THE INFLUENCES OF LOCAL ENVIRONMENTAL FACTORS ON SETTLEMENT AND AGRICULTURE IN SALTFLEET TOWNSHIP, ONTARIO, 1790-1890.

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By

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SETTLEMENT AND AGRICULTURE IN SALTFLEET TOWNSHIP, 1790-1890 DOCTOR OF PHILOSOPHY (2001) (History) McMaster University Hamilton, Ontario

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ABSTRACT

This thesis addresses the deficiencies of recent studies that principally employ cultural factors, such as religion and country of birth, to explain variations in wealth and property in nineteenth-century Ontario. Southern Ontario's "first land," an amalgam of particular environmental, climatic, and geophysical factors, presented settlers with a defined set of agricultural and economic possibilities. As settlement activities altered the natural surroundings, a new series of economic possibilities emerged, which in turn, required its own settler response. This relationship changed constantly. In Saltfleet Township, Ontario, the principle area of study for this thesis, the main economic activity was agriculture. A few decades of intensive farming negated the millennia required to enrich the soil with the matter necessary to sustain plant life, while deforestation exposed the ground to the eroding effects of rain and wind. These alterations required a change in the settlement landscape, broadly characterized as improved husbandry and crop specialization tailored to a farm's particular environmental characteristics. This combination of settlement and natural responses produced individual parcels of property with distinct characteristics, including soil fertility, climate, and distance to markets. Studies that seek to understand settlement and agriculture in southern Ontario cannot treat farmland as homogeneous, no matter how many qualifying statements are employed to acknowledge and then exclude these variations. In isolating local environmental variables, such as a farm's topography, drainage, distance to water, and location relative to the Niagara Escarpment, this thesis uses a new settlement model that emphasizes the

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importance of local environmental variations, the effect of which is only recognizable over a long period of time. What emerges is the importance of farmers' abilities to perceive changes in the land and market, and to act upon what they saw.

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My parents have always supported my decision to pursue an academic career. Their love and support was constant and unwavering and I could not have completed the

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-- Introduction --

Man and the Mountain: Landscape and Settlement in Saltfleet Township

For the good times come and go, But at least there's rain, So this won't be barren ground when September rolls around. So watch the field behind the plow turn to straight dark rows. Put another season's promise in the ground.

> "The Field behind the Plow" Song by Stan Rogers

How do historians account for differences in material success among

agriculturalists in Victorian Ontario? Many studies have noted the high-level of

inequality among nineteenth-century residents at the local, regional, and provincial level

in the second half of the nineteenth century. At the local level, Michael Katz's study of

Hamilton suggested that inequality was a staple component of nineteenth-century urban

and rural life.¹ Regionally, Livio Di Matteo and Peter George, in their study of probated

descendents in Wentworth County, noted persistent inequality between 1872 and the turn

¹ Michael B. Katz, *The People of Hamilton, Canada West: Family and Class in a Mid-Nineteenth-Century City*, (Cambridge, Mass: Harvard University Press, 1975). Katz focused on the urban centre of Hamilton, but also noted the transiency of labour from city to countryside depending on the seasonal availability of work. Studies of rural and urban wealth distribution in the United States have produced similar results. In Jeremy Atack and Fred Bateman's study of agricultural settlement in the Antebellum Northern United States, for example, inequality proved a fundamental characteristic of life in the New World [Jeremy Atack and Fred Bateman, *To Their Own Soil: Agriculture in the Antebellum North* (Ames: Iowa State University Press, 1987), p. 89-90]. Winifred Rothenberg produced similar results [Winifred B. Rothenberg, "The Emergence of a Capital Market in Rural Massachusetts, 1730-1838," *Journal of Economic History*, Vol. 45, No.4 (December 1983)].

of the century.² Gordon Darroch and Lee Soltow, in their ambitious and thought provoking province-wide study *Property and Inequality in Victorian Ontario* (1994), examined patterns of wealth distribution at the provincial level for the census year of 1871. The last authors used differences in levels of land ownership and quantity of land as determinants of prosperity and middle-class status. Through a careful analysis of cultural and temporal factors, namely religion, country of birth, occupation, and the age of the heads of household, Darroch and Soltow found that members of certain Evangelical denominations possessed average property holdings greater than members of other faiths. In particular, Baptists owned fifteen to twenty percent more acreage per capita and Methodists ten percent more than either Roman Catholics or Anglicans.³ The historians concluded, in a Canadian re-statement of the Weberian hypothesis, that there is "evidence to suggest the continuing importance of an evangelical moral order in fostering an emergent agrarian middle class,"⁴

² Livio Di Matteo and Peter George, "Patterns and Determinants of Wealth among Probated Descendents in Wentworth County, Ontario, 1872-1902," *Histoire sociale / Social History*, Vol. 31, No. 61 (May 1998), p. 23. See, in particular, the Gini coefficients at the bottom of Table 10. Generally, a will was registered with the Court of Probate (later the Surrogate Court) if the estate was greater than £5 in value.

³ Gordon Darroch and Lee Soltow, *Property and Inequality in Victorian Ontario: Structural Patterns and Cultural Communities*, (Toronto: University of Toronto Press, 1994), p.64. Table 2.6 and accompanying text; and Table 2.7 and accompanying text.

⁴ Darroch and Soltow, *Property and Inequality*, p. 64. Much of the debate regarding the emergence of a well-established agrarian class over mid century stems from attempts to explain demographic and economic changes in Ontario. The evidence for some of these changes comes from a variety of historical studies which emphasize lower birth rates and a greater participation in formal education amongst some groups. William Marr's examination of household structure in Canada West in 1851, for example, noted that older settlements possessed lower birth rates than frontier settlement areas [William L. Marr, "The Household Structure of Rural Canada West in 1851: Old Areas and Frontier Settlement," *Canadian Papers in Rural History IX*, Ed. Donald Akenson, (Kingston and Montreal: McGill-Queen's Press, 1994), p. 375]. He also concluded that religion had little influence on family size when other variables are held constant but that country of birth had some effect. With the exception of those born in the United States, heads of household born outside Canada West had smaller families. Marr used the percentage of acres under cultivations to distinguish settlement areas into three categories of age of settlement. Saltfleet would have fallen into his

Darroch and Soltow mined the 1871 census data to craft a conscientious and

complex analysis of settlement patterns in Ontario. They carefully spelled out the

limitations of their study. One such caution was an acknowledgement of the importance

of geographical patterns which could readily differentiate settlement characteristics of

one region from provincial averages. In their introduction, they stated

It is clear that in focusing on provincial patterns and selected social groups, the analysis cannot do justice to a full range of subregional and community variations in property holding. The study's main concerns preclude detailed analysis of geographic patterns. We do not deny the salience of a multitude of local variations on the general themes; on the contrary. The provincial focus reflects a judgment on research priorities and a specific design for analysis that follows from it.⁵

Despite this caution, the authors ultimately argued that the distribution of religions,

ethnicities, and age groups of farmers in Ontario was sufficiently diffuse to compensate

for geography. Crucially, they asserted that the distribution of wealth, as determined by

⁵ Darroch and Soltow, *Property and Inequality*, p. 18.

[&]quot;Old" settlement area. Marr concluded that the Ontario experience followed similar patterns in the United States, particularly with respect to the decline in birth rates. Darroch and Soltow, on the other hand, concluded that family size was smallest amongst the most evangelical groups (Property and Inequality, p. 111). See also Marvin McInnis, "Childbearing and Land Availability: Some Evidence from Individual Household Data," Ed. R. Lee Population Patterns in the Past (New York: Columbia University Press, 1977), pp. 201-228; and W. L. Marr, "Nuptiality, Total Fertility, and Marital Fertility in Upper Canada, 1851," Canadian Studies in Population, Vol. 13 (1986). For an American perspective see, for example, R.A. Easterlin, et al., "Farms and Farm Families in Old and New Areas: The Northern States in 1860," Ed. Tamara K. Hareven and Maris A. Vinovskis Family and Population in Nineteenth Century America (Princeton: Princeton University Press, 1978). This relatively prosperous emerging landed class stood in contrast to rural labourers, although the lines between the two groups were often blurred. Rural labour could take many forms, ranging from agriculture to timbering to manufacturing, with many using tenant farming as a means of climbing the economic ladder. Many historians have written on this topic, including Chad Gaffield, Language, Schooling, and Cultural Conflict: The Origins of the French-Language Controversy in Ontario, (Kingston and Montreal: McGill-Oueen's University Press, 1987); Chad Gaffield, "Children, Schooling and Family Reproduction in Nineteenth-Century Ontario," Canadian Historical Review, Vol. 72, No. 2 (June 1991), pp. 157-191; Joy Parr "Hired Men: Ontario Agricultural Wage Labour in Historical Perspective," Labour/Le Travail, Vol. 15 (Spring 1985), pp. 91-104; Terry Crowley, "Rural Labour," Ed. Paul Craven, Labouring Lives: Work and Workers in Nineteenth-Century Ontario, (Toronto: University of Toronto Press, 1995), pp. 13-104; Ian Radforth, "The Shantymen," Ed. Paul Craven, Labouring Lives: Work and Workers in Nineteenth-Century Ontario, (Toronto: University of Toronto Press, 1995), pp. 204-77.

