Ontario.

Not everyone agreed that makers suffered dire straights. In 1890, a factory owner from western Ontario named John D. Leitch scoffed at Robertson's suggestion that the western Ontario makers should hold some meetings amongst themselves to discuss their grievances, asking sarcastically whether they should "protest against nature and the Creator," while they were at it. He continued:

there is not a single cheesemaker here but has a better coat to his back than I have....We [the manufacturers] pay the makers all we can afford. I give some of my men \$2 a day, and do not like to change any of them, providing they are faithful....[I]f they only save part of their wages and do not dress quite so fine, and do not spend money quite so freely, I think they can lay up money after paying for their living.<sup>117</sup>

The *real* problem, he insisted, was that makers mismanaged their finances by prioritizing extravagance over thrift.

There were surely some differences amongst cheesemakers in terms of their experience, skill, and ambition. Recognize, too, that there were critical differences between makers who owned their factories and were contracted by the pound—making them more like independent contractors than wage labourers—and those who were hired by either proprietary, co-operative, or joint-stock companies. However, paying too much attention to the distinction between respectable and so-called shiftless cheesemakers obscures how, as a group, makers increasingly bore the brunt of the tensions between patrons and buyers. When makers' wages fell, they often tried to make up the losses in a variety of ways, whether by purchasing cheaper boxes or brands of rennet and salt or stretching those supplies further across the season.<sup>118</sup> Meanwhile, factory directors and

<sup>117</sup> DAWO, *Annual Report of the Dairymen's and Creameries' Association of the Province of Ontario 1889* [hereafter 1889] (Toronto, ON: 1890), 25.

<sup>118</sup> These problems were commonly discussed at conventions. For an example, see DAEO, 1893, 27.

patrons who might have quietly legitimized makers' attempts to maximize output or economize on supplies when prices were high—even at the expense of quality—began to shift much of the responsibility for cheese quality and declining prices onto the makers in an effort to protect whatever was left of their profit margins. Even though reformers like Ruddick and Robertson took pains to distinguish between fault for flavour (often, but not always, due to the patrons) and texture (generally, though not always, due to the makers), cheesemakers increasingly signed contracts with companies that included clauses holding them financially culpable for any losses from cheeses deemed not be of 'first-class' quality.

In his report to the DAWO in 1890, one travelling instructor claimed that many cheesemakers in his district would agree to absorb losses in price because of quality, and thus “wind up the season without any wages for themselves, and a loss to the patrons.”<sup>119</sup> The Big Springs factory, mentioned above, appears to have had such an arrangement. In 1898, Harry Rowe lost \$3.00 on nine cheeses sold on June 24<sup>th</sup>, while Bert Mason, the maker for the following season, apparently had \$53.60 reduced from his pay in 1899.<sup>120</sup> In at least one case, a cheesemaker took his employer to court. The maker, William Bird, alleged that he was hired to make cheese at seven ‘mills’ per pound for the 1891 season. Much of the stock did not sell as ‘first class,’ so the defendant, factory owner J.K. McCargar, claimed he was entitled to charge the losses to Bird’s account.<sup>121</sup> An article in

<sup>119</sup> DAWO, 1889, 55.

<sup>120</sup> Cheesemaker’s accounts, 109, 123, Account Book (1893–1900), Big Springs Cheese Factory fonds, F 4348, Archives of Ontario.

<sup>121</sup> “Assizes at Belleville: A Complicated Cheese Case—Actions to Recover,” *The Globe* (1844–1936), 29 March 1892.

the *Canadian Cheese and Butter Maker* alleged that in some instances, buyers found “imaginary fault[s]” in cheeses and demanded payment from the makers to remain quiet, such that “In quite a few instances makers are known to have been compelled to pay out the whole year’s wages as ‘silence’ money to the buyer.”<sup>122</sup> Without any legislated standards of cheese quality in place, buyers were largely free to determine what ‘first-class’ cheese entailed, which gave them significant leverage over both the makers and the patrons. These complaints are difficult to substantiate for obvious reasons, but the allegations highlight the extent to which makers found themselves caught between patrons, on the one hand, and the buyers on the other.

By the late 1890s, the state of affairs had become intolerable for makers who found themselves at the end of each season without “one dollar to rub against another,” as one prominent cheesemaker put it.<sup>123</sup> In 1898, a cheesemaker known only as ‘R.C.B.’ wrote a letter for the short-lived, Kingston-based periodical, the *Canadian Cheese and Butter Maker*. He called on fellow makers to organize against the “commercial, financial, [and] political [circumstances]” that “militate against your success[.]” Speaking to the isolating effect of many factories, he encouraged men to form groups based on where they lived, rather than the precise branch of dairying they pursued (cheese or buttermaking). R.C.B. may have used more militant language than reformers in his justification for unionizing, but his vision of a cheese- and buttermakers’ union still relied

<sup>122</sup> “A Cheese Maker’s Association,” *The Canadian Cheese and Butter Maker*, July 1898.

<sup>123</sup> DAEO, 1893, 11.

on the liberal distinction between respectable and shiftless men. “[P]ermit no man of bad character or of inexperience to join,” he cautioned.<sup>124</sup>

That same summer, a group of cheesemakers around London, Ontario, held a handful of meetings to establish the Cheese and Buttermakers’ Association of Western Ontario, which held its first and only convention in February of 1899, in the town of Listowel. Two hundred fifteen makers signed a legal document between themselves and the Cheese and Butter-makers’ Association, suggesting an attempt to create a collective agreement amongst themselves. Their president, T.B. Millar—one of the cheese instructors at the OAC’s Dairy School—described the association’s efforts to circulate a standardized “form of agreement” that makers could use in drawing up contracts with their employers. The association also tried to establish a system for adjudicating disputes about quality between makers, patrons, and buyers, though how and whether it functioned at all is unclear. During the association’s one and only annual convention, discussions about the difficulties of producing cheeses with good body using inconsistent milk and unpredictable tools occupied much of the agenda. Overall, the Cheese and Butter Makers’ Association was an organization similar in form to the DAWO and DAEO—more like a parallel trade association than a union—albeit with more of a focus on the particular,

<sup>124</sup> “Protection, Important to Makers,” *Canadian Cheese and Butter Maker*, August 1898. A number of historians who have studied the organizing efforts of craft workers in Canada have had to grapple with the complex reasons for many (white, male) craftworkers’ overwhelming exclusivity and lack of class-based solidarity in their organizing, which has sometimes taken the form of active hostility toward workers of colour, the ‘unskilled’ working class, women, and others. Ruth Frager, “Labour History and the Interlocking Hierarchies of Class, Ethnicity, and Gender: A Canadian Perspective,” *International Review of Social History* 44 (1999): 217–247, offers an excellent appraisal of some of these debates and calls for labour historians to pay careful attention to “interlocking hierarchies” and their effect on workers’ organizing.



practical concerns of the cheesemakers. Millar's opening address made the association's non-combative, liberal identity clear: "During the short time that we have been in office we have endeavored to advance the interests of dairying, especially those of the makers."<sup>125</sup>

There was no second meeting of the Western Ontario Cheese and Buttermakers' Association—which merged with the DAWO in 1900—nor is there any indication that makers in eastern Ontario heeded R.C.B.'s call to organize. Earl Haslett suggests that the failure of the Western Ontario Cheese and Buttermaker's Association to continue beyond its first year was probably due to their inability to increase makers' rates for the 1899 season.<sup>126</sup> There was no single reason why cheesemakers failed to form stronger organizations in the 1890s. The decentralized and often isolated character of cheese factory work made it difficult for makers to organize with one another—recall Fitzgerald's reluctance to "find my way alone" at Rose Hill. Structurally, makers who were hired by proprietors or boards of directors had somewhat different interests from makers who owned their own factories. The faith amongst some makers in 'craft mobility'—an artisanal corollary to the liberal vision of farm ownership—further weakened craft solidarity, while others makers registered their discontent by leaving for other industries and the cities.<sup>127</sup>

<sup>125</sup> Cheese and Butter-maker's Association of Western Ontario, *Annual Report...1898* (Toronto, ON: 1899), 141. Moreover, the 109 members listed in the convention report in 1899 included a number of prominent factory owners and reformers in addition to "practical" makers.

<sup>126</sup> Haslett, "Factors," 106.

<sup>127</sup> On craft mobility, see Kristofferson, *Craft Capitalism*, 76–110.

This section has shown that the challenges of craft and problem of milk outlined earlier in this chapter escalated into general dysfunction within the industry by the end of the 1890s. Widespread droughts and general rural discontent combined to put greater pressure on cheese companies to reduce their costs of production, which were often passed on to cheesemakers, who were often blamed for the industry's difficulties and called upon to overcome them. Even though efforts to establish cheesemakers' unions do not appear to have amounted to much more than a handful of localized false starts, they highlight how widespread the tensions between and amongst patrons, shareholders, proprietors, buyers, reformers, and cheesemakers were by the start of the twentieth century.

### *Conclusion*

In 1893—in the midst of these heightened tensions—twelve Ontario cheesemakers collectively produced a 22,000 lb. wheel of cheddar called the 'Mite' at the Dominion Experimental Station in Perth, Ontario. The gargantuan cheese was meant to represent Canada's dominance in the global cheddar trade and was intended for show at the World's Columbian Exhibition in Chicago later that year. It arrived at the fair to great acclaim, only to immediately crash through the floor of its display room.<sup>128</sup> Canada's 22,000 lb. behemoth is wonderfully symbolic of the state of the industry by the turn of the

<sup>128</sup> Fair officials moved it to another location and placed it on a reinforced floor, and apparently it was not much worse for wear despite its spoiled exterior. For descriptions of the saga of the Mite in greater detail see Elsbeth Heamen, *The Inglorious Arts of Peace: Exhibitions in Canadian Society During the Nineteenth Century* (Toronto, ON: University of Toronto Press, 1999), 242; and McCormick, *A Hundred Years*, 72–75.

twentieth century. Much like the Mite, the Ontario cheddar industry was elephantine and precarious all at once. Supporters of factory cheese production regularly and proudly celebrated Ontario's dominant role in the country's growing dairy export sector. By the early 1890s, Canada was the United Kingdom's largest source of imported cheddar.<sup>129</sup> However, paying close attention to the daily craft of factory cheesemaking—as both an engagement with extra-human nature and a contested social arrangement—offers a very different story. Whether it was milk, or drought, or a cheesemaker who was ready to quit, neither people nor extra-human nature seemed to behave in the harmonious and progressive ways that reformers expected. In fact, the challenges that rural Ontarians faced seemed to grow in direct proportion to the size of the industry itself.

A secondary goal of this chapter has been to explain the 'nature' of the problems of milk and craft. I have argued that the challenges facing the industry emerged from the complexities of the dairy zone as an organic machine; they were neither 'external' to the industry nor straightforwardly natural, social, or economic. Unintended consequences like the problem of milk challenge neat distinctions between humanity and extra-human nature. Nevertheless, many reformers, buyers, and patrons expected cheesemakers to manage the complex effects of factory cheese manufacturing and hold the cooperative industry together using their craft skills, in spite of worsening labour conditions for makers in the 1890s. Chapter 4 examines how dairy reformers—with increasing ties to

<sup>129</sup> Recall the claim Daniel Derbyshire made to the DAEO in 1894, which open this dissertation. See page 1, note 1. Between 1891 and 1895, Canada represented 48.7% of cheese imported in the United Kingdom, compared to the 31.7% from the United States, 13.5% from Holland, and 6.1% from other countries. Canada's proportion actually continued to increase, reaching a peak of 69.1% of all imported cheese between 1901–1905. See Haslett, "Factors," Table 2, 42.

the state—sought to stabilize the dysfunctional Ontario cheese industry by implementing two programs of labour reform: technical craft education programs for cheesemakers, on the one hand, and the scientific management of cow labour, on the other.

## Chapter 4: Stabilizing the Dairy Zone

### *Introduction*

In October 1888, James W. Robertson—then the head of the Dairy Department at OAC—penned an impassioned reply to a representative of the struggling Belmore Cheese Factory, reiterating the link between cheese and rural progress: “I cannot agree with you that the cheese factory as an institution is a fraud,” he wrote. “When managed by *capable honest men* it is one of the most helpful agencies for advancing the agricultural interest of any district.”<sup>1</sup> He exemplified the mid-nineteenth century liberal outlook of most dairy reformers by measuring the success of society in terms of individual effort, and he refused to interpret the industry’s many challenges as a fundamental crisis of the dairy zone vision. In the late nineteenth century, Robertson and others set out to stabilize the cheese industry through a series of programs that would reform cheesemakers and farmers into ‘capable, honest men.’ Their first strategy was the establishment of technical craft education through permanent winter dairy schools, which began in the 1890s. Reformers and school administrators believed—somewhat erroneously—that taking firmer control over the reproduction of craft labour through technical education would translate to higher prices for cheese abroad and diffuse many of the tensions felt within the industry. The reformers’ second strategy involved leveraging the state’s dairy institutions and the dairymen’s associations to encourage farmers to improve dairy cow productivity through scientific farm management. Many reformers saw these

<sup>1</sup> Robertson to the Belmore Factory, 20 October 1888 (emphasis mine), Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario. Unfortunately the letter books only document outgoing correspondence, so the initial letter from the Belmore Factory has not survived.

interventions as complementary: craft education would increase the quality of cheese produced, while scientific farm management would help reduce the costs of production.<sup>2</sup>

Despite these efforts, by the end of the First World War, the holistic, cooperative dairy zone vision espoused by Robertson and others had been weakened by a more atomized vision of rural modernity, one that included cheese but was not beholden to it. Scientific management of cow productivity in particular signals the growing strength of what environmental historian Deborah Fitzgerald calls the “industrial ideal,” or the goal of rationalizing agricultural production by adopting the principles of urban manufacturers and engineers.<sup>3</sup> Furthermore, federal and provincial dairy institutions began to take on greater regulatory and interventionist roles in addition to their existing emphases on education and self-improvement.<sup>4</sup> Together, these shifts signal a crisis of faith in the dairy zone vision that would ultimately hasten the demise of the rural cheese industry after the First World War. Critically, I argue that this was not an inevitable transition from ‘tradition’ to ‘modernity,’ but the marginalization of one modernist vision by another.

<sup>2</sup> These were not the only strategies for stabilizing the industry during this period. Reformers and the state also embarked on other technoscientific ‘fixes’ to improve quality and reduce losses, such as cold storage (which reduced the shrinkage of cheese during its oceanic voyage), improved tests for measuring the quality of milk and identifying spoilage, and establishing a grading system (in 1921) for all cheese and butter for export. I have chosen not to focus on those here because they have received more attention in the literature to date, but they are part of the wider story of how state and corporate institutions eventually developed greater (but incomplete) control over the ‘nature’ of cheese production. On cold storage, see DAEO, 1903, 142–152; Ruddick et al., *The Dairy Industry in Canada*, 188–120. On the ‘Hart Casein’ test for measuring the protein in milk (in conjunction with the Babcock tester for measuring butterfat), see Dean, *Canadian Dairying*, 70–71; on the milk sediment test, see DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1914* [hereafter 1914] (Toronto, ON: 1915), 39–40; on grading and the Dairy Produce Act, see McCormick, *A Hundred Years*, 51–52.

<sup>3</sup> Fitzgerald, *Every Farm a Factory*, 1–32.

<sup>4</sup> Murton makes a similar point about the state’s role in *Creating a Modern Countryside*, 46, 119–120. For a broader assessment of the state’s changing roles from the nineteenth to the twentieth centuries, see Elsbeth Heaman, *A Short History of the State in Canada* (Toronto, ON: University of Toronto Press, 2015).

*The Rise of Technical Craft Education*

If the dairy zone was not in peril during the 1890s, Robertson and others agreed it was at least in need of fundamental intervention. The existing system of itinerant instruction managed by the dairymen's association left much to be desired, both in terms of its reach and its efficacy. For one, only a portion of companies used the voluntary service. In 1891, fewer than half of the makers at western Ontario's approximate 300 factories received instruction.<sup>5</sup> Instructors nevertheless found themselves stretched thin, since the associations could not afford to hire more than a handful of individuals each year. It was not unusual for an instructor to represent dozens of factories across multiple counties. For example, between 1894 and 1897, the average number of factories visited per instructor was sixty-six in the west and sixty-two in the east.<sup>6</sup> The eastern Ontario regions in particular tended to be quite large, which meant instructors spent much of their

<sup>5</sup> DAWO, 1891, 99. In 1887, representatives of both associations approached the provincial government to ask for enough funds to expand their programs. They wanted to increase the number of instructors from two in the east and none in the west to four in each section, all of whom would be overseen by the Dairy Department at OAC. Reformers hoped that expanding the program and making it more systematic would help stabilize the apparent decline in cheese quality and create the basis for true rural cooperation. However, the government initially denied the increase. Instead, for the 1888 season, both associations committed to four instructors each by increasing the fee charged to factories to \$10 per season. In the west, these instructors fell under the purview of the Dairy Department at OAC (then headed by Robertson), while in the east they were under the management of the DAEO itself. Daniel Derbyshire blamed the DAWO for the failure of the expansion plan, claiming that the DAWO allowed "politics to get into it," and that the lack of unification between the two organizations defeated their proposal to the provincial government. See DAEO, 1888a, 80.

<sup>6</sup> Unfortunately statistics on instruction are difficult to compare because instructors did not submit their reports in the same format. I chose to provide the averages between 1893 and 1897 since these were a series of years in which the DAWO and the DAEO both provided comparable numbers, and because the instruction system had become a regular fixture of both associations by the mid-1890s. See DAEO, *Annual Report of the Dairymen's and Creameries' Association of the Province of Ontario 1894* [hereafter 1894] (Toronto, ON: 1895), 11–17, 49–50; DAEO, 1895, 6–7, 21–26; 63–65; DAEO, *Annual Reports of the Dairymen's and Creameries Association of the Province of Ontario 1896* [hereafter 1896] (Toronto, ON: 1897), 44–52, 53–54; DAEO, 1897, 49–57; DAWO, *Annual Report of the Dairymen's and Creameries' Association of the Province of Ontario 1894* [hereafter 1894] (Toronto, ON: 1895), 76–77; DAWO, 1895, 112–115; DAWO, *Annual Reports of the Dairymen's and Creameries Association of the Province of Ontario 1896* [hereafter 1896] (Toronto, ON: 1897), 73–80, 91–94; DAWO, 1897, 79–80, 91–94.

time travelling. Their efficiency depended on the weather, the state of the roads, and the labour of their horses. In the early 1900s, one instructor noted that “sandy and hilly” roads prompted him to occasionally take days off to rest or reshoe his horse.<sup>7</sup> In practice an instructor might only visit a factory once or twice in a season, hardly the sustained contact that reformers believed was necessary to improve the overall standards of craft.

The instructors’ efforts were also met with mixed reviews. Some cheesemakers appear to have appreciated the system, or at the very least, a day’s company and the extra set of hands. Fitzgerald was pleased that the instructor who visited him at Rose Hill in May 1892 described his cheese as “first class,” while in 1903, an instructor arrived at a western Ontario factory at 7:20 in the morning to find a maker who “wished me to help him with the making as he was alone.”<sup>8</sup> But others perceived the instructors’ scrutiny as patronizing oversight. In one scathing letter to the editor of Woodstock’s *Daily Sentinel-Review*, an anonymous cheesemaker called instruction a program with little benefit for cheesemakers *or* patrons. The writer was highly skeptical that an instructor could improve “the dairy business” better than cheesemakers and dairymen themselves. The writer argued further that instructors could do harm by “asking the company whose servant I am, to engage another person to stand between me and my employers.” Anticipating rebuttals from readers that the program had been unanimously approved at the previous year’s convention, he argued that makers and patrons in the DAWO were outnumbered

<sup>7</sup> Diary entry, 22 April 1903, Dairy Factory Inspector’s diary, File 33A, Box 4, Ontario Dairy Industry records, XA1 RHC A0386026, University of Guelph Archives.

<sup>8</sup> Diary entry, 9 May 1892, William Fitzgerald fonds, Queen’s University Archives, Kingston, ON; and Diary entry, 27 May 1903, Dairy Factory Inspector’s diary, File 33A, Box 4, Ontario Dairy Industry records, XA1 RHC A0386026, University of Guelph Archives.



by “those who have no connection with dairying, near or remote,” referring to reformers, politicians, and merchants.<sup>9</sup> Seasoned cheesemakers in particular bristled at the idea that instructors—who often sought to enter government bureaucracy or the commercial side of the business—could offer them useful advice. Instructors were certainly aware of such dynamics and occasionally even deferred to very experienced makers, as did one instructor in 1903, even though he found the maker’s practice wanting.<sup>10</sup>

In light of the limits of instruction, reformers searched for other solutions to what they perceived to be one of the most pressing problems facing the industry: the lack of reliable, highly skilled makers. By framing the problem as one of education and self-improvement—rather than the complex effects of a dysfunctional industry, as discussed in chapter 3—the most obvious solution was to take firmer control of the education of Ontario’s cheesemakers to produce the “capable, honest men” that Roberston and others believed were the key to achieving rural stability, cooperation, and progress. At the DAEO convention in 1891, Thomas Ballantyne gave an address titled, “A Plea for Dairy Schools,” in which he encouraged the construction of two permanent schools—one in the east and one in the west—where makers could improve their craft, calling on “only the very best men” to teach. He explicitly contrasted the vision for dairy schools with the existing instruction system, claiming, “Factory men do not want to listen to second class men who may visit them, although I have known much improvement to result from the visits of some of our inspectors.”<sup>11</sup> The creation of schools for cheesemakers in

<sup>9</sup> “Cheese Inspectors [Letter to the editor],” *Daily Sentinel-Review*, 25 April 1888.

<sup>10</sup> Diary entry, 13 May 1903, Dairy Factory Inspector’s diary, File 33A, Box 4, Ontario Dairy Industry records, XA1 RHC A0386026, University of Guelph Archives.

<sup>11</sup> DAEO, 1890, 34.

Wisconsin and Scotland added further pressure on Ontario reformers to provide comparable opportunities for technical education, lest they lose prospective cheesemakers to expanding dairy regions elsewhere, particularly the U.S. Midwest.<sup>12</sup>

Ballantyne's plea came at a moment of political and social ferment around the place and nature of technical education in Canada. Debates about the desirability and feasibility of public education in the mid-nineteenth century had given way to conversations about educational opportunities for adults and working-class men and women through institutions like the Mechanics Institutes, the Ontario School of Art and Design, and the Toronto Technical School.<sup>13</sup> Technical education—which historian Suzanne Zeller defines as “the means of imparting skills, techniques, and applied principles in preparation for the practice of a trade or profession”—was foremost amongst these conversations.<sup>14</sup> As systems of apprenticeship and craft unions were eroded by industrial capital, the country's manufacturing elite and labour advocates alike worried about a potential shortage of skilled workers and tradesmen. Yet many disagreed about the ideal direction for technical and vocational education, including whose responsibility

<sup>12</sup> DAWO, 1892, 138; Dean to R.W. Townsend, 2 November 1908, Letter books (1907–July 1909), Box 7, RE1 OAC A0601, University of Guelph Archives, Ontario. Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario; Dean to Prof. J.W. Mitchell, 22 February 1909, Letter books (1907–July 1909), Box 7, Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>13</sup> On the Mechanics Institutes, see Bryan D. Palmer, *A Culture in Conflict: Skilled Workers and Industrial Capitalism in Hamilton, Ontario, 1860–1914* (Montreal, QC: McGill-Queen's University Press, 1979), 49–51; Darren Ferry, “‘Open to All Classes on Terms of Perfect Equality’: The Association of Mechanics' Institutes and the Establishment of ‘Adult’ Education in Ontario, 1868–1895,” *Historical Studies in Education* 27, no. 2 (2015): 1–20; and Patrick Oisín Rafferty, “Apprenticeship's Legacy: The Social and Educational Goals of Technical Education in Ontario, 1860–1911,” Ph.D. Thesis, McMaster University (1995), 113–162. On the Toronto Technical School, see Rafferty, “Apprenticeship's Legacy,” 215–257; and Suzanne Zeller, “Roads not Taken: Victorian Science, Technical Education, and Canadian Schools, 1844–1913,” *Historical Studies in Education* 12, no. 1/2 (2000): 17–19.

<sup>14</sup> Zeller, “Roads not Taken,” 1.

it was to train the next generation of skilled labour: the provinces, the federal government, or industrial employers?<sup>15</sup> These questions became matters of national and provincial debate under the Laurier government in the late 1890s and early 1900s.<sup>16</sup>

Between the relatively haphazard process of educating new factory cheesemakers, the lack of any organized, craft-based resistance to formal instruction in cheesemaking, and the threat of losing the province's best makers to other cheese producing regions, technical dairy education grew quickly in Ontario in the 1890s. The state neither directly established nor managed the earliest schools in the province. In the spring of 1891, Ballantyne took it upon himself to begin the Tavistock Dairy School with A.T. Bell, a veteran cheesemaker, at the factory they co-owned in southwestern Ontario. (Bell doubled as cheesemaker and instructor.) In the three years that the Tavistock School operated, cheesemakers could visit Bell during the regular season to learn about the latest methods in cheesemaking, including the use of the recently invented Babcock tester for measuring milk quality and detecting adulteration. Bell reported in 1893 that during its second year of operation, roughly sixty cheesemakers visited "with a sincere desire for information," staying between one and ten days' each.<sup>17</sup> The DAEO, impressed by the school's apparent popularity, received \$750 from the provincial government to enact a similar system in eastern Ontario for the 1892 season. They chose to rotate their 'school'

<sup>15</sup> On the debates about technical education in public schools, see Zeller, "Roads Not Taken."

<sup>16</sup> Robert M. Stamp, "Technical Education, the National Policy, and Federal-Provincial Relations in Canadian Education, 1899–1919," *Canadian Historical Review* 52, no. 4 (1971): 404–423.

<sup>17</sup> DAWO, 1892, 186–187.

between a small handful of factories over the course of the season in order to reach a larger proportion of the region's makers.<sup>18</sup>

Neither field school continued after the province's three permanent winter dairy schools were built: the OAC-affiliated Dairy School in Guelph (1893), the Eastern Dairy School in Kingston (1894), and the relatively short-lived Western Dairy School in Strathroy (1896).<sup>19</sup> John Dryden was central to the establishment of the first school at Guelph. A staunch liberal and the provincial Minister of Agriculture in the Mowat government, Dryden abhorred the thought of providing direct support or subsidies to cheese manufacturers or dairy farmers, but celebrated the government's role as an educator. "I was quite shocked when I was made to think and see that there was no place in Ontario or in the Dominion of Canada where a young man who wanted to get information about cheese-making could be taught," he exclaimed to the DAWO in 1893.<sup>20</sup> Dryden used his close supervision of the OAC to ensure that a seasonal dairy school was one of the new programs available to students.<sup>21</sup> Henry Hoshel Dean, a former

<sup>18</sup> DAEO, 1892, 7–9. Fitzgerald attended one of these eastern Ontario travelling schools, run by Prof. McEwan, and was pleased to find that "Mr. McEwan's system of making Cheese is not at variance with my own system." See diary entry, 1 August 1893, Diary, William Fitzgerald fonds, Queen's University Archives, Kingston, Ontario.

<sup>19</sup> McCormick, *A Hundred Years*, 75. To some extent, the industry was late to the game of formal rural education; dairying was not included in the curriculum of the Ontario Agricultural College until a professorship of dairying was created in 1885 (first held by S.M. Barre of Quebec), eleven years after the school's establishment. See James L. Baker, "Formal Dairy Instruction and Technical Training from 1885," in *Dairy Branch & 100 Years of Service*, edited by W.A. Harley (Toronto, ON: Ontario Ministry of Agriculture and Food, 1988), 125. The Strathroy school only lasted until 1907. I am focusing primarily on the other two schools, whose records have survived.

<sup>20</sup> DAWO, 1892, 138.

<sup>21</sup> The OAC was the subject of a government-appointed inquiry in 1893 after tensions between the President of the College, James Mills, and numerous other faculty members and students threatened to produce backlash for the Liberal Party. Dryden made it clear that it was he, not Mills, who *really* oversaw the College's affairs. See Alexander M. Ross and Terry Crowley, *The College on the Hill: A New History of the Ontario Agricultural College, 1874–1999* (Toronto, ON: Dundurn Press, 1999), 50–54.

cheesemaker who completed a degree in agriculture at OAC in 1890 before replacing Robertson as the head of the OAC's Dairy Department, proposed the actual structure of the Guelph school and recruited its teaching staff. Dean wrote to Dryden in 1892 to propose a two-month program in February and March of 1893. Dean secured the services of J.T. Bell from the Tavistock school to lead the cheese courses.<sup>22</sup> Dryden agreed to offer space for fifty cheese- and buttermakers the first year and the school had to turn down dozens of applicants.<sup>23</sup>

Following, once again, the apparent success of a western Ontario institution, the Dominion Dairy Branch opened the Eastern Dairy School the following year through the Queen's University's School of Mining and Agriculture at their Kingston campus. The school drew on a wide range of resources and support, including the donation of a property from the city of Kingston, funds from the provincial government for its construction, and public subscriptions of shares totaling \$36,000, much of which came from the School of Mining and Agriculture's Board of Governors.<sup>24</sup> The initial superintendent was J.A. Ruddick, who worked under Robertson at the Dairy Commissioner's office, but in 1896 its management was transferred to the Ontario Department of Agriculture, which constructed a new building in 1897 and managed its

<sup>22</sup> Letter from Dean to Dryden, 20 July 1892, Book 1 (1888–1895), Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>23</sup> DAWO, 1892, 138. Dryden promised the DAWO they would expand spots in future years, since "it will not do to have one hundred men seeking admission to the school, and to have accommodation for only fifty."

<sup>24</sup> DAEO, 1894, 19–20.

affairs until it was folded into the curriculum of the Kemptville Agricultural School in 1937.<sup>25</sup>

These schools were designed specifically for factory cheese- and buttermakers, though administrators encouraged farmers to attend as well whenever possible. Promotional material likened the premises to small factories, even though the schools were better outfitted with the most recent technologies and equipment than the average working factory.<sup>26</sup> They offered courses of various lengths depending on the abilities and needs of the applicants. The main focus at both the Guelph and Eastern schools was the ‘long course,’ a six- to twelve-week program designed primarily for teenage boys and younger men who lacked the necessary experience to manage a cheese factory or creamery. Applicants had to be sixteen years of age or older with at least one season’s experience as a factory assistant.<sup>27</sup> At both schools, the long course constituted the backbone of a professional cheese- and/or buttermaking certificate, which, in addition to attending courses, required students to pass a series of practical and theoretical exams, and upon graduation, successfully manage a factory or creamery for a full season. Makers with more experience or those who could not afford to forgo wages for the greater part of the winter could instead take advantage of the short courses. These were typically week-

<sup>25</sup> McCormick, *A Hundred Years*, 75; and Ruddick et al., *The Dairy Industry of Canada*, 106. It is unclear when Eastern Dairy School was discontinued at Kemptville, which amalgamated with the University of Guelph as a satellite campus in 1997.