accrued acreages, was distinct from regional variations and that "the aggregate census data give no reason to think that the denominational differences in size of farm holdings reflect geographical patterns. This fact encourages a cultural interpretation."⁶ Later in their book, they articulated such an interpretation: "The association between real estate accumulation and Protestant denominations in nineteenth-century Ontario reflects persistent cultural differences."⁷

This thesis asserts that this claim is premature given the authors' exclusion of land quality and time on the land variables in the statistical analysis.⁸ The first of these omitted factors, land quality, can be discussed with reference to regional variation or environmental variation. Even though Darroch and Soltow asserted that their model of

⁷ Darroch and Soltow, *Property and Inequality*, p. 111. This statement followed an examination of family size and attendance in formal education.

⁶ Darroch and Soltow, *Property and Inequality*, p. 53. Many studies have emphasized the importance of race, ethnicity, and religion on a variety of crop choices, wealth, and/or land ownership. Perhaps the most influential and successful examination of the influence of cultural variables, such as religion and ethnicity, was Donald H. Akenson's The Irish in Ontario: A Study on Rural History (Kingston and Montreal: McGill-Queen's University Press, 1984). See also, Frank Yoder, "Rethinking Farm Tenure: A Cultural Perspective," Agricultural History, Vol. 71, No. 4 (Fall 1997), pp. 457-478; Paul Wallace Gates, Landlords and Tenants on the Prairie Frontier: Studies in American Land Policy (Ithaca: Cornell University Press, 1972); Jeremy Atack, "Tenants and Yeomen in the Nineteenth Century," Agricultural History, Vol. 62, No. 2 (Summer 1983), pp. 6-32; Robert P. Swierenga, Pioneers and Profits: Land Speculation on the Iowa Frontier (Ames: Iowa State University Press, 1968); Charles F. Heller, Jr. and John T. Houdek, "Farm Tenants and Landlords in Nineteenth-Century Southern Michigan: A Study of Two Townships," Agricultural History, Vol. 70, No. 4 (Fall 1996), pp. 598-621. James T. Lemon, in The Best Poor Man's Country: A Geographical Study of Early Southeastern Pennsylvania, (New York: W.W. Norton & Company, 1972), p. 73-77, described the attribution of settlement patterns to cultural propensities as a particularly troubling interpretive paradigm. He noted that this approach's seeming simplicity could quickly become a tangled mass of unending variability and exception.

⁸ Other have raised this concern, including Kris Inwood in his review of *Property and Inequality* [*Canadian Historic Review*, Vol. 77, No. 3, (September 1996), p. 457]; and John C. Weaver in his review of the same book [*Ontario History*, Vol. 87, No. 1 (Spring 1995), p. 89]. There are, of course, numerous other variables that ideally should be included in an examination of settlement, including the sequence of land acquisitions in a particular region, access to credit, initial capital, distance to markets, access to effective transportation, early knowledge of changes in market demand, fluency in the cultural and linguistic levers of political power, and access to cultural and social organizations that provided aid when needed. Including even a few of these variables would be very difficult, if not impossible, given the lack of surviving material, especially for a province-wide study.

wealth distribution could withstand regional differences, there would be little to gain from examining the distribution of wealth in a single township using the same variables employed by Darroch and Soltow. Employing statistics from local studies to challenge conclusions drawn from a province-wide sample is not, in itself, effective argumentation. Unless there are a number of randomly selected townships, the local studies would not likely mirror the province. This study does much more than simply replicate the broader study on a small scale and then show how its results contrast with province-wide figures. Instead, the statistical model employed in this thesis incorporates a number of land quality variables to see if cultural factors prove robust to these differences.⁹ By controlling for environmental variables, it will be possible to consider whether differences in wealth among farmers are better explained by religion or by other considerations.

Farmers possessed a detailed knowledge of their land after having worked it for a number of years. Qualities like stoniness, drainage, sandiness, acidity, and fertility prompted farmers to experiment with different crops, till with different techniques, and fertilize with different manures. As Douglas McCalla once noted, "If most elements of mixed farming were widely practiced, they could be combined in differing ways depending on soil and climate and on farmers' knowledge, capital and expectations regarding markets."¹⁰ Climate also played an important role in determining how and

⁹ The specific variables included in the model will be discussed in Chapter 1.

¹⁰ Douglas McCalla, *Planting the Province: The Economic History of Upper Canada, 1784-1870* (Toronto: University of Toronto Press, 1993), p. 222. Emphasizing the importance of geography, even at the township level necessitates disagreeing with conclusions from R. Marvin McInnis's earlier work with the Canada West Farm Sample from 1861 in "Marketable Surpluses in Ontario Farming, 1860," *Social Science History*, Vol. 8, No.4 (Fall 1984). Here, McInnis stated that location was not particularly important, or at

when a farmer planted, as certain crops in some locations simply would not mature before the first autumn frost. There have, of course, been numerous excellent township, county, and province-wide studies that have discussed the importance of geography in the history of Upper Canada. David Gagan's excellent *Hopeful Travellers*, for example, examined settlement persistence and inheritance patterns in the wheat-rich soils of midnineteenth Peel County. For the most part, however, the pattern that emerges in Upper Canadian historiography is an acknowledgement of the geophysical and climatic variations of a region within the text, but the exclusion of such factors from the statistical analysis.¹¹ In this thesis, I attempt to dissect and analyze these variations at the lot level

least, not as important as settlement persistence and distance to urban markets. While Ontario's physiography is less varied than the northern United States, to conclude that it is "fairly homogeneous" is too sweeping (p. 397). Having said that, it would be difficult to overstate McInnis's contribution to the understanding of settlement and agriculture in Ontario and Quebec. Citing only one aspect of his research, the methodology and assumptions he and Frank Lewis employed in the calculation of farm output provided a new standard for examining the history of agriculture in Ontario and elsewhere. Many historians have followed their work. See, for example, Rusty Bittermann, Robert A. MacKinnon, and Graeme Wynn, "Of Inequality and Interdependence in the Nova Scotian Countryside, 1850-70," *Canadian Historical Review*, Vol. 74, No. 1 (March 1993), p. 20-1, N28. This thesis also uses many of the assumptions employed by Lewis and McInnis in the calculation of a statistic called "farm worth," which can be seen in Appendix A.

¹¹ There are, of course, important exceptions. See, for example, H.W. Taylor, J. Clarke, and W.R. Wightman's article which incorporated environmental variables into a complex curvilinear regression of a range of variables on land development. They concluded that, among other things, the quality of the environment was a critical factor in understanding regional patterns of development ("Contrasting Land Development Rates in Southern Ontario to 1891," Ed. Donald Akenson, *Canadian Papers in Rural History V*, (Gananoque: Langdale Press, 1986), p. 71. See also John Clarke's work on Essex County, in particular, "Aspects of Land Acquisition in Essex County, Ontario, 1790-1900," *Histoire social / Social History*, Vol. 11, No. 21 (May 1978) pp. 98-119; and his work with G.F. Finnegan, "Colonial Survey Records and the Vegetation of Essex County, Ontario." *Journal of Historical Geography*. Vol. 10, No.2, (1984). pp.119-138; R.W. Widdis outlines some of the potential of incorporating spatial factors in "Tracing Property Ownership in Nineteenth-Century Ontario: A Guide to the Archival Sources," Ed. Donald Akenson, *Canadian Papers in Rural History II* (Gananoque, Ontario: Langdale Press, 1980), p. 92. Mart A. Stewart made a similar lament regarding the study of cattle raising in "Whether Wast, Deodand, or Stray': Cattle, Culture, and the Environment in Early Georgia," *Agricultural History*, Vol. 65, No. 3, (Summer 1991), pp. 1-28.

in order to emphasize the importance of environmental variables in the decision-making processes of individual farmers.¹²

The statistical model employed in this thesis also incorporates a measure of a farmer's time on the land, which I call settlement persistence. Along side the much noted poverty and transiency of rural existence in Victorian Ontario stood the constancy of many "middling"¹³ and well-established families. Some of the most important studies in Ontario history have emphasized the significance of putting down lasting agricultural and familial roots. As David Gagan noted, settlement persistence was paramount to success on the land.

They came to Peel in search of vocational and social mobility defined in terms of occupying land, acquiring property, and emulating the material success of Peel's most established farmers. Few enough achieved their goal, at least in part because these migrants failed to comprehend the fundamental irony of Canadian life. They were taught to equate moving on with moving up. Yet the race was invariably won by those who stayed put.¹⁴

¹² The historiography of Quebec agriculture and settlement has a longer tradition of incorporating landscape and environment into the analysis. Pioneering work by Lewis and McInnis, for example, examined agricultural outputs in Quebec for the year 1851. The authors attempted to account for environmental variations in farm property by incorporating a variable into their assessment of agricultural output that captured soil quality (dLQ). Based on the Canada Land Inventory agricultural land classification system, the system takes the area of classes I-III as a percentage of classes I-IV. They found that land quality did prove significant in accounting for variations in "Total Factor Productivity" in Lower Canadian agriculture in 1851 (Lewis and McInnis, "Agricultural Output," p. 64-5 and 82 N16). See also, Gérard Bouchard, *Quelques arpents d'Amerique. Population, économie, famille au Saguenay* (Montréal: Boréal, 1996); and Serge Courville, *Entre ville et campagne. L'essor du village dans les seigneuries du Bas-Canada* (Québec: Les press de l'université Laval, 1990). In the Maritimes, Bittermann, MacKinnon, and Wynn examined, in part, the variations in land worth that contemporary assessors placed on different pieces of land, depending on its relative utility (Bittermann, MacKinnon, and Wynn, "Of Inequality," p. 13).

¹³ The term comes from Gordon Darroch's "Scanty Fortunes and Rural Middle-Class Formation in Nineteenth-Century Central Ontario," *Canadian Historical Review*, Vol. 79, No. 4 (December 1998), p. 623.

¹⁴ David Gagan, Hopeful Travellers: Families, Land, and Social Change in Mid-Victorian Peel County, Canada West, (Toronto: University of Toronto Press, 1981), p. 96.

This thesis adds a settlement persistence variable to the statistical model by comparing the presence of farmers in one primary document to a earlier one.¹⁵

Agriculture is both a local and a regional concern. Local because each year a farmer decided where each crop would best grow, and regional because each year a farmer assessed what crops would best sell at market.¹⁶ Appreciating the relationship between land quality and time on the land and the distribution of wealth in rural communities can best be served by a local study. Broad studies, because of their nature, can gloss over substantive differences that shaped and altered settlement in a region. William Cronon noted, "the study of such relations is usually best done at the local level, where they become most visible; the best ecological histories to date have all examined relatively small systems as cases."¹⁷ An examination of these changes in Saltfleet Township (see Figure I-1), located in Wentworth County at the head of Lake Ontario, can address significant aspects of the historiographical debate behind the distribution of wealth in nineteenth-century Ontario. I selected Saltfleet Township, not at random, but

¹⁵ The methodology behind the calculation of settlement persistence is discussed in Chapter 3. I could not find a suitable means of capturing initial capital and access to credit consistently for the township. Further research here is needed.

¹⁶ Mary Eschelbach Gregson constructed an equation that represents a farmer's decision-making process to plant one crop over another, which provides an effective insight into the complexity of the issues at hand ["Long-Term Trends in Agricultural Specialization in the United States," *Agricultural History*, Vol. 70, No. 1 (Winter 1996), pp. 90-101].

¹⁷ Cronon, *Changes*, p. 14. Of course, many broad studies have effectively examined the relationship between changing landscapes and human adaptation. Historians in the Annales School, for example, championed the *longue-durée*, that is, humanity's relationship with the land over a long time span [Fernand Braudel, "History and the Social Sciences," *On History*, Trans. Sarah Matthews, (Chicago: The University of Chicago Press, 1980), p. 27]. More recent variations of this approach, such as Jared Diamond's *Guns, Germs, and Steel*, attributed the ultimate reason for the development and success of some populations over others squarely on the geophysical formation of continents over millions of years and the biological predisposition of plants and animals towards domestication over thousands of years [Jared Diamond, *Guns, Germs, and Steel: The Fate of Human Societies*, (New York : W.W. Norton, 1997)].

for its pronounced physical traits and because of its surviving historic documents. The Niagara Escarpment divides Saltfleet Township almost evenly into two distinct landscapes. Traditional settlement studies have used cultural factors as an interpretive paradigm. The two distinct regions in Saltfleet allow an examination of variations in material achievement by considering the influence of the physical landscape.¹⁸



Figure I-1: Location of Saltfleet Township.

In addition, a local study more readily allows for an examination of changes in land use and wealth distribution over time. The reason is a practical one. Collecting data on households is labour intensive, and researchers often have to trade off breadth of regions covered against span of time. Many studies opt for geographic breadth rather

¹⁸ An insightful and thoroughly enjoyable read that dissects the relationship between the land and its settlement history is Thomas F. McIlwraith's *Looking for Old Ontario: Two Centuries of Landscape Change* (Toronto: University of Toronto Press, 1997). Part 1, in particular, provides an interesting examination of the changing nature of settlement and landscape in Ontario (pp 15-102).

than multiple time periods. I prefer the use of more than one census document. A limitation inherent in all studies that use a single year to obtain a cross section of society is that important changes in agricultural and settlement activities can be missed.¹⁹ The initial environmental conditions presented European occupants of new world settlement frontiers with a certain set of possibilities that influenced their economic and agricultural decisions.²⁰ Individual action altered this "first nature," changing the initial potentialities. Cronon noted that the "environment may initially shape the range of choices available to a people at a given moment, but then culture influences people who reshape the environment when responding to these choices. The reshaped environment presents a new set of possibilities for cultural reproduction."²¹ The virgin soils of southern Ontario, for example, offered Natives and Europeans the opportunity to farm without much concern for deep ploughing and extensive fertilization. As the soil gave up its richness (the environmental response to over-farming), settlers adopted more intensive agricultural practices, altering the cultural dynamic.

Agricultural and settlement adaptations in nineteenth-century Saltfleet provide an excellent example of how recourse to several cross-sectional studies at a decade or more

¹⁹ This limitation should not be viewed as a criticism of Darroch and Soltow's book. The authors clearly acknowledge the difficulty of working with a single census year and call attention to this limitation. As Darroch noted, in a more recent work that analyzed middle-class formation through the 1861 and 1871 census, "Snapshots can be revealing, however, so long as we do not mistake the frozen image for the social processes they reflect" (Darroch, "Scanty Fortunes," p. 623). Although this thesis uses a number of census and assessment rolls, Darroch's caution regarding the limitation of single-year documents is well worth noting.

²⁰ William Cronon, *Nature's Metropolis: Chicago and the Great West*, (New York: W.W. Norton & Company, 1991), p. xix. Cronon's use of the term "First Nature" is adapted from Marx and Hegel, but as Cronon points out, the artificial division hides that fact that we are always in a state of flux and ambiguity between levels of nature.

²¹ William Cronon, Changes in the Land: Indians, Colonists, and the Ecology of New England, (New York: Hill and Wang, 1983), p. 13.

apart can reveal important changes in the settlement of the land. Historically, the best agricultural lands in Saltfleet were located below the escarpment. The rich soil receives more sun, more rain, and is better protected from early and late frosts by the moderating effects of Lake Ontario. By 1810, many of the township's first settlers, namely loyalists and British Army officers, had established large farms below the escarpment, leaving the relatively less productive lands above for later arrivals. For sixty years, the farms below the escarpment were, on average, substantially larger than farms above the escarpment. However, as farmers accelerated their specialization in fruit, tailoring their endeavours to the specific environmental conditions they faced, the average farm below the escarpment ended up much smaller than the average farm above by 1890. In 1871, the average size of farms above the escarpment and the average size below were equal. By tracing landholdings and agricultural practices through time, this evolving process of settlement can be better understood. This evolving relationship between land and settler forms the basis of this thesis.