<sup>26</sup> Kingston Dairy School calendar (1897–1898), EDS File 9, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

<sup>27</sup> Application form, EDS File 8 (Misc. Incomplete/Torn Calendar Pages from 1896–7), Box 1, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario; and Application Form ca. 1893, OAC Department of Dairying collection, RE1 OAC A0700, University of Guelph Archives, Ontario.

long programs on a variety of practical and theoretical subjects, such as milk testing or even ice cream production.<sup>28</sup> However, administrators encouraged students to enroll in the long course. In March of 1893, Dean recommended to one maker that he “wait until next year + take the full course as you would hardly receive enough in a week or two, to pay you for coming.”<sup>29</sup>

Following the general trend within technical education toward supplementing the mechanical arts with theoretical, scientific training, the dairy schools combined hands-on instruction in cheese production with classes like chemistry. “[O]ur factories must be manned with superior managers and makers, men with a thorough grasp of the fundamental principles of dairying and with the training and ability to intelligently apply these principles—men with trained intellects, trained senses and trained hands,” explained the Eastern Dairy School’s calendar for the 1904–5 season.<sup>30</sup> The long courses included practical, laboratory-based classes in testing milk, cheese and buttermaking, repairing boilers, and keeping factory accounts, but also required students to attend lectures in bacteriology and chemistry, similar to those offered to regular OAC students pursuing degrees in agriculture. Experimentation was central to these dual goals, and the calendar for the Eastern Dairy School stressed that “In the cheese-making department students...are encouraged to discuss matters connected with their art, to experiment on

<sup>28</sup> L.M. McKnight, “Historical Review of OAC Dairy School 1969,” 15, OAC Department of Dairying collection, RE1 OAC A0855, University of Guelph Archives, Ontario.

<sup>29</sup> Dean to [illegible], 21 March 1893, Book 2, Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>30</sup> Kingston Dairy School calendar (1904–1905), 4, EDS File 15, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

doubtful points, to enquire into the merits of new methods and apparatus, thereby learning in a few weeks what a lifetime of work over the cheese-vat might fail to teach.”<sup>31</sup>

School administrators were especially concerned with educating makers in the theory and practice of dealing with the microbial world, since, as the 1899 Eastern Dairy School calendar put it, “bacteria play an invaluable part in the manufacture of dairy products[,] while in the hands of the inexperienced or careless, they are ruinous to high quality.”<sup>32</sup> School instructors sought to influence how makers treated ‘starters’ and curtail their “prevailing inclination to ripen the milk too much,” habits that had apparently worsened in many districts of the province during the early 1890s.<sup>33</sup> Whereas reformers and dairy scientists had formerly discouraged the use of starters in nearly all situations—recall J.B. Harris’s frustration with the use of sour whey to seed milk with lactic acid bacteria—they now hoped to replace the regular, indiscriminate use of old whey with the “judicious” and systematic use of well-managed, pasteurized starters.<sup>34</sup> The constant difficulty for instructors was how to instill in students the capacity and willingness to adapt one’s technical skills to a variety of conditions found in the isolating environment of a cheese factory. Knowing how to use an acidimeter to gauge the ripeness of milk, or

<sup>31</sup> Kingston Dairy School calendar (1899–1900), EDS File 11, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

<sup>32</sup> Kingston Dairy School calendar (1899–1900), EDS File 11, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

<sup>33</sup> DAEO, 1892, 9.

<sup>34</sup> Kingston Dairy School calendar (1904–1905), EDS File 15, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario. A poorly maintained starter could easily transfer undesirable bacteria to a vat of cheese, but a starter made from clean milk and loaded with lactic acid bacteria had the capacity to curb the development of other microbes in milk, especially those that produced “gassy curds” or certain off-flavours.



how and when to use a starter for slowing unwanted bacterial growth meant little if a maker was unwilling to do so in their daily practice.

Hence the schools sought to inculcate a self-disciplined, respectable craft ethic in young, prospective makers in addition to teaching the basic scientific and practical principles of cheesemaking. Students were required to wear white aprons and caps, which the schools provided for a nominal fee, and they were expected to keep them in the proper condition. Not maintaining cleanliness in one's personal appearance suggested a student's ineptitude for the respectability of factory cheesemaking, as did a reluctance to take the scientific training seriously. At the end of the first season of the school at Guelph, Dean responded to a query from the father of one of the students in the program. Dean explained that while his son "was a general favorite with the students" and showed a capacity for the practical aspects of cheesemaking, he "did not evidence that desire to improve himself that some of our students did," and as a consequence, "he did not do as well on his examinations as he might have done."<sup>35</sup> For Dean, the student's clear aptitude for the process of cheesemaking was not enough to make him a good maker. The cultivation of self-disciplined cheesemakers was also explicitly gendered; the Eastern Dairy School's program calendar stated that, "students may remain at the school as long as they wish, provided they show an interest in their work and conduct themselves in a

<sup>35</sup> Dean to J. Henry Wooley [Letter], 27 March 1893, Book 2, Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives.

*gentlemanly* manner.”<sup>36</sup> One’s respect for cleanliness, rennet, starter cultures, and the principles of chemistry were signs of manliness, honest work, and respectability.<sup>37</sup>



**Figure 8:** Students in the cheesemaking lab at the Eastern Dairy School in Kingston. (Eastern Dairy School calendar 1906–1907, EDS File 17, Box 2, Eastern Dairy School collection, University of Guelph Archives, Ontario.)

<sup>36</sup> Kingston Dairy School calendar (1899–1900), EDS File 11, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

<sup>37</sup> Women were discouraged (although not prohibited) from taking the factory courses. Instead, the ‘farm dairy’ course was created for women who wanted to make high-quality dairy products (typically butter) at home. In 1910, H.H. Dean replied to a query from Florence J. McDonald, who was keen to enroll in the factory course at OAC, by encouraging her to take the farm dairy course instead: “In reply would say you can take the Farm dairy course in our Dairy School, in which you will learn farm dairy cheesemaking[,] also soft cheesemaking[,] without having spent six months in a factory. Unless you are a very strong girl, I think the work is too heavy in a cheese factory.” See Dean to Florence J. McDonald, 4 April 1910, Book 2, Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

Producing better makers was a long term strategy, but the schools also positioned themselves to intervene in specific issues facing the industry at any given time. For instance, their promotional materials hinted at their role in quelling labour tensions and intervening in the actual placement of makers in factories upon graduation. The Eastern School pitched its 1899 curriculum in terms of the struggles over wages and questions of quality. They explained that students were trained specifically to keep records of each step of the production process, with an eye toward

the points in manufacturing where losses occur....To those who have given the matter any thought no argument is necessary to prove that a man trained in this manner will, in the average factory, save more than enough in the loss of valuable milk solids *to pay his wages* as compared with the man lacking the training, to say nothing of the improved quality whether butter or cheese is made.<sup>38</sup>

While school administrators stopped short of guaranteeing graduates high paying positions as head makers, they also made it clear that the most ‘progressive’ companies looked to the schools for “good men” at the start of each season.<sup>39</sup> In effect, schools hardened the common distinction between progressive cheesemakers as those with a dairy school education and illiberal ones (those without), while discouraging demand for the latter on the basis of cost.

Proper training in the management of starters, rennet, whey, and other mediums for the transfer of microbial life took on added significance in the early 1900s, when a series of previously unknown yeasts and detrimental bacteria swept through the dairy

<sup>38</sup> Kingston Dairy School calendar (1899–1900), EDS File 11, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

<sup>39</sup> Kingston Dairy School calendar (1901–1902), EDS File 12, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario. The calendar states: “Many enquiries are received while the school is session for good men, especially for those who can make both butter and cheese.” For an example of such correspondence, see Dean to A. Taylor [Letter], 7 April 1910, Letter books (July 1909–October 1910), Box 7, RE1 OAC A0601, University of Guelph Archives, Ontario.

zone, alarming cheesemakers, patrons, and buyers alike. In the eastern counties, rusty-coloured spots appeared—seemingly overnight—on cheeses lining curing room shelves, while in pockets of the province, a sudden increase in bitter flavoured milk flummoxed many makers.<sup>40</sup> Some patrons, many of whom “had been handling their milk the same way for years and had no trouble until a few years ago...were disposed to blame the maker,” explained the OAC's bacteriologist F.C. Harrison, while “others that had no silos blamed those who had thinking that ensilage gave a bitter taste to the milk; and others again regarded Ragweed (*Artemisia ambrosifolia*) as the cause of the unpleasant flavor.”<sup>41</sup> After conducting a series of experiments on the milk of one factory in southwestern Ontario, Harrison determined that an unidentified yeast organism appeared to be causing the bitterness. Naming it *Torula amara* or the “bitter Torula,” he tried to identify its source at the patrons’ farms and the factory, before bringing samples of the yeast back to the OAC Dairy School’s cheesemaking premises to produce “experimental” bitter cheeses.<sup>42</sup> It was a risky move—unwanted yeasts and other microbes were difficult to eradicate once they took hold. Meanwhile, the Eastern Dairy school billed its program as an important means of training makers to contend with “new problems [that] are constantly presenting themselves...and new obstacles arising which only skilled dairymen can hope to cope with successfully—to wit, the yeast organism which so recently taxed the combined skill of the bacteriologist and the experienced dairyman,” referring to

<sup>40</sup> F.C. Harrison, “Bitter Milk and Cheese,” OAC Bulletin 120 (1902). See also DAEO, 1904, 46–49.

<sup>41</sup> Harrison, “Bitter Milk and Cheese,” 1.

<sup>42</sup> Harrison, “Bitter Milk and Cheese,” 3.

*Torula*.<sup>43</sup> However, the Eastern school found itself unable to deliver on these promises even at its own premises; in the winter of 1904 they too struggled with regular shipments of bitter milk.<sup>44</sup> Although the schools insisted that proper education could overcome many of the complex microbial challenges facing the industry, in practice, the problems of cheese manufacturers continued to be borne of a complex set of socioecological circumstances.

Both schools faced other logistical challenges as well. Guelph regularly struggled to obtain enough milk to use in their labs. Dean estimated they would need roughly 2500 lbs. of milk and 1500 lbs. of cream per day for the cheese and butter classes in the winter of 1893, but he was still trying to finalize a contract for milk as late as January 14<sup>th</sup>, just two weeks before the long course was set to begin.<sup>45</sup> By the early 1900s—when a shift toward beef raising and competition from the nascent urban fluid milk industry began to encroach on the milkshed surrounding Guelph—the college found it increasingly difficult to pay competitively for a dwindling supply of milk.<sup>46</sup> The Guelph school was also expensive to maintain, especially since students were charged only a nominal fee to attend. The 1894 program cost the Dairy Department of the OAC \$4500 for milk, \$375

<sup>43</sup> Kingston Dairy School calendar (1904–1905), 4, EDS File 15, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

<sup>44</sup> DAEO, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1904* [hereafter 1904] (Toronto, ON: Ontario Department of Agriculture, 1905), 49.

<sup>45</sup> Dean to President Mills, 3 October 1892, Book 1, Dairy Department Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario; and Dean to Jacob S. Betzner, 14 January 1893, Book 2, Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario. Dean offered to pay Betzner \$1.25/100 lbs. of milk of 3.5% fat content, a very considerable rate for the time.

<sup>46</sup> Dean to Prof. James, 27 June 1908; Dean to President Creelman, 14 September 1908 and 28 September 1908; Book 7 (1908–1909), Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

for the instructors' salaries, \$163 for teamsters to draw the milk from the rail station to the college, \$75 for a general labourer, and \$500 for 100 hogs who were presumably fed the whey produced in the cheese department.<sup>47</sup> The school tried to recoup some of its costs by selling students' cheeses locally, though they were not always successful. Dean was still trying to peddle the cheese from the 1893 session a few months later. In a letter to a prospective buyer, he described the stock on hand as "somewhat moulded owing to the dampness in our refrigerator, still I think you will find it fair cheese. Please do the best you can with it."<sup>48</sup> Securing milk was less of a concern at the Eastern school, despite its larger student body, since there were fewer industries that competed with them for patrons' winter milk, at least until exporting cream to the U.S. became profitable after 1911. The Eastern school's primary difficulty was providing students with adequate facilities. Their laboratories and classrooms were continually cramped, prompting renovations in 1903 to widen the cheesemaking room so that "the confusion and discomfort incidental to having a large class standing for hours at a time will be done away with."<sup>49</sup>

Both schools were popular in the first few years of operation. Students who applied late often found themselves on waitlists. Dean advocated on the behalf of one prospective student from Quebec who was waitlisted two years in a row by asking the President of the OAC if they could make an exception, since "he wishes to come very

<sup>47</sup> List of expenditures, 1893 and 1894 (p. 15), Book 2, Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>48</sup> Letter Dean to [Ryan?], 29 June 1893, Book 2, Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>49</sup> Kingston Dairy School calendar (1903–1904), EDS File 14, Box 2, Eastern Dairy School collection, XA1 RHC A0386007, University of Guelph Archives, Ontario.

much[.]”<sup>50</sup> In 1898, J.O. Lingenfelter—editor of the *Canadian Cheese and Butter Maker* and a graduate of the Eastern Dairy School—described his own experience at the Eastern Dairy School in glowing terms. After explaining the differences between his informal apprenticeship at a Brockville area factory and his experience at the school, he concluded, “Do you suppose, dear reader, that I could earn \$50.00 a month making cheese if I had not attended a Dairy School?”<sup>51</sup> Similarly, the young cheesemaker who penned the letter about unionization described in chapter 3, praised how the schools offered makers a forum for engaging with one another and making connections in an otherwise isolating industry. His interest in developing a union for “respectable” makers suggests that the schools likely buttressed liberal, middle class ideals amongst many of its students. Like instruction, the voluntary nature of the winter courses likely appealed to those already keen to improve their craft and reach a middle-class, professional status.

Despite their apparent popularity, only a small portion of the province’s cheesemakers ultimately attended the dairy schools in the years before the province made dairy school certificates a requirement for managing a cheese factory or creamery in 1909. The Eastern School, the larger of the two, registered a total of 1448 students between 1898 and 1909, but the majority attended the short courses and some returned multiple times over the years, while others attended from outside Ontario and even beyond the country.<sup>52</sup> There were probably quite a few makers, especially those later in

<sup>50</sup> H.H. Dean to President Mills, 13 October 1893, Book 2, Letter Books, Ontario Agricultural College, Agricultural History Collection, RE1 OAC 10601, University of Guelph Archives, Ontario.

<sup>51</sup> “A Few Hints for 1899,” *Canadian Cheese and Butter Maker*, October 1898.

<sup>52</sup> Registration Book 1 (1898–1911), File EDS2, Box 1, Eastern Dairy School collection, University of Guelph Archives. The Guelph school also had attendees from many parts of the country and as far away



their careers, who saw little benefit to attending, a point suggested by the fact that the median age of applicants to the OAC program in its first five years of operation was only twenty-three.<sup>53</sup> In 1903, an instructor for the Cornwall region in eastern Ontario, W.J. Carson, noted that many of the head makers he visited had only a single season's experience or less, and earned less than \$30 a month. Only seven of the thirty-five makers under his supervision had "ever taken a dairy course although some of them have been making cheese for twenty-five years."<sup>54</sup> The situation was more dire for factory assistants, most of whom, he noted, had almost no formal education at all. Carson further explained that the difference between cheesemakers with and without dairy school educations was considerable: "I find that the makers who have taken a dairy course are easier taught, more anxious to learn, and are making more rapid advancement."<sup>55</sup> However, the extent to which limited attendance was due to the schools' limited capacities, disinterest on the part of makers, or their inability to forego winter earnings in other industries, is difficult to know.

Faced with the realization that neither instruction nor the dairy schools reached the majority of Ontario's cheesemakers, the first decade of the twentieth century witnessed another burst of educational expansion that extended the reach of the state into the dairy zone. Reformers were no less committed to the liberal ideal of a rural industry anchored

as Japan. See McKnight, "Historical Review of OAC," 8, OAC Department of Dairying collection, RE1 OAC A0855, University of Guelph Archives, Ontario.

<sup>53</sup> This is a rough measurement only. The calculation does not account for the possibility of some repeat students, who attended over multiple years and thus would impact the median overall. See Volume 1 (1874–1906), OAC student register (1874–1920), Ontario Agricultural College, RE1 OAC A0810, University of Guelph Archives, Ontario.

<sup>54</sup> DAEO, 1902, 185.

<sup>55</sup> DAEO, 1902, Ibid.



around respect for property and cooperation, but they sought more extensive tools for reaching makers (and patrons) to stamp out their ‘illiberalism.’ The voluntary, itinerant instruction system was the first to be rationalized and brought under the direct management of the state. In 1902, a trial system of instruction was adopted in two Ontario counties—Perth in the west and Brockville in the east—based on a similar program in Quebec, where the ratio of factories to instructors was less. The idea was that the province would be divided into small syndicates of no more than twenty-five factories, each of which would be overseen by a dedicated instructor who could also pursue cases of milk tampering and spoilage. Although the government-run syndicate system was initially still voluntary for cheese companies, it radically reduced the ratio of factories to instructors. In Lambton County, for instance, George Barr “looked after” just fifteen cheese factories and one creamery, which allowed him to visit each factory approximately every three weeks, as opposed to twice or thrice a season in the former system.<sup>56</sup> The number of small, experimental syndicates expanded over the next few seasons as discussions took place about whether the province should formally take over both instruction and inspection. The possibility of provincial oversight included formally separating duties of instruction and inspection while also giving officials the right to inspect factories involuntarily. These proposals met with some resistance—especially since factories would initially be required to pay a small fee toward the administration of the program—but a motion from the dairymen’s associations to take the proposal to the

<sup>56</sup> DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1902* [hereafter 1902] (Toronto, ON: 1903), 72.

Department of Agriculture eventually passed.<sup>57</sup> By 1907, travelling instruction was entirely under the control of the Dairy Branch of the Ontario Department of Agriculture and its voluntary basis had been replaced by a compulsory, sanitation-focused mandate.<sup>58</sup>

Debates about the desirability of making dairy school education compulsory for all cheese- and buttermakers took place in this wider context. In early 1903, one instructor recommended that the DAWO lobby for legislation that would compel aspiring cheesemakers to hold a Dairy School diploma, or at the very least, require them to pass some kind of practical examination before taking up a factory position.<sup>59</sup> Others echoed his suggestion at subsequent meetings, such as the Montreal-based cheese buyer R.M. Ballantyne, who believed certificates would simultaneously reward good makers with higher wages and rid the industry of “incompetent men.”<sup>60</sup> While factory owners and reformers tended to support certification on the grounds that it would improve cheesemakers as a group, individual makers were interested in the effect it would have on their wages and standard of living. S.M. Carscallen, from Glengarry County in eastern Ontario, encouraged certification insofar that it might raise wages to help makers survive year-round, so they would not be forced into other low-wage work during the winters: “I do not think a cheese-maker, who has worked all season in a factory is in fit condition to

<sup>57</sup> For example, one member of the DAEO remarked that “Coercion is not a very nice thing to talk about.... There is no doubt that if a man does not want to employ an instructor it should be arranged so that he would not have to pay \$12.” See DAEO, *Annual Reports of the Dairymen’s Associations of Ontario 1906* [hereafter 1906] (Toronto, ON: 1907), 92.

<sup>58</sup> Fred D. Harrison, “Dairying and the Dairy Associations as Precursors of the Dairy Inspection Branch,” in *Dairy Branch & 100 Years of Service*, edited by W.A. Harley (Toronto: Ontario Ministry of Agriculture and Food, 1988), 29.

<sup>59</sup> DAEO, 1902, 185.

<sup>60</sup> DAEO, 1904, 69. For an example from the DAWO in the same year, see DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1904* [hereafter 1904] (Toronto, ON: 1905), 158;

go to a lumber shanty or the likes in winter to get work.”<sup>61</sup> Support from makers was so strong that in 1909, *Farm and Dairy* (formerly the *Canadian Dairyman and Farming World*) submitted a petition of 350 names of cheesemakers who supported some sort of certification process.<sup>62</sup>

Yet a number dairymen and makers who applauded the dairy schools as voluntary institutions balked at the idea of making attendance and certification mandatory. Some makers resisted compulsory certificates on practical grounds, arguing that it would be a futile measure unless there was also a way to ensure factory proprietors and boards of directors did not hire ‘unqualified’ men. J.A. Williams, a maker from Stormont County, suggested in a letter to the *Canadian Dairyman and Farming World* that, “a cheese-makers [sic] union would do more to better the condition of makers than any other move that could be made.”<sup>63</sup> The most common concern expressed was that a provincially mandated certificate would have little effect as long as so-called model factories were threatened by the proliferation of small, cheaply built enterprises. ‘Opposition’ factories—small enterprises erected in close proximity to established factories with the goal of manufacturing cheese at a lower rate and drawing away patronage—received particular scorn. Although not all new factories were necessarily intent on ‘opposing’ existing companies, much of the new factory development after 1900 was in areas that already sustained many cheese manufacturers. The problem was most extreme east of

<sup>61</sup> Letter to the editor, *The Canadian Dairyman and Farming World* 27, no. 44 (November 1908), 13.

<sup>62</sup> “Cheese Makers’ Certificates,” *Farm and Dairy and Rural Home*, 14 January 1909.

<sup>63</sup> “Doubtful About the Certificate Plan [Letter to the editor],” *The Canadian Dairyman and Farming World* 27, no. 45 (December 1908), 12.

Toronto. In 1906—the year that the number of Ontario cheese factories peaked at 1,237—the counties under the umbrella of the DAEO represented 993 (or eighty per cent) of the province’s factories, and the nine most eastern Ontario counties surrounding Ottawa and along the St. Lawrence corridor—Glengarry, Prescott, Russell, Stormont, Dundas, Carleton, Grenville, Leeds, and Lanark—represented more than fifty per cent alone.<sup>64</sup>

In early 1909, G.A. Putnam, Director of Dairying in Ontario, reported to the DAEO that provincial representatives were working on a proposed piece of legislation that would give the province the power to limit the erection of new, poorly equipped factories in areas of high concentration while also requiring makers to hold a license in order to manage a factory.<sup>65</sup> The first part involved registering factories and ensuring they met minimum standards of sanitation, but ostensibly this was also meant to limit the further construction of small unsanitary factories. The second section of the bill was designed to ensure that factories only employed qualified makers (and paid them accordingly). The DAEO passed a resolution generally recommending the legislation, but in the west there was more resistance.<sup>66</sup> An editorial in the London-based *Farmer’s Advocate* complained that the “conditions” warranting the legislation existed in the east more than the west, and thus, that the legislation was unfair to western producers. The editors reported that western dairymen were likewise concerned that the legislation would “cut out some of the very best practical makers [without a dairy school education].”<sup>67</sup>

<sup>64</sup> See Appendix 4 for full citation.

<sup>65</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1908* [hereafter 1908] (Toronto, ON: 1909), 60. An outline and analysis of the proposed legislation was also published in “Registration of Factories—Certificates for Makers,” *Farmer’s Advocate*, 8 April 1909.

<sup>66</sup> DAEO, 1908, 67–68.

<sup>67</sup> “Licensing Cheese and Butter Makers,” *Farmer’s Advocate*, 11 February 1909.

These complaints, rooted as they were in classically liberal resistance to state regulation of business activity, also likely reflected the strength of Liberal party support in the southwest. In any case, the DAWO initially refused to endorse the recommendation made at the DAEO meeting.<sup>68</sup>

The Conservative provincial government under James Whitney had to tread carefully. They were keen to avoid the political strife involved in forcing small, unsanitary factories out of business or compelling cheesemakers to hold certificates, both of which were measures that shifted the state into an increasingly regulatory position. On the other hand, the ongoing struggles of the industry appeared to leave them little choice but to take action. The legislation that was passed ultimately mirrored Putnam's initial recommendation quite closely, except they did not go as far as limiting further factory development in areas of high concentration. Instead, the Act required all cheese factories and creameries built or reconstructed after 1910 to meet provincial standards of construction and sanitation and reserved the right to halt operations in preexisting factories with extreme unsanitary conditions. The second part of the legislation pertained to professional standards. Beginning in 1911, only cheese- and buttermakers with a professional certificate from the Eastern Dairy School or OAC would be allowed to manage a cheese factory or creamery, unless granted a "special permit from the minister of Agriculture on the grounds of experience and competency."<sup>69</sup>

<sup>68</sup> "Licensing Cheese and Butter Makers," *Farmer's Advocate*, 11 February 1909.

<sup>69</sup> Government of Ontario, *Report of the Milk Commission, Appointed to Enquire into the Production, Care and Distribution of Milk, 1909* (Toronto, ON: 1910), 11.

*Seeds of Doubt*

After the depression of the 1890s, farmers took advantage of increased prices for cheese (and butter) by building more factories and producing more cheese for the UK. Yet the early 1900s would prove to be the export-oriented cheese industry's peak. Between 1897 and 1906, the number of factories climbed—somewhat unsteadily—from 1,161 to 1,237, before falling—more surely this time—to 968 in 1914.<sup>70</sup> Ontario's fortunes shaped national trends as well: in 1904, Canadian cheese exports reached an all-time high of 233,980,716 lbs. before falling fairly steadily to 137,601,661 lbs. by 1915.<sup>71</sup>

The decade leading up to the First World War was marked by a growing unease about dairying as the primary path towards rural prosperity and stability. Whether it was inopportune drought or the stubborn proliferation of detrimental microbes, rural Ontarians seemed to face an increasingly intransigent environment, not a malleable, cooperative one. The spread of *Torula amara* and other detrimental yeasts and bacteria throughout large parts of the dairy zone prompted worries that the problem of soil infertility during the wheat era had simply been replaced by a new problem, the overabundance of dangerous bacteria and yeasts (and overripe milk), which people linked to the rise in the average volume of milk required to make a pound of cheese. When asked if factories and farms “seeded with that undesirable fermentation” were to blame for the growing

<sup>70</sup> Ontario Bureau of Industries, *Annual Report of the Bureau of Industries for the Province of Ontario 1907* (Toronto, ON: 1908), 43; and Ontario Bureau of Industries, *Annual Report of the Bureau of Industries for the Province of Ontario 1914* (Toronto, ON: 1915), 43. It is not the case that factories simply amalgamated or scaled up their production. The volume of cheese produced in Ontario reached a high of 165,306,573 lbs. during the 1903 season, and fell to 101,712,336 lbs. in 1914, a decline of 38 per cent. Ontario Department of Agriculture, *Annual Reports of the Ontario Bureau of Industries, 1893–1914*.

<sup>71</sup> Dominion of Canada Census and Statistics Office, *Report on the Production of Creameries and Cheese Factories 1915 and 1916* (Ottawa, ON: 1917), 8.

inefficiency of Ontario cheese production, the head of dairy instruction in western Ontario, George Publow, agreed.<sup>72</sup> Reports about the ‘purity’ of milk in northern Ontario and further west bolstered fears that maintaining Ontario’s reputation as a producer of high quality cheese had become more difficult.<sup>73</sup> Was the dairy zone beginning to rot, some wondered?

Others believed that Canada was losing its place to New Zealand, whose highly efficient cheese industry, refrigerated shipping, and seasonal advantage had made them a competitive exporter of cheese and butter on the global market in the late-nineteenth century. The tenor of the DAEO convention in January 1914 was somber; association president G.A. Gillespie acknowledged that 1913 had “been disappointing on the whole, and the new year was being entered upon under slowing-down conditions.”<sup>74</sup> Some of the greatest concerns were about labour. An article in the *Daily Sentinel Review* about dairying in Oxford County acknowledged that the “labor problem...presses both on the cheese factory and the farm.”<sup>75</sup> The author noted it was becoming increasingly necessary for farmers to hire married couples at considerable expense to assist with the time consuming work of milking and managing their dairy herds: “The help so employed have free house, garden, have their milk supplied, and can keep a few hens, etc. The man

<sup>72</sup> DAEO, 1902, 139–140.

<sup>73</sup> One speaker at the DAWO convention in 1901 reported that in seven years of running a creamery in the Northwest Territories he had seen the quality of milk fall, from being so “sweet” it could be sent “every fifth day” to souring in just a day or two. See DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1901* [hereafter 1901] (Toronto, ON: 1902), 54. Some years later, at the 1917 convention, the government instructor Mr. McAllister reported that the average quantity of milk required per pound of cheese in the northern districts was only 9.94 lbs. compared to the 11.02 required in southeastern Ontario. See DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1917* [hereafter 1917] (Toronto, ON: 1918), 28.

<sup>74</sup> “Agricultural Moses Needed in Ontario,” *The Globe (1844–1936)*, 8 January 1914.

<sup>75</sup> “Great is Oxford County,” *The Daily Sentinel-Review*, 6 June 1901.

works on the farm the year round and the wife helps with washing up the milk cans, and in other little ways. The wages run about \$240 a year.”<sup>76</sup> Farmers who were unable or unwilling to pay competitively for labour struggled to meet the increasing standards for cleanliness in livestock husbandry and milk production.

Others looked to the growing number of mechanical milkers on the market by the turn of the twentieth century. The Hinman Milking Machine Company of Oneida, New York boasted that their machine would “save an almost unbelievable portion of labor over hand milking; that it is much cleaner and more satisfactory in every way.”<sup>77</sup> However, few mechanical milkers lived up to such claims. Dean reported to the DAEO in 1898 that, “the milk becomes tainted and the expense of operating does not pay for the labor saved.”<sup>78</sup> A bulletin issued by the OAC in 1907 concluded that milk machines performed comparably to “inexperienced” hand milkers, required extra care in cleaning, and were only economically viable on farms that kept more than twenty-five cows and where the cost of hired labour was especially high.<sup>79</sup> By the First World War, however, the labour problem had become so severe that reformers and dairy scientists cautiously advocated

<sup>76</sup> “Great is Oxford County,” *The Daily Sentinel-Review*, 6 June 1901.

<sup>77</sup> Hinman Milking Machine Co., “How One Man Can Milk 25 Cows An Hour: Reducing the Cost of Operation with the Hinman Milker,” 3–4, Agricultural Records File (UV 9 A1), Norwich and District Museum & Archives, Norwich, ON.

<sup>78</sup> DAEO, 1897, 131.

<sup>79</sup> H.H. Dean, “Milking Machines,” *OAC Bulletin* no. 159 (Toronto: Ontario Department of Agriculture, 1907), 19–20.



their use.<sup>80</sup> Publow reported that 625 patrons in eastern Ontario surveyed by the provincial instructors used milking machines by 1917.<sup>81</sup>

Companies also found it difficult to retain makers. Despite the expansion and rationalization of craft education in the early 1900s, it was becoming increasingly clear that improving the quality of cheesemakers and their products through dairy schools could not alone stabilize the dysfunction of the dairy zone if makers saw no future in the industry. “Who among the cheesemakers are preparing themselves to take the places of men like Adam Bell, ‘Billy’ Bothwell, John Brodie, the Travis boys, ‘Tom’ Grieve, the Boyes boys, and others who might be named—men who fitted themselves for their work in the best way possible?” asked Dean, who led the chorus calling for higher wages for makers.<sup>82</sup> The problem was especially acute in eastern Ontario’s smallest factories, which often did not produce enough cheese to pay makers more than a few hundred dollars a season.<sup>83</sup> For example, the Harbor Cheese Factory in Fitzroy Harbour, near Ottawa, struggled to keep its makers for more than a year or two, before they moved on to “larger co-ops” or left cheesemaking altogether. The directors complained at the 1914 annual

<sup>80</sup> DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1906* [hereafter *1906*] (Toronto, ON: 1907), 110–11; DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1914* [hereafter *1914*] (Toronto, ON: 1915), 77–86. An unintended consequence of the machines was the rise in mastitis amongst dairy cattle, which Kendra Smith-Howard links to the increased use of antibiotics in dairying in the mid-twentieth century. See Smith-Howard, *Pure and Modern Milk*, 124–125.

<sup>81</sup> DAWO, *1917*, 30.

<sup>82</sup> DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1907* [hereafter *1907*] (Toronto, ON: 1908), 157.