In addition to changes over time, this thesis employs a number of measures of wealth to explore the level of inequality in Saltfleet. Many historians acknowledge the difficulty of using only the size of farms as a means of examining patterns of wealth. Marvin McInnis, for example, noted that farm size could be quite misleading in terms of understanding agricultural activity, and ultimately the distribution of wealth. He concluded, however, that other factors, such as cultivated acres and reported farm value, also present difficulties and that farm acreage at least captured the most "essential, discriminating asset."²² Using total acreage as a surrogate for wealth without including some element of a land's particular geophysical and climatic peculiarities, however, assumes no variation in land quality. Darroch and Soltow, for example, acknowledge quite clearly that land in northern Ontario is worth much less than land in the south but do not incorporate this distinction in their analysis, and yet still conclude that cultural variations continued to prove statistically significant even when these regional variations were not taken into account.²³ This study found dramatic variations in the value of land within the confines of a single township, which indicates that acreage alone may not be the best surrogate for wealth. Conclusions drawn from this single measure could be misleading. To provide a more complete picture of material prosperity across the township, this thesis examines inequality using three plausible and reasonably simple statistics: farm acreage, assessed value, and an estimation of the value of farm produce and livestock as presented in the decennial censuses of 1851, 1861, and 1871, which in this thesis is called farm worth.²⁴

The presence of inequality in Saltfleet Township should be no surprise. As land in Saltfleet was taken up and occupied by a variety of newcomers, including army officers, government officials, and United States émigrés, patterns of inequality immediately appeared. From its earliest days, the distribution of lands in Saltfleet was uneven, favouring important loyalist families that arrived early. Understanding and

²² Marvin McInnis, "The Size Structure of Farming, Canada West, 1861," Eds. George Grantham and Carol S. Leonard, *Research in Economic History – Supplement 5 (Part B)*, (Greenwich, Connecticut: Jai Press Inc, 1989, p. 322.

²³ Darroch and Soltow, Property and Inequality, p. 192.

²⁴ The procedure for generating farm worth is presented in Appendix A.

explaining nineteenth-century rural inequality (measured by Gini coefficients of total acreage, assessed value, and farm worth), however, requires careful consideration. In an effective outline of the difficulty, Rusty Bittermann, Robert MacKinnon, and Graeme Wynn noted three points as crucial to the discussion. First, increases in age are often associated with the accumulation of property and capital, so comparisons of wealth must be made among individuals of similar age.²⁵ Second, inequality is a natural byproduct of a society that possesses an equality of opportunity, as different faculties and abilities will heavily influence the accumulation of wealth over a lifetime. The analysis of historic communities should, therefore, examine whether a society fostered "ability and sacrifice, not privilege."²⁶ And third, complete equality has never been assumed. Instead, comparisons between inequality in the New World and that of the Old remain key to understanding the truth behind the myths of a land of opportunity.²⁷

Although the local landscape is essential to understanding settlement and agriculture in Saltfleet, the township's farmers did not act in a vacuum. The growth of local and more distant markets held the attention of Ontario farmers. This orientation towards market activity provides an important element in understanding the relationship between land and its occupants. Although most historians generally acknowledge that settlers were never purely subsistence farmers, the debate regarding the timing and level

²⁵ To accommodate the concerns presented in Bittermann, MacKinnon, and Wynn, "Of Inequality," I divided the measures of inequality in land distribution, assessed value, and farm worth into two groups: forty years old and under and older than forty years old. There were insufficient numbers in Saltfleet to breakdown the data into smaller bins. The average decline in wealth for individuals over sixty-five should not overly affect the average as Saltfleet had very few individuals that survived past this age.

²⁶ Bittermann, MacKinnon, and Wynn, "Of Inequality," p. 18.

²⁷ Bittermann, MacKinnon, and Wynn, "Of Inequality," p. 18.

of self-sufficiency and market orientation is particularly well defined in the study of early agriculture in the United States. Possibly the most important work to reject the myth of self-sufficient subsistence-based farming was by James Lemon in *The Best Poor Man's Country*. Farmers in Pennsylvania, according to Lemon, were entrepreneurs readily aware of market forces.²⁸ He rejected notions of subsistent self-sufficiency as romantic and ill-founded, concluding that the "golden age of noncommercial simplicity … did not exist in rural or even frontier Pennsylvania."²⁹

In contrast, some historians, such as James A. Henretta, argued that, while farmers did trade openly at local and even regional markets, the majority of produce satisfied the internal needs of the family or neighbours.³⁰ Often beginning with Marx's distinction between farm production for internal uses (use-value) and production for exchange (exchange-value), these efforts stress the importance of land and farm production as a means to maintain family, religious, and communal lineages, especially in the absence of a large merchant community.³¹ Henretta argued that,

Given the absence of an external market, there was no alternative to subsistence and semi-subsistence production. Following the settlement of an inland region, for example, there would be a flurry of barter transactions, as established settlers exchanged surplus foodstuffs, seeds, and livestock for the scarce currency and manufactured items brought by newly arrived migrants...Migrants quickly planted their own crops, and most rural artisans cultivated extensive gardens and

²⁸ Lemon, Poor Man's Country, p. 2.

²⁹ Lemon, Poor Man's Country, p. 6.

³⁰ James A. Henretta, "Families and Farms: *Mentalité* in Pre-Industrial America," *William and Mary Quarterly*, Vol. 35, No. 1, (January 1978), p. 16. Allan Kulikoff provides an excellent examination of this topic in his review article "The Transition to Capitalism in Rural America," *William and Mary Quarterly*, Vol. 46 No. 1 (January 1989). p. 122-3.

³¹ Kulikoff, "Transition to Capitalism," p. 122-3.

kept a few head of livestock. The economy \dots stabilized at a low level of specialization.³²

Most settlers, according to this interpretation, conducted trade directly with other producers avoiding the intercession of merchants or brokers. The high cost of transport contributed to this isolation.³³ In pre-industrial United States, the dominant market structure was a "safety-first subsistence agriculture"³⁴ of household production. The noncommercial exchange of labour between producers emphasizes this lack of traditional market-orientation.³⁵

The debate regarding the market orientation of nineteenth-century farmers in

Upper Canada is less polarized. Although early wheat-oriented theorists suggested that

³⁵ Kulikoff, "Transition to Capitalism," p. 123 and Michael Merrill, "Cash is Good to Eat: Self-Sufficiency and Exchange in the Rural Economy of the United States," Radical History Review, Vol. 4 (Winter 1977), p. 43. Christopher Clark, who expanded on this theme, emphasizes the lack of conflict between the household mode of production and increased market participation, stating that the early industrialization (or proto-industrialization) helped preserve the existing domestic order [Christopher Clark, "The Household Mode of Production - a Comment," Radical History Review, Vol. 18 (Spring 1978), p. 1661. Winifred Rothenberg effectively countered this return to a self-sufficiency paradigm in a series of articles that compared farm prices at market with farmers' journey to market and account receipts. Her work, filled with regression analysis and correlations, showed that farmers tailored their activities to markets, altering their agricultural practices if warranted by market demand. If farmers used the vast majority of their production to solidify familial and communal ties, then the regional and provincial markets for grain, for example, would have acted independently, bearing little or no relation to the local markets of exchange, which was not the case. This network of markets, not only in agricultural products but also in capital and labour, clearly illustrated the profit-orientation of farmers in the United States, and in Massachusetts in particular, well in advance of industrialization. [Winifred B. Rothenberg, "The Market and Massachusetts Farmers, 1750-1855," Journal of Economic History, Vol. 41, No.2 (June 1981), p. 287; Winifred B. Rothenberg, "The Market and Massachusetts Farmers: Reply," Journal of Economic History, Vol. 43, No.2 (June 1983); Winifred B. Rothenberg, "The Emergence of a Capital Market in Rural Massachusetts, 1730-1838," Journal of Economic History, Vol. 45, No.4 (December 1983); and Winifred B. Rothenberg, "The Emergence of Farm Labor Markets and the Transformation of the Rural Economy: Massachusetts, 1750-1855," Journal of Economic History, Vol. 48, No.3 (September 1988). See also Bettye Hobbs Pruitt, "Self-Sufficiency and the Agricultural Economy of Eighteenth-Century Massachusetts," William and Mary Ouarterly, Vol. 41 (July 1984), p. 364]. Ultimately, this liquidity and mobility of agricultural savings transformed the rural economy. Rothenberg, "Capital Market," p. 807 and "Farm Labour," p. 561.