<sup>83</sup> The problem of scale in eastern Ontario persisted in spite of the fact that the average size of cheese factories in some eastern counties, such as Prince Edward and Lennox and Addington, increased significantly between the 1880s and the end of the 1900s. For instance, the average output of cheese factories in Prince Edward County increased from 49,000 lbs to 240,000 lbs between 1882 and 1905, even as the absolute number of factories in the area increased. See Tosine, “Quinte-Upper St. Lawrence,” 74.

meeting that, “To hire and keep a good cheesemaker continues to be one of our main problems.”<sup>84</sup>

In the years leading up to the First World War, labour difficulties, the pull of the west and urbanization, and continued microbial challenges to making high quality cheddar combined to deliver the dairy zone vision and its proponents their most formative challenge yet: a crisis in faith. Responding to the growing number of editorials and articles questioning the value of dairying in the province, H.H. Dean of the OAC gave voice to the concerns of many when he spoke to the DAWO in 1908:

[W]hat should be done in order to stop this progress to ‘final extinction.’ [sic] We may very well ask ourselves if the farm, the cheesemaker, and the buttermaker are getting their fair share of the profits in the business. Have the workers been having ‘a square deal?’ Has there been an undue share of the profits diverted into illegitimate channels? Why are many of the best cheese and buttermakers leaving the business? What is to become of the business when the making is left largely in the hands of inexperienced men? These are questions which must be answered, and conditions which must be changed, if we are to continue the export dairy trade along profitable lines.<sup>85</sup>

The prospect that ongoing success in cheese production and dairying more generally would require increased effort on the part of farmers and makers did not sit well with those who saw greater opportunity for prosperity and advancement in cities and agricultural lands to the west.

J.A. Ruddick succeeded Robertson as the second Dairy Commissioner of Canada in the midst of this period of unease.<sup>86</sup> Like Robertson, Ruddick began his career as a cheesemaker and shared many of the early reformers’ values, such as self-improvement

<sup>84</sup> Sadler, *Harbor Cheese Factory*, 30.

<sup>85</sup> DAWO, 1907, 157.

<sup>86</sup> Robertson stepped down as Dairy Commissioner in 1904 to pursue a joint partnership with tobacco magnate Sir William Macdonald to establish a system of national technical education in public schools. On his educational work, see Kristen Jane Greene, “The Macdonald Robertson Movement 1899–1909,” Ph.D. Thesis, University of British Columbia (2003).

and the importance of rural education. He was also adamant that neither dairy farmers nor cheese manufacturers were facing a crisis, even though he acknowledged that New Zealand's high standards of factory construction and maintenance, combined with their position in the southern hemisphere, allowed them to outcompete Canadian producers on the quality of dairy products during the winter months. "The industry is not declining, nothing like it, and I think it is a mistake to allow that impression to go abroad, because it would have a very bad influence on the producers of milk if it were generally believed that the industry was a declining one," he testified to the Select Standing Committee on Agriculture and Colonization in 1913.<sup>87</sup>

Although Ruddick believed that cheese factories would continue to be an important part of Ontario's dairy zone, he was far more concerned than some of his predecessors about the capacity of the industry to keep up with a dynamic global economy. Dairy farmers had to take advantage of domestic markets, changing consumer preferences, and embrace the dynamism of the twentieth century economy to succeed—the status quo would not suffice. In fact, Ruddick argued to the Standing Committee that this adaptation was already underway: "it is entirely wrong to assume that, because there has been a decrease in the export trade, there has been a corresponding decline in the dairying industry; and I make this assertion, which I hope to prove before I finish, that

<sup>87</sup> J.A. Ruddick, "Evidence of J.A. Ruddick Dairy and Cold Storage Commissioner given before the Select Standing Committee on Agriculture and Colonization 1912–13, respecting the Progress of Dairying in Canada," (Ottawa, ON: 1913), 117. Ruddick's views were undoubtedly shaped by his direct experience with the New Zealand, where he spent two years at the turn of the century as their Dairy Commissioner before returning to Canada to take up the same post for the Dominion. On the influence of Ruddick and other Canadians on the development of the industry in New Zealand, see Marvin Sundstrom, "Technological Transfer: the Case of Canadian Involvement in the New Zealand Dairy Industry, 1880–1920," *Journal of Rural Studies* 2, no. 2 (1986): 103–116.

there has been as much increase in milk production during the years of decreasing exports, as there ever was in any similar period in the history of the industry.”<sup>88</sup> He insisted farmers were simply branching out from patronizing cheese factories to take advantage of emerging domestic (and export) markets for fluid milk, canned milk, ice cream, butter, and other dairy products. This argument is referred to as the ‘diversion thesis’ in the historiography on dairying in Ontario, and its roots can be found in much of Ruddick’s writings.<sup>89</sup>

Ruddick arguably represents an early iteration of what James Murton has called “new liberalism,” the rise of a technocratic and bureaucratic style of governance in the twentieth century that “aimed at engineering social and environmental change while leaving the liberal individual largely unchanged.”<sup>90</sup> Ontario’s twentieth-century

<sup>88</sup> Ruddick, “Evidence of Mr. J.A. Ruddick,” 117. Similarly, see Ruddick’s address, “Is the Canadian Cheese Trade in Danger?” at the DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1909* [hereafter 1909], (Toronto, ON: 1910), 161–173.

<sup>89</sup> “A Growing Market for Dairy Products,” *The Globe (1844–1936)*, 2 January 1914. A later proponent of the ‘diversion thesis’ is Tosine, “Cheese Factories in the Quinte–Upper St. Lawrence,” 121. Both Robert Ankli, and more recently, Marvin McNnis, have taken issue with the ‘diversion thesis’ to explain the fall in export cheese production in the first decade of the twentieth century. McNnis analyzed county-level data on cheese and butter production in Ontario and found that the fluid milk industry was still too small to account for the falling off of cheese production in many areas. Moreover, increases in butter production did not come at the expense of cheese production. Areas that had tended to focus on butter increased their production (largely for domestic urban consumption), while many dairy farmers with a specialization in cheese left dairying altogether to pursue raising beef for domestic, urban consumption. The effect of condensed milk producers and other large-scale, ‘multi-product’ milk plants was similarly limited until after the First World War. McNnis reasons if there was a diversion away from cheese in the early twentieth century, it was for other agricultural products altogether, not for non-cheese dairy production. McNnis suggests instead that the primary impetus for this change can be found on the supply side of the equation, in the unwillingness or inability of farmers to meet the high costs of labour involved in dairy production. Considering that the pressure on farmers to adopt methods of scientific management grew in the early twentieth century, it is reasonable to believe that many farmers refused to heed the advice of reformers to once again increase the labour they devoted to dairying and sought out less labour-intensive agricultural options. In other words, the promises of the dairy zone vision were no longer very convincing to a number of Ontario’s farmers. See Ankli, “Ontario’s Dairy Industry,” 273; and McNnis, “The Declination of Canada’s Cheese and Bacon Export Industries.”

<sup>90</sup> Murton, *Creating a Modern Countryside*, 42.

agricultural reformers did not undertake the same large-scale, state-led, transformative projects on the land as their British Columbian counterparts, not least because of the radically different timelines of Euroamerican settlement and geological contexts of the two provinces. However, Ruddick and other successors to the original wave of reformers responded to the general tenor of unease of the early twentieth century with a vision for Ontario dairying that was increasingly based upon an ethic of efficiency, one marshaled and directed by agricultural economists, dairy scientists, and bureaucratic officials rather than voluntary institutions managed by the rural elite. For this emerging group of agricultural experts, the ongoing success of the dairy industry—whatever its form—would require a more productive and efficient ‘nature.’ They turned their attention from cheesemakers to another type of worker in the cheese industry: the cow.

*The Scientific Management of Cows, an Underclass*

If the goals of craft education were to improve the professional standard of makers in the hopes that they would produce better cheddar, the scientific management of cow labour served a complementary function for the cheese industry: it was geared toward reducing the costs of producing milk, and by extension, cheese. In the nineteenth century, members of the dairymen’s associations periodically encouraged lowering the costs of production on the farm by increasing the milk yields of individual cows, but these interventions were less frequent than those about the skill of cheesemakers, and secondary to questions of how to manage milk so as to make high quality cheese. For instance, in 1890, Robertson recommended that farmers pursue dairy cow improvement

since improved yields would (theoretically) allow the farmer-patrons to pay higher wages to their makers: “If the farmer gets, instead of 3,000 pounds of milk per cow, 6,000 pounds, he will not be so cheese-paring in regard to the cheesemaker’s compensation,” he explained.<sup>91</sup> In the twentieth century, the cost of production became a problem in its own right. It was not enough to make *good* cheese—one had to do so in a cost-effective manner. As Dean wrote in an article for the *Farmer’s Advocate* in 1910, “The average cow of yesterday produced less than 3,000 pounds of milk during the cheese season; the cow of to-day has probably struggled slightly over the 3,000-pound line[,]” She is the “weakest link,” he concluded.<sup>92</sup>

The growing cohort of dairy-related experts at the federal and provincial Dairy Branches, the OAC, and other institutions often likened cows to machines subject to human control—one speaker at the DAWO convention in 1906 described the cow as a “wonderful moving, living, breathing, active piece of machinery”—but many within the industry approached the problem of ‘unproductive’ cows as though they were workers in need of a firm managerial hand.<sup>93</sup> Cows were regularly described as loafers who didn’t “pay their board,” simple-minded workers, or even “lazy strikers” in the winter months when they went dry.<sup>94</sup> Cows also functioned more like workers than machines, since their labour had to be continually reproduced and paid for by the owners of capital. Dairy

<sup>91</sup> DAWO, 1889, 22.

<sup>92</sup> “Yesterday, To-Day and Tomorrow of Canadian Cheesemaking,” *Farmer’s Advocate*, 8 December 1910 [as seen in the Norwich Archives newspaper collection]. Dean’s passion for dairy and cow improvement garnered him the nickname of ‘Henry Holstein’ amongst his students. See Ross and Crowley, *The College on the Hill*, 51.

<sup>93</sup> DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1905* [hereafter 1905] (Toronto, ON: 1906), 133.

<sup>94</sup> For examples, see DAEO, 1888a, 48, 57–59; and DAEO, 1904, 34.

improvers recognized that their potential productivity could be a source of greater profit.

As J.H. Grisdale, an agriculturist at the Central Experimental Farm in Ottawa, put it: “It is not as if we had to divide the profit with the cow. We don’t; we get it clear into our own pockets. If we give the cow so much food she will live on it and every bit we give her over that she gives to us in profit.”<sup>95</sup>

To improve the productivity of Ontario’s bovine working class, Grisdale, Ruddick, and others recommended that farmers adopt a series of farm management reforms that bore considerable similarities to the theory of scientific management then gaining adherents within industrial manufacturing. Scientific management is a theory of labour management and reform articulated most famously by Frederick Winslow Taylor in *The Principles of Scientific Management*, published in 1911, although the book described a managerial style that he and others had developed over the previous two or three decades. The approach became widely known and appreciated in the early twentieth century as it was applied to various factory and industrial settings. Scientific management or ‘Taylorism’—as it is sometimes called—involved measuring individual labour productivity to ascertain the most efficient system of production, and as a result, the most harmonious, stable, and profitable arrangement of labour. Taylor’s focus on stability was key. He disagreed with socialists and capitalists alike that class antagonism was an inevitable part of capitalist production. Harmony and “permanent prosperity” would define productive work when it was organized along scientific lines, he argued.<sup>96</sup> In this

<sup>95</sup> See DAEO, 1904, 13–14.

<sup>96</sup> Frederick Winslow Taylor, *The Principles of Scientific Management* (New York, 1919 [1911]), 11.

respect, he and the liberal dairy reformers would have agreed, since they sought to maintain social harmony while making cheese production more profitable for patrons.

Taylor himself was adamant that the thrust of scientific management was in its principles, and could be applied widely to home life, farms, and even church organization.<sup>97</sup> Ontario's dairy reformers do not appear to have explicitly referenced Taylor or his writings, but their approach to cow management reflected many of scientific management's central tenets. At the heart of this idea was the assumption that workers could not organize their work in the most efficient ways. It was the job of the managerial class to analyze, select, and improve workers on an individual basis rather than treating them as a murky mass beholden to 'rule of thumb' methods or the whims of particular workers with influence over the whole.<sup>98</sup> By removing decision making about the direction, timing, and pace of one's labour from the worker and placing it in the hands of management, the labour process could be reorganized to make each labour task more efficient.

To approach cow management scientifically entailed a shift in the farmer's gaze from the overall herd to its individual members, much like Taylor recommended managers approach their employees in industrial factories.<sup>99</sup> "Study the capacity, likes, and dislikes of *each* cow," recommended Dean in his widely-distributed textbook on

<sup>97</sup> Taylor, *The Principles of Scientific Management*, 8. Deborah Fitzgerald, in *Every Farm a Factory*, esp. 77–105, discusses the relevance of Taylorism for agricultural change in the United States at length. Similarly, see Sackman, "'Nature's Workshop.'" On the adoption of scientific management principles within Canadian industries in the early twentieth century, see Paul Craven, *An Impartial Umpire: Industrial Relations and the Canadian State, 1900–1911* (Toronto, ON: University of Toronto Press, 1980), 93–110.

<sup>98</sup> Taylor, *The Principles of Scientific Management*, 24–27.

<sup>99</sup> Taylor, *The Principles of Scientific Management*, 37–49.



Canadian dairying, going on to highlight the considerable differences between individual animals' abilities to transform grass and grain into milk efficiently.<sup>100</sup> Similarly, Grisdale explained that, "If you are going to succeed you must know every cow...not to know that her name is Bess, or that she is spotted brown or white, but to know what she will do at the pail, and to know what she will do every day."<sup>101</sup> Charles Whitley—who oversaw the cow testing program administered by the Dairy Branch of the federal Department of Agriculture (discussed below)—argued for individual cow testing in overtly ideological terms: "Let us cease this unsatisfactory, unenlightening talking of the herd 'average.' It is rabid Socialism, steamrolling to one dead level, independent of strong individuality and ability."<sup>102</sup> Industrializing the herd meant analyzing its individual components.

Understanding one's cows as distinct, discrete units rather than an amorphous whole required an unprecedented quantification of livestock husbandry. Estimates of how much each cow ate, feed costs, the volume of milk each produced, as well as their milking and breeding habits, were all necessary for determining which animals were the most productive in a herd. Quantifying these practices involved radical changes in how farmers worked with their animals on a daily basis in turn. In order to manage feeding with greater precision, farmers had to bring cows into their stables to feed or keep them

<sup>100</sup> Dean, *Canadian Dairying*, 39.

<sup>101</sup> DAWO, 1904, 122–123. In her M.A. thesis on the relationship between farmers and animals in early twentieth century Ontario, Katharine Anderson argues that farmers often treated their animals on a continuum of detached to attached "pragmatic stewardship," and sometimes struggled to relate to their animals in highly commodified ways, while government based officials viewed them in more highly mechanical and rationalized ways. See Anderson, "'Hitched Horse, Milked Cow, Killed Pig'."

<sup>102</sup> Charles Whitley, "Some Notes Gleaned from the Work of the Dairy Record Centres in 1912," Office of the Dairy and Cold Storage Commissioner Circular No. 7 (Ottawa, ON: Department of Agriculture, 1913), 2.

there longer to combine the chore with milking, which had itself become more labour intensive as standards of cleanliness and sanitation increased. Decisions about when to eat, how much, and in what fashion—choices previously made by cows while they lived at pasture—were increasingly brought under the farmers’ control. As E. Melanie DuPuis explains, the industrialization of dairying in the United States, “was, for farmers, a taking on of the work previously done by the cow....Industrial farmers began to take on a dual role as both cropper and cow-tender.”<sup>103</sup>

Or so reformers hoped. Recognizing that too many demands on farmers’ time would likely go unheeded, the Dominion Department of Agriculture encouraged farmers to form cooperative cow testing associations (CTAs) to collectively share the costs and work involved in the recording and quantifying individual animals’ productivity. Loosely based on a model developed in Denmark and adopted in the United States and elsewhere, a CTA consisted of a group of local farmers who committed to recording the weight of milk from each cow three times per month and received help from the state—in the form of subsidies, standardized forms, and access to equipment at cost—to produce records that farmers could use to make changes on the farm or to their herds.<sup>104</sup> CTAs were designed particularly for farmers who kept grade stock—meaning animals of mixed breed ancestry or those without registered pedigrees—since those with registered purebred animals could avail themselves of the long-term ‘Record of Performance’ program (also

<sup>103</sup> DuPuis, *Nature’s Perfect Food*, 133.

<sup>104</sup> The first association of this kind was formed in Denmark in 1895. On the Danish system, see Bernhard Böggild, “The Danish Cow-Test Associations,” *The Journal of Heredity* 6, no. 1 (1911): 288–295. For their development in the United States, see Colon C. Lillie, “Cow-Testing Associations,” *The Journal of Heredity* 6, no. 1 (1911): 295–300; Olmstead and Rhode, *Creating Abundance*, 344; and Smith-Howard, *Pure and Modern Milk*, 86.

managed by the Dominion Department of Agriculture) that tested the milking capacity of purebred heifers as a means of enforcing breed standards for the emerging national breeding associations.<sup>105</sup> The first attempt to organize a CTA in Canada was undertaken by federal Minister of Agriculture Sydney Arthur Fisher in 1904, after the Dairymen's Association of Quebec passed a motion calling on the government to assist them with the process. Dubbed the "cow census," Fisher's staff solicited the participation from all the patrons of cheese factories and creameries near Cowansville, Quebec.<sup>106</sup> With the assistance of Grisdale and the Central Experimental Farm in Ottawa, they secured the participation of farmers from seventy-seven factories and creameries, representing 1431 individual cows.<sup>107</sup>

Before long, the Dairy Commissioner's office encouraged dairymen to replicate the Quebec system elsewhere. Charles Whitley spoke about the Quebec cow census at both of the Ontario dairymen's conventions in early 1905, highlighting how two farmers with herds of the same size and in the same township received a difference of roughly twenty dollars in income.<sup>108</sup> The Dairy Commissioner's office insisted that participating in a CTA would involve no more than ten minutes' work per cow for three days each month. Farmers were responsible for weighing the daily volume of milk supplied by each cow, and storing the cumulative individual samples in small bottles that were later sent to

<sup>105</sup> Dean, *Canadian Dairying*, 35–37. On breeding standards, standardization, and 'gate keeping,' see Orland, "Turbo-Cows," 177–180. On the development of Canadian (dairy) breed associations, see McCormick, *A Hundred Years*, 30–47.

<sup>106</sup> Papers in Connection with Cow Census, Files 164165–164211, Vol. 996, Department of Agriculture, Central Registry Files (RG 17), Library and Archives Canada.

<sup>107</sup> Letter Dunn to Fisher, 28 March 1904, Papers in Connection with Cow Census, File 164211, Vol. 996, Department of Agriculture, Central Registry Files (RG 17), Library and Archives Canada.

<sup>108</sup> DAEO, 1904, 10–12. Similarly, see DAEO, 1906, 10–15.

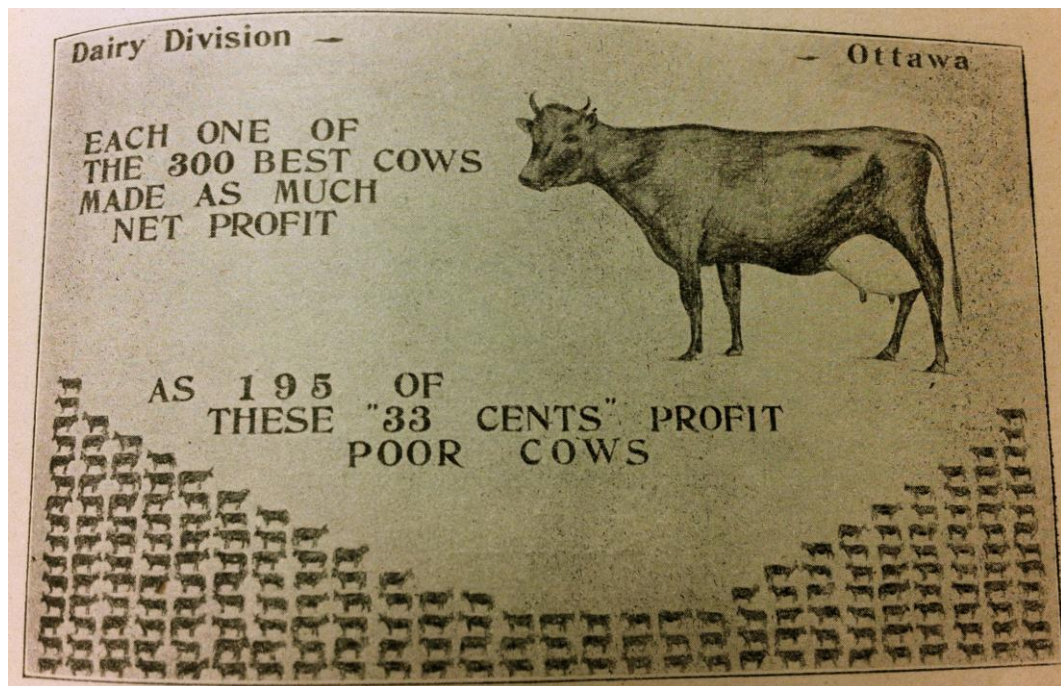
a single person who would test them all for butterfat content. The Dairy Commissioner's office would then consolidate the data into reports. Farmers had to purchase the bottles and boxes for holding and shipping the samples and a set of scales. The Dairy Commissioner's office encouraged farmers to form CTAs within local communities, especially around the patronage of existing cheese factories and creameries. Factories were a "natural choice" as the basis for an association for a CTA. The department hoped that participation of some of the patrons would set an example for the rest—since, as with so many dairy improvements, their acceptance was read as a measure of liberal cooperation—but also because factories were often already equipped with Babcock testers for measuring the butterfat of milk and cheesemakers who were capable of doing the testing. The Department of Agriculture even offered to pay makers 5¢ per test to take up the work where patrons requested it.<sup>109</sup> However, the Dairy Branch also kept recorders on staff, individuals farmers could call on to test the milk of their cows at no cost beyond the supplies required.<sup>110</sup> Each year a representative of the Dairy Commissioner's office highlighted the results of the work at the dairymen's conventions. In January 1913, for example, Whitley addressed both associations armed with a litany of results from cows and herds tested in the previous year. Taking the results of the 300 lowest yielding cows and the 300 highest, he showed that the former produced an average profit, after feeding,

<sup>109</sup> DAWO, 1907, 113.

<sup>110</sup> The specifics of the testing system for CTAs changed periodically in the early decades of the century. Some time before the 1920s the federal Department of Agriculture began appointing testers rather than relying individual volunteers in the area (though some of those appointed were still local cheese and buttermakers). In 1926, they changed the system again in order to reduce the costs to the Department by downloading more of the responsibilities—such as securing a site for testing—on the local CTA members themselves. See "Cow-Testing Plan on Different Basis," *The Globe (1844–1936)*, 26 January 1926.

of just .33 cents each, while the latter produced an average of \$64.33 (see Figure 9).<sup>111</sup>

Testimonials such as these were meant to persuade more farmers to take up the opportunity to quantify their cattle's productivity. If some dairymen and rural observers worried about the state and prospects of dairying in the early twentieth century, then cow testing promised to quell those fears and unleash "unsuspected possibilities in undeveloped resources on old Ontario farms."<sup>112</sup>



**Figure 9.** Promotional material for the cow-testing program administered by the Dairy Division of the Department of Agriculture. (DAWO, *Annual Reports of the Dairymen's Associations of Ontario 1912* [hereafter 1912] (Toronto, ON: 1913), 93.)

<sup>111</sup> Whitley, "Some Notes," 5–6. This circular was a republication of the address he delivered to the dairymen's convention, given its importance for the Dairy Division.

<sup>112</sup> Whitley, "Some Notes," 7.

Like so many interventions on the part of reformers, the results were mixed. CTAs enjoyed an initial wave of popularity, especially amongst western Ontario farmers, who formed most of 160 CTAs in the province by 1910.<sup>113</sup> Local CTAs were celebrated in the *Globe* and other publications as an indication of farmers' "progressive" practices.<sup>114</sup> It is also possible that some farmers took up their own record keeping using blank forms distributed by the Dairy Division, or devised their own systems entirely.<sup>115</sup> CTAs were less common in eastern Ontario, where large numbers of dairy farmers were pulling out of cheese patronage by selling their cream and their cows to U.S. buyers. Only three or four CTAs were located east of Peterborough by 1910, while Oxford County had nearly twenty, accordingly to Whitley.<sup>116</sup> In 1911, J.A. Ruddick wrote to Henry Glendenning, the president of the DAEO, apologizing for his absence from that year's convention (he was laid up in bed with bronchitis), but took a moment to shame the DAEO membership for their lacklustre results on cow testing: "There is surely no more important matter for the consideration of the farmers of Eastern Ontario, and yet I regret to say that less

<sup>113</sup> DAEO, *Annual Reports of the Dairymen's Associations of the Province of Ontario, 1910* [hereafter 1910] (Toronto, ON: 1911), 23.

<sup>114</sup> "What Good Roads Mean to Farmers...Testing Cows..." *The Globe* (1844–1936), 12 December 1907; "Dairying Outlook in West Counties: Perth and Oxford Will Increase Cheese Output," *The Globe* (1844–1936), 29 June 1908; "A Rural Ontario Preacher Who is Helping Dairymen," *The Globe* (1844–1936), 28 January 1921; "Testing Association off to A Good Start," *The Globe* (1844–1936), 14 June 1924; "Many Norfolk Cows Are Now Under Test," *The Globe* (1844–1936), 6 October 1926; "Milk Production Grows in Ontario: Cow-Testing Work Already Showing Good Results," *The Globe* (1844–1936), 13 January 1927.

<sup>115</sup> In 1911, the DAEO reported "several thousand blank record forms have been distributed to individual farmers, not belonging to associations, who are also keeping records as a result of frequent announcements made by the Department." See DAEO, 1910, 23. One possible example of this practice can be found in the records of dairy farmer John Nesbitt Chambers near Woodstock, who kept a government issued milk record sheet that identified ten Jersey cows and a handful of yield and butterfat results. However, Chambers had evidently repurposed the sheet for his own use, scratching out certain columns and using them for other ends. See File 17: John Nesbitt Chambers correspondence, Box J15, Chambers Family collection, Norwich and District Museum & Archives, Norwich, ON.

<sup>116</sup> DAEO, 1910, 23.



progress has been made in the section represented by your Association than in any other part of Eastern Canada. It seems strange that this should be so, because no other district in Canada depends so largely on dairying.”<sup>117</sup> Ultimately, CTAs in Ontario (and Canada more generally) never enjoyed the popularity they had in Denmark and other major dairy producing countries in the early twentieth century. In 1937, the economist W.M. Drummond admitted that CTAs had never tested more than one per cent of the national cow population in any given year since their inception.<sup>118</sup>

Records meant little if farmers were unwilling to translate them into changes in the management of their farms. As Whitley explained in 1912, “This knowledge should induce action, otherwise it is a golden opportunity wasted.”<sup>119</sup> Reformers and government officials used the phrase, ‘feed, breed, and weed’ as shorthand for the overall system of livestock management they wanted farmers to adopt.<sup>120</sup> This threefold approach to herd management represented a shift toward a more industrial model of agricultural production, one in which the primary purpose of biological intensification was profit. Scientific dairy management hinted at the possibilities of specialization for the farmer as a businessman and a capitalist. This industrial approach was summed up nicely by Dean in a lecture on dairy economics to the DAEO in 1905: “The science of making money in

<sup>117</sup> DAEO, 1910, 24.

<sup>118</sup> Ruddick et al., *The Dairy Industry in Canada*, 136. Compare this rate with the 1911 estimate that roughly 18 per cent of dairy cows in Denmark were documented through that country’s cow testing associations, reaching 40 per cent by 1930. Böggild, “Danish Cow-Test Associations,” 291.

<sup>119</sup> Whitley, “Some Notes,” 7.

<sup>120</sup> The order of the three categories often changed depending on the speaker, though ‘feed, breed, weed’ was the most common. Interestingly, someone underlined the following sentence in a copy of Dean’s 1920 edition of *Canadian Dairying* and scribbled ‘correct order’ beside it: “*Breed, Feed, Weed*—the triple servants of the dairyman.” This preference could reflect the general ascendancy of breeding as the primary way to improve herds in the twentieth century.

dairying lies in the application of the best and most scientific labor to the natural products in the soil, with the least expenditure of capital possible.”<sup>121</sup>

Scientific feeding involved supplementing grass with concentrated feeds—such as corn ensilage—and determining the point at which increasing rations brought diminishing returns. Recall that nineteenth-century reformers had also encouraged building silos and preparing ensilage, but primarily to feed during times of drought and to extend the milking season further into the winter months, not so much for the purpose of driving down production costs. Agricultural experts from the OAC and the Central Experimental Farm in Ottawa armed themselves with experimental evidence to prove that providing dairy cows with greater volumes of (concentrated) feed and high quality roughage was the fastest way to increase milk production, since the milk output of cows is determined—to a point—by the volume and nutrition of feed consumed. Using the results of the OAC Dairy Department’s experimental herd, Dean explained that systematic, liberal feeding was good; lavish, indiscriminate feeding unaccompanied by careful record keeping was not. The yield of the OAC’s individual cows varied from 3,000 to 10,000 lbs. of milk per year, but each animal had radically different feeding requirements. What mattered, he emphasized, was the average cost per cow, which varied during the 1904 season between \$22 and \$44, averaging \$28.70 overall.<sup>122</sup>

<sup>121</sup> DAEO, 1904, 80. Similarly, see Fitzgerald, *Every Farm a Factory*, 49–51.

<sup>122</sup> DAWO, 1904, 118–119. However, Dean acknowledged that the statistics he brought forward did not account for “the value of the skim milk or the manure, no charge made for labor,” so that the profits only reflected the difference between remuneration for milk and the cost of feed. Similarly, see J.A. Ruddick and Charles Whitley, “Cow Testing Associations with Some Notes on the Sampling and Testing of Milk,” Bulletin No. 12, Dairy Commissioner’s Series (Ottawa, ON: Department of Agriculture, 1906): 7.



However, many farmers did not produce enough ensilage, grain, or high quality hay to keep cows from going dry early in the winter, much less to supplement their grazing during the summer. Hence scientific feeding entailed the reorganization and further intensification of farm production. As the head agriculturist of the Central Experimental Farm in Ottawa, J.H. Grisdale wanted all dairy farmers to devote roughly a quarter of their arable land toward growing feed corn and spend more time cultivating richer pastures, instead of turning their cows out to sparse pastures that required little effort to maintain.<sup>123</sup> He advised farmers to cultivate the land intended for pasture “at frequent intervals all autumn,” spread manure diligently, and sow a careful selection of grass and legume seed at such high densities that mechanical seed drills could not possibly handle the volume, meaning farmers would have to sow their fields by hand.<sup>124</sup> Unsurprisingly, the primary concern for most farmers was the cost of feeding their cows this way. Despite Grisdale and others’ insistence that such measures would pay for themselves through greater milk production, they were regularly challenged by farmers who could not fathom increasing their labour when dairying was already one of the most labour intensive lines of agriculture to undertake. “Is there anything cheaper than grass to produce milk?” asked one member in response to Grisdale’s address in 1906.<sup>125</sup>

<sup>123</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario, 1905* [hereafter 1905] (Toronto, ON: 1906), 20.

<sup>124</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1909* [hereafter 1909] (Toronto, ON: 1910), 92. See also J.H. Grisdale, “Milk Production in Canada: Crop Rotations, Dairy Barns, Breeding Dairy Cattle, Feeding, Care and Management of Milch Cows,” *Dominion Experimental Farms Bulletin No. 72* (Ottawa, ON: 1913), 7–10.

<sup>125</sup> DAEO, 1905, 20.

Judicious feeding could increase the yield of milk from a cow, but only to a point; some cows were simply more efficient at transforming feed into milk than others. Nor could feeding alter the basic ratio of butterfat, proteins, and water in the milk of an individual cow. Breeding, not feeding, controlled the overall milking capacity of a cow and the proportion of fat in her milk. Yet breeding for desirable traits in dairy cattle was far from straightforward. As Barbara Orland has shown, cattle breeders in Europe and North America struggled for centuries to identify the traits and mechanisms by which milking capacity was inherited, especially once the demand for single-purpose cattle began to grow.<sup>126</sup> Farmers and breeders tended to draw on a wide variety of vernacular and aesthetic characteristics to make breeding decisions—what sociologist Richie Nimmo calls “a sort of bovine semiotics”—such as a ‘feminine’ appearance or a ‘well-shaped’ udder. The ‘escutcheon theory,’ was popular, which contended that milking qualities could be ascertained by the pattern and shape of the rear ‘escutcheon’ region of the cow (including the udder, thighs, and hips).<sup>127</sup> If they had the capital and inclination to do so, pedigree and reputation might also factor into farmers’ breeding decisions.

To cut through the ambiguity of knowledge around breeding cattle for milk, dairy experts stressed that the most important criterion to consider when breeding were milk records, irrespective of pedigree or breeding. In fact, reformers often found themselves in the somewhat strange position of insisting to dairymen that registered purebred cattle

<sup>126</sup> Orland, “Turbo-Cows,” 181. Single-purpose cattle are those bred for either beef or dairy, but not both.

<sup>127</sup> See Nimmo, “Auditing Nature, Enacting Culture,” 289. Smith-Howard, *Pure and Modern Milk*, 86–87, notes that these non-systematic criteria remained common in American dairy farmers’ breeding practices until around the Second World War.

were *not* necessarily the most profitable animals in a herd. Instead, they recommended that farmers examine the milk records of sires or dams when purchasing young heifers or bulls. In one address summarizing ten years' work with the dairy herd at OAC, Dean explained that the average output per cow had been increased from 6,000 to 7,000 lbs. (which significantly exceeded the provincial average), and that the herd was made up of Holsteins, Jerseys, Ayrshires, Guernsey, and Red Rolled, as well as "a number of grades of nearly all breeds, and some of no particular breeding."<sup>128</sup> Dean's advice for the "average" dairyman looking to build up a herd was to purchase the best grade cows they could find of a particular breed, and then breed those animals to a proven purebred sire. Yet attendees at the dairymen's convention insisted on asking asked Dean and others which breed(s) to purchase, which signals a significant shift away from the average nineteenth-century farmer's skepticism about the benefit of purebred stock for dairy production.<sup>129</sup> Contrary to the reformers' insistence that any breed *could* do, the Holstein emerged as Ontario's "turbo cow" *par excellence* during these decades, growing from just 2,792 animals in 1901 to 66,245 by 1921.<sup>130</sup> Holsteins' popularity stemmed from their reputation as particularly high-volume milk producers. Jerseys—the second most numerous dairy breed in the province—were preferred amongst creamery patrons for

<sup>128</sup> DAWO, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1900* [hereafter 1900] (Toronto, ON: 1901), 99. For another example from a few years later, see DAEO, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1911* [hereafter 1911] (Toronto, ON: 1912), 17–24.

<sup>129</sup> Derry, *Ontario's Cattle Kingdom*, 110.

<sup>130</sup> Ankli, "Ontario's Dairy Industry," Table 4, 267. The phrase is borrowed from Orland, "Turbo-Cows."

their higher average fat content.<sup>131</sup> Overall, however, grades remained the most common type of dairy cattle kept by farmers.<sup>132</sup>

Weeding—the third major tenet of the scientific management schema—was a euphemism for culling unprofitable heifers from one’s herd, whose bodies were often dumped on local markets as poor quality ‘dairy beef.’<sup>133</sup> There was no point in keeping cows once it was determined they were inefficient producers, dairy experts reasoned. “How long is she to be allowed to misappropriate good feed and act as a common poacher? Should she not be arrested as a vagrant and waster?” asked Whitley in 1911 about cows who could not ‘pay their board.’ Not only did these cows eat away a farmer’s profit, he continued, but it was unfair to the other animals in the herd, who “have the herculean task of dragging a few hundred thousand poor cows up a heavy grade before all, good bad and indifferent alike, can be represented as showing anything like a fair average yield.”<sup>134</sup> Dean recommended in 1920 that farmers allow cows one full lactation period to develop “the milking habit,” and, “If at the end of the second lactation period she does not attain to the standard of 6,000 pounds of milk, or 250 pounds of butter, she may be considered as not worthy a place in a herd.”<sup>135</sup> This meant feeding a potentially unprofitable animal for multiple years before deciding its worth to the herd as a whole.

<sup>131</sup> Ankli, “Ontario’s Dairy Industry,” Table 4, 267.

<sup>132</sup> See “Farming in Dundas—Its Troubles and Joys,” *The Globe* (1844–1936), 3 July 1912. The authors note that in Dundas County in eastern Ontario, Holsteins were the most popular breed (followed by Ayrshires and Jerseys), but “Grade animals are...greatly in the majority.” Similarly, Dean speculated in 1920 that, “Grade Short-horn (Durham) cows are possibly more common in the Province of Ontario than cows of any other breed.” Shorthorns, which were generally bred for beef, had long been used for dairying too. See Dean, *Canadian Dairying*, 32.

<sup>133</sup> Derry, *Ontario’s Cattle Kingdom*, 111–112.

<sup>134</sup> DAEO, 1910, 17–18.

<sup>135</sup> Dean, *Canadian Dairying*, 32–33.

Advocates of the ‘feed, breed, weed’ system insisted that all three components worked together; adopting only one or two at the expense of the others would limit one’s success. The agricultural press and dairymen’s associations routinely included reports about the practices and records of progressive farmers in the hopes that others would adopt similar practices. In January 1915, for example, a farmer named F.R. Mallory gave an address to the DAEO meeting that described his family’s experience “building up the dairy herd” over three generations. Mallory noted “with all reverence” that his grandfather “was a breeder, but he was not a feeder, and he was not a weeder.” The elder Mallory had purchased a Holstein bull and bred him “indiscriminately,” which translated into marginal improvements at best, Mallory explained. By comparison, Mallory’s father was a weeder *and* a breeder, but not a feeder. By culling low yielding cows regularly, his father obtained a 5000 lb. increase in milk production over the fourteen years in which the herd was under his care. But now, by adopting all *three* components of scientific management, Mallory had tripled milk yields in some of his cows.<sup>136</sup>

In addition to imploring farmers to adopt the practices of Mallory and other model dairymen, the DAWO organized and sponsored an annual dairy herd competition in which factory and creamery patrons could compete against one another for cash prizes and prestige. The winner was the patron with the herd showing the highest average of milk supplied per cow. The competition relied on the records supplied from the milk books of participating factories as proof. Winners tended to be prominent, progressive

<sup>136</sup> DAEO, 1914, 21–24. For an example from the agricultural press, see “Queens of the Dairy World,” *Farmer’s Advocate*, 8 December 1910.

farmers, whose practices came fairly close to the model recommended by reformers, but even they sometimes struggled to live up to the ideals of Ontario's dairy experts. For instance, the winning patron in 1908, John W. Cornish of Harrietsville, explained that while he supplemented the summer pasture for his herd of grade Holsteins with a bit of meal and grain, he could not tell the audience how much, since he did not keep sufficient records.<sup>137</sup> Despite the incentives of cash and prestige, very few farmers entered.<sup>138</sup>

To what extent did Ontario's dairy farmers heed the advice circulated through annual dairymen's meetings, departmental bulletins, and the agricultural press in the early twentieth century? Much like nineteenth-century reformers, twentieth-century dairy experts and bureaucrats worried they only reached the most progressive, liberal farmers—those who attended the annual conventions, read the scientific literature, and experimented on their farms—not the “bed rock” farmers, the “average farmers” who failed to take the ‘business’ of dairying seriously.<sup>139</sup> The Bureau of Industries reported in 1916 that “No uniform system of feeding live stock is in vogue, methods ranging from the most careful stall feeding to that of carrying the animals over winter on the barest maintenance ration,” although they recognized that “[t]he silo is more and more playing a leading part in cattle feeding, both for beef and milk.”<sup>140</sup> Many farmers probably

<sup>137</sup> DAWO, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1910* [hereafter 1910] (Toronto, ON: 1911), 109.

<sup>138</sup> DAWO, 1907, 105–108. Only eight farmers, for instance, entered the competition in 1907.

<sup>139</sup> DAEO, 1905, 15. As Ruth Sandwell notes in *Canada's Rural Majority: Households, Environments, and Economies, 1870–1940* (Toronto, ON: University of Toronto Press, 2016), 82, farmers' responses to the rise of agricultural science and education in the nineteenth and early twentieth centuries was generally “mixed.”

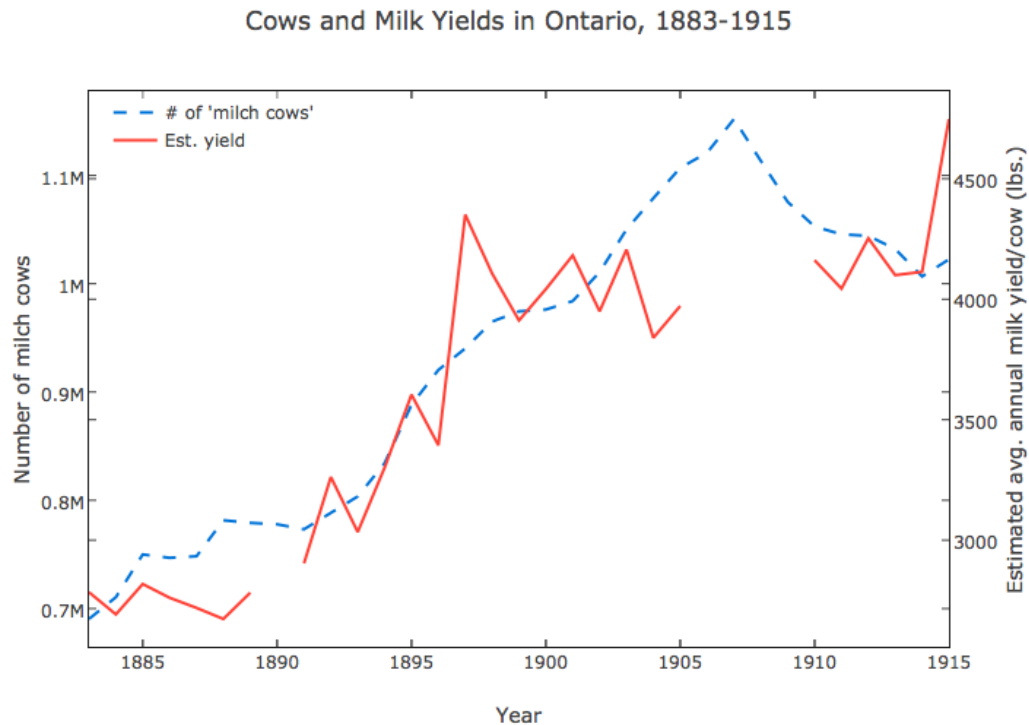
<sup>140</sup> Ontario Bureau of Industries, *Annual Report of the Bureau of Industries for the Province of Ontario 1916* (Toronto: Ontario Department of Agriculture, 1917), 15–16.

continued to rely primarily on pasture to feed their cattle, either because of labour constraints, or skepticism that the increased effort would translate into greater profits. Even if many farmers were unaware of or reluctant to adopt all the recommendations of dairy scientists, expert advice legitimized and hardened the gendered distinction between managerial dairy work like feeding, growing feed crops, assessing the herd's health, and the construction and maintenance of suitable dairy barns (tasks deemed appropriate for male farmers) and milking and scrubbing milk cans (chores that still fell to farmwomen) in the early twentieth century.<sup>141</sup>

Despite the lacklustre results of Ontario's CTAs and farmers' lukewarm reception of the advice of agricultural experts, Ontario's dairy cattle did become more productive between the late nineteenth century and the Great Depression. According to estimates calculated by Robert Ankli, the most impressive gains in milk yield per cow were accomplished during the 1890s, which he attributes to general improvements in husbandry and the lengthening of the milking season. Improvements in milk yield continued to increase from 1900 onward, but more erratically (see Figure 11 below). These averages obscure how unequal the gains were between farmers. In 1910, western Ontario dairy instructors calculated the average yield for herds supplying seventeen factories in the region (totaling 8,137 cows) and found less than 43% averaged a yield of

<sup>141</sup> As milking machines became more common, however, milking became a task more associated with men. On women's work in relation to dairying in the early twentieth century, see Terrence Crowley, "Experience and Representation: Southern Ontario Farm Women and Agricultural Change, 1870–1914," *Agricultural History* 73, no. 2 (1999): 248–249; Monda Halpern, *And on that farm he had a wife: Ontario Farm Women and Feminism, 1900–1970* (Montreal, QC: McGill-Queen's University Press, 2001), 35 [e-book]; Quaile, "Sisters of Toil," 236–266; and Sandwell, *Canada's Rural Majority*, 90, 94.

at least 4,000 lbs., a standard that many considered necessary in order to make a profit by patronizing cheese factories.<sup>142</sup>



**Figure 10.** Cows and milk yields in Ontario, 1883–1915. Data from 1906 to 1909 is unavailable. (Bureau of Industry data, as estimated by Ankli, “Ontario’s Dairy Industry,” 268–269.)

We should not be too quick to assume that any increases in the productivity were due to the successful influence of agricultural experts or that farmers unquestioningly adopted their recommendations. Historians of science and technology have rightly cautioned against assuming that the transfer of scientific and technological knowledge

<sup>142</sup> DAWO, 1910, 146.



and practices from ‘expert’ to ‘user’ are unidirectional or smooth.<sup>143</sup> There is some evidence to suggest that the yield improvements between 1914 and 1920 were somewhat inadvertent. In the late 1900s, the seeds of doubt about cheese manufacturing that germinated in the minds of Ontario’s dairymen combined with a growing domestic demand for beef and other agricultural goods to compel a number of farmers to (temporarily) shift out of dairying, sell their cattle, and take up beef raising, fruit culture, and other lines of production instead. Ankli speculates that an increasing number of farmers “were not making profits and therefore decided to get out of the industry” between 1907 and 1914.<sup>144</sup> The decline was especially pronounced in the eastern counties after 1911, when an easing in tariff rates between Canada and the United States for a range of goods created a surge in U.S. demand for Canadian cattle. One resident of Prince Edward County who was critical of the trend reported that, “The buyers are coming down there and blinding our eyes with gold and taking our stock from us.”<sup>145</sup> Cheese buyer and exporter R.M. Ballantyne estimated that the number of cattle exported during the early 1910s exceeded 150,000, the majority of them from east of Belleville. Echoing the reformers’ criticisms of farmers who sold their cattle to the U.S. under the Reciprocity Treaty in the nineteenth century, he discouraged the sale of cattle—especially calves—as

<sup>143</sup> Cohen, *Notes from the Ground*, esp. 49–80; Christopher R. Henke, *Cultivating Science, Harvesting Power: Science and Industrial Agriculture in California* (Cambridge, MA: MIT Press, 2008); and Peter Howlett and Aashish Velkar, “Technology Transfer and Travelling Facts: A Perspective from Indian Agriculture,” in *How Well do Facts Travel? The Dissemination of Reliable Knowledge*, edited by Peter Howlett and Mary S. Morgan (Cambridge, UK: Cambridge University Press, 2011), 273–300.

<sup>144</sup> Ankli, “Ontario’s Dairy Industry,” 273.

<sup>145</sup> DAEO, *Annual Reports of the Dairymen’s Association of the Province of Ontario 1913* [henceforth *1913*] (Toronto, ON: 1914), 14.

detrimental to Canadian progress.<sup>146</sup> Others, however, speculated that selling dairy livestock might improve the overall quality of the provincial stock if most of the culled stock were poor quality animals.<sup>147</sup> It is possible that the gains during and after the war can be explained in part by their replacement with higher yielding animals.

Although signs pointed toward some improvement in dairy cattle productivity in the early twentieth century, there was still little evidence available beyond anecdotal and individual testimonials to suggest that increasing milk yields made dairying more economically viable for farm families who relied on cheese factories as the primary outlet for their milk. Ontario's agricultural institutions were relatively slow to establish agricultural economics departments in comparison to the prairies and elsewhere, a gap that the OAC sought to remedy during the war. Under the supervision of A. Leitch (of the animal husbandry department), economics researchers undertook two county-wide surveys (in Dundas and Oxford) to ascertain the state of dairying in Ontario.<sup>148</sup> Unlike the Bureau of Industries, which collated data at the county level, researchers investigated sub-county differences to understand the success or failure of dairy farming in general. During the spring of 1918, they collected data from 340 farms in Dundas County and 437 in Oxford, taking care to select a cross-section of farmers from less intensive dairy areas as well as "highly specialised dairy sections."<sup>149</sup> They collected information about acreage devoted to various land uses, crop yields and prices, feed purchased, livestock

<sup>146</sup> DAEO, 1913, 109.

<sup>147</sup> DAWO, 1914, 68.

<sup>148</sup> Department of Farm Management, "The Dairy Farming Business in Eastern Ontario," (Guelph, ON: Ontario Agricultural College, 1918); and Department of Farm Management, "The Dairy Farming Business in Western Ontario," (Guelph, ON: Ontario Agricultural College, 1918).

<sup>149</sup> Department of Farm Management, "The Dairy Farming Business in Western Ontario," 4.

inventories, capital investments in buildings and machinery, labour expended and purchased, and more. Although the researchers occasionally struggled to get adequate details during their on-farm interviews, the authors of the Oxford reported with some paternalism that, “Contrary to the generally accepted opinion that farmers do not know as much as they might about their own business, it was found that the great majority could give definite and accurate details of their farm business if asked in a detailed and logical manner.”<sup>150</sup> Similarly, the Dundas County researchers explained that the average farmer surveyed could recall “large items...without assistance, even though he kept no books.”<sup>151</sup>

Both reports were unequivocal in their claims that “good live stock” translated into greater labour income for farmers.<sup>152</sup> Using the “average quality of stock” as a baseline, they showed that farmers in Oxford whose stock were 130% higher than average received an average of \$1905 in labour income compared to \$443 for those whose stock were less than 66% of the average, irrespective of farm size.<sup>153</sup> In Dundas County, the *difference* in labour income between those who kept stock 130% higher than average and less than 66% below average was \$1153.<sup>154</sup> After comparing the relative influence of “good crops” and “good livestock” on labour income, both of which improved it to some

<sup>150</sup> Department of Farm Management, “The Dairy Farming Business in Western Ontario,” 5.

<sup>151</sup> Department of Farm Management, “The Dairy Farming Business in Eastern Ontario,” 4.

<sup>152</sup> The authors explicitly chose to use the term ‘labor income’ rather than profit. They defined labor income as the money remaining after a farmer paid for running expenses, “depreciation on buildings and machinery”; labour for unpaid members of the family; and 5% interest on any investments. See Department of Farm Management, “The Dairy Farming Business in Western Ontario,” 4.

<sup>153</sup> Department of Farm Management, “The Dairy Farming Business in Western Ontario,” 4. The authors did not explain how they arrived at the baseline average.

<sup>154</sup> Department of Farm Management, “The Dairy Business in Eastern Ontario,” 9.

degree, reports found that high quality herds, and especially purebred ones, had the greatest effect on the profit of farmers overall.<sup>155</sup> For reformers and dairy experts these reports appeared to support what they had been advocating at length for the past twenty years: that feeding, breeding, and weeding in systematic ways translated into greater economic gains for Ontario farmers.

The OAC reports did not advocate widespread specialization in dairying, advice that initially seems at odds with the otherwise economic approach they expressed. In response to whether intensive dairying translated into greater profit, the authors of the Oxford study noted that farmers on either end of the spectrum—those who derived either less than 50% or more than 90% of their overall farm revenue from dairying—made significantly less profit than those who received only 60 to 70% of their revenue from dairy cattle.<sup>156</sup> The authors of the Dundas County report approached the question differently since, unlike in Oxford, cheese factories were still the primary outlet for milk production. They compared the patrons who shipped milk primarily to cheese factories, and those who patronized condensers and fluid milk markets, finding that, “Those men who specialized to a greater degree than 70%, and sold to cheese factories, did so at a very material loss.”<sup>157</sup> Only condensed and fluid milk patrons found it profitable to specialize further, although even then the rate of return fell beyond the 90% threshold,

<sup>155</sup> Department of Farm Management, “The Dairy Business in Eastern Ontario,” 9–11; and Department of Farm Management, “The Dairy Business in Western Ontario,” 8–10.

<sup>156</sup> Department of Farm Management, “The Dairy Farming Business in Western Ontario,” 12.

<sup>157</sup> Department of Farm Management, “The Dairy Farming Business in Eastern Ontario,” 12.

similar to Oxford County. “Even where cows are of high quality and the price for milk is good, the dairyman cannot afford to neglect side lines,” the Dundas report concluded.<sup>158</sup>

Although both reports advocated the adoption of mixed farming systems, they did so on the basis of narrowly economic criteria rather than on conservationist grounds like their nineteenth-century predecessors, for whom mixed farming (with an emphasis on dairy) had been as much a means of conserving soil fertility as producing profit. The Dundas report, for instance, continued their recommendation of a mixed farming system because, “As in any other manufacturing business, the side line by-products [hogs, cash crops, and so on], if judiciously handled, help to reduce the cost of the article of the business—with a corresponding increase in profits.”<sup>159</sup> The absence of conservationist concern in these reports is all the more striking considering how resource conservation became a question of national concern in both Canada and the United States in the early twentieth century.<sup>160</sup> In 1909, Prime Minister Laurier responded to growing anxiety about the capacity of Canada’s natural resources to sustain a rapidly urbanizing society by forming the Canadian Commission of Conservation (CCC), an advisory body composed of government ministers, other officials, and university professors from across the country. Their goal was to take stock of “all questions related to the conservation and

<sup>158</sup> Department of Farm Management, “The Dairy Farming Business in Eastern Ontario,” Ibid.

<sup>159</sup> Department of Farm Management, “The Dairy Farming Business in Eastern Ontario,” Ibid.

<sup>160</sup> A selection of key texts in Canadian conservation history include George Altmeyer, “Three Ideas of Nature in Canada, 1893–1914,” *Journal of Canadian Studies* 11, no. 3 (1976): 21–36; R. Peter Gillis and Thomas R. Roach, *Lost Initiatives: Canada’s Forest Industries, Forest Policy and Forest Conservation* (New York: Greenwood Press, 1986); Loo, *States of Nature*; and H.V. Nelles, *The Politics of Development: Forests, Mines & Hydro-Electric Power in Ontario, 1849–1941* (Montreal, QC: McGill-Queen’s University Press, 2005 [1974]). For an introduction to the literature on conservation in the United States in the early twentieth century, see Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (Cambridge, MA: Harvard University Press, 1959).

better utilization of the natural resources of Canada,” including forests, fisheries, wildlife, public health, water, mineral, and (rural) lands.<sup>161</sup> The growing dissonance between questions of conservation and dairying is even more striking when one considers that none other than James W. Robertson—champion of the cheese industry—chaired the Committee on Lands, which was tasked to study the preservation and improvement of rural life and agricultural production in the country but said little about dairying in particular.<sup>162</sup>

The dissonance makes more sense when one recognizes how much the question of dairy cow productivity had narrowed since the 1860s. It became almost solely an issue of yield and a means of accumulating profit. By putting the work of dairy cows under greater scrutiny, scientific management both reflected and intensified the industrial tendency toward “assessing individually every part of what was formerly an ‘organic’ farming unit,” as Barbara Orland has described the development of ‘turbo-cows’ in Europe since the eighteenth century.<sup>163</sup> ‘Weeding’ cattle depended on reducing a cow’s usefulness to the efficiency with which she transformed feed into milk, ignoring her function to the herd and to soil fertility. This atomization is also reflected in institutional

<sup>161</sup> Alan F.J. Artibise and Gilbert A. Stelter, “Conservation Planning and Urban Planning: The Canadian Commission of Conservation in Historical Perspective,” in *Consuming Canada: Readings in Environmental History*, edited by Chad Gaffield and Pam Gaffield (Toronto, ON: Copp Clark, 2005).

<sup>162</sup> Patricia Bowley has argued that CL stood in stark contrast from the other subcommittees of the CCC because it was dominated by romantic non-farmers like Robertson who “neither accepted nor understood contemporary Ontario agriculture as an intellectual, businesslike occupation.” She critiques the committee’s focus on mixed farming and the work of central experimental farms and other agricultural scientists. While the CL undeniably advanced a more ‘romantic’ or ‘agrarian’ outlook than some of the other committees, I think her characterization of Robertson and others as out of touch with twentieth-century ‘scientific agriculture’ presumes that the distinctions between romantic and rational understandings of agriculture were more fixed than was actually the case. See Bowley, “The Committee on Lands,” 67–87.

<sup>163</sup> Orland, “Turbo-Cows,” 183–184.

arrangements: Dean had long supervised the management of the OAC's experimental dairy as the head of the Dairy Department, but in 1907 its care was transferred to the Animal Husbandry unit of the Farm Department, while the mandate of the Dairy Department narrowed to the realm of processing and food science.<sup>164</sup> At the federal level, the Live Stock Branch took over cow testing from the Dairy Branch in 1924.<sup>165</sup> What was once a single question—what system could simultaneously reform rural society, improve soil fertility, and sustain economic growth?—was becoming many, each the purview of a different set of economists, scientists, and engineers.

### *Conclusion*

This chapter has examined two elements of the Ontario cheese industry that have received relatively little attention in the historiography to date: the rise of technical craft education through permanent dairy schools, and the scientific management of dairy cattle through the development of CTAs and the 'feed, breed, weed' strategy. These reforms were designed to stabilize the dysfunction of the industry and put the holistic dairy zone vision back on track by increasing the quality and consistency of the provincial cheese

<sup>164</sup> Baker, "A Chronology," 247. Crowley and Ross note that distinctions between departments hardened as the new president of the College in 1904, George Creelman, took up his post "full of a reforming zeal" and "attuned to the ways in which scientific knowledge was becoming increasingly specialized[.]" Ross and Crowley, *The College on the Hill*, 74.

<sup>165</sup> Ruddick et al., *The Dairy Industry of Canada*, 134. A splintering of 'interests' was also evident within the realm of voluntary organizations (although the DAWO and DAEO did merge the work of the Creameries' Association into their own organizations in 1897) as new organizations formed to represent the special interests of various 'branches' of the industry: the Toronto Milk Producers' Association (1906); the Ontario Milk and Cream Producers' Association (1917); the Canadian Creamery Association of Ontario (1917); the Ontario Whole Milk Producers' League (1932); and the Ontario Concentrated Milk Producers' Association (1934). On these and other organizations, see McCormick, *A Hundred Years*, 143–172; and Ruddick et al., *The Dairy Industry in Canada*, 78–84.

supply and reducing the costs of production. Yet the differences between these programs also signal a movement away from the alternative modernity of the dairy zone vision. The severance of economic questions from more or less ecological ones—illustrated here by the search for a high-yielding dairy cow—speaks to the dissolution of the holistic dairy zone vision of the mid-nineteenth century and its replacement with a narrower, growth-centered vision of rural modernity. On the eve of the First World War, Dean acknowledged the unease of many by calling for an “agricultural Moses” to help lead them through a period of change and upheaval in the dairy industry. “The times are changing,” he warned.<sup>166</sup>

It would be a mistake to understand this change through the simplistic lens of tradition versus modernity. The older dairy zone vision—with its focus on uniform, industrial production for export markets—was also very modern in its goals. Nineteenth-century dairy reformers shared with the agricultural economists, engineers, and bureaucrats of the twentieth century what Deborah Fitzgerald calls “transfer mentality,” or the deeply modernist belief that a given system of farming could be adopted in various locations, regardless of social or ecological context.<sup>167</sup> Early rural reformers were optimistic that industrial cheddar production could be transferred throughout large parts of Euroamerican settler societies, although the *means* of transfer at their disposal were less mechanized, systematic, and replicable than the highly industrial systems of dairy processing and agricultural production that were developed later in the twentieth century.

<sup>166</sup> “Agricultural Moses Needed in Ontario: Eastern Ontario Dairymen Show Keen Interest in Convention,” *The Globe* (1844–1936), 8 January 1914.

<sup>167</sup> Fitzgerald, *Every Farm a Factory*, 186–187.



The shift examined here is between two different models of rural modernity. In the next and final chapter, I examine the decline of rural cheese factories in the early twentieth century, paying particular attention to how the dairy zone landscape generated and constrained the growth of corporate agribusiness, or ‘Big Dairy.’

## Chapter 5: The Rise of Big Dairy

Spectator 1: I think it was, “Blessed are the cheesemakers”!  
Mrs. Gregory: What’s so special about the cheesemakers?  
Gregory: Well, obviously it’s not meant to be taken literally. It refers to any manufacturers of dairy products.<sup>1</sup>

### *Introduction*

Between 1904 and 1931 the number of cheese factories in Ontario declined by more than forty per cent, leaving just 714 in the province.<sup>2</sup> Annual cheese production fell too, from a high of 154,879,438 lbs. to just 84,010,148.<sup>3</sup> On the other hand, milk production *increased* during this period, but it was increasingly sent to urban dairies and multi-product milk plants for processing into a wide range of products, including fresh, condensed and evaporated milk, dried milk powder, ice cream, and even industrial inputs like casein. By the height of the Great Depression, industrial dairy processors and their multi-product milk plants had become some of the most powerful players in Ontario dairying, while small-scale cheddar producers had been reduced to “the ‘balance wheel’ of this large and diverse dairy industry, the market into which farmers could conveniently dump their extra milk when other markets were saturated,” writes Heather Menzies.<sup>4</sup>

Scholars and observers have pointed to modernization and urbanization as general explanations for the collapse of the small rural cheese industry in the twentieth century, but these interpretations, while tidy, naturalize the trajectory of dairying while framing

<sup>1</sup> Graham Chapman, John Cleese, Michael Palin, Terry Gilliam, and Eric Idle, *Life of Brian*, DVD, directed by Terry Jones, Sony Pictures, 2008 [1979].

<sup>2</sup> Department of Agriculture, “An Economic Analysis of Cheese Factory Operations,” 5.

<sup>3</sup> Bureau of Industries, *Annual Report of the Bureau of Industries for the Province of Ontario, 1904* (Toronto, ON: 1905), 44.

<sup>4</sup> Menzies, *By the Labour of Their Hands*, 91.

the earlier factory cheese industry as static and traditional, a characterization I have challenged in the preceding chapters.<sup>5</sup> Although it is true that the changes in Ontario follow, in broad strokes, a pattern seen in dairy regions of the United States, the story on the ground is more complex.<sup>6</sup> Why was ‘Big Dairy’ able to encroach on the milk supply of cheese factories so successfully? How, too, were these changes perceived, adopted, and challenged by farmers, makers, and the state? In this chapter, I argue that the rural cheese industry and its environment—the dairy zone—inadvertently generated the conditions out of which emerging dairy agribusiness (Big Dairy) was able to successfully accumulate capital after the First World War.<sup>7</sup>

In order to better understand the relationship between the decline of the rural cheese industry and the rise of Big Dairy, I turn to the work of Marxist geographer Don Mitchell. According to Mitchell, the primary purpose of landscape in a capitalist system is “either to directly realize value (make money), or to establish the conditions under which value can be realized.”<sup>8</sup> But as he explains elsewhere, the relationship between

<sup>5</sup> For example, see Cartwright, “Cheese Factories in Southwestern Ontario”; Lawr, “The Development of Ontario Farming,” 249; Menzies, *By the Labour of Their Hands*, 116–124; and Reeds, “Agricultural Regions of Southern Ontario,” 265–266. For an example from the popular press, see Harry Theobald, “Expanding Dairy Firms Snuffed Out Cheese Plants,” *Peterborough Examiner*, 29 June 1948, who described the transition from cheese manufacturing to highly industrialized dairying in the following terms: “Eclipse of the cheese industry in this district was a result of the gradual development of the modern dairies with increased consumption of milk and butter.”