³² Henretta, "Mentalité," p. 15.

³³ Henretta, "Mentalité," p. 17.

³⁴ Henretta, "Mentalité," p. 20.

farmers were less involved in market activities in early settlement periods,³⁶ a general consensus of a contrary view has emerged. McInnis, for example, emphasized the market orientation of farmers in much of his work, particularly in his examination of marketable surpluses. He concluded that self-sufficiency never really existed:

From the earliest years of settlement farmers had some degree of orientation to the market. Even on the frontiers of most recent settlement, farms generally could not be characterized as being of a wholly subsistence nature. Nor was there some mystic moment when agriculture shifted from self-sufficiency to commercialization.³⁷

McCalla noted that, for the average farmer, self-sufficiency was never a condition of initial settlement as most entered into debt when buying land, farm equipment, essential supplies, and seed.³⁸ In his work "Marketable Surpluses in Ontario Farming, 1860," McInnis concluded that the majority of farming families in Ontario produced at least some surplus that could be sold at local markets or through merchants. Sixteen percent of these farms produced surpluses in excess of the estimated consumption needs of three families, which he deemed to be commercialized farming activities.³⁹ Darroch arrived at similar conclusions in his comparative study of the 1861 and 1871 census, noting that "well over half of all families occupied 'middling' or substantial farms in central

³⁶ V.C. Fowke, *The National Policy and the Wheat Economy*, (Toronto: University of Toronto Press, 1957), p.11-21.

³⁷ Marvin McInnis, "Marketable Surpluses in Ontario Farming, 1860," Social Science History Vol. 8, No. 4 (Fall 1984), p.395.

³⁸ Douglas McCalla, "The Wheat Staple and Upper Canadian Development," *Historical Papers* (1978), p.39.

³⁹ McInnis, "Marketable Surpluses," p. 410-413.

Ontario.⁴⁰ This thesis, based on the work of others, assumes that farmers by at least mid-century onwards produced sufficient quantities of agricultural goods to generate a surplus that was sold at market.

The importance of generating surpluses for market was surely quite evident to Saltfleet farmers because the township was located near a large urban centre and numerous smaller towns. There is a long tradition in historical geography of associating rural specialization and property values with proximity to urban markets. This discussion begins with Johann von Thünen, whose model of agricultural variation by proximity to market began with the assumption of a number of constants, including uniform physical environment and means of transportation, and parity in farmers' knowledge of technology and market needs.⁴¹ The artificiality of his proposal, which he acknowledged, resulted in a model of concentric rings of farm produce centred on a large market. The

⁴⁰ Darroch, "Scanty Fortunes," p. 653. Darroch came to this conclusion even with the inclusion of farmers with very small farms or no farms at all, which McInnis had excluded. The success of Ontario farmers contrasts with the circumstances of many farmers in the Maritimes. The majority of Nova Scotia farmers were barely capable of producing sufficiently for family consumption. Many suffered from starvation (Bittermann, MacKinnon, and Wynn, "Of Inequality," p. 35-7). To make up for farming shortfalls, many individuals tried to supplement their income in waged employment earning meager incomes in an uncertain labour market (p. 36). A perhaps even more pessimistic view is presented by Julian Gwyn and Fazley Siddig in "Wealth Distribution in Nova Scotia during the Confederation Era, 1851 and 1871," Canadian Historical Review, Vol. 73, No. 4 (December 1992), pp. 435-452. Kris Inwood and Phyllis Wagg presented a contrary opinion, concluding that many Nova Scotia farmers continued to accumulate wealth throughout the Pre-Confederation era ("Wealth and Prosperity in Nova Scotian Agriculture, 1851-1871," Canadian Historical Review, Vol. 75, No. 2 (June 1994), p. 257. Studies of inequality in Quebec are also helpful for comparison. Sylvie Dépatie, for example, noted that even though land ownership was relatively equal, perhaps stemming from its initial free distribution, a hierarchy of land ownership existed that differentiated one agriculturalist from another ["La structure agraire au Canada: Le cas de l'Île Jésus au XVIII^e siècle," Historical Papers, (1986), p. 83-5; and Sylvie Dépatie, "La transmission du patrimonie dans les terroirs en expansion: un exemple canadien au XVIII^e siècle," Revue d'histoire de l'Amerique française, Vol. 44, No. 2 (automne 1990), p. 197-8]. Beatrice Craig examined how inequality can emerge from initial waves of settlers claiming the best land and using this advantage to provide for their children ("Immigrants in a Frontier Community: Madawaska 1785-1850," Histoire sociale / Social History, Vol. XIX, No. 38 (November 1986), p. 295-7.

⁴¹ Lemon, Poor Man's Country, p. 185.

types of produce originating closest to the centre, which were the most expensive to transport or most likely to be damaged during shipping, included milk and crops of market gardeners. These were followed by grain, dairy products other than milk, and livestock.⁴² This analysis would appear to have some bearing on Saltfleet, as both fruit production below the escarpment and milk production in the Red Hill Creek Valley flourished close to Hamilton.⁴³ The model only holds, though, below the escarpment. Farmers below the escarpment began concentrating on fruit, while those above generally continued to grow grain and grasses. This pattern, which stretched throughout the Niagara Peninsula, arose as a consequence of environmental factors and not distance to market. Von Thünen's concern regarding the proximity of markets, however, does emphasize the importance of Hamilton to Saltfleet farmers. Most agriculturalists could not ignore the draw of the farmers' market founded in the late 1830s, which offered a ready opportunity to sell goods to the citizens of a growing city.⁴⁴

Farming in a large town's shadow changes many of the dynamics between the land, the farmers, and their efforts to sell their goods. Rather than reviewing the enormous body of literature that has emerged from von Thünen's work, a summary of one study that provides striking parallels to Saltfleet's circumstances would be helpful. Michael Conzen's examination of Blooming Grove Township near Madison, Wisconsin, is a particularly appropriate study of urban-shadow farming. Conzen detailed four stages

⁴² Lemon, Poor Man's Country, p. 185.

⁴³ Lemon, Poor Man's Country, p. 275 N1.

⁴⁴ John C. Weaver, *Hamilton: An Illustrated History*, (Toronto: James Lorimer & Company and National Museum of Man, 1982), p. 39.

of development: first, the establishment of a wheat-based subsistence agriculture; second, the increased contact with local and distant markets fostered intense specialization in one particular cash crop, such as wheat; third, a diversification resulting from declining yields from over-farming and insect depredations; and fourth, a new specialization more attuned to local resource factors arising from the failure of increased diversification to provide sufficiently for individual farms.⁴⁵ He concluded that the pattern of agricultural development of Blooming Grove followed these general stages, although the lines distinguishing one stage from the next become much more blurred in practice than in conception.⁴⁶ Conzen noted that the increasing amount of market gardening and milk production strongly supported the continued applicability of von Thünen's model of nineteenth century farming near an urban centre.⁴⁷

I argue that the earliest systematic primary documents regarding agriculture in the township show that farmers began emphasizing certain crops based on particular local environmental variables very early, bypassing Conzen's somewhat rigid stages of agricultural progression and his emphasis on wheat production.⁴⁸ This early

⁴⁵ Michael P. Conzen, Frontier Farming in an Urban Shadow: the Influence of Madison's Proximity on the Agricultural Development of Blooming Grove, Wisconsin, (Madison: The State Historical Society of Wisconsin, 1971), p. 3. Conzen used Eric E. Lampard's paradigm for regional patterns of agricultural development, which can be found in "Regional Economic Development, 1870 – 1950," Harvey Perloff et al., Regions, Resources and Economic Growth (Baltimore, 1960), Part III, pp. 109-292.

⁴⁶ Conzen, Frontier Farming, p. 150.

⁴⁷ Conzen, Frontier Farming, p. 150.