<sup>6</sup> A broad overview of the ‘migration’ of cheese production in the United States (with brief mention of Canada) is provided by Durand Jr., “The Migration of Cheese Manufacture,” 263–282. DuPuis, *Nature’s Perfect Food*, 144–182, offers a more complex story about the changing shape of New York’s dairy zone in the early twentieth century.

<sup>7</sup> I use the term ‘Big Dairy’ as a convenient shorthand for the collection of emerging corporate dairy processors and distributors emerging in the twentieth century, such as Borden’s, Kraft, and others. Many of these companies were U.S. based, though not all. The phrase is also a play on the language used by the United Farmers of Ontario (UFO), who often juxtaposed the farming class and ‘Big Business.’ I discuss the UFO in greater detail below.

<sup>8</sup> Don Mitchell, “New Axioms for Reading the Landscape,” 35. Mitchell has put his seven ‘axioms’ for analyzing landscapes to work in subsequent analyses of California’s migrant labour system in the post-

capitalism—always a dynamic process—and landscape (or environment) is contradictory, because landscapes constrain the possibilities for future development as much as they generate growth. When capital encounters an existing environment, it must compel further productivity from it (from workers, paid and unpaid, as well as extra-human resources), without transforming the environment in ways that might undermine or disrupt the accumulation of profit, such as creating significant worker unrest or destroying the fertility of the soil.<sup>9</sup> Capital does not do this alone: Mitchell emphasizes how state policy, knowledge production, techno-scientific developments, and other ‘extra-economic’ factors are all integral for securing capital’s continued growth.<sup>10</sup> One especially important factor for the success of Big Dairy in Ontario was the liberal character of the preexisting cheese industry. Even though the influence of the dairy zone vision was waning in the early twentieth century, the continued faith amongst many rural Ontarians (and the state) in self-improvement and maintaining class harmony helped minimize any organized, collective resistance to the changes that Big Dairy wrought, most notably its transformation of dairy farmers from owners and manufacturers of a value-added product—cheese—to mere suppliers of a raw material.

WWII period. See Mitchell, “Labour’s Geography and Geography’s Labour,” 219–233; and Mitchell, *They Saved the Crops*.

<sup>9</sup> Mitchell, “Labour’s Geography and Geography’s Labour.”

<sup>10</sup> For instance, in *They Saved the Crops*, Mitchell shows that California’s large growers ultimately achieved this balance by lobbying the state to preserve a subservient, migrant labour force that could be made to appear (and disappear) in specific parts of the state at particular times, so as not to interrupt the continual transformation of land into commodities and profit.

*Urban Dairies, Rural Creameries, and Industrial Dairy Processors before the First World War*

Urban dairies, rural creameries, and industrial dairy processors were a marginal but growing presence in Ontario before the First World War. In the case of creamery butter production, it was not for lack of trying. As early as the 1880s, reformers had encouraged the transfer of butter production from home dairies, which remained under the management of farm women, to off-farm creameries, much as they did with cheese in the 1860s. However, their progress on this front was slower than anticipated, due to Canada's reputation for low quality butter on the export market (which reformers blamed, probably excessively, on the reputation of butter produced by women in home dairies), the cost and difficulty of obtaining enough cream, and the continued importance of butter production to rural women.<sup>11</sup> By the start of the First World War, there were just 167 creameries in Ontario, while 159 cheese factories had installed butter plants for manufacturing butter in the off-season.<sup>12</sup> The vast majority of butter produced in Ontario was still made by women in home dairies, often in the winter, after farmers stopped sending milk to cheese factories.<sup>13</sup> In the early twentieth century, the annual volume of creamery butter produced in Ontario began to climb, from approximately 7.5 million pounds in 1900 to more than 37 million by 1920.<sup>14</sup> However, Marvin McNinnis has shown

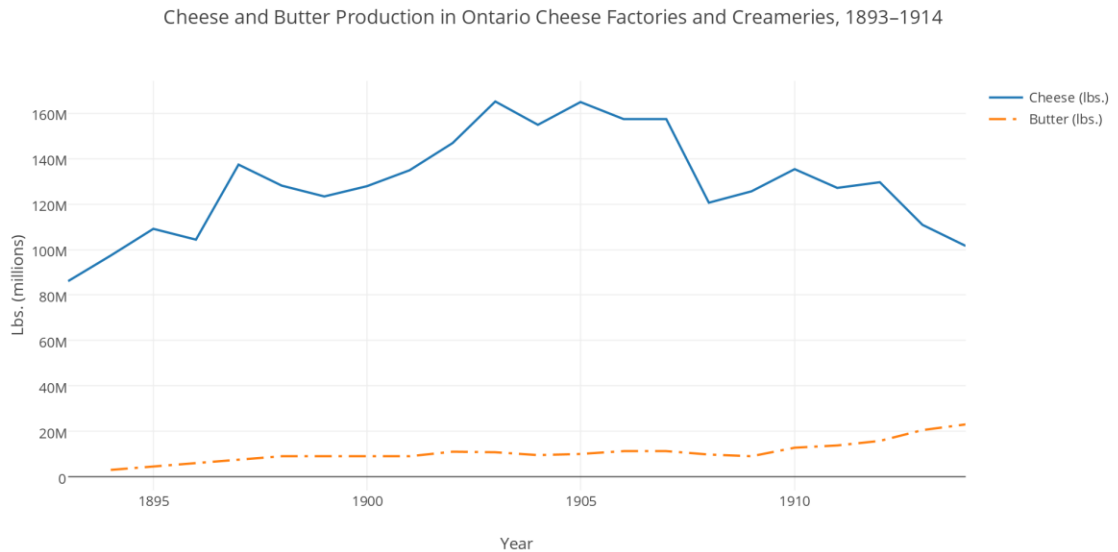
<sup>11</sup> Derry, "Gender Conflicts in Dairying," 31–45; Haslett, "Factors," 110–133; Jones, *History of Agriculture in Ontario*, 263; and Ruddick et al., *The Dairy Industry in Canada*, 37–40.

<sup>12</sup> Ontario Department of Agriculture, *Annual Report of the Bureau of Industries for the Province of Ontario 1915* (Toronto, ON: 1916), 45–46. However, on farm butter production continued to be an extremely important part of the rural economy.

<sup>13</sup> Derry, "Gender Conflicts in Dairying," 31.

<sup>14</sup> Ruddick et al., *The Dairy Industry in Canada*, Table II, 274.

that relatively little of this growth came at the expense of the cheese industry before the First World War, despite contemporary claims to the contrary.<sup>15</sup>



**Figure 11.** Cheese and butter production in Ontario cheese factories and creameries, 1893–1914. (Department of Agriculture, *Annual Reports of the Ontario Bureau of Industries*, 1893–1914.)

Large urban dairies opened in Toronto, Hamilton, and other urban centres began to serve expanding consumer markets with fresh, ‘pure’ milk around the turn of the twentieth century.<sup>16</sup> Their effect on the rural dairy zone was initially limited since they sourced their supply from specific farms in close proximity to urban boundaries, where

<sup>15</sup> McInnis, “The Declination of Canada’s Cheese and Bacon Export Industries,” 11–12.

<sup>16</sup> Drummond, *Progress without Planning*, 131. There is a growing literature on the technological, social, and political aspects of securing clean milk for the fluid milk industry in Canada. See Catherine Carstairs, Paige Schell, and Sheilagh Quaile, “Making the ‘Perfect Food’ Safe: The Milk Pasteurization Debate,” in *Food Promotion, Consumption & Controversy: How Canadians Communicate VI*, edited by Charlene Elliott (Edmonton, AB: Athabasca University Press, 2016), 163–184; Andrew Ebejer, “‘Milking’ the Consumer? Consumer Dissatisfaction and Regulatory Intervention in the Ontario Milk Industry during the Great Depression,” *Ontario History* 102, no. 1 (2010): 20–39; and Jenkins, “The Naturalizing Myth of Pure Milk,” 86–105.

cheese factories were already relatively scarce. For instance, the Pure Milk Company in Hamilton (formed in 1902) distributed just 400 gallons of fresh milk a day in its first year of operations, while the City Dairy in Toronto drew much of its supply from a single farm owned by Walter Massey (the Dentonia Park Farm) on the outskirts of the city until 1913.<sup>17</sup>

Meanwhile, factories for the production of condensed milk, evaporated milk, milk powder and casein emerged and expanded. Ontario's first condensed milk manufacturer began production in Aylmer in 1893.<sup>18</sup> The first milk powder plant in Canada—Canadian Milk Products Ltd.—opened in 1904 at the former Brownsville Cheese Factory, one of the oldest cheese factories in the province.<sup>19</sup> Casein, a milk protein, was produced as an industrial input rather than a food commodity. Kendra Smith-Howard notes that it enthralled 'chemurgists' in the early twentieth century because of its possibilities for paper, plastic, and fabric manufacture.<sup>20</sup> When dairy farmers in eastern Ontario began to

<sup>17</sup> Drummond, *Progress without Planning*, 131; and "Hamilton Served By Pure Milk Co. Over Long Span," *Financial Post*, 16 October 1930.

<sup>18</sup> Condensed and evaporated milk are similar products (the former includes sugar while the latter is unsweetened) that involve the concentration of milk into a thicker, more stable form that is subsequently canned. The technology for condensed and evaporated milk was first commercialized in the 1850s by Gail Borden Jr., who produced condensed milk for soldiers during the U.S. Civil War. Canadian reformers were aware of condensed milk as early as the 1860s, but it was not until 1883 that Canada had its first condensed milk factory, located in Truro, Nova Scotia. See Valenze, *Milk*, 179–187; Joe B. Frantz, *Gail Borden: Dairyman to a Nation* (Norman, OK: University of Oklahoma Press, 1951); CDA, *1869 and 1870*, 23–24.

<sup>19</sup> Milk powder is made by evaporating milk until no moisture remains, but it is generally reduced from skimmed rather than whole milk. There were numerous attempts in Europe and North America to perfect the process of converting milk into powder during the nineteenth century, but progress was slow. Canadian Milk Products Ltd. was financed by a prominent Boston lawyer named Benjamin Gould, who purchased the Brownsville Cheese factory from Ebenezer Agur, its former proprietor, and kept him on as the plant manager. Gould had to import much of the initial equipment from Scotland, but changed the system in 1908 when he adopted the Merrell-Soule process of manufacturing milk powder. See "The Powdered Milk Industry of Ontario," unpublished manuscript, Brownsville Milk Powder collection, University of Guelph Archives, Ontario.

<sup>20</sup> Smith-Howard, *Pure and Modern Milk*, 71–75, notes that it took an average of thirty-three pounds of skim milk to produce a single pound of casein.

ship whole cream to U.S. producers in the late 1900s—disappointed as they were with the returns from cheesemaking—cream distributors used the skim milk by-product to produce casein.<sup>21</sup>

Unlike fluid milk distributors, who based their operations in large towns and cities, condenseries and powder manufacturers tended to locate their plants in the heart of rural cheese producing districts. The competition for milk between cheese factories and condenseries stemmed from the latter's need for large volumes of milk while minimizing the cost of its transportation in raw form. Condenseries and milk powder plants were typically organized on a larger basis than most cheese factories and were more capital intensive, so securing a regular supply of sufficient milk was a priority.<sup>22</sup> Regions where dairy farmers had expanded and increased the productivity of their herds through CTAs and scientific farm management were desirable to multi-product plants because they were more likely to obtain a high volume of milk throughout the year. Cheese factories' proximity to rail transportation was another factor that appealed to multi-product processors, who relied heavily on rail to move their products to markets. They also required clean, high quality milk, which the cheese industry had spent the past half a

<sup>21</sup> These factories would receive the whole milk from farmers, separate the cream to send to the U.S., and use the skim milk to produce casein, although the returns they received for the latter were minimal. Ruddick clarified in his testimony to the Standing Committee that these companies only received between 6 and 10 cents per lb. of dry casein, and that they likely made the bulk of their profits through the shipping of cream. See Ruddick et al., *The Dairy Industry in Canada*, 75; and Ruddick, "Standing Committee," 110.

<sup>22</sup> To get a sense of the difference in scale between a condenser and an average cheese factory, consider that in August 1931, the Borden Company's Norwich plant (see Figure 12) received 1,548,366 lbs. of milk and consumed 288,590 lbs. of coal, in comparison to their Burgessville feeder station—a former cheese factory—which received 460,933 lbs. of milk and used just 9,300 lbs. of coal during the same period. Monthly Coal and Milk Reports, Loose Papers in File, Borden's Fonds, 2007.048, Norwich & District Museum and Archives, Norwich, ON.



century working to produce through education, instruction, and inspection. While there were still many problems with the cleanliness and quality of milk, it made sense for processors to draw milk from farmers already familiar with best practices in clean milking, cooling milk, and milk testing.<sup>23</sup> Reformers and the state, in their attempts to overcome the challenges of the cheese industry, had inadvertently generated the socio-ecological conditions that made southern Ontario a desirable place for Big Dairy to invest in. The global expert on condensed milk and powder manufacture in the early twentieth century, Otto Hunziker, put it bluntly: “The presence of whole milk creameries and cheese factories renders a locality most attractive for the establishment of milk condenseries.”<sup>24</sup>

Condensed milk production grew faster in Ontario than either milk powder or casein manufacturing, especially as U.S.-based companies began to expand their operations northward. The Borden Company (then the New York Condensed Milk Company) made its first foray into Canada by purchasing the St. Charles Condensing Company in Ingersoll around 1900. In 1908 they built a second plant in Tillsonburg for the purpose of producing condensed and evaporated milk, before adding a third in Norwich in 1913 (see Figure 12).<sup>25</sup> The majority of condenseries were located in southwestern Ontario, but a few opened along the Upper St. Lawrence corridor. For instance, a condenser in Dundas County was receiving 12,000 lbs. of milk per day in

<sup>23</sup> Large processors sought to minimize these problems further using capital intensive clarifying and pasteurizing technologies as they became more readily available.

<sup>24</sup> Otto van Hunziker, *Condensed Milk and Milk Power*, 2<sup>nd</sup> ed. (La Grange, IL: 1918), 29.

<sup>25</sup> Moore, *When Cheese was King*, 19, 53.

1912.<sup>26</sup> By 1912, the production of sweetened and unsweetened condensed milks in Ontario had reached approximately 12,000,000 lbs., about one-third of which was exported.<sup>27</sup>

The distinctions between fluid milk and industrial dairy processing began to blur when single-product companies moved into multiple lines of dairy processing and production. For example, cheesemaker turned dairy processor and proprietor George A. Gillespie purchased a creamery in Peterborough in 1910 that was designed solely to produce butter. In 1911 he added an ice cream plant, before installing clarifying and pasteurizing equipment in 1913 for the purpose of distributing fresh, bottled milk. By 1917, the company—then the Peterborough Milk Products Company Ltd.—was also manufacturing condensed milk.<sup>28</sup> Furthermore, as the number and scale of urban fluid milk distributors began to grow, their search for milk expanded, and they drew more farmers with good access to rail transportation away from cheese factories. For instance, dairy farmers in Peterborough County in the interwar years could choose between patronizing local cheese factories or creameries, delivering to condenseries or multi-product plants like Peterborough Milk Products, or even shipping their milk by train to

<sup>26</sup> “Farming in Dundas—Its Troubles and Joys,” *The Globe* (1844–1936), 3 July 1912.

<sup>27</sup> Ruddick et al., *The Dairy Industry of Canada*, 76.

<sup>28</sup> “Tenth Anniversary of Creamery Business from Which Peterboro Milk Products Ltd. Developed,” *Peterborough Examiner*, 20 July 1920, Gillespie Collection NPC 2 (File), George A. Gillespie fonds, Peterborough Museum and Archives, Peterborough, ON.

Toronto.<sup>29</sup> These “multi-product milk plants,” as Donald Cartwright describes them, increased their control over Ontario’s dairy zone during the First World War.<sup>30</sup>



**Figure 12.** The Borden Company’s condenser at Norwich, ca. 1929. Note the difference in scale between this factory and a typical nineteenth century cheese factory, seen in Figure 1. (Poole Family collection, Norwich & District Museum and Archives.)

### *Big Dairy from the First World War to the Great Depression*

War destabilized the rural cheese industry even though it temporarily increased both the demand for cheddar overseas and the prices paid to patrons. The first major

<sup>29</sup> Harry Theobald, “Expanding Dairy Farms Snuffed Out Cheese Plants,” *Peterborough Examiner*, 29 June 1948, Gillespie Collection NPC 2 (File), George A. Gillespie fonds, Peterborough Museum and Archives, Peterborough, ON. Social scientists and historians of dairy (especially U.S. dairying) have long debated whether von Thünen’s theory about the relationship between transportation costs, agricultural, and urbanization explains the distribution of dairy farmers that patronize cheese, butter, or fluid milk markets. Daniel Block and E. Melanie DuPuis argue that an overreliance on the von Thünen model downplays the extent to which milksheds are politically produced. Likewise, the ‘milksheds’ for various dairy markets in Ontario were not determined solely by perishability and transportation costs. See Daniel Block and E. Melanie DuPuis, “Making the Country Work for the City: Von Thünen’s Ideas in Geography, Agricultural Economics and the Sociology of Agriculture,” *American Journal of Economics and Sociology* 60, no. 1 (2001): 79–98; and DuPuis, *Nature’s Perfect Food*, 152–160, 165–180.

<sup>30</sup> Cartwright, “Changes in the Distribution of Cheese Factories,” 230.

setback for cheese producers was a severe nationwide shortage of rennet, which illuminates the extent to which the industry had become dependent on global circuits of trade for this essential input in the cheesemaking process. Most of the rennet used by Ontario cheesemakers was sourced from calves in Europe, especially Bavaria and Russia. The war effectively cut off the supply of calves' stomachs from the territory of the Central Powers, while in Russia the slaughter of calves for rennet was prohibited.<sup>31</sup> The shortage of calves' stomachs drove up the price of extract. Cheesemakers—who were often responsible for buying extract—struggled to purchase enough extract affordably. The price for a gallon of rennet extract soared to nearly \$15, a fair sum considering many makers made only a few hundred dollars per season.<sup>32</sup> If one assumes, following scientific literature from the time, that a gallon of rennet produced roughly 3,000 pounds of cheese, and the average Ontario factory in 1915 produced 126,000 pounds of cheese, then rennet for the season would have cost the average maker upwards of \$600.<sup>33</sup> Dean worried publicly that were the United States to withdraw *its* limited exports of rennet extracts to Canada to serve its own ends, “it would be a body-blow to the Canadian cheese trade.”<sup>34</sup>

<sup>31</sup> DAE0, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1916* [henceforth 1916] (Toronto, ON: 1917), 60.

<sup>32</sup> DAE0, 1916, 60. Ruddick claimed the price per stomach increased nearly five times in parts of Europe.

<sup>33</sup> Harvey M. Merker, “Pepsin Versus Rennet in Cheese Making,” *Journal of Dairy Science* 2, no. 6 (1918): 482, noted that in Wisconsin, a gallon of rennet would produce roughly 3,000 lbs. of cheese. According to the Ontario Department of Agriculture, *Annual Report of the Bureau of Industries for the Province of Ontario 1915* (Toronto, ON: 1916), 45, the average volume of cheese produced per factory was nearly 126,000 lbs. A maker, responsible for supplying rennet to a factory of that size, would thus require more than three dozen gallons of rennet extract—a significant cost.

<sup>34</sup> DAE0, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1915* [henceforth 1915] (Toronto, ON: 1916), 49.

Makers turned to the patrons for increases in their wages or the rate of manufacture to cover climbing costs. In 1915, the maker at East Zorra & Blandford Cheese Manufacturing Company in Oxford County asked the board of directors for an additional 5 cents per 100 lbs. of cheese manufactured for as long as the price of rennet remained above average.<sup>35</sup> Similarly, the maker at Blanshard and Nissouri Cheese and Butter Company, also in Oxford, reported to the board on March 15<sup>th</sup>, 1916, that he could not continue producing cheese at 88 cents per 100 lbs. “on account of the raise on price of Boxes and rennet,” and managed to negotiate a temporary raise to 92 cents.<sup>36</sup> At the same time, makers were compelled to economize on rennet whenever possible, which threatened the quality of cheese produced.<sup>37</sup>

The Dairy Commissioner’s office pursued two strategies for easing the shortage and its effects on local cheese manufacturers. In the short term, Ruddick encouraged makers to return to the practice of producing their own, homemade rennet extracts using local calves’ stomachs, surely a desperate act given the reformers’ active support for *eradicating* that habit in the 1870s and 1880s. During the war, they published a series of bulletins and newspaper articles with instructions for farmers and butchers about how to save the organ and explanations for makers on how to create their own extracts. That they had to do so was telling: the practice was so uncommon in Ontario by the 1910s the

<sup>35</sup> Minutes of the Board of Directors, 22 September 1915, Minute Book 1897–1922, East Zorra and Blandford Cheese Manufacturing Company collection, County of Oxford Archives, Woodstock, ON.

<sup>36</sup> Board of Director minutes 15 & 16 March 1916, Minute Book 1891–1929, Box 1, Blanshard and Nissouri Cheese & Butter Company collection, University of Guelph Archives, Ontario. Only a year later Murphy was making for \$1.35 per hundred pounds, which highlights how dramatically costs rose during the war.

<sup>37</sup> Dean discussed this risk at the convention of the DAEO, 1915, 49.

bulletins called it “practically a lost art.”<sup>38</sup> The Commissioner’s second strategy was to find a suitable, affordable substitute for rennet lest the shortage continue. Pepsin—an enzyme present in the digestive system of pigs and humans—was the obvious choice for further experimentation given its partial success as a coagulant in former cheese experiments at the OAC.<sup>39</sup> In 1916, scientists at the OAC and Finch Dairy Station, the Dominion’s experimental cheese factory, worked together to test and source pepsin. Pepsin had some clear disadvantages—it was more labour intensive to prepare and did not always dissolve well in milk, plus it allowed too much fat to drain off in the whey—but it appeared to be an adequate, or at least tolerable, substitute in the midst of a crisis.<sup>40</sup> The Department of Agriculture secured a large supply of one particular brand of pepsin and began offering it to cheesemakers at cost during the 1916 season. They cautioned makers against sourcing it elsewhere, since commercial brands varied significantly in their strength.<sup>41</sup> By 1917, the Dairy Commissioner’s office estimated that more than eight hundred factories across Ontario and Quebec had begun using pepsin in full or in part to continue producing cheese, while Canadian farmers and butchers reportedly saved at least 100,000 rennets for the local manufacture of extract.<sup>42</sup> Together these strategies managed to avoid a more serious crisis in rennet, but for patrons and makers already nervous about

<sup>38</sup> Ruddick, “The Probable Scarcity of Rennet for the Manufacture of Cheese with Some Directions for Securing a Supply,” Dairy and Cold Storage Commissioner, Circular 17 (Ottawa, ON: Department of Agriculture, 1916), 1.

<sup>39</sup> Merker, “Pepsin versus Rennet,” 483.

<sup>40</sup> DAEO, 1916, 55–58; and DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1916* [hereafter 1916] (Toronto, ON: 1917), 112–114.

<sup>41</sup> Ruddick, “Further Notes on the Use of Pepsin and Other Substitutes for Rennet in the Manufacture of Cheese,” Office of the Dairy Commissioner, Circular No. 21 (Ottawa, ON: Department of Agriculture, 1917), 3.

<sup>42</sup> Ruddick, “Further Notes on the Use of Pepsin,” 4; and “Famine in Tin[,] Dairy Supplies,” *The Globe* (1844–1936), 18 January 1918.

the long term prospects of rural cheese manufacturing, the shortage was yet one more episode of instability in an industry that had promised continued rural prosperity.<sup>43</sup>

On the other hand, the demand for cheese increased in the early years of the war, which drove up prices. Between 1908 and 1913, prices had increased (but unsteadily) between an average of 10.9 and 12.5 cents a pound. The provincial average in 1914 jumped to 13.4 cents, and again to 15.1 in 1915.<sup>44</sup> An article in *The Globe* in 1915 reported that farmers in Perth County were selling cheese at 15 and 16 cents, the highest price they had received in years.<sup>45</sup> However, in 1917, the federal government formed the Dairy Produce Commission of Canada to manage the marketing of dairy products during the war. That season they negotiated an agreement with the British government to sell all of Canada's exportable surplus of cheese to the UK at fixed prices ranging from 20  $\frac{3}{4}$  cents per lb. of cheese for 'third grade' goods up to 21  $\frac{3}{4}$  for first grade. The British navy took on the responsibility for shipping it across the Atlantic. The response from some farmers, particularly in western Ontario, was swift. They criticized the choice to grade cheese in Montreal (an inaccurate claim, since the government inspectors were simply meant to confirm the quality of the grades chosen by the buyers in western Ontario), but

<sup>43</sup> After the war, most makers returned to using their preferred rennet extracts, but the brief crisis in supply had exposed the enormous vulnerability of the Ontario industry's position in an increasingly globalized food system. Chr. Hansen—the world's first and largest industrial rennet producer (chapter 2)—used the shortage as an opportunity to expand its production in Canada by opening a laboratory in Toronto after the war. Meanwhile, the Ontario researchers' work on pepsin also (somewhat inadvertently) helped jumpstart the process of refining laboratory-produced rennet substitutes, so that today, most North American cheesemakers—'artisanal' or otherwise—use rennet sourced from fungi, plants, or ones that are genetically engineered. On current rennet practices, see Tunick, *The Science of Cheese*, 34.

<sup>44</sup> Ontario Department of Agriculture, *Annual Report of the Bureau of Industries for the Province of Ontario 1911* (Toronto, ON: 1912), 45; and Ontario Department of Agriculture, *Bureau of Industries...1915*, 45.

<sup>45</sup> "Farmers of Perth Wallow in Wealth," *The Globe* (1844–1936), 20 July 1915.

they were particularly angered by the lack of comparable constraints on condensed milk and milk powder manufacturers, who were free to sell their goods at whatever price they could get, which allowed them to pay farmers a higher rate for their milk than patrons could expect through the sale of cheese.<sup>46</sup> Ruddick insisted at the DAEO convention in 1918 that prices were not fixed—“if someone can get cheese to the UK somehow, and pay for the shipping, and can get a higher price, they’re permitted to,” he claimed, knowing full well that was nearly impossible—and explained that enacting a similar agreement for condensed milk and milk powder was too complex since, unlike with cheese, the manufacturers exported their products to a greater number of countries.<sup>47</sup>

If patrons were angry about advantages that multi-product plants had over cheese factories during the war, many nevertheless jumped at the chance to divert their milk to a higher bidder, which reflects both the precarious position of cheese manufacturing and the willingness of many farmers to respond to difficulties in the industry in individualized ways.<sup>48</sup> The high demand for condensed milk during the war, especially to fill military contracts, meant condenseries could afford to draw many patrons away from cheese factories by paying them high prices for their milk, which destabilized not just the cheese industry, but even domestic fluid milk markets.<sup>49</sup> One factory owner complained at the

<sup>46</sup> DAEO, 1917, 38.

<sup>47</sup> “Cheese Factories and Milk Condenseries,” *Farm and Dairy and Rural Home*, 20 September 1917. The following year, the Commission attempted to quell some of the volatility that the 1917 agreement caused in domestic milk markets by extending the agreement to include surplus butter and condensed milk. See Roy C. Barnes, “The Rise of Corporatist Regulation in the English and Canadian Dairy Industries,” *Social Science History* 25, no. 3 (2001): 392.

<sup>48</sup> The cost of producing milk had increased steadily during the war, to the point that dairy farmers worried that they would be unable to produce milk at a profit in 1918 if trends continued. See “Cheese Men are Millions Ahead...Dairymen Want More,” *The Globe (1844–1936)*, 12 January 1918.

<sup>49</sup> T.A. Crerar, *Report of the Canada Food Board February 11 – December 31, 1918* (Ottawa, ON: The Board, 1919), 14, accessed 26 October 2016 at [http://eco.canadiana.ca/view/oocihm.9\\_89650](http://eco.canadiana.ca/view/oocihm.9_89650). Some



DAWO convention in early 1918 that he had lost seven or eight patrons the previous season since the nearby milk powder factory could pay nearly a dollar more per hundredweight of milk than his patrons could expect from the sale of cheese. “I could not sustain the loss involved if like conditions continued another year,” he warned.<sup>50</sup> *Farm and Dairy and Rural Home* reported that at least nine cheese factories in Dundas County closed during 1917, unable to compete with the Maple Leaf Condensed Milk Company (Nestlé) operating in the village of Chesterville. Those who remained feared the company’s plan to double its output the following season.<sup>51</sup> The Borden Company could barely keep up with demand by the middle of the war; its plants worked “at capacity” to produce an average of 25,000 to 50,000 cases of condensed milk per month by 1916.<sup>52</sup> In the eastern Ontario community of Smiths Falls (located between Brockville and Ottawa in Lanark County), a Philadelphia-based manufacturer expanded its “modest” condensed milk outfit during the war to fill large contracts for condensed milk in China, driving nearly all the cheese factories within a twenty-five mile radius out of business.<sup>53</sup> A letter to the editors of *Farm and Dairy and Rural Home* warned that unless the “powers that

cheese factory boards of directors even discussed how to prohibit patrons from leaving to send their milk elsewhere, such as the United Empire Loyalist Cheese and Butter Company near Kingston. See Minutes of the Board of Directors, June 1914, Minute Books, with Accounts, June 1897–December 1915, MF 2124, United Empire Loyalist Cheese Factory Records, Queen’s University Archives, Kingston, ON.

<sup>50</sup> “Famine in Tin Dairy Supplies; Rennet in Very Much Larger Volume than Last Year; Control of Condensers; This May be Effected by Co-operative Buying for Allied Governments,” *The Globe* (1844–1936), 18 January 1918.

<sup>51</sup> “Dairy Progress in Eastern Ontario,” *Farm and Dairy and Rural Home*, 13 September 1917. Similarly, see “Milk Condenseries vs. Cheese Factories,” *Farm and Dairy and Rural Home*, 13 September 1917.

<sup>52</sup> “Borden Co. Makes Half Dozen Brands in Four Factories,” *Financial Post* 16 October 1930. The retrospective article detailed many of the Borden Company’s moves in the 1920s. Edward Moore notes that in the earliest part of the war Borden’s actually overproduced condensed milk, forcing the Norwich plant to briefly slow its operations and distribute milk back to some cheese factories. Moore, *When Cheese Was King*, 54.

<sup>53</sup> “The Canadian Dairy Industry Has Expanded,” *The Globe* (1844–1936), 2 January 1918.

be” put cheesemaking and condensed milk manufacturing on even footing, “there will be a number of idle cheese factories in Eastern Canada” in 1918.<sup>54</sup> The chief instructor for eastern Ontario, George Publow, reported that eastern Ontario cheese factories lost 570 patrons between 1917 and 1918 alone.<sup>55</sup>

Big Dairy also employed strategies to secure the milk of whole companies, rather than persuading individual farmers to divert their milk. Some urban dairies and multi-product processors proposed buying cheese factories’ entire milk supply on a contractual basis, especially during the winter, an occasional pre-war practice that expanded during the conflict. In these arrangements, cheesemakers would work reduced hours at their factories in the winter months receiving milk and either shipping it whole, or separating and shipping just the cream. The Excelsior Cheese Factory near Napanee in eastern Ontario separated cream and sold it to whichever urban creamery would offer them the best deal: Toronto Creamery in 1913, Belleville Creamery in 1914, and the St. Lawrence Creamery in 1917.<sup>56</sup> In December 1921, the Bowes Company Ltd. (a food processor that produced ice cream, canned fruit, and other goods) approached the New Lawson Cheese Company in Oxford County about purchasing their winter cream at .45 cents per lb. of butterfat, enlisting their regular cheesemaker to separate the milk at the factory and ship the cream to the nearest train station.<sup>57</sup> These arrangements essentially converted cheese

<sup>54</sup> Letter to the Editor, *Farm and Dairy and Rural Home*, 20 December 1917.

<sup>55</sup> “High Quality of 1918 Cheese; But Fewer Patrons Supplying Factories in Eastern Ontario...” *The Globe* (1844–1936), 11 January 1919.

<sup>56</sup> Excelsior Cheese Company Annual Statements (1913, 1914, 1917), File 04-260, Collections of Miscellany [Box], Lennox and Addington Museum and Archives, Napanee, ON.

<sup>57</sup> Minutes of the Board of Directors, 5 December 1921, Minute Book (1921–1946), Account Books, New Lawson Cheese Factory Records, Norwich & District Museum and Archives, Norwich, ON.

factories into temporary ‘receiving’ or ‘feeder’ stations for other processors, a practice that continued to expand in subsequent decades.<sup>58</sup> Relying on cheese factories as receiving stations allowed Big Dairy to source milk from a widespread area without disrupting farmers’ regular patterns of work. These practices are a clear example of how large processors used the preexisting dairy zone system to their benefit.

Big Dairy also began to purchase factories (and implicitly, the milk supplied to those enterprises), effectively turning them into permanent feeder stations for their larger plants.<sup>59</sup> In 1916, the milk powder producer Canadian Milk Products (CMP) set their sights on the large and popular Hickson Cheese and Butter factory a few miles north of Woodstock as an ideal location for expanding their production.<sup>60</sup> When the factory’s patrons refused to sell, CMP owner S.B. Trainer threatened to build a competing plant within a mile or two of the factory. Whether CMP would have carried through with its threat is unknown, but it worked: the patrons reluctantly sold the factory rather than engaging in a more protracted struggle over the local milk supply.<sup>61</sup> By 1920, CMP owned at least five such stations to supply its four milk powder plants, which extended the company’s reach from Brantford in the east to London in the west.<sup>62</sup>

The Borden Company used multiple tactics in its quest to secure the milk sent to the Burgessville Cheese and Butter Factory. In 1907, cheesemaker John Mac Hoover

<sup>58</sup> Cartwright, “Changes in the Distribution,” 231.

<sup>59</sup> Cartwright, *Ibid.*

<sup>60</sup> Hickson probably appealed to CMP because of its large capacity and relatively modern equipment since the patrons financed an addition onto the original factory in 1898.

<sup>61</sup> Moore, *When Cheese was King*, 119.

<sup>62</sup> “Canadian Milk Products Deny Sale of Plant,” *The Globe* (1844–1936), 12 January 1921. For descriptions of other receiving stations, see “City Dairy Sales were the Greatest in Company’s Career,” *The Globe* (1866–1936), 31 January 1928.

purchased the factory from the patrons who had been operating it as a joint-stock company since the 1880s.<sup>63</sup> Hoover managed Burgessville as a proprietary enterprise for the next seven years, proudly making note of its successes in his diary. In September 1911 he wrote, “We sold cheese during the month of Sept. for 14<sup>13/16</sup> ¢ per lb the highest I ever had cheese to sell for.”<sup>64</sup> Yet in late 1914, the Borden Company contacted him about a contract to produce cheese for them. The arrangement involved using Hoover’s facilities to divert 20,000 lbs. of excess milk that the Borden condenser at Norwich was receiving daily. He agreed to manufacture Borden’s milk into cheese until April 1<sup>st</sup> of the following year, when the factory reverted to its normal cheesemaking operations.<sup>65</sup> It is unclear if this arrangement continued the following winter, but in early 1916, as demand for condensed milk continued to grow, Borden’s approached him once again with an offer to buy the factory. Hoover agreed to the deal, but admitted in his diary that it “was not very satisfactory to the patrons.”<sup>66</sup> The *Globe*, however, framed the transaction in a positive light, noting that, “the investment in Burgessville has not been destroyed...as the building is used as a receiving station for the condenser.”<sup>67</sup>

<sup>63</sup> Diary entry, 3 January 1907, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>64</sup> Diary entry, September 1911, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON. Note that Hoover sold cheese that belonged to the patrons, not him, unless he was also supplying milk to his own factory (which he may have done).

<sup>65</sup> Diary entry, 18 November 1914, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>66</sup> Diary entry, 28 January 1916, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>67</sup> “Where 130 Farmers Are Using Electric Power; 140,000 Lbs. Milk Delivered at One Factory in One Day....” *The Globe* (1844–1936), 6 June 1917.

What the *Globe* article failed to mention, but Hoover's diary alludes to, is that industrial dairy processors like Borden's were radically altering the organizational basis of the nineteenth-century factory system even as they worked to preserve certain elements of the environment to their benefit (such as the daily rhythm of moving milk from farms to factories). Unlike in the older factory system, where farmers retained ownership over the cheese produced, industrial dairy processors typically purchased the milk from farmers outright, which reduced their role to mere suppliers. This new arrangement may have appealed to patrons of proprietary factories and 'outside patrons' of joint-stock companies—those who shipped milk to factories but did not have any stake in the rest of the business—who might have preferred the clarity of knowing how much they would be paid for their milk upfront. But others worried that these new arrangements would put farmers in a less secure position since they would lose control over marketing and production decisions, as well as their right to by-products like whey, which they had formerly coveted as livestock feed for pigs or young calves.<sup>68</sup>

At the heart of these debates was the continued feasibility of the nineteenth-century vision of alternative rural modernity. In addition to problems of milk, patron-maker relations, and the disproportionate power of cheese buyers, rural producers now had to contend with direct competition from large, organized capital that set its sights on the productive landscape of Ontario's dairy zone. Could rural communities realistically forge an alternative model of capitalist economic growth, social harmony, and soil conservation based on craft cheesemaking? The answer amongst many state-based dairy

<sup>68</sup> For an example of this worry publicly expressed, see DAEO, 1917, 49.

experts, patrons, and makers was increasingly no. Their former faith in high quality, craft cheese manufacturing as the basis for rural progress and their ability to manage capitalism through liberal cooperation was giving way to an understanding of capitalism that naturalized its upheavals. If dairymen and makers could not “keep pace” with the “great and rapid changes” underway, the success of rural society itself was at stake.<sup>69</sup> The dominant response amongst farmers, cheesemakers, and the state to the intrusion of large dairy processors during this period was to interpret and rationalize the rise of Big Dairy as an unavoidable transition best navigated through compromise, continued self-improvement and ongoing class cooperation rather than antagonism. This is a critical point: dairy experts and state officials began to embrace a dynamic, unpredictable dairy industry as the natural state of affairs while trying to maintain its underlying liberal order. This ‘liberal resignation,’ we might call it, contributed to Big Dairy’s ascendancy by diffusing collective, organized resistance to the processors’ consolidation over the dairy zone and naturalizing the shift from rural cheese manufacturing to large-scale, industrial dairy processing.

The strongest expression of this liberal resignation came from state and quasi-state institutions. Dairy Commissioner J.A. Ruddick framed the development of new outlets for dairy farmers’ milk as unavoidable and ultimately progressive in one speech to the DAEO during the war. “[I]f the demand for condensed milk is to be a permanent one,” he explained, “then the passing of the cheese factory in certain districts is a matter of

<sup>69</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1912* [henceforth 1912] (Toronto, ON: 1913), 7.

evolution and is bound to be upsetting to some interests as evolution always is. The manufacture of cheese is only a means to an end, that end being the profitable use of milk.”<sup>70</sup> Similarly, in 1917, Dean argued in a letter to *Farm and Dairy and Rural Home* that, “While it is advisable to maintain the cheese industry of Canada as a ‘safety-valve’ in the dairy business, we may reasonably expect a marked change in methods of manufacturing and utilizing milk as human food, in the near future.”<sup>71</sup> These statements reflected how much the reformers’ goals had narrowed in respect to cheese, treating it less as the cornerstone of widespread social, economic, and environmental reform than merely one mechanism—and not the preferred one—for wresting profit from cows and the land. Moreover, dairy experts encouraged continued cooperation and harmony between and amongst farmers, makers, and the big processors during this period of change. In a 1920 address to the DAEO meeting in Brockville, Dean likened the dairy industry to “a large tree growing in the fertile lands of the finest farming district in the world,” whose leaves and branches—the various manufacturers, buyers, and sellers—had to make room for one another.<sup>72</sup> Dean, Ruddick, and others began to suggest that the

<sup>70</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1918* [hereafter 1918] (Toronto, ON: 1919), 119.

<sup>71</sup> Letter to the editor, *Farm and Dairy and Rural Home*, 27 September 1917. One factory owner from Stormont County replied to Dean publicly to note his disappointment that “the cheese business has no friends.” In a subsequent letter, Dean backtracked by suggesting his dismissive tone was simply meant to “arouse those interested in the cheese trade by telling them it will not do to go on as we have been doing...it is not advisable for us to be asleep at the dairy switch.” See Letter to the editor, *Farm and Dairy and Rural Home*, 18 October 1917; “Prof. Dean Replies [Letter to the editor],” *Farm and Dairy and Rural Home*, 1 November 1917.

<sup>72</sup> DAEO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1919* [henceforth 1919] (Toronto, ON: 1920), 31–32.

DAWO and DAEO should consider including representatives from the fluid milk trade, condensers, and others at their meetings.<sup>73</sup>

Not everyone agreed that the ascendancy of Big Dairy was the inevitable trajectory for dairying in Ontario. Those wary of the large processors and their effects on rural society found a platform for their frustrations in the United Farmers of Ontario (UFO), a populist farmers' movement formed in 1913 that became the ruling political party in Ontario between 1919 and 1923. The UFO's meteoric rise in the 1910s reflected the extent of farmers' frustrations with a wide range of issues, including tariff policies, inflation, conscription, and the loss of rural youth to cities.<sup>74</sup> It was the primary "organizational vehicle" for farmer dissent and protest during and immediately after the war.<sup>75</sup> There were three branches within the movement: the UFO was the social, educational, and eventually political arm; the United Farm Women of Ontario (UFWO) was the "women's auxiliary"; and the United Farmers Cooperative Company (the UFCC)—an umbrella organization that supported the establishment of many different kinds of cooperatives—was its economic manifestation.<sup>76</sup>

Yet even supporters of the UFO felt that an alternative vision of rural modernity centered on small cheese factories was no longer viable in the era of "organized capital."

<sup>73</sup> DAEO, 1919, 32; and DAEO, 1912, 26.

<sup>74</sup> Kerry Badgley, *Ringling in the Common Love of Good: The United Farmers of Ontario, 1914–1926* (Montreal, QC: McGill-Queen's University Press, 2000), 52–53, Scholar's Portal e-book edition. UFO membership grew from only a couple thousand people in 1915 to 60,000 by 1920.

<sup>75</sup> Anthony Winson, *The Intimate Commodity: Food and the Development of the Agro-Industrial Complex in Canada* (Toronto, ON: Garamond Press, 1993), 28.

<sup>76</sup> Terry Crowley, "J.J. Morrison and the Transition in Canadian Farm Movements During the Early Twentieth Century," *Agricultural History* 71, no. 3 (Summer, 1997): 337. On UFCC operations in particular, see Badgley, *Ringling in the Common Love of Good*, 142–169. On the UFWO, see Margaret Kechnie, "The United Farm Women of Ontario: Developing a Political Consciousness," *Ontario History*, 77, no. 4 (1985): 267–279.



In a letter to the *Globe* in May 1920, one writer known only by his pen name, ‘Ahmik,’ argued “a radical change in method must be inaugurated” if cheese factory patrons were to resist the spread of condenseries and dairies that represented the interests of ‘Big Business’:

The old plan, under which each cheese factory was a separate unit, is obsolete....That loose and expensive system cannot stand up permanently against the competition of the organized capital in great condensers and great urban milk-distributing companies. A process of consolidation in the cheese industry is bound to go on, and it will be carried out either by Big Business or by Co-operation, with the farmers as the co-operators.<sup>77</sup>

According to ‘Ahmik,’ Ontario’s cheese companies would need to scale up their cooperative efforts to withstand the rise of Big Dairy, and treat one another as allies rather than competitors. In 1919, H.B. Cowan—editor of *Farm and Dairy and Rural Home* and a prominent agrarian populist—attended the DAWO convention in Stratford with a plan for Ontario’s cheesemakers and patrons to scale up their cooperative efforts based on the model of large cooperatives in western Canada.<sup>78</sup> He proposed that groups of nearby factories organize themselves as cooperative unions, with each factory governed by a local committee that would designate a delegate to represent them on the union wide Board of Directors. Each group would benefit from cooperative buying, which would lower their manufacturing costs, as well as cooperative marketing, which would circumvent the speculation of local buyers.<sup>79</sup> The following spring, he was actively trying

<sup>77</sup> “Cheese-Making Coming Back This Season?” *The Globe* (1844–1936), 5 May 1920.

<sup>78</sup> On Cowan’s life as a social reformer and agrarian populist, with particular attention to his work with the Canadian Chamber of Agriculture in the 1930s, see Ian MacPherson, “An Authoritative Voice: the Reorientation of the Canadian Farmers’ Movement, 1935 to 1945,” *Historical Papers* 14, no. 1 (1979): 169–170.

<sup>79</sup> “Cheese-Making Coming Back This Season?” *The Globe* (1844–1936), 5 May 1920. Cowan claimed that “Even by cutting out the middlemen between local factories and Montreal we are justified in

to establish cooperative unions in eastern Ontario, particularly around Belleville and Prince Edward County, where he believed the “conditions” for development “were more favorable than in other parts of the province,” because of the high costs they faced and perhaps because there was less immediate competition from condenseries and other large processors.<sup>80</sup> Later that season, factory patrons in Hastings County discussed Cowan’s proposed model, which suggests his ideas resonated with some dairymen.<sup>81</sup>

Inspired in part by the growing strength of agrarian populism, Ontario cheese patrons became more vocal in their frustration over inflation, competition from condenseries and other processors. In August 1919, more than six hundred dairymen from Ontario and Quebec met in Ottawa to protest the announcement that 20,000 tons of the season’s remaining cheese production would be allocated to the British government at a fixed rate of 25¢ a pound in Montreal and a maximum retail price of 36¢ in England. The group blasted the federal government for coming to an agreement with the British Food Commission “without consulting the Canadian dairymen as to the cost of production,” and accused them of arriving at a price that would ensure a “margin of profit was guaranteed the British retailer, the British wholesaler, the Canadian Exporter, and all other interests concerned except the Canadian producer.” They proposed instead that the price be increased to 28¢ in Montreal to help cover dairy farmers’ rising production

saying that gain of \$100,000 a year can be made on the cheese output for all Ontario,” but it isn’t clear how he arrived at those estimates.

<sup>80</sup> “Cheese-Making Coming Back This Season?” *The Globe* (1844–1936), 5 May 1920. DAWO, *Annual Reports of the Dairymen’s Associations of the Province of Ontario 1918* [hereafter 1918] (Toronto, ON: 1919), 86.

<sup>81</sup> “Co-operative Dairy Proposed in Hastings,” *The Globe* (1844–1936), 28 March 1919.

costs.<sup>82</sup> In a memorandum to the Minister of Finance the following week, Ruddick downplayed the farmers' frustrations, citing his county-level connections who claimed that "the excitement over the price of cheese has subsided" and suggesting that the farmers were "mistaken" in their belief that 25¢ was unfair. "The producers do not realize that the actual market value was between 23 and 24 cents," he noted with some condescension.<sup>83</sup> Nevertheless, Ruddick quietly encouraged the removal of controls on cheese export prices for the following season.<sup>84</sup>

The federal Dairy Branch was not altogether opposed to some of the UFO proposals for scaling up cooperation, but they were concerned about maintaining cooperation between and amongst various members of the dairy industry.<sup>85</sup> Their primary response to the upheaval within the industry was to model best practices for cheese producers at the Finch Dairy Station, rather than address the clear imbalance of power between Big Dairy and the cheese industry. This approach continued the state's history of supporting the cheese industry by education and example more than direct support or economic policy. Finch Station was established in eastern Ontario's Stormont County in 1912 under the management of the Dairy Commissioner's office. Their choice to locate

<sup>82</sup> Text of the Cheese Producers' Protest to the Dominion Government, File 268492, Cheese Commission correspondence, Vol. 1284, RG 17, Library and Archives Canada, Ottawa, ON. To strengthen their case, they drew on the economic surveys (discussed at length in chapter 4) conducted by Prof. A. Leitch and the OAC on the economics of dairy farming in Oxford and Dundas counties.

<sup>83</sup> Further Memorandum for Sir Henry Drayton re: Offer of the British Butter and Cheese Import Committee to Purchase 20,000 tons of Canadian Cheese at 25 cents per pound at Montreal, File 268492, Cheese Commission correspondence, Vol. 1284, RG 17, Library and Archives Canada, Ottawa, ON. Ruddick echoed these frustrations publicly in an address to the DAEO in 1920. See DAEO, 1919, 25–26.

<sup>84</sup> Ruddick to J.H. Grisdale, 23 March 1920, File 271676, Cheese Commission correspondence, Vol. 1284, RG 17, Library and Archives Canada, Ottawa, ON.

<sup>85</sup> I am adopting a similar analysis here to Kerry Badgley, who has argued that the state helped to co-opt the *potentially* radical work of the UFCC by reducing it to an economic institution narrowly concerned with profit. See Badgley, *Ringling in the Common Love of Good*, 2.

the station in an area like Stormont was intentional; the region had excellent access to rail transportation but was characterized by excess competition for milk by numerous small factories. As George H. Barr, Chief of the Dairy Division, put it to the DAEO, they negotiated with two factories that were “cutting each other’s throats” to purchase the “premises and good will” of both, with the expectation that the factories’ former patrons—and other nearby farmers—would patronize the new station once it was constructed.<sup>86</sup> The station’s primary goals included conducting experiments of utility to the cheese and butter industries and demonstrating “the advantages of a well-conducted factory[.]”<sup>87</sup> Finch was managed as a commercial operation in order to deflect any criticism that government demonstration was not relevant to the practical challenges of everyday dairymen and manufacturers. Beginning in 1920, the Dairy Branch experimented with using Finch as a flexible factory capable of responding to the “ruling conditions” within the dairy industry, whether that be high demand from condensers, the fluid milk trade, or export cheese markets. Ruddick explained:

[P]roducers should not be placed in dependence upon any single outlet for their milk. An ideal arrangement might be to have receiving stations, preferably under the control of the producers, equipped to manufacture either butter or cheese and equipped to turn, if necessary, to the manufacture of certain other milk products for which there is a market.<sup>88</sup>

<sup>86</sup> For Barr’s statement, see DAEO, 1912, 39–40. The second quotation, “premises and good will” is drawn from J.A. Ruddick and George A. Barr, “The Finch Dairy Station Report of Progress,” Bulletin No. 55 (Ottawa, ON: Department of Agriculture, 1920), 1. The relationship between Finch Station and the greater community may not have been as rosy as the Report suggests. A memorandum from Deputy Minister of Agriculture J.H. Grisdale to the Deputy Minister of Justice E.L. Newcombe in 1924 suggests that other factories in the vicinity that lost patrons to Finch Station in the early 1920s were upset and may have demanded compensation. The Department of Agriculture requested that the matter of compensation be sent to arbitration. See Memorandum, 10 May 1924, File #833-847 1924, Records of the Department of Justice, RG 13, Vol. 288, Library and Archives Canada, Ottawa, ON.

<sup>87</sup> Ruddick and Barr, “The Finch Dairy Station Report of Progress,” 1. They did experiments on the use of pepsin as a rennet substitute, fuel economy of factories, the losses in weight when making cheese of various sizes, paying for milk by quality, and more. See “The Finch Dairy Station Report of Progress” for a general discussion of their work and findings until 1920.

<sup>88</sup> “Need Not Fear Big Production, States Ruddick,” *The Globe* (1844–1936), 14 January 1921.

In other words, the Dairy Branch was advising patrons to actively organize their factories with flexibility and diversification in mind, including the sale of whole milk or cream to other processors as necessary, but in larger units than the average factory at the time. In areas where cheese factories were under threat from the fluid milk trade or industrial dairy processors, it would be “wiser” to organize along the lines of Finch Station than “trying to fight this competition,” Ruddick advised.<sup>89</sup> While his emphasis was on amalgamation and diversification, he did stress that cooperative ownership of such plants was “preferable,” which highlights the Dairy Branch’s support of cooperation on narrowly liberal, economic grounds.

1920 proved to be another volatile year for dairy farmers, particularly those who had left cheese factories for the condensers and milk powder manufacturers during the war. The demand for condensed and powdered milk slowed as European countries began to rebuild their dairy herds and military contracts came to an end. A memo from Ruddick to Minister of Agriculture S.F. Tolmie in April warned that “Stocks of condensed milk have been accumulating recently, and some difficulty has been found in marketing the input.”<sup>90</sup> By October, a number of condenseries and milk powder factories had curtailed production or diverted milk to cheese factories temporarily. The *Globe* reprinted a letter from Ruddick to the President of the Brockville District Milk & Cream Producers Association on October 2<sup>nd</sup>, reporting that the Borden Company planned to temporarily

<sup>89</sup> “Finch Dairy Station is Fair Investment,” *The Globe* (1844–1936), 9 January 1925.

<sup>90</sup> Memorandum Ruddick to S.F. Tolmie, 17 April 1920, File 255390, Cheese Commission correspondence, Vol. 1284, RG 17, Library and Archives Canada, Ottawa, ON.

halt its Quebec operations in Huntingdon and reduce production at its Ontario plants by twenty per cent for the remainder of the year.<sup>91</sup> The panic amongst dairy farmers who had left cheese factories for the large processors was swift. “Dairymen Begin to Regret Quitting Cheese Industry,” and “Much Confusion is Caused by Closing of Condenseries,” read headlines in the following weeks.<sup>92</sup> CMP tried to quell rumours that it too planned to shut down operations or sell some of its plants.<sup>93</sup> Ruddick—in an apparent reversal of his former stance—chided cheese factory patrons for thinking the demand for milk from multi-product plants would continue unabated after the war.<sup>94</sup> A handful of cheese factories that had gone out of business during the First World War reopened in 1921, and even a few new operations were built.<sup>95</sup>

However, the UFO and its supporters were unable to use the slump in demand for canned and powdered milk to great advantage, which mirrored the movement’s overall inability to translate its groundswell of support into lasting change.<sup>96</sup> There were a few developments: a local branch of the United Dairymen’s Cooperative Company opened in Middleville, near Ottawa, and a number of eastern Ontario cheese factory patrons agreed

<sup>91</sup> “Condensed Milk Output to be Reduced: Object to Reduce Surplus Stock,” *The Globe* (1844–1936), 2 October 1920.

<sup>92</sup> “Dairymen Begin to Regret Quitting Cheese Industry,” *The Globe* (1844–1936), 16 June 1920; Gordon Furrow, “Much Confusion is Caused by Closing of Condenseries,” *The Globe* (1844–1936), 13 October 1920.

<sup>93</sup> “Canadian Milk Products Deny Sale of Plant,” *The Globe* (1844–1936), 12 January 1921; “Doing Best for Patrons,” *The Globe* (1844–1936), 16 November 1920; and “Milk Products Not Shut Down,” *The Globe* (1844–1936), 15 October 1920.

<sup>94</sup> “Need Not Fear Big Production, States Ruddick,” *The Globe* (1844–1936), 14 January 1921; and Ruddick, “The Milk Situation in Ontario,” *Journal of Dairy Science* 4, no. 2 (March 1921): 119–120.

<sup>95</sup> “Ontario’s Cheese Industry is Regaining Lost Ground,” *The Globe* (1844–1936), 13 January 1922.

<sup>96</sup> Badgley, *Ringling in the Common Love of Good*, 81. That said, Anthony Winson notes the movement did secure a handful of important reforms, such as establishing a minimum wage for women and girl workers. See Winson, *The Intimate Commodity*, 28–30.

in the spring of 1920 to market their cheese cooperatively on the recently formed United Dairymen's Marketing Board established in Montreal, but the board ultimately only managed to control a small proportion of the Ontario cheese trade.<sup>97</sup> A further attempt in 1922 to establish a government-run marketing board that would compel all cheese companies to participate failed after it was put to a referendum.<sup>98</sup> Nor did many companies adopt the Finch Station plan as advised by the Dairy Branch. In 1925, after CMP purchased the Finch Dairy Station from the federal government, Ruddick boasted to the press and agricultural groups that the station had done excellent experimental work and functioned as a model, profitable factory, but complained that it "has not, judging from lack of imitation, made as much impression on the industry in Eastern Ontario as was hoped."<sup>99</sup> Echoing the longstanding complaints of reformers who believed that individual effort was to blame, Ruddick felt that cheese factory patrons were willfully resistant to valuable advice and instruction from the state.

Cheese companies that did not pursue amalgamation or scale up their cooperative efforts, often tried to diversify or make their individual factories more efficient instead, but they mostly did so in piecemeal, limited ways. In 1917, "Cheesemaker" suggested to

<sup>97</sup> The Middleville example is from Badgley, *Ring in the Common Love of Good*, 158. See also: "Link Cheese Producers in One Company: Eastern Ontario Dairy Farmers Affiliate with United Co-op," *The Globe (1844–1936)*, 9 April 1920. Drawing on Ruddick, Menzies, *By the Labour of Their Hands*, 89, puts the proportion of the provincial export trade under the marketing board's control at fifteen per cent.

<sup>98</sup> Badgley, *Ring in the Common Love of Good*, 143; and Menzies, *By the Labour of Their Hands*, 89. Heather Menzies attributes the failure of the UFCC referendum to farmers' "fear of 'antagonizing' the powers that be," while Kerry Badgley suggests that state organizations increasingly encouraged cooperatives as economic ventures, while discouraging their more overtly political characteristics, ultimately reducing them to a tool for maintaining farm incomes. Both of these explanations point to how much the state *and* many dairymen treated cooperation as an economic arrangement between property-holding individuals, rather than a radical political cause.

<sup>99</sup> "Tells of Finch Station," *The Globe (1844–1936)*, 9 January 1925.

the readers of *Farm and Dairy and Rural Home* that cheese and butter factories should mimic the condenseries' "businesslike basis," by investing in trucks to haul milk more cheaply, and making sure that hot water did not go to waste.<sup>100</sup> Other companies considered manufacturing additional varieties of cheese. For instance, in the 1920s, Blanshard and Nissouri experimented with producing Stilton, an English blue cheese.<sup>101</sup> Yet the most popular option for diversification was to manufacture butter from whey, the main by-product of cheesemaking, since it made use of the remaining fat remaining in the whey while still allowing farmers to take home the sugary liquid for feed. It was a means of diversifying without seriously disrupting existing cheese factory operations or leaving cheese equipment idle for long periods of time. Whey butter production had been on the rise since the early 1900s, despite the initial discouragement from dairy officials and creameries, who saw whey butter as a threat to the country's domestic and export creamery butter industries, much like margarine. However, its production jumped during and after the war, as cheese companies searched for other profitable avenues.<sup>102</sup> John Snetsinger, proprietor of Sweet Briar Cheese Factory in Cornwall, estimated in 1919 that the province's cheese factories collectively wasted 4.5 million pounds of butter by returning the butterfat to patrons in the whey, "almost \$32 wasted after each ton of the

<sup>100</sup> Letter to the editor, *Farm and Dairy and Rural Home*, 16 November 1917.

<sup>101</sup> Board of Directors minutes, 1 November 1928, Minute Book 1891–1929, Box 1, Blanshard and Nissouri Cheese & Butter Company collection, University of Guelph Archives, Ontario.

<sup>102</sup> For instance, in 1908, the DAEO acknowledged that whey butter production was increasing around Brockville, but clarified that it was not recommended in spite of its potential profitability. See DAEO, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1907* [hereafter 1907] (Toronto, ON: 1908), 14. Few producers appear to have heeded that advice. The chief dairy instructor for eastern Ontario reported to the DAEO in 1910 that the number of factories manufacturing whey butter in eastern Ontario jumped from 63 to 119 in just one year. See DAEO, 1909, 53.



cheese is made. Could any other business succeed under such conditions,” he asked?<sup>103</sup>

The United Empire Loyalist Cheese and Butter Company near Kingston installed a whey separator in 1918, which ended their practice since 1911 of shipping whey to the St. Lawrence Dairy Company.<sup>104</sup> Still, whey separators were not always easily acquired or financed. For instance, the Blanshard and Nissouri Cheese and Butter factory in Oxford County decided to purchase a Sharples whey separator in 1920 for \$875, but struggled to pay for it in a timely manner.<sup>105</sup>

Large dairy processors were able to exploit economies of scope through diversification far more successfully than small cheese factories could. Ontario’s large dairy processors diversified production within individual plants as well as across their entire Canadian operations to insulate themselves from the volatility of demand for particular products. Between 1929 and 1931, the Borden Company produced no fewer than thirteen products between its three Ontario plants, altering the levels of production of each in response to market fluctuations and particular orders (see Table 4). Many of these goods used very similar production methods and were differentiated by size, branding, or the addition of one or two different ingredients, which minimized the cost of retooling

<sup>103</sup> John Snetsinger, quoted in Stiles, *History of the Cornwall Cheese and Butter Board*, 259.

<sup>104</sup> Minutes of the Board of Directors, December 1918, Minute Books, with Accounts, April 1916–December 1922, MF 2125, United Empire Loyalist Cheese Factory Records, Queen’s University Archives, Kingston, ON.

<sup>105</sup> Whey separator account statements & correspondence, 1920, File 7, Box 8: Financial & Contracts and Agreements, Blanshard and Nissouri Cheese & Butter Company collection, University of Guelph Archives, Guelph, ON. They considered replacing their ‘Sharples’ whey separator in 1927 with a more efficient one that would cost them \$890.00, which they planned to finance using the returns from the added whey butter that a more efficient machine would produce, but determined that the expected increase would not make the investment worthwhile. See Board of Director minutes, 24 February 1927, Minute Book 1891–1929, Box 1, Blanshard and Nissouri Cheese & Butter Company collection, University of Guelph Archives, Ontario.

plants for different purposes.<sup>106</sup> Borden's production of Reindeer coffee (a brand they acquired from Nova Scotia's Truro Condensed Milk Company), for example, involved adding coffee to existing condensed milk before the canning process. Borden's was not the only company to pursue this type of production strategy. A preliminary report on the dairy processing industry in 1930 noted that Canadian condensed milk and milk powder plants produced at least fifteen different products, including full fat and condensed skim milk, full fat and skimmed evaporated milk, regular and skim milk powder, cream powder, buttermilk powder, casein, condensed coffee, butter, whey butter, ice cream, fluid milk, fluid cream, and even cheese.<sup>107</sup>

**Table 4.** Goods produced at Borden's multi-product milk plants, 1929–1931.

Norwich plant	Other plants
9% Eagle No. 1 15 oz. cans	Tall Evaporated No. 2 16 oz. cans
8.1% Domestic No. 2 14 oz. cans	Small Evaporated No. 5 6 oz. cans
9.1 % British Eagle No. 2 14 oz. cans	Hotel Evaporated No. 3 32 oz. cans
9% Fresh stock	Reindeer Coffee Large No. 1 14 oz. cans
Large cheese (in lbs.)	Reindeer Coffee Small No. 3 6 oz. cans
	Eagle Export No. 2 14 oz. cans
	Chocolate Malted Milk
	Confectioners' Evaporated gallons

*Source:* Production Reports and Stock Records, 1920–21\* and May 1929–Jan. 1930, Borden's Fonds, 2007.048, Norwich & District Museum & Archives, Norwich, ON.

*Notes:* This list is drawn from Borden's Norwich plant books, which only show what was produced at Norwich and transferred *from* other plants (especially Ingersoll and Tilsonburg) for storage at Norwich. It is possible that the other plants produced an even wider variety of goods than what is listed above.