⁴⁸ The importance of wheat to the nineteenth-century farmer has been frequently debated. H. Innis and W.A. Mackintosh championed the Canadian staples thesis as an interpretive paradigm. A number of historians and economists have contributed to this blueprint of economic settlement, including W. A. Mackintosh, "Economic Factors in Canadian History," *Canadian Historical Review*, Vol. 4, No.1 (March 1923), pp. 12-25; W.T. Easterbrook and Hugh G. J. Aitken, *Canadian Economic History* (Toronto: Macmillan of Canada, 1956); William L. Marr and Donald G. Paterson, *Canada: An Economic History* (Toronto: Macmillan of Canada, 1980); M.H. Watkins, "A Staple Theory of Economic Growth," *Canadian*

specialization (or at least emphasis) in Saltfleet highlights the market orientation that influenced each planting decision made by farmers. Although the majority of Saltfleet settlers began with common or shared perceptions of what crops should be grown, namely wheat, oats, barley, and potatoes, and what livestock to raise, namely cows, sheep, and pigs, many began concentrating their efforts on activities best suited to their farm. By concentrating on fewer and fewer crops, each tuned to particular fields and microclimates, a farmer could capitalize on certain market opportunities. Farmers near a reliable water source, for example, found raising livestock slightly easier than those more distant from water. This advantage allowed these farmers to gradually increase their herd size and ultimately their marketable efforts. On the other hand, farmers below the escarpment had an easier time bringing their goods to Hamilton's market than farmers above the escarpment, allowing an advantage in the production of more tender produce. Agriculturalists above the escarpment needed to navigate one of the five roads that traversed the mountain, all of which could be particularly treacherous in winter or during

Journal of Economic and Political Science, Vol. 29 (1963), pp. 141-58; V.C. Fowke, Canadian Agricultural Policy (Toronto: University of Toronto Press, 1946); and John McCallum, Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario until 1870, (Toronto: University of Toronto Press, 1980). Recently, the staples thesis has come under much fire, especially from Marvin McInnis and Douglas McCalla [Marvin McInnis, Perspectives on Ontario Agriculture, 1815-1930, (Gananoque: Langdale Press, 1992); and McCalla, Planting the Province]. McInnis argued that the majority of wheat exported from Upper Canada and then Canada West really serviced markets in Lower Canada, which could hardly be considered an external trading partner. McCalla also pointed out that most of the wheat trade occurred within this "Laurentian economy" (p.5), but his argument went much further. He emphasized the importance of local trade by examining the trading practices of merchants and farmers finding that wheat, while important, was certainly not the one and only staple of Ontario farmers. A number of crops, depending on region and season, contributed significantly to the farmers' economy. As McCalla noted, "The local market gave Upper Canadians choices of what to produce and meant they were not dependent on a single export commodity. A farm provided much more than wheat, and the forests provided many other products besides...squared white pine timber" (Planting the Province, p.6). After these two books, any historian seeking to rescue the staples theory will have much work to do. A Marxist interpretation of the wheat economy, which attacks McInnis's interpretation (but ignores McCalla's), can be found in Norman N. Feltes, This Side of Heaven: Determining the Donnelly Murders (Toronto: University of Toronto Press, 1999), in particular, Chapter 4.

a spring downpour.⁴⁹ Environmental advantages pushed farmers to specialize early, and the market pulled them along.

The reactions of farmers to a host of factors – markets, climate, land quality, and much else – resulted in diverse agricultural practices which produced varied patterns of property accumulation.⁵⁰ By isolating particular environmental variables, I will show that important variations in agricultural and market specialization created dramatically different distributions of wealth among the people of a single township. These differences indicate that the exclusion of land quality and settlement persistence from the statistical analysis is a mistake. It is in not helpful to simply acknowledge the importance of these local issues and then ignore them. The exclusion neglects too much.

⁴⁹ See, for example, *Minutes of the Gore District Council*, RG F 1679-1-0-1, Archives of Ontario, No. 23, February 6, 1843 and *Minutes of Saltfleet Township Council*, RG GS 623-4, Archive of Ontario, February 25, 1850 and April 20, 1850.

⁵⁰ Property accumulation raises the issue of an active land market, which this thesis assumes to have been the norm for Saltfleet Township throughout most of the nineteenth century. Other studies in the province have emphasized the vitality of the land market over the nineteenth century. Based on an examination of the Newmarket Era and Express, a weekly newspaper with a large farmer readership, Gordon Darroch, for example, concluded that the land market in Ontario was very dynamic (Darroch, "Scanty Fortunes," p. 649). John Clarke and D.L. Brown's work in Essex County showed that, while the buying and selling of land was active, the level of activity fluctuated depending on immigrations, and political and economic pressures (John Clarke and D.L. Brown, "The Upper Canadian Land Market: Insights from Essex County," Canadian Historical Review, Vol. 69, No. 2 (June 1988), p. 234: See also McCalla, Planting the Province. p. 68, and Akenson, The Irish, p. 147-9). A preliminary examination of the Abstract Index to Land Registry Records for Saltfleet indicates numerous transactions for lands during the township throughout the nineteenth century. There were also numerous advertisements for farms in Saltfleet and throughout Wentworth County in The Daily Spectator and Journal of Commerce, a Hamilton newspaper. An active land market allowed established families to provide independent farms for their children nearby. Furthermore, it allowed new arrivals the opportunity to break into the township's landed class, assuming they had the means. For an American perspective, see Allan G. Bogue's review essay "The Heirs of James C. Malin: A Grassland Historiography," Great Plains Quarterly Vol. 1, No. 1 (1981), pp. 105-31; and Sean Hartnett's "The Land Market on the Wisconsin Frontier: An Examination of Land Ownership Processes in Turtle and LaPrairie Township, 1839-1890," Agricultural History Vol. 65, No.4 (Fall 1991), pp. 38-77.
Of course, the challenge of collecting values for environmental variables is an obstacle. They are not found in routinely generated records favoured by quantitative historians. Chapter 1 of this thesis outlines the methodology used to insert the environment into a data set through a complex process of linking historical censuses and assessment rolls to computer-based digital maps of the township. It is necessary to explain this process and the source material at the beginning – rather than in an appendix - in order to appreciate the strengths and limitations of the quantitative analysis in the rest of the thesis. It is this process that makes this thesis different and allows for consideration of human interaction with the changing physical landscape. Chapter 2 examines the province's earliest European settlement and agricultural activities, and it establishes a number of benchmarks against which trends found in later periods can be compared. Chapters 3, 4, and 5 provide the bulk of the statistical examinations of cultural and environmental variables in relation to the distribution of wealth in the township. Each chapter, after placing the township's population characteristics in context with county and provincial demographic averages, uses a decennial census (1851/2, 1861, and 1871) to examine the impact of specific environmental characteristics on settlement and agriculture. These chapters focus on wealth distribution through a consideration of cultural and physical influences and the response of farmers to changing demographic, market, and physical characteristics of the township.

Chapter 6 takes a different approach to the discussion of the influence of cultural factors on farming activities. One means of accumulating wealth in an agricultural setting would be to increase agricultural yields. Farm journals throughout the nineteenth century promised greater yields and increased wealth through "scientific" farming. Some

historical studies of literacy in Ontario have commented on the association between, on the one hand, cultural variables and literacy, and wealth and literacy, on the other. Darroch and Soltow are among those who draw a connection. They noted that literate individuals were more likely to own land and were much more likely to own greater amounts of land than their illiterate peers.⁵¹ Rather than step into the literacy aspect of the debate, I argue that the programs for improved husbandry presented in farm journals were neither scientific nor effective. The failure of improved husbandry to provide a successful regimen for farmers to follow indicates that prosperous farmers prior to 1871 were not successful because of the content of farm journals. The literate might have been more wealthy, but they were not wealthy because of what they read about farming. In future, researchers might ask if the statistical association between literacy and wealth captures the influence of wealth on education, or ask if the link is the consequence of associations with factors not captured in the data. This skeptical and questioning observation dovetails with points raised in the next chapter which outlines what I believe were the essential elements of successful farming in Saltfleet. Chapter 7 provides a more detailed focus on the influence the environment had on human choice from the 1860s to 1890. It examines, in detail, the motivations and decisions of a few of the township's

⁵¹ Darroch and Soltow, Property and Inequality, p. 111 and 159. Katz also supported this premise in Michael B. Katz, "Social Structure in Hamilton, Ontario," Eds. Stephan Thernstrom and Richard Sennett, Nineteenth Century Cities: Essays in the New Urban History, (New Haven, 1969), p. 211. Frank T. Denton and Peter J. George argued against this propensity in the results they published for their sample of the 1871 census for Wentworth County in "Socio-economic Characteristics of Families in Wentworth County, 1871: Some Further Results," Histoire sociale / Social History, Vol. 7, No. 13, (May 1974), p. 107. Preliminary results for the same region can be found in Frank T. Denton and Peter J. George, "An Exploratory Statistical Analysis of Some Socioeconomic Characteristics of Families in Hamilton, Ontario, 1871," Histoire sociale / Social History, No. 6, (April 1970); and Frank T. Denton and Peter J. George, "The Influence of Socio-Economic Variables on Family Size in Wentworth County, Ontario, 1871: A Statistical Analysis of Historical Micro-Data, Canadian Review of Sociology and Anthropology, Vol. 10, No. 4 (November 1973).

farmers, with particular attention paid to E.D. Smith, a Saltfleet farmer made famous in the early twentieth century by his company's line of fruit preserves. Smith appreciated the economic potential of new markets in the Hamilton region, understood his land and its capabilities, and possessed the hard work and vision needed to tie the two together. His wise actions respecting the selection and use of land do not appear to have been critically influenced by journals and books, but rather by an astute reading of the landscape of Saltfleet Township.