<sup>106</sup> Alfred Chandler and Takashi Hikino single out Borden's as representative of food and chemical companies that grew through diversification in production and marketing in the early twentieth century. See Alfred Chandler and Takashi Hikino, *Scale and Scope: the Dynamics of Industrial Capitalism* (Cambridge, MA: Belknap Press, 1990), 162.

<sup>107</sup> Dominion Bureau of Statistics, *Preliminary Report of Condensed Milk and Milk Powder Plants, Canada, 1929* (Ottawa, ON: 1930), 2.

\*The book listed in the archival finding aid as 1920–21 appears to actually reflect the stock records from November 1930 to September 1931, since the preprinted date (“192\_”) at the top of each page was crossed out and replaced with threes.

Borden’s and other large dairy processors did not just respond to market conditions; they also shaped them by investing enormous resources to influence and develop consumer demand.<sup>108</sup> A common strategy involved publishing ‘branded’ mass cookbooks aimed at women looking for convenience and safety in food preparation. *Borden’s Eagle Brand Book of Recipes*, published during the Depression, included more than sixty recipes (ranging from custard pie to a cheese and olive salad) using the company’s Eagle Brand of condensed and evaporated milks.<sup>109</sup> Carnation Company, another U.S.-based condensed milk manufacturer that operated in Ontario during the 1920s, employed a strategy common to many food manufacturers at the time by creating a fictional trade character—‘Mary Blake’—to advertise and legitimize its goods. In 1926, the company published a cookbook of Mary Blake’s hundred favourite recipes, geared specifically toward Canadian consumers, which made extensive use of Carnation’s evaporated and condensed milk products manufactured at its Aylmer and Springfield plants in southwestern Ontario.<sup>110</sup> Both Borden’s and Carnation downplayed the industrialized character of condensed and evaporated milks by illustrating their

<sup>108</sup> As James Murton has argued, markets are not natural entities, but products of social, economic, cultural, and ecological forces. See Murton, “The Creation of a British Imperial Food System,” 226–227.

<sup>109</sup> The Borden Company, *Borden’s Eagle Brand Book of Recipes* (Montreal, QC: The Borden Co., 193[?]).

<sup>110</sup> Carnation Milk Products Co., *My Hundred Favorite Recipes* (Aylmer, ON: Carnation Milk Products Co., 1926). On the use of trade characters and their relationship to the social, cultural, and economic dynamics of food procurement in early twentieth century Canada, see Nathalie Cooke, “Getting the Mix Just Right for the Canadian Home Baker,” *Essays on Canadian Writing* 78 (Winter 2003): 192–219.

cookbooks with images of Holstein cows grazing in pastoral settings, and they framed the process of condensing and evaporating as steps taken to preserve nature's essential purity rather than transforming nature into something different through industrialization.<sup>111</sup>

These production and marketing strategies helped industrial dairy processors continue their expansion through the dairy zone during the 1920s. The Peterborough Pure Milk Company, for example, increased its processing capacity from 25,000 to 75,000 lbs. of milk in 1920.<sup>112</sup> Toronto's City Dairy Company posted net profits in 1927 of \$323,902.<sup>113</sup> Even the Finch Dairy Station was sold to CMP in 1925. Especially successful were the U.S.-based processors who not only expanded at the expense of cheese factories, but also began to compete with Canadian owned multi-product milk plants as well.<sup>114</sup> No U.S. multinational did this more successfully than the Borden Company, which, by the early 1930s, had acquired CMP, Hamilton Dairies Ltd., and

<sup>111</sup> To this extent, they followed pattern of advertising common in the U.S. butter industry during the interwar years. Kendra Smith-Howard in *Pure and Modern Milk*, 53, explains that "Advertisements and food labels told consumers that butter's purity originated in one of two places: the pastoral landscape or the modern factory. Butter appeared either as an industrial product or a product of nature, but not one of an industrialized nature."

<sup>112</sup> "News Among Manufacturers...: Extensions in Peterboro," *The Globe* (1844–1936), 6 April 1920.

<sup>113</sup> "City Dairy Sales were the Greatest in Company's Career: Net Earnings..." *The Globe* (1844–1936), 31 January 1928.

<sup>114</sup> Chandler and Hikino, *Scale and Scope*, 157, argue that in oligopolistic competition between U.S. manufacturers of "branded, packaged [food] products" before the War allowed them to successfully expand their operations through foreign direct investment in Europe as well as Canada, especially after the First World War. While there has been some debate about the relationship between this trend and Canadian economic policy, Stephen McBride suggests (drawing on the work of Stephen Scheinberg) that the rise of U.S. direct investment in Canada was an unintended consequence of Macdonald's National Policy. See Stephen McBride, *Paradigm Shift: Globalization and the Canadian State* (Halifax, NS: Fernwood, 2001), 39–40. Others, such as Michael Bliss, argue that the effects of the National Policy were not simply foreseen by Canada's manufacturing elite, but to a large extent, welcomed. See Bliss, *A Living Profit*, 109–111.

Toronto's City Dairy Company (which itself manufactured ice cream and dried milk through numerous subsidiaries in rural Ontario, in addition to distributing fresh milk).<sup>115</sup>

Just as the large industrial processors transformed the roles of patrons from producers and manufacturers to mere suppliers, so too did they undermine the central role of craft cheesemakers in the establishment of a harmonious, stable rural system. For makers who had long been conditioned to pursue a life of self-improvement and mastery over their craft, the expansion of Big Dairy threatened their prospects. Unlike small cheese factories, the largest of which might have employed seven or eight makers and assistants, and only then at the height of the cheese season, multi-product milk plants often employed dozens of low-skilled workers.<sup>116</sup> Mechanized canning processes and other technological developments allowed companies like Borden's to rely more on general labourers. For example, in August 1929, some of the semi-skilled and low-skilled jobs at Borden's Norwich plant included unloading milk and coal; operating the milk pans; filing, crimping, and sealing the cans; and labeling products.<sup>117</sup> Of course, multi-product milk plants still relied on highly skilled workers—often former cheese and buttermakers—to test and receive milk, repair equipment, and occasionally even make cheese, but these opportunities were limited and insecure. Meanwhile, those who

<sup>115</sup> "Borden Enterprises Broaden in Canada," *Financial Post* 16 October 1930; "Hamilton Served By Pure Milk Co. Over Long Span," *Financial Post* 16 October 1930.

<sup>116</sup> Menzies, *By the Labour of Their Hands*, 91.

<sup>117</sup> August 1929, Pay Roll Distribution and Journal Vouchers, Borden's Fonds, 2007.048, Norwich & District Museum and Archives, Norwich, ON. The Pay Roll journal spans July 1929 to December 1930, minus a few months. Unfortunately the journal only indicates the total hours worked within each category and not the number of employees responsible for each task, but in total, the Norwich plant used 5,623 hours of labour that month, compared to just 521 hours worked at the Burgessville receiving station.

continued to make cheese for Ontario's remaining cheese factories struggled to make a decent return for their labour.<sup>118</sup>

The provincial dairy schools implicitly supported the needs and demands of Big Dairy by broadening their curricula from the First World War through the 1930s. As early as 1912, the authors of the annual report of the OAC dairy school acknowledged that in order to “keep up to the times,” they would need to expand both the scope of their instruction and the facilities for doing so. They positioned themselves as leaders in “the onward march of progress.”<sup>119</sup> By 1923 the College had constructed an entirely new dairy building, outfitted with equipment for teaching students how to make ice cream, buttermilk, condensed milk, powdered milk, fluid milk, and ‘soft’ (cream) cheese in addition to cheddar cheese and butter.<sup>120</sup> A maker who carefully honed his ‘cheesecraft’ at the expense of all other dairy products found himself too specialized for an industry that demanded greater flexibility from its skilled employees: Big Dairy wanted a cheesemaker at one moment, and a lab technician the next.

<sup>118</sup> The Department of Agriculture's 1932 report on the economics of cheese factories found that cheesemaker-proprietors received an average profit, after expenses, interest, and depreciation, of just \$599 a season, while hired makers made an average of \$862 and contracted makers made an average of \$1,253. Note that the definitions they use to distinguish categories of makers do not map perfectly onto the categories I use in chapter 2. By hired makers they mean makers paid either a flat salary or piece rate who are only responsible for hiring extra labour, while by contracted makers they mean those who are contracted at a rate per pound of cheese and pay all the costs of supplies (labour, fuel, etc.) except the costs associated with maintaining the factory or its equipment. See Department of Agriculture, “Cheese Factory Operations in Ontario,” 23–27.

<sup>119</sup> DAWO, *Annual Reports of the Dairymen's Associations of the Province of Ontario 1911* [henceforth 1911] (Toronto, ON: 1912), 168; and DAWO, 1912, 143.

<sup>120</sup> See “Programme, 17–19 February 1931,” Miscellaneous Folder, 1885–1967 + photos, OAC Dept. of Dairying, RE1 OAC A0011, University of Guelph Archives, Guelph, ON; “Post for Bulletin, 1924,” Miscellaneous Folder, 1885–1967 + photos, OAC Dept. of Dairying, RE1 OAC A0011, University of Guelph Archives, Guelph, ON; and “Pamphlet celebrating the new dairy building in 1923,” Miscellaneous Folder, 1885–1967 + photos, OAC Dept. of Dairying, RE1 OAC A0011, University of Guelph Archives, Guelph, ON.

One cheesemaker who tried to navigate this new state of affairs was John Hoover, the proprietor who sold the Burgessville Cheese and Butter factory to Borden's in 1917 for use as a receiving station. Born in or around 1870 in southwestern Ontario, Hoover began his career as a cheesemaker at the Elma Cheese combination in eastern Ontario, followed by a tenure as manager of the Vernon River Cheese Factory in Prince Edward Island. At some point in the 1890s, he returned to Ontario, married, and embarked on a career as a maker and cheese factory proprietor. Aside from a brief foray into the construction sector in the early 1900s, he committed his entire life to dairying.<sup>121</sup> In keeping with a liberal worldview that linked respectability and personal success with access to and control of property, Hoover continually sought (perceived) autonomy from the system of industrial rural food production characteristic of the Borden Company and other multi-product milk plants. He tried to establish himself as a small business owner and respectable member of the rural middle class. To this end he purchased and sold nearly a dozen different dairy operations between the 1890s and the 1930s, but many of these ventures failed and he spent repeated periods in employment with Borden's and other large processors, albeit often in managerial roles. Taking a closer look at Hoover's life is interesting for two reasons. First, it drives home the dominance of Big Dairy over the heart of Ontario's cheese industry during the interwar years, and secondly, he provides an example of how liberal resignation to the new rural order manifested amongst some individual makers.

<sup>121</sup> Much of the narrative that follows is drawn from Hoover's own diaries, which he kept regularly from 1899 until his death in 1958, and supplemented with miscellaneous accounts and clippings that he collected during his lifetime. See Appendix 5 for a timeline of Hoover's life and career.

Hoover's longest uninterrupted stint as a proprietor was between 1907 and 1914, when he owned and managed the Burgessville Cheese & Butter Factory. Once he sold Burgessville to the Borden Company he accepted an offer to work for them, first as a milk inspector at their Norwich plant between April and June of 1917, before heading back to Burgessville—his former factory—to oversee its work as a receiving station for Borden's Ingersoll plant. He continued working a range of jobs for the Borden Company until the mid-1920s. At first, his work there was stable and lucrative; he received a salary of \$1200 in 1918, which almost certainly exceeded what he would have expected to make as a proprietor of a small cheese factory after costs of supplies and maintenance were factored into the equation.<sup>122</sup> However, during the postwar recession, his salaried job with the Borden Company collapsed into a series of short term, insecure contracts to make cheese at Burgessville for \$150 a month.<sup>123</sup> He supplemented these opportunities by selling milk to the Borden Company from his own small herd of cattle.

In 1926, Hoover attempted to set out on his own once again by purchasing an old casein plant in Villa Nova (near Brantford), leaving his farm to his son Douglas. The switch to a casein plant suggests he saw a better chance for independence in this new line of industrial dairy processing than in cheese. The supply of milk and markets for casein grew slowly, but by March of 1927 he was producing casein daily and had found buyers in local paper and hat industries.<sup>124</sup> Despite these apparent successes, Hoover sold the

<sup>122</sup> Diary entry, 22 April 1918, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>123</sup> Diary entry, 9 September 1925, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>124</sup> Diary entry, 17 March 1927, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.



Villa Nova plant to the City Dairy Company of Toronto just one year later, in March of 1928, for the tidy sum of \$14,000. He retained a position at Villa Nova as plant manager. He spent the next three years working for the City Dairy Company in a variety of capacities. The Villa Nova plant produced casein for a few months at a time, before receiving and separating milk for other plants managed by the City Dairy Company. Villa Nova was purchased by the Borden Company in 1930. By 1931, the Depression had taken quite a toll on the even the largest processors, and Hoover noted in September that Villa Nova “might be idle for some time.”<sup>125</sup> The company kept him on as milk inspector of the various farms that supplied their subsidiary, the Drimilk Company. When the Villa Nova plant remained closed six months later, Hoover approached Borden’s about purchasing it back. The deal was never completed—either the company refused to sell, or perhaps Hoover had a change of heart given the persistence of the Depression—and instead he worked as a travelling inspector for the company for another year and a half.<sup>126</sup>

<sup>125</sup> Diary entry, 19 September 1931, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>126</sup> Diary entry, 6 April 1932, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.



**Figure 13.** The Villa Nova Casein Factory, owned by John Mac Hoover, n.d. Hoover sold the factory to the Toronto's City Dairy Company, which was later purchased by the Borden Company. Hoover is on the far right, closest to the automobile. (Joyce Hoover Clark collection, Norwich & District Museum and Archives.)

By 1933, Hoover was restless once again, but to a greater degree than ever before, his struggle against corporate dependency became profoundly *spatial*. Although he wanted to remain near his home in Oxford County, his chances of successful proprietorship in an area dominated by Big Dairy was slim at best. By the Great Depression, large processors had made serious inroads in counties that historically had high cheese factory concentration. Between 1906 and 1932, the decline in the number of cheese factories in Oxford, Middlesex, and Perth counties—the southwestern ‘heart’ of Ontario’s dairy zone—was forty-five, fifty-three, and forty-four per cent, respectively

(see Appendix 6 for the change in all counties).<sup>127</sup> Ontario had eighteen condensed and evaporated factories by 1934, many of them in southwestern Ontario.<sup>128</sup>

So Hoover turned his sights toward regions with less competition from Big Dairy, but the trade-off was poorer access to rail transportation and markets for his goods. In September 1933, he and his wife Maie travelled by car and ferry to Manitoulin Island and “halted at Manitowaning to look over a creamery for sale.”<sup>129</sup> A week later he had “severed” his ties with the Borden Company, but deliberated between purchasing the creamery in Manitoulin or a different one in Bobcaygeon.<sup>130</sup> He ultimately settled on the island factory for unknown reasons. The first winter at Manitowaning was hard; he split his time between operating the creamery, building an ice house, and harvesting wood from a twelve acre lot he purchased to serve the creamery the following season, since the milk supply during the winter months was minimal. The business remained sluggish the following summer. A drought in August curtailed nearly all the milk—“Pastures burned brown,” he wrote—and by November he noted with some frustration that it “Seems to be the custom here to let their cows go dry at this time of year.”<sup>131</sup> Despite these challenges, Hoover persevered on Manitoulin Island for two more seasons with what appears to have

<sup>127</sup> The decline in eastern Ontario counties was generally less extreme, but still dramatic given the east’s higher absolute number of factories. For instance, Prescott saw a decline of twenty-three per cent, Glengarry twenty-four per cent, Russell thirty-three per cent, and Hastings thirty-five per cent, but overall these four counties lost ninety-five factories compared to just fifty-two in the big ‘three’ counties of southwestern Ontario. The only areas of the province where cheese factories did *not* decline was in the ‘clay belt’ of the more recently settled counties of Nipissing and Muskoka. See Appendix 4.

<sup>128</sup> Ruddick et al., *The Dairy Industry of Canada*, 76.

<sup>129</sup> Diary entry, 23 September 1933, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>130</sup> Diary entry, 30 September 1933, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

<sup>131</sup> Diary entries, 25 August 1934 and 28 November 1934, Diary of J Mac Hoover 1899–1936, Box 1, Joyce Hoover Clark collection, Norwich & District Museum and Archives, Norwich, ON.

been only limited success. In the fall of 1936, he sold once again—this time to another former Borden employee, J.G. Milne—but continued making butter there until the following March, when Milne graduated from the OAC Dairy School program.<sup>132</sup>

Instead of returning to Oxford, Hoover's next and final experiment in independent proprietorship took him to Ridgetown in Lambton County (near the Canadian-U.S. border and south of Lake Huron), where he purchased the Oil Springs Creamery in December of 1937. By this time Hoover was sixty-seven years old and delegated much of the laborious work of cheese- and buttermaking to the younger men he hired. Yet he only lasted at Ridgetown for a single year before making his way back to Oxford in 1938. It was not long before a Borden's representative paid him a visit—perhaps to offer him more work with the company—but he does not appear to have resumed working for them. Instead, Hoover spent the last twenty years of his life dabbling in cattle breeding, vacationing in Florida, and keeping up to date with dairy industry developments. He died in 1958 at eighty-eight years old.

On balance one might say Hoover succeeded as a small entrepreneur: he spent more of his working life as a proprietor than an employee, and in a handful of instances he managed his own hired staff—a definite mark of middle-class respectability. Yet he invariably financed his continued 'autonomy' by selling his factories and he spent

<sup>132</sup> J.G. Milne might be the same individual identified in a newspaper article from 1945 commemorating the work of veteran employees at Borden's. If so, it suggests Milne returned to Borden's after his time at Manitowaning. "Borden Company Honours Veteran Employees," 22 November 1945, clipping, unknown newspaper, Borden's Dairies [File], Norwich & District Museum and Archives, Norwich, ON.

stretches of time working for these large companies, which highlights the extent to which Big Dairy controlled southern Ontario's dairy zone by the Great Depression.

### *Conclusion*

Roughly seven hundred cheese factories remained in Ontario by the early 1930s—most of them in eastern Ontario—but their resilience was taken as a sign of farmers' stubborn irrationality and a threat to the stability of the new, more diverse dairy processing sector, rather than a cause for celebration. This perspective was represented most clearly in a study jointly carried out by the Dominion Department of Agriculture and the Ontario Department of Agriculture in 1932, titled "An Economic Analysis of Cheese Factory Operations in Ontario." The authors studied a sample of 125 cheese factories from different parts of the province to consider whether enlarging and consolidating cheese factories in certain districts would improve their profitability. The report acknowledged that there were non-economic factors to consider in the argument *against* amalgamation, including that "the cheese factory is a community enterprise of considerable significance and that to deprive a community of such an institution would not be desirable," but its overall findings clearly supported consolidation on narrow economic grounds.<sup>133</sup> It argued that enlarging operations in fewer establishments would lower the unit cost of cheese manufacturing. Factories in eastern Ontario—where the average annual make of cheese was just 56.3 tons (compared to an average of 159.8 tons in western Ontario)—were singled out as emblematic of this undesirable state of

<sup>133</sup> Department of Agriculture, *An Economic Analysis of Cheese Factory Operations*, 43.

affairs.<sup>134</sup> In 1937, the economist W.M. Drummond noted that the nine eastern Ontario counties responsible for the bulk of Ontario's remaining cheese factories were roughly similar in size to the area devoted to dairying in New Zealand, but paled in comparison to the latter's output.<sup>135</sup> He had little faith in the ability of small cheese producers to amalgamate of their own volition, and praised the work of Borden's and other companies in this direction.<sup>136</sup>

Indeed, Big Dairy was remarkably successful at navigating the tensions between capital's dynamic character and the rural Ontario dairy zone in the first three decades of the twentieth century. Using its significant access to capital and various manufacturing and marketing strategies, Big Dairy capitalized on the destabilization of war, but its ascendancy was also facilitated by the state, and critically, the continued cooperation from farmers and cheesemakers—in spite of the fact that Big Dairy reduced the roles of many dairy farmers from owners and manufacturers of cheese to suppliers of a raw material. As a result, industrial dairy processors were able to expand and consolidate their control in rural Ontario, and capitalize—literally—on the environment produced by the preexisting cheese industry. Although some farmers—with the support of the UFO—sought to challenge the rise of Big Dairy, the overall resignation amongst dairymen and

<sup>134</sup> There are parallels here to the work of historical sociologist E. Melanie DuPuis, who shows in *Nature's Perfect Food*, 130–133, how agricultural economists at Cornell often used regional surveys and research reports to further their industrialized vision of dairying.

<sup>135</sup> Ruddick et al., *The Dairy Industry in Canada*, 150–151.

<sup>136</sup> Ruddick et al., *The Dairy Industry in Canada*, 148–149. The federal government also took steps to push cheese factory amalgamation and modernization along. In 1939, they passed the Cheese and Cheese Factory Improvement Act, which offered subsidies to companies that made improvements to their plants through consolidation and purchasing new equipment and processing technologies, as well as offering a bonus to cheesemakers who consistently produced high quality cheese. The government was still offering these incentives at the time that McCormick was writing, in 1967. See McCormick, *A Hundred Years*, 50. The Act was repealed in the 1970s.

state experts about the future of dairying ultimately quelled any widespread, collective defense of the Ontario cheese industry.

The decline of cheese factories at the hands of Big Dairy accelerated the dissolution of the dairy zone vision in turn. The reformers' Victorian experiment to establish an alternative rural modernity through factory cheese production had come to an end by the 1930s. The belief that rural individuals could, in liberal cooperation with one another (and with relatively little help from the state), selectively adopt elements of industrial production to build a rural sector that would deliver economic profit, minimize class antagonism, and conserve soil fertility—all while withstanding the volatility of global capitalism in the longer term—was no longer convincing to either the majority of Ontario's dairy farmers or state-based agricultural experts. Even supporters of the UFO believed that any viable resistance to Big Dairy would require reorganization of dairy production along more efficient lines; they simply advocated that such operations be controlled by farmers through scaled up cooperatives, rather than corporate agribusiness. Rural cheese factories persisted as a marginal, but declining element of the Ontario dairy landscape until well into the twentieth century,<sup>137</sup> but the vision of nineteenth-century reformers to harmoniously manage land, capitalism, and society through cheese was defeated by the Great Depression.

<sup>137</sup> See Menzies, *By the Labour of Their Hands*, 104–159 for a discussion of this second wave of decline between 1941 and 1959.

## **Conclusion**

### *Summary*

This dissertation has reevaluated the roots and development of Ontario's export-oriented, rural cheese industry between the 1860s and 1930s. As an environmental historian, I have approached the topic interested in the relationship between the industry and the wider rural environment. My approach juxtaposes the goals and claims of Ontario's rural elite and state officials with the daily human and extra-human work involved in manufacturing cheese for export, a method that has yielded new interpretations about the character and development of the industry.

First, I argue that the cheese industry emerged as a project of reform encouraged by a group of elite Victorian men in their quest for a uniquely rural type of modernity, rather than the spontaneous and harmonious development of cheese factories and mixed farming methods by Ontario's farmers in the mid-nineteenth century. The deliberate role of reformers has been underappreciated in the historiography. Reformers championed cheese in the context of widespread concerns about the capacity of the Ontario's soil and farmers to continue producing large volumes of wheat for a volatile global market, especially given a growing number of biological pests and the threat of western wheat. Influenced by contemporary scientific debates about soil fertility and the 'factory system' of cheesemaking developing in New York State, reformers imagined rural Ontario as a progressive, dairying landscape: a 'dairy zone.' They encouraged factory cheese manufacturing as the backbone of a rural society that was capitalist but cooperative and free of class conflict, economically productive but conservationist, and industrial but



dependent on craft. Their vision lacked the cohesion of state-based planning, but it constituted a set of principles and practical advice geared toward rural people that reformers considered to be insufficiently progressive and liberal. They spread their message of reform to rural communities primarily through the agricultural press and voluntary organizations like the CDA (which eventually became the DAWO and DAEO).

Like so many projects of modernist reform, the industry looked very different in practice than in principle. Indeed, the second major argument of this dissertation is that the industry transformed the socio-ecological landscape of rural southern Ontario into a ‘dairy zone,’ even though it did not function as long, as harmoniously, or as profitably as reformers had imagined it would. Although factory cheese production and exports increased enormously in the second half of the nineteenth century, and contributed to a general shift toward mixed farming systems, factories were unevenly distributed throughout the province and often operated on a smaller scale than reformers had hoped. Moreover, as the industry expanded, so too did problems with milk, craft, and costs of production, which strained the supposed ‘liberal cooperation’ between patrons, cheesemakers, factory directors, buyers, and reformers. This general dysfunction of the industry becomes quite clear when one looks closely at the daily work of craft cheesemaking, rather than relying solely on the rhetoric of reformers or aggregate readings of the industry’s growth.

Reformers and state officials tended to diagnose the ills of the industry through the prism of liberalism. The root problem, many reasoned, was the failure of individual patrons and cheesemakers, rather than the complex and somewhat unanticipated

consequences of reorganizing human and extra-human nature. With the increasing assistance of the state, reformers attempted to quell tensions within the industry by focusing on improving the skill and disposition of individual cheesemakers and farmers through programs like an itinerant instruction network, technical craft education, and the encouragement of CTAs and scientific cow management. These reforms had modest positive impacts on the quality of cheese, costs of production, and labour relations, but the industry continued to face challenges in the early twentieth century. Seeds of doubt about the capacity of cheese to sustain rural stability and progress that took root in the early 1900s flowered into widespread ambivalence about the desirability of cheese manufacturing as a means of rural reform by the end of the First World War.

Big Dairy—defined here as the emergent network of corporate dairy agribusiness, especially in the form of large urban fluid milk distributors and dairy processors—seized on this unstable state of affairs. It appropriated the energy expended by farm families, makers, educators, and state experts in the name of the cheese industry and used it to expand their own capitalist growth. It benefitted from the transportation and labour systems of the established cheese factory network, the ability of farm families and makers to supply (relatively) clean milk, and the geographic concentration of increasingly productive dairy cattle in parts of the province. At the same time, however, Big Dairy necessarily undermined the social basis of the cheese industry, in which farmers were owners—manufacturers—of cheese, by reducing them to suppliers. So too did it begin to reduce highly skilled craft cheesemakers to technicians, although that process continued for a number of years (aided by pasteurization and other techno-scientific developments).

The dairy zone's *liberal character*—which, by the Great Depression, took the form of liberal resignation amongst government officials, dairy experts, and many farmers and makers—was also beneficial to Big Dairy, because it minimized collective resistance to expansion of multi-product milk plants and naturalized the shift from cheese to a broader dairy sector. By the 1930s, cheese factories were in serious decline, and the dairy zone vision had succumbed to a less holistic, more growth-oriented view of rural development. The reformers' experiment in creating an alternative rural modernity was over, even if some makers and farmers would continue to defend rural cheese production in subsequent decades.<sup>1</sup>

One of the reasons the cheese industry failed to deliver everything reformers promised is because its relationship to the wider environment—which includes social relations—functioned in complex, often unexpected ways. Reformers' understanding of how both human and extra-human systems functioned was fundamentally mechanistic. They believed individuals—and society, which they took to mean individuals in aggregate—could control both 'nature' and the long-term success of a regional economy. Yet, as an *organic* machine, the industry behaved in unpredictable ways, ways that were decidedly unlike the machines of Victorian industrialization. Even the movement of cheese manufacture from farm dairies to larger-scale cheese factories—an almost negligible shift in spatial terms—produced a series of unintended consequences that made it very difficult to produce standardized cheddar and stoked class tensions within rural

<sup>1</sup> Menzies, *By the Labour of Their Hands*, follows the resistance of small cheese factories and their supporters through to the Kraft boycott of the 1970s.

society instead of minimizing them. On one level, then, this is a story of hubris and unintended consequences.

The second reason the dairy zone vision did not come to fruition was the industry's relationship to the emerging global capitalist food system. Reformers believed capitalism could be managed without the direct intervention of the state, that individual producers could selectively adopt elements of industrial capitalism and liberalism and combine them with other values to fashion a stable, progressive whole from the parts. Hence they combined technologies of standardization and mechanization with craft labour; advocated high quality, perishable goods for export in a time of mass production of grains and other staples; and embraced a labour intensive, niche manufacturing sector to facilitate soil conservation. In short, reformers believed they could construct a sustainable regional capitalist economy on their own terms, but in practice, the Ontario cheese industry could not be separated from the global capitalist system. These pressures were felt 'internally' in the form of rising costs of production and growing dissent amongst farmers and makers, but also 'externally,' in the form of structural changes like the emergence of agribusiness (Big Dairy) after the First World War, which was able to exert considerable control over the dairy zone to hasten the cheese industry's demise.

### *Contributions*

*Building 'a natural industry of this country': an environmental history of the Ontario cheese industry from the 1860s to the 1930s* adds to a growing body of work that emphasizes Canadian rural society's dynamism after the mid-nineteenth century, a period

generally associated with urbanization and industrialization in Ontario.<sup>2</sup> Focusing on the cheese factory as a dynamic institution, and on the dairy zone as a dynamic environment, this study emphasizes two main features of rural Ontario in the late nineteenth and early twentieth centuries. First, it reminds historians that rural Ontario was not just an agricultural space, it was also a manufacturing one, even if the cheese industry looked very different than one might expect from urban industrialism. It also had close connections to the lumber industry throughout the period of study, which suggests that the separation of Ontario's rural history into clearly demarcated periods of resource extraction (lumber, fur), agricultural production, and industrialization is much too simplistic. Instead, these sectors, broadly defined, have coexisted throughout the history of Euroamerican settlement and nation building, albeit in different arrangements and scales at various times. Ultimately, this study suggests that the dairy zone is better understood as part of a process of environmental and capitalist transformation than a clearly circumscribed, naturally derived place.

Secondly, rural Ontario was a contested space. We should not mistake the relative lack of direct involvement of the state and governmental institutions in rural life in the second half of the nineteenth century for an absence of reformist planning or tensions within rural society. In other words, this study implicitly challenges whether “progress without planning” is the most appropriate epithet for describing the historical trajectory of

<sup>2</sup> In a recent synthesis of Canadian rural scholarship, Ruth Sandwell argues that Canada was a largely rural society until the Second World War, both demographically and culturally. She emphasizes how rural life was quite varied—economically, socially, ecologically—across and within households, communities, and regions. Sandwell, *Canada's Rural Majority*, 10.

the province in the late nineteenth century.<sup>3</sup> Based on the experience of the export-oriented cheese industry, I would suggest that the development of rural Ontario was both more planned and less cooperative than has been suggested to date.<sup>4</sup>

In particular, the contested nature of rural Ontario as seen through the lens of the craft cheese industry was part of the wider project to establish liberal order in Canada. By examining the particular character of elite-led rural reform in Ontario and its relationship to the cheese industry and the wider environment, this study contributes to an emerging “environmental history of the liberal order” in Canada.<sup>5</sup> Following the work of Stéphane Castonguay, Darren Kinsey, James Murton, Tina Loo, and others who have sought to understand how liberal order has been established—and resisted—through the environment, I have shown that for Ontario’s dairy reformers, there were no easy distinctions between reforming rural people and extra-human nature along liberal lines; the two processes were deeply intertwined. We see this in the ways reformers encouraged cheese manufacturing as cooperation: they treated and understood milk as individual property—even when it was pooled—and thus cooperation was framed as a voluntary relationship entered into by owners of property. The ‘pay by quality’ debate in the late nineteenth century (chapter 3) was not just a technical conversation about how best to produce high quality cheese, but a matter of being fair to owners of property, the patrons. Conserving soil fertility through mixed farming and increasing the productivity of dairy

<sup>3</sup> Drummond, *Progress without Planning*, 17.

<sup>4</sup> In this respect my work supports the findings of Darren Ferry, *United in Common Good*, who argues that numerous tensions existed beneath the veneer of liberal cooperation in voluntary societies in central Canada in the nineteenth century.