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-- Chapter 1 --

From Sources to Output: Quantitative Primary Records, Computer Mapping, and Statistical Methodology

They must be telling lies...

"Lies" Song by Stan Rogers

It is perhaps to be expected that historians analyze historical demographic trends in terms of political and intellectual constructs. The primary documents that help us understand the past are categorized within a political framework: probate records are collected by county, census records are arranged by township, and assessment rolls depend on lot and concession. Survey lines broke up the land into manageable bits and pieces that allowed for its effective political and economic management, regardless of more natural divisions. It is common for historians to view the parcels defined by lines as the land itself. The carefully gathered statistics that document most aspects of agricultural settlement in Ontario seem independent of local geophysical realities. The 1871 census, for example, barely acknowledged the numerous geological variations that exist between the granite of the Canadian Shield and the silty loams of southern Ontario. The census for Saltfleet Township gives no indication of the existence of the Niagara Escarpment that bisects the township. This chapter explains the process I used to integrate the environment with the data contained in the primary resources.

25

Primary Documentation and Nominal Record Linkages

This thesis employs a variety of quantitative sources, the contents of which should be approached with care. The census should not be understood as an abstract or objective documentation of particular settlement and agricultural characteristics. Bruce Curtis sounded the most stern and possibly extreme cautionary note in the study of census information, noting that the data is "made, not taken, fabricated through processes that select, and do not simply reflect dimensions of social organization."¹ The manner in which a census is constructed and the questions framed are subjected to political manipulation that seeks to establish social identity.² Curtis framed his concerns around the motivations for conducting the census. Attempts to understand population emerged "not as a form of existence, but as a normative construction useful for modifying social relations."³ As such, the values presented in the census should be considered secondary constructions.⁴ Contemporary public perceptions of the role of the census and these

¹ Bruce Curtis, "On the Local Construction of Statistical Knowledge: Making up the 1861 Census of the Canadas." *Journal of Historical Sociology*. Vol. 7, No. 4 (December 1994), pp. 418.

² Bruce Curtis, "Expert Knowledge and the Social Imaginary: The Case of the Montreal Check Census," *Histoire Social / Social History*, Vol. 28, No. 56 (November 1995), p. 329.

³ Curtis, "Expert Knowledge," p. 314.

⁴ Darroch, "Scanty Fortunes," p. 623 N6. An introduction to census use and the availability of census data bases across Canada is presented in Kris Inwood and Richard Reid's "Introduction: The Use of Census Manuscript Data for Historical Research," *Histoire sociale / Social History* Vol. 28, No. 56 (November 1995). Geographers have had similar debates regarding the role of their profession and the sources they use. A good beginning for a discussion of this topic is a collection of essays edited by J. David Wood called *Rethinking Geographical Inquiry* (Maple, Ontario: Printing and Publishing Services, 1982), in particular John U. Marshall's article entitled "Geography and Critical Rationalism," pp. 75-176. An additional difficulty in working with census information is underenumeration. A series of articles in the Winter 1991 edition of *Social Science History* addressed this topic, including Richard H. Steckel, "The Quality of Census Data for Historical Inquiry: A Research Agenda," *Social Science History*, Vol. 15, No. 4 (Winter 1991), pp. 579-599; John W. Adams and Alice Bee Kasakoff, "Estimates of Census Underenumeration Based on Genealogies," *Social Science History*, Vol. 15, No. 4 (Winter 1991), pp. 527-543; Donald A. DeBats, "Hide and Seek: The Historian and Nineteenth-Century Accounting," *Social*

social constructions complicated matters. For example, fears about the purposes of a census caused some farmers, who feared an increased tax assessment, to underreport certain things.

In addition, a number of technical difficulties complicate working with systematic primary documents. Difficulties arose during the nominal records linkages between census schedules that detracted from the accuracy of the database. These problems included poor handwriting, omissions, and enumerator inconsistency. In order to limit the errors caused by these factors, and also to reduce the number of data-entry errors, I entered the information in each column of the primary documents twice into a spreadsheet. I then subtracted one column from the other. Any errors in data entry would have appeared as something other than zero and could be corrected, unless of course, I entered the same error twice. This process largely eliminated data entry errors, because a random check produced an accuracy rate of approximately ninety-nine percent.

The process of linking the digitized mapping capabilities of ArcView, a Geographical Information Systems (GIS) mapping program, with the primary census material will be discussed with respect to the 1871 census, which was the largest and most difficult primary source to prepare for analysis. More specific difficulties with the other sources will be discussed in chapters relevant to that data. Three of the primary quantitative documents proved relatively straightforward (*Abstract Index to Land*

Science History, Vol. 15, No. 4 (Winter 1991), pp. 545-563; and Kenneth Winkle, "The U.S. Census as a Source of Political History," Social Science History, Vol. 15, No. 4 (Winter 1991), pp.565-577. This thesis makes no attempt to compensate for underenumeration. This is problematic, but not overly so considering that the analysis of the distribution of wealth in Chapter 3, 4, and 5 is based primarily on heads of household that owned land, who were far less likely to be underenumerated than tenants or farm labourers.

Registry Records, Assessment Roll of 1819, and Assessment Roll for 1890), principally because the records were stand-alone documents that did not require linking an individual in one schedule to settlement information in another.

Abstract Index to the Land Registry Records

The Abstract Index to Land Registry Records for Saltfleet Township provides a summary of land transfers (bargain and sale and wills), mortgages, discharges of mortgages, Sheriff certificates, and liens for each lot in the township.⁵ The document includes information on the grantor, grantee, date of transfer, date of registration, and instrument number, as well as irregular information on property size and sale price. I used this resource to examine two patterns of land ownership over twenty-year periods, namely, the largest single farm on each 100-acre lot and the number of times properties over five acres changed hands on each lot.⁶ This data and subsequent analysis appear in Chapter 6.

⁵ Definitions of these terms as well as some of the limitations found in the Abstract Index can be found in John Clarke's "Land and Law in Essex County: Malden Township and the Abstract Index to Deeds," *Social History*, Vol. 11, No.22 (1978), pp 475-493.

⁶ The problem of how much land is required in order to qualify a farm as a farm remains problematic. McInnis, in his most of his studies, eliminated properties that were smaller than ten acres, as he believed that most were single-acre plots that might have had a cow and a few vegetables, but could not be called farms. Certainly farms that were an acre or smaller should not be considered farms, as most would not satisfy domestic home consumption, never mind surpluses for market. However, farms of less then tenacres were important contributors to agriculture and did more than just reflect "mainly the extent of nonagricultural development [and] ...the vagaries of census enumeration." This small-scale farming becomes even more important as fruit farming increased as the century wore on. I have included all farms of five acres or larger, which captures small market gardeners, but eliminates the one-acre homesteads that rightfully troubled McInnis (Lewis and McInnis, "Agricultural Output," pp. 69-85; McInnis, "Marketable Surpluses," pp. 400-403; McInnis, *Perspectives*; and Marvin McInnis, "Some Pitfalls in the 1851-1852 Census of Agriculture of Lower Canada," *Histoire sociale / Social History*, Vol. XIV, No. 27 (May 1981). Interestingly, Gordon Darroch, in an analysis of a sample from the 1861 and 1871 census, noted that oneacre farms were not clustered around towns and villages, as McInnis had speculated (Darroch, "Scanty Fortunes," p. 643).

1819 Assessment Roll

The 1819 Assessment Roll contains 145 names of heads of household in Saltfleet Township. The roll provides an interesting collection of information including assessed property, house size and building material, and some information on livestock. Unfortunately the roll does not provide lot and concession information for the individual settlers. This location data had to be obtained by cross-referencing the assessment information with names in the *Abstract Index to the Land Registry Records*. Problems such as misspelled names, omissions, and illegible handwriting, made linking every name to a specific property impossible. Of one hundred property owners, only sixty could be accurately linked to a specific location. These data are presented in Chapter 3.