<sup>5</sup> Castonguay and Kinsey, “The Nature of the Liberal Order,” 222.

cows also reinforced the view of nature as property and as resource. Self-improvement was an especially important part of the reformers' project of alternative rural modernity, and here, too, liberal identities were negotiated through extra-human nature. The relationship between makers and microbes, for example, was treated as a matter of individual effort and improvement, rather than class or the complexities of the extra-human world as they took shape in the factory system.

Liberalism outlasted the dairy zone experiment; in fact, the strengthening of liberalism amongst rural Ontarians was arguably the reformers' biggest success. Yet liberalism is never static. As Ian McKay argues, liberal order must be continually reinforced to remain the dominant, hegemonic mode of rule. Periodic challenges to liberalism need to be stifled, contained, or co-opted in some way lest they create opportunities for serious challenges to the existing system.<sup>6</sup> The heightened tensions between and amongst farmer-patrons, makers, and buyers in the late nineteenth century threatened to take on an antagonistic, class-based character, which reformers responded to with various educational reforms, muted support for increasing cheesemakers' wages, and a redoubling of their emphasis on liberal cooperation (chapters 3 and 4).

The dissolution of the cheese industry at the hands of Big Dairy (which benefitted from liberal resignation amongst cheese-producing farmers and makers) ironically hastened greater "chaos" and "disorganization" within the dairy sector writ large, which in turn constituted a new threat to liberal order in the Ontario countryside that had to be

<sup>6</sup> McKay, "The Liberal Order Framework," 644. McKay expands on how this work has been accomplished within more general capitalist transformation using the concept of "passive revolution." See McKay, "The Canadian Passive Revolution, 1840–1950," *Capital & Class* 34, no. 3 (2010): 361–381.

managed.<sup>7</sup> During the Depression, the fall in prices for milk supplied to cheese factories and multi-product plants prompted remaining cheese factory patrons to flood the fluid milk market, where prices were typically higher than in other dairy sectors.<sup>8</sup> Existing fluid milk suppliers resented the intrusion of cheese factory patrons. As a result, they formed the Ontario Whole Milk Producers League in 1932 to lobby for a regulatory system that would help stabilize the provincial dairy sector. In 1934, fearing further unrest amongst dairy farmers and urban consumers struggling to afford a regular supply of clean, certified milk, the provincial government stepped in to stabilize dairy markets through mechanisms like the Milk Control Board of Ontario (1934).<sup>9</sup> The rise of the Milk Control Board, and eventually, a national system of milk supply management, represent the shift from more laissez-faire to welfare state liberalism in Canada in the twentieth century, but an examination of how the state negotiated liberal order through the dairy environment in the mid-twentieth century remains a question for future research.<sup>10</sup>

<sup>7</sup> Scholars of government intervention in dairying in Canada in the twentieth century have often described dairying in Ontario in the 1930s as chaotic and disorganized. What they have failed to acknowledge is that this was not the ‘natural state’ of the sector, but the product of changes after the turn of the twentieth century. For example, see Andrew Ebejer, “‘Milking’ the Consumer? Consumer Dissatisfaction and Regulatory Intervention in the Ontario Milk Industry during the Great Depression,” *Ontario History* 102, no. 1 (2010): 24–25; and Winson, *The Intimate Commodity*, 80. The one scholar to address the growing disorganization of dairying as an outcome of previous government policies and “market failure” in the 1930s is Barnes, “The Rise of Corporatist Regulation,” 389–394. My point here is similar to E. Melanie DuPuis’s in her discussion of the relationship between “disordered” dairy markets and the role of politics and legislation in shaping milksheds in the United States. See DuPuis, *Nature’s Perfect Food*, 165–182.

<sup>8</sup> McCormick, *A Hundred Years*, 18, notes that the average price of Canadian cheddar in the UK fell from 23¢ per pound in 1928 to 12¢ by 1932.

<sup>9</sup> Ebejer, “Milking the Consumer,” 24; McCormick, *A Hundred Years*, 155–160; and Winson, *The Intimate Commodity*, 77–80.

<sup>10</sup> On the rise of milk supply management in Canada, see Bruce Muirhead, “Crying Over Spilt Milk: The History of Dairy Supply Management and its Role in Recent Trade Negotiations,” *Centre for International Governance Innovation Papers* No. 30 (Waterloo, ON: CIGI, 2014), accessed 11 November 2016 at [https://www.cigionline.org/sites/default/files/cigi\\_paper\\_30.pdf](https://www.cigionline.org/sites/default/files/cigi_paper_30.pdf); and Winson, *The Intimate Commodity*, 82–87.



This dissertation has also made a modest contribution to the work of understanding the relationship between environments and capitalist development. In a recent chapter in the *Oxford Handbook of Environmental History*, Steven Stoll acknowledges that capitalism is not a new concern for environmental historians—he points to the work of many of the field’s pioneering scholars, such as Donald Worster, William Cronon, and Carolyn Merchant as evidence of a longstanding concern—but convincingly argues that, as a field, environmental history has been more successful in documenting capitalism’s (often detrimental) effects on the environment than providing an effective and holistic account of “the history of the human and material relationships that *generate* capital.”<sup>11</sup> Jason W. Moore is similarly interested in how capitalism develops through the environment—he argues it *is* a fundamentally ecological system—and how that system has developed on a worldwide scale over the past six hundred years.<sup>12</sup> The takeaway from both Stoll and Moore is that environmental historians are well-placed to contribute to larger discussions about capitalism as an *historical* environmental system, because of their ability to produce empirical, historically-grounded case studies that are sensitive to extra-human nature’s changing relationships with human nature.

Indeed, this study reminds environmental historians of food and agriculture that the material specificities of potential commodities matter for understanding how they are embedded into the global capitalist system.<sup>13</sup> The rise and fall of the rural cheese industry

<sup>11</sup> Stoll, “A Metabolism,” 373.

<sup>12</sup> Moore, *Capitalism and the Web of Life*.

<sup>13</sup> Stoll, “A Metabolism,” 373.

is an important story precisely because it is atypical: cheese manufacturing did not follow quite the same patterns of mechanization and monoculture production that have underpinned the classic stories of transformation from grasslands to wheat and other grains in the North American plains, or the intensive industrial horticulture of California's agricultural valleys. Compared to wheat and corn, two preeminent capitalist crops, milk's perishability and cheese's status as a partially *living* product made it less amenable to commodification, although that did not stop reformers from trying to merge scientific and industrial principles with craft methods of production in the name of standardization and economies of scale. Documenting the variety of ways that capitalism works through the environment highlights its flexibility as a mode of production, and goes some way to explaining its persistence.

Finally, this dissertation has contemporary significance because it historicizes and illuminates the character of the current wave of craft or 'artisanal' cheese manufacturing. Historians never write in a vacuum; our work is always shaped—knowingly or otherwise—by contemporary events and assumptions. When Heather Menzies published *By the Labour of Their Hands: the Story of Ontario Cheddar Cheese* in 1994, Ontario's rural cheese industry had reached its lowest point since the emergence of factories in the 1860s; only a dozen or so craft cheese producers remained in the province. The book ended on a solemn note about the loss of craft knowledge and tradition, but Menzies remained hopeful that "we might yet find ways to build on the heritage of Ontario cheddar cheese."<sup>14</sup>

<sup>14</sup> Menzies, *By the Labour of Their Hands*, 170.

The research and writing of this dissertation have taken place in a much different context. Since the turn of the twenty-first century, the number of craft cheese producers in Ontario has grown steadily. At the time of writing, there are at least two dozen self-described craft or artisanal cheese companies in Ontario—many of them rural—including a small handful of cheddar producers that survived the long decline of the twentieth century.<sup>15</sup> Local cheese—along with craft beer, local wine, and other goods—have become symbols of “creative rural development,” a neoliberal strategy that aims to jumpstart rural economic growth through the cultivation of a “creative class” in rural communities and the marketing of local products and other place-specific “comparative advantages.”<sup>16</sup> Craft, artisanal foods are often associated with these initiatives. In a report published by the Martin Prosperity Institute, aptly titled “From Kraft to Craft: Innovation and Creativity in Ontario’s Food Economy,” geographer Betsy Donald juxtaposes craft cheese with highly industrialized Kraft cheese to highlight the potential of a supposedly post-industrial, creative economy for economic growth.<sup>17</sup> In addition, she calls for a “full-fledged mainstreaming of the creative food economy through innovative and multi-scalar

<sup>15</sup> Government of Canada, “List of Cheese Manufacturers by Province,” *Canadian Dairy Information Centre*, accessed 10 November 2016 at [http://cheese-fromage.agr.gc.ca/pml-lmp\\_eng.cfm](http://cheese-fromage.agr.gc.ca/pml-lmp_eng.cfm). Note that this list includes non-craft, large-scale corporate cheese producers as well, such as Kraft and Saputo. That said, the definition of craft is a slippery one, and agribusinesses are increasing purchasing craft and artisanal brands to add to their non-craft product lines.

<sup>16</sup> Anne Lee and Geoffrey Wall, “Food Clusters: Towards a Creative Rural Economy,” Working Paper Series: Ontario in the Creative Age (Toronto, ON: Martin Prosperity Institute, 2012): 2–13, accessed 11 November 2016 at [http://martinprosperity.org/papers/Lee%20\(2012\)%20Food%20Clusters-formatted-V2.pdf](http://martinprosperity.org/papers/Lee%20(2012)%20Food%20Clusters-formatted-V2.pdf); and Anne H. Lee and Geoffrey Wall, “Food Clusters, Rural Development and a Creative Economy,” *Journal of Rural and Community Development* 9, no. 4 (2014): 1–22.

<sup>17</sup> Betsy Donald, “From Kraft to Craft: Innovation and Creativity in Ontario’s Food Economy,” Working Paper Series: Ontario in the Creative Age (Toronto, ON: Martin Prosperity Institute, 2009): 9, accessed 11 November 2016 at [http://martinprosperity.org/media/pdfs/From\\_Kraft\\_to\\_Craft-B\\_Donald.pdf](http://martinprosperity.org/media/pdfs/From_Kraft_to_Craft-B_Donald.pdf).

policy solutions led by federal, provincial and local actors.”<sup>18</sup> There have been some attempts to encourage the growth of artisanal cheesemaking in Ontario, such as the Artisan Dairy Program, which was created in 2006 and expanded in 2011. The program makes up to three million litres of milk available annually to new artisanal producers who are creating ‘innovative’ cheese, yogurt, and other dairy products.<sup>19</sup>

At first glance, today’s vision for craft-based, creative rural economies differs markedly from the reformers’ dairy zone vision. Where the earlier industry produced standardized cheddar for an overseas market, today’s craft producers valorize the particularity of “place,” which is reflected in the variety of local cheeses available beyond cow-milk cheddar.<sup>20</sup> In her study of twenty-first century artisanal cheese production in the United States, anthropologist Heather Paxson describes this emphasis on the specificity of place and its connections to quality as “reverse engineering *terroir*,” a reference to the French concept that suggests the value of certain products derives from their specific environments and/or methods of production.<sup>21</sup> Tourism is another critical feature of today’s craft economy, unlike in the nineteenth century.<sup>22</sup> Consultant Greg Baeker begins

<sup>18</sup> Donald, “From Kraft to Craft,” 2.

<sup>19</sup> Dairy Farmers of Ontario, “Artisan Dairy Program,” web page, accessed 11 November 2016 at <https://www.milk.org/Corporate/View.aspx?Content=Processors/ArtisanCheese>. Applicants are first required to apply to the Domestic Dairy Production Innovation Program operated by the Dairy Commission of Canada. If they are turned down, they can apply to the Ontario program, and if successful, receive a maximum of 300,000 litres annually for three years.

<sup>20</sup> Government of Canada, “List of Cheese Manufacturers by Province,” *Canadian Dairy Information Centre*, accessed 10 November 2016 at [http://cheese-fromage.agr.gc.ca/pml-lmp\\_eng.cfm](http://cheese-fromage.agr.gc.ca/pml-lmp_eng.cfm).

<sup>21</sup> Paxson, *The Life of Cheese*, 187–188.

<sup>22</sup> While ‘touring’ and ‘tourism’ were certainly features of nineteenth- and twentieth-century Ontario, nineteenth-century cheese factories did not rely on tourism as a means of deriving income. There is a growing scholarly literature on the links between rural tourism, food, and community development in the twenty-first century. An excellent entry point into this literature is Bernard Lane and Elisabeth Kastenholtz, “Rural Tourism: the Evolution of Practice and Research Approaches – Towards a New Generation Concept?” *Journal of Sustainable Tourism* 23, nos. 8–9 (2015): 1133–1156.

an article about creative rural development in Prince Edward County with a second-person narrative of the experience of tasting and purchasing cheese whilst navigating the county's "Taste Trail, an award winning program connecting 25 restaurants, wineries, and boutique hotels." Cheese, he notes, is central to the Taste Trail experience: "You stop at roadside stands for fresh produce, and visit an organic cheese producer and a 107-year-old-cheese company."<sup>23</sup> Today's industry differs from the nineteenth century in its celebration of local food, local environments, and local tourism, even though today's boosters invoke Ontario's cheese heritage to legitimize their claims to authenticity.<sup>24</sup>

Despite these differences, I would argue there are a number of similarities between the current resurgence of craft cheese manufacturing and the nineteenth-century industry. For one, the current craft economy is buttressed by a neoliberal moralism that echoes the self-improvement ethic of the nineteenth-century reformers in important ways.

<sup>23</sup> Greg Baeker, "Building a Creative Rural Economy," *Municipal World* (September 2008): 9. See also Kevin Stolarick, Betsy Donald, and Gregory M. Spencer, "Creativity, Tourism and Economic Development in a Rural Context: the Case of Prince Edward County," *Journal of Rural and Community Development* 5, no. 1/2 (2010): 238–254.

<sup>24</sup> These appeals to history are generally romanticized, if not downright inaccurate. For example, a pamphlet advertising the Fifth Town Artisan Cheese Company in Prince Edward County—and quoted at length in Donald's report—suggests that "Prince Edward County cheese was well appreciated for its quality and 'taste of place,' stemming from milk produced cows grazing on local pasture, or hay grown in our unique micro-climate and limestone-rich terrain....Our hope is that together we can once again animate the County's reputation for making great cheese." Of course, as I hope my dissertation has made clear, high-quality Ontario cheese was remarkable for its likeness to British cheddar, in terms of qualities like texture. Even when local communities were regarded overseas as having particularly good cheese (such as Belleville in the late-nineteenth century), it was attributed to the strength of the region's individual makers and companies, not the region's micro-climate. See Donald, "From Kraft to Craft," 17. Many of the examples I've raised so far focus on Prince Edward County, which is arguably at the forefront of creative rural development efforts, but similar changes are happening in other parts of Ontario, particularly around Oxford County. For example, see Tourism Oxford, "Oxford County Cheese Trail," advertising brochure, accessed on 11 November 2016 at <http://www.tourismoxford.ca/Portals/4/Documents/2015-Cheese-Trail-Brochure-Printable.pdf>.

Much like Daniel Derbyshire, George Buckland, and James W. Robertson, today's rural reformers emphasize the ability of individuals and local communities to cooperatively solve the complex social and ecological issues facing rural Ontario society. For instance, Baeker explains that one of the keys to creating successful development in Prince Edward County has been cooperative planning and "cultural mapping" amongst the region's stakeholders, including local politicians, business owners, artists, community members, service representatives, and others, in order to identify the specific advantages of a region or community that can become the basis for capital investment.<sup>25</sup> Implicit in this recommendation is the belief that the cooperation and labour of liberal individuals, combined with strategic investment, can overcome the structural challenges facing rural communities, such as class differences, underemployment, inequality, racism, and so on. Today's reformers also view craft cheese and other creative rural strategies as potentially ecologically sustainable, which echoes the Victorian reformers' belief that capitalist production and soil conservation were compatible goals. Although today's understandings of the environment—not to mention the actual environmental *problems* we face—are different (and more dire) than in the mid-nineteenth century, the same basic assumption characterizes both visions: niche capitalist markets can facilitate ecological sustainability.

In light of these comparisons, the story of Ontario's craft cheese industry between the 1860s and 1930s offers a cautionary tale about the capacity of individual people and communities to fashion and sustain market-based, capitalist solutions to complex social and ecological issues. By examining the nature and difficulties of the Ontario cheese

<sup>25</sup> Baeker, "Building a Creative Rural Economy," 10.

industry between the 1860s and the 1930s, this study seeks to challenge the easy romanticization of Ontario's dairy heritage in the service of neoliberal, capitalist growth.

## Appendix 1

Capital stock arrangements of select joint-stock cheese companies in Ontario, 1874–1903.

<b>Company name</b>	<b>County</b>	<b>Year</b>	<b>Capital stock</b>	<b># Shares available</b>	<b>\$/Share</b>	<b>Share limit</b>
<b>Roblin</b>	Hastings	1871	3000	500	6	
<b>Fordwich</b>	Wellington	1874	2000	200	10	–
<b>Springbank</b>	Wellington	1878	1200	40	30	–
<b>Elma</b>	Perth	1879	4000	200	20	–
<b>Blanshard &amp; Nissouri</b>	Perth	1880	1500	150	10	–
<b>Hopetown</b>	Lanark	1883	780	Unlimited	10	–
<b>Norwich Junction</b>	Oxford	1892	–	Unlimited	25	10
<b>Culloden</b>	Oxford	1893	–	Unlimited	10	–
<b>Oliver</b>	Oxford	1894	–	Unlimited	5	10
<b>Bennington</b>	Oxford	1895	2000	200	10	50
<b>Tilsonburg</b>	Oxford	1896	–	Unlimited	10	25
<b>Northport</b>	Prince Edward	1899	1200	40	30	–
<b>Black River</b>	Prince Edward	1901	1800	90	20	5
<b>Cassel</b>	Oxford	1903	–	Unlimited	20	20

*Note:* Elma Cheese Factory was later called the Atwood Cheese Co. Ltd., and thus is listed under the latter name at St. Marys Museum and Archives.

*Sources [in order of Table]:* Charter and By-laws, Roblin Cheese Factory Record Book 2 (1871–1900, 1960), Roblin Cheese Factory fonds, University of Guelph Archives, Ontario; Letters Patent, Fordwich Cheese and Butter Company, File 2A, Series 2 – Letters Patent, Agreements, 1878–1910, James Henry Shannon collection, Wellington County Archives, Wellington, ON; Letters Patent, Howick Spring Bank Cheese Company, Files 1A/B, Series 2 – Letters Patent, Agreements, 1878–1910, James Henry Shannon collection, Wellington County Archives, Wellington, ON; Typewritten history of the Atwood Cheese Co. Ltd. (Elma), St. Marys Museum and Archives, St. Marys, ON; Charter and By-laws, Minute book (1880–1891), Box 1, Blanshard and Nissouri Cheese & Butter Company collection, University of Guelph Archives, Guelph, ON; Minutes of the founding meeting of a cheese factory in Hopetown, Hopetown Cheese Factory 1883, MG 55/28, No. 51, Library Archives Canada; Letters Patent, Norwich Junction Cheese and Butter Manufacturing Company Ltd., 1892, File 10A34-Cheese and Butter, Box 3, County of Oxford Archives 34 Incorporations, County of Oxford Archives, Woodstock, ON; Letters Patent, Culloden Creamery Association Ltd., 1893, File 10A34-Cheese and Butter, Box 3, County of Oxford Archives 34 Incorporations, County of Oxford Archives, Woodstock, ON; Letters Patent, Oliver Cheese and Butter Association, 1894–95, File 10A34-Cheese and Butter, Box 3, County of Oxford Archives 34 Incorporations, County of Oxford Archives, Woodstock, ON; Letters Patent, Bennington Cheese and Butter Manufacturing Company Ltd., 1895, File 10A34–Cheese and Butter, Box 3, County of Oxford Archives 34



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## Appendix 2

Mapping methodology and data citations for Figures 3 and 4.

In order to map cheese factory development and distribution, I adopted Tonu Tosine's method of using factories' locally listed postal offices as proxies for their general location.<sup>1</sup> Using postal offices as proxies for factory location is far from a perfect measure, but a more precise identification of locations for the entire province proved too laborious for a single researcher. One potential difficulty with using postal offices is that in some instances, factories were owned by 'absentee' proprietors who tended to list the postal office most proximate to their residence rather than the factory in question. This means that some factories may be located inaccurately. Furthermore, the fact that postal office locations themselves could change over time means some of the apparent spread of factories might be attributed to the simultaneous growth and decentralization of the postal network. However, as a general indicator of the spread of cheese factory development for the province as a whole, postal offices were deemed a sufficiently accurate proxy for factory location.

The postal office data for Map 1 (Figure 3) was obtained from the census industrial manuscripts, as digitized through the Canadian Industry in 1871 Project (CANIND71) database developed by researchers at the University of Guelph.<sup>2</sup> For Map 2 (Figure 4), I used the 1891 *Annual Report* from the Bureau of Industry, which included a list of all registered cheese factories and the postal office information for each.<sup>3</sup> This information was translated by hand to a digital database consistent with that used for 1871. Shapefiles for the factory locations are available from the author upon request.

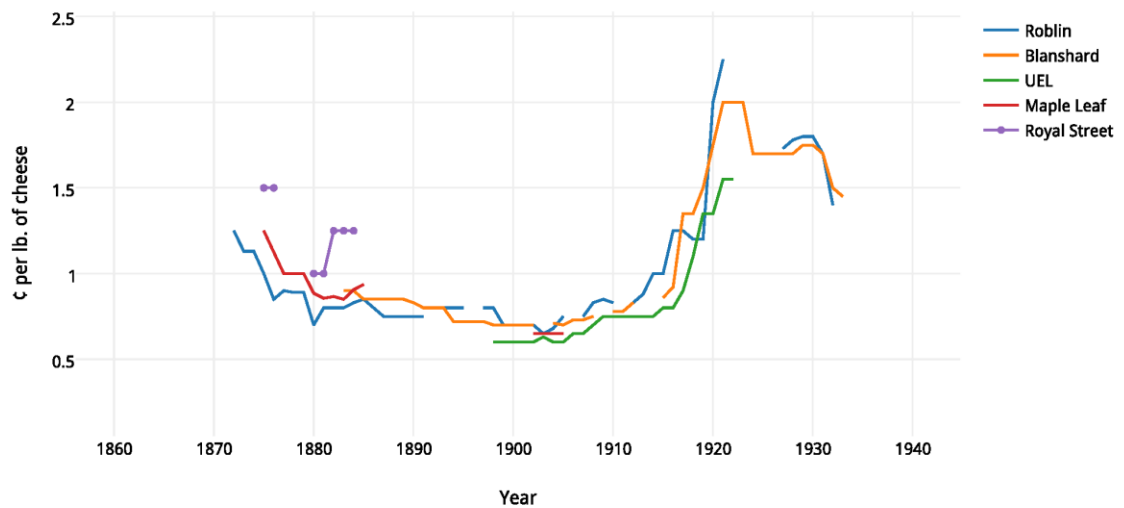
<sup>1</sup> Tosine, "Quinte-Upper St. Lawrence," 101–110.

<sup>2</sup> The sources of data for the 1871 map include: Canadian Industry in 1871 Project (CANIND71), University of Guelph, Ontario, 1982–2008, accessed 24 February 2014 at <http://www.canind71.uoguelph.ca/index.shtml> [computer file]; CanMap Rail (RL) database, DMTI Spatial Inc., 2014, accessed via Scholars GeoPortal [computer file]; and Post Offices of Canada online database, Postal History Society of Canada, accessed 28 July 2015 at <http://www.postalhistorycanada.net/php/PostOffices/index.php>.

<sup>3</sup> The sources of data for the 1891 map include: CanMap Rail (RL) database, DMTI Spatial Inc., 2014, accessed via Scholars GeoPortal [computer file]; Department of Agriculture, *Annual Reports of the Bureau of Industries for the Province of Ontario 1891* (Toronto, ON: 1892), 71–83; and Post Offices of Canada online database, Postal History Society of Canada, accessed 28 July 2015 at <http://www.postalhistorycanada.net/php/PostOffices/index.php>.

### Appendix 3

Manufacturing Rates for Cheesemakers Hired on Piecework Contracts at Select Factories, 1872–1934



*Note:* Wages not adjusted for inflation.

*Sources:* Blanshard and Nissouri Minute Book 1 (1880–1891) and 2 (1891–1929), Box 1, Blanshard and Nissouri Cheese & Butter Company fonds, XA1 RHC A0386027, University of Guelph Archives, Ontario; Maple Leaf Cheese Company Minute Books (1874–1905), Folder 5, and Maple Leaf Cheese Company Financial Accounts (1874–1885), Folder 6, Maple Leaf Cheese Co. fonds, F 266, Container 1, MU 7263, Archives of Ontario; Roblin Cheese Factory Record Book 1871–1900 (RCF File 2) and Record Book 1891–1923 (RCF File 3), Roblin Cheese Factory fonds, XA1 RHC A0386012, University of Guelph Archives, Ontario; Royal Street Cheese Factory Accounts and Minute Book, Folder 5, Royal Street Cheese Factory collection, MU 7106, Archives of Ontario; and United Empire Loyalist (UEL) Minute books, with accounts, June 1897–December 1922 (Microfilm reels 2124 and 2125), United Empire Loyalist Cheese Factory Records, 3621.20, Queen’s University Archives, Ontario.

**Appendix 4**

Cheese factories in Ontario by county between 1906 and 1932.

<b>County</b>	<b>Cheese factories in 1906</b>	<b>Cheese factories in 1932</b>	<b>Absolute change</b>	<b>Per cent change</b>
<b>Brant</b>	8	1	-7	-88
<b>Bruce</b>	10	2	-8	-80
<b>Carleton</b>	71	43	-28	-39
<b>Cochrane</b>	—	1	—	—
<b>Dufferin</b>	5	0	-5	-100
<b>Dundas</b>	77	45	-32	-42
<b>Durham</b>	11	0	-11	-100
<b>Elgin</b>	22	7	-15	-68
<b>Essex</b>	1	1	0	0
<b>Frontenac</b>	52	49	-3	-6
<b>Glengarry</b>	78	59	-19	-24
<b>Grenville</b>	49	26	-23	-47
<b>Haldimand</b>	9	0	-9	-100
<b>Haliburton</b>	2	0	-2	-100
<b>Hastings</b>	94	61	-33	-35
<b>Huron</b>	5	4	-1	-20
<b>Lambton</b>	13	3	-10	-77
<b>Lanark</b>	46	27	-19	-41
<b>Leeds</b>	106	66	-40	-38
<b>Lennox and Addington</b>	34	23	-11	-32
<b>Lincoln</b>	5	0	-5	-100
<b>Middlesex</b>	38	18	-20	-53
<b>Muskoka and Nipissing</b>	3	—	—	—
<b>Nipissing</b>	—	9	—	—
<b>Norfolk</b>	22	2	-20	-91
<b>Northumberland</b>	44	29	-15	-34
<b>Oxford</b>	47	26	-21	-45
<b>Peel</b>	2	0	-2	-100
<b>Perth</b>	25	14	-11	-44
<b>Peterborough</b>	41	18	-23	-56
<b>Prescott</b>	86	66	-20	-23
<b>Prince Edward</b>	23	17	-6	-26

<b>Renfrew</b>	26	9	-17	-65
<b>Russell</b>	74	51	-23	-31
<b>Simcoe and Grey</b>	8	0	-8	-100
<b>Stormont</b>	60	38	-22	-37
<b>Timiskaming</b>	—	1	—	—
<b>Victoria</b>	16	4	-12	-75
<b>Waterloo</b>	6	4	-2	-33
<b>Welland</b>	2	1	-1	-50
<b>Wellington</b>	8	1	-7	-88
<b>Wentworth</b>	5	0	-5	-100
<b>York</b>	3	0	-3	-100

*Note:* Differences are only available where county boundaries were stable between 1906 and 1932.

*Sources:* Bureau of Industries, *Annual Report of the Bureau of Industries for the Province of Ontario 1906* (Toronto, ON: Ontario Department of Agriculture, 1907), Table XXI, 43; and Department of Agriculture, “List of Cheese Factories and Creameries in Canada and Registered Numbers,” Bulletin 109—New Series (Ottawa, ON: Department of Agriculture, 1932), Agricultural Records collection (UV 9 A1), Norwich and District Museum and Archives, Norwich, ON.

## Appendix 5

Chronology of the life and career of John Mac Hoover.

- |             |   |
|-------------|---|
| ~1870       | Born 'James Maximillian Hover' to James and Mariah Hover in Middlesex, Ontario.   |
| 1887        | Begins working for John N. Logan, proprietor of the Elma Cheese Combination, likely as a cheesemaking apprentice.   |
| ~1893       | Returns from PEI, where he managed the Vernon River Cheese Factory for an unknown period of time.   |
| 1894        | Purchases a half interest in the Goldfield Cheese Factory No. 1 in Stormont County (eastern Ontario) for \$400.00.  |
| 1895        | Purchases machinery and other cheesemaking equipment from Charles H. Wood of the Goldfield Cheese Factory for \$850.00.                                       |
|             | Purchases a half interest in the land, building, and equipment of the Grantley Cheese Factory in Stormont County (eastern Ontario) from James Small.          |
| 1898        | Marries Maie Morrison.  |
| 1903        | Sells an unnamed cheese factory in Aylmer, ON (southwest Ontario) to Ebenezer Agur (who would soon become manager of the province's first milk powder plant). |
|             | Attends the Forest City Business and Shorthand College in London, ON.   |
| 1904 (July) | Buys one-third interest in the Brampton Pressed Brick Works.  |
| 1907 (Jan.) | Purchases the Burgessville Cheese & Butter Factory in Oxford County.  |
| 1914 (Nov.) | Contracts with the Borden's to make cheese from their excess milk.  |
| 1916 (Jan.) | Sells the Burgessville Cheese Factory to the Borden Company.  |
| 1916 (Apr.) | Employed as a milk inspector for the Borden Company.  |
| 1917 (Jun.) | Shipping milk from Burgessville factory (as a receiving station) to the Borden Company in Ingersoll.  |

- 1923 (May) Appears to have cows of his own; sends milk to the Borden Company.
- 1923 (Oct.) Hired by the Borden Company to manufacture cheese until January 1924.
- 1924 (Sept.) Resumes making cheese for Borden's at rate of \$150/month, but employment in this position seems unstable through 1926.
- 1926 (Nov.) Purchases a casein factory at Villa Nova, ON, leaving his farm to his son, Douglas, and his daughter-in-law.
- 1928 (Mar.) Sells the Villa Nova casein factory to the City Dairy Co. of Toronto, but remains the manager of the factory.
- 1930 (Oct.) Borden's purchases the City Dairy Co. of Toronto.
- 1931 (Mar.) Works at the Villa Nova plant as a separator/receiver of milk.
- 1931 (Sept.) Works as milk inspector for the City Dairy Company/Borden's.
- 1932 (Apr.) Investigates the possibility of (re)purchasing or leasing Villa Nova.
- 1933 (Sept.) Resigns from the City Dairy Company/Borden's. Investigates purchasing a creamery on Manitoulin Island.
- 1934 (Jan.) Purchases the Manitowaning Creamery on Manitoulin Island and moves there with Maie.
- 1936 (Oct.) Sells the Manitowaning Creamery to an OAC graduate and former Borden Company employee, J.G. Milne, but continues manufacturing butter until Milne arrives in March 1937.
- 1937 (Mar.) Appears to return to the family farm in Norwich, which now belongs to his son, Douglas.
- 1937 (Dec.) Purchases the Ridgetown Creamery in Oil Springs, ON.
- 1938 (Sept.) Sells the Ridgetown Creamery to L.H. Gray.
- 1938 (Nov.) Takes over the mortgage on the Oilsprings Creamery, belonging to L.M. Kauffman.
- 1939 (Jan.) Takes vacation to Florida.
- 1958 Dies at eighty-eight years old.

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