1890 Assessment Roll

While the number of primary nineteenth-century documents that still exist for Saltfleet is surprisingly good, only a few assessment rolls have survived. The 1890 roll provides information on personal and real property, age, occupation, property size, property cleared, and occasionally, a brief description of whether the property was swampy or part of the escarpment. The information is contained on one schedule that spans approximately one hundred pages. There were 1218 names on the roll, but 109 of these were for properties located on the beach strip, which is not part of this study. There were 513 farmers, market gardeners, and fruit growers with property over five acres. The analysis of these data will appear in Chapter 6.

1851-2 Census

The three complete decennial censuses (1851-2, 1861, and 1871) required extensive preparation in order to ready the material for statistical and mapping analysis. Although W. Crofton, the Secretary to the Board of the Inspector General's Department, circulated the instructions for the 1851-2 Census in November of 1851, the enumerators did not begin their work until early 1852.7 The census itself had two schedules, one personal and the other agricultural. The personal census provided basic demographic information, as well as data on house size, material, and location. The agricultural census provided information on a dizzying array of farm characteristics, including farm size, acres dedicated to specific crops, livestock, and domestic production. Unfortunately, there is no 'key' that conveniently linked the personal schedule with the agricultural. To make matters worse, the names in the two schedules are not presented in the same order. Linking a name in the personal schedule to the agricultural requires scouring the latter for each head of household. Fifty-two of the 232 persons in the nominal index could not be matched with the agricultural index. One of these, John Dynes, lived on the beach and was therefore excluded. Two lived on farms smaller than five acres, leaving 177 names for the analysis. Like most primary documents, this particular resource was hampered by a number of factors, ranging from atrocious handwriting to the omission of data to a misunderstanding of the purpose of the census. The enumerator for Saltfleet, for example, had particularly bad handwriting, making the task of linking the names between the two schedules very difficult.

⁷ David Gagan, "Enumerator's Instruction for the Census of Canada 1852 and 1861," *Histoire sociale / Social History*, Vol. VII, No. 14 (November 1974), p. 359.

Shortly after the census was completed, the government recognized its flaws. They "ascribed its difficulties to the suspicions of a population who associated both the decennial enumerations and the more frequent local assessments with the imposition of new or increased taxes, and who therefore withheld information."⁸ This hesitation to provide correct information suggests that crop yields and calculations of wealth were probably underreported. Chapter 3 discusses the 1851-2 Census in detail.

1861 Census

The 1861 census is also composed of a nominal (called the Personal and Household Census) and an agricultural schedule. Although again no key links the two forms, the names in the agricultural census follow the order in which they are presented in the nominal index, making linking the forms relatively straightforward. One entry in the 1861 census listed George Healdreath as living on concession IX, lot 9, somewhat odd considering that the eighth concession is the last in the township. This typo resulted in the elimination of the entry from the statistical and GIS analysis. Additionally, the census had no location information for the farms of A. Isaacson, William G. Lewis, and William Hanyon, so these farmers were also eliminated. In the end, 244 entries remained.

The Government of the Canadas took particular pains to correct the deficiencies of the previous national census. William Hutton, the Secretary of the Board, instructed enumerators to "endeavour to impress upon the people in your Enumeration District that

⁸ Gagan, "Enumerator's," p. 357.

the information here sought has no reference whatever to taxation.³⁹ Instead, the Secretary urged the enumerator to drive for honesty and completeness "in order to ascertain the state of the resources of the country and encourage the introduction and investment of Capital in the Colony, where the statistics, truthfully taken, warrant the investment.³¹⁰ The officials in charge were optimistic about the accuracy of this census. They believed, according to Gagan, that Upper Canadians would answer the questions truthfully in order to provide "an exact numerical basis for the supremacy in a system of 'representation by population'.³¹¹ The inaccuracy of the returns from Peel County that Gagan found suggests that this hope was misplaced. The Saltfleet returns, however, seem complete and were reasonably legible.¹² The analysis and discussion of this census appear in Chapter 4.

1871 Census

The 1871 Census of Canada was the first after Confederation. The government decided to expend much effort on gathering information on its citizenry in order to obtain a good understanding of everything the new country could call its own. This particular census was much more complex than previous ones, and it was extensive. Nine schedules covered issues from apple orchards to zinc mining. Canadian citizens were still worried that the information gathered by the census takers would be used for

⁹ "Instructions to Enumerators in the 1861 Census of Canada," as printed in Gagan, "Enumerator's," p. 365.

¹⁰ "Instructions," as printed in Gagan, "Enumerator's," p. 365.

¹¹ Gagan, "Enumerator's," p. 357.

¹² Curtis provided a detailed description of the difficulties that Hutton faced in drafting the census and that enumerators faced when conducting census (Curtis, "On the Local Construction," p. 419-30).

assessment purposes. The enumerators' guidelines took great pains to counter this perception. The second line of the handbook for census takers addressed this point:

A census is not taken for the purposes of *taxation*, as, unfortunately, many persons imagine. None of the information contained in it could be turned to such account. The results it exhibits, like those of any other statistical enquiries, are directly connected with the science of government; which pre-supposes a general knowledge of the want and capabilities, the defects and advantages, numerically presented, of the population of the country."¹³

The enumerators were to assure individuals that all facts were confidential and that they had taken an oath of secrecy not to reveal personal and economic information to anyone other than their superiors.¹⁴

Each of the nine schedules denoted a particular aspect of settlement life in Canada for the twelve months prior to April 2, 1871.¹⁵ Schedule four contained the lot and concession information and the majority of the agricultural information, with the exception of livestock. This schedule served as a beginning point for my linkage efforts because without the location information (lot and concession), the remaining schedules are not particularly useful when it comes to mapping. I used the page and line numbers denoted in the agricultural return as a key to join schedules one (nominal index), three (buildings, vehicles, agricultural implements), five (livestock, domestic production, furs), seven (forest products), and eight (fish and other marine products) together.¹⁶ Darroch

¹³ Manual Containing 'The Census Act,' and the Instructions to Officers employed in the Taking of the First Census of Canada (1871), Department of Agriculture (Census Branch), (Ottawa: Brown Chamberlin, 1871), p. 9.

¹⁴ Manual Containing, p. 15.

¹⁵ Manual Containing, p. 14.

¹⁶ Schedule two is the census return for the deceased. Schedule six is the industrial return and is not used

and Soltow, in *Property and Inequality in Victorian Ontario*, noted few difficulties with the linking of the nominal index (Schedule 1) with the other schedules, stating simply that the links were made manually. In the Saltfleet census, the joining of page and line numbers from schedule to schedule had some typos, omissions, and illegible scribblings that produced a number of "unlinkable" entries.

The accuracy of this particular census depends, yet again, on the diligence of the particular enumerator. Gagan found that the Peel County records were quite accurate, unlike previous decennial censuses.¹⁷ Elements of the 1871 Saltfleet Census were also well executed. Individual columns tally accurately as do the summary figures at the end of each schedule. This exactness made recording and analysing the census material much easier. Unfortunately, a number of factors contributed to the paring down of the number of cases that I could include in my data set. Illegible or omitted entries coupled with mismatched page and line numbers prompted the removal of approximately 101 of the original 606 heads of household in the 1871 Census for Saltfleet Township. Additionally, a number of entries that appeared in schedule four could not be aligned with a name in schedule one. Twenty-nine of these entries were certainly farmers, possessing properties ranging from twelve to 194 acres but the lack of lot and concession information resulted in their having to be eliminated from the mapping and regression analysis.

methodically in this thesis. A description of this census and the multi-function nature of industry in 1871 Canada, can be found in Kris Inwood's "The Representation of Industry in the Canadian Census, 1871-1891," *Histoire sociale / Social History*, Vol. 28, No. 56 (November 1995). There were no entries for schedule nine, which detailed mining and mineral returns for the township.

¹⁷ Gagan, "Enumerator's," p. 358.

Perhaps the most challenging aspect of categorizing the census stemmed from determining who actually farmed the land. I began by including all household heads who were listed as farmers in the census unless the property was less than five acres or the owner did not produce any agricultural output. While a few market gardeners might have been left out of the analysis, insisting that an agricultural property has five or more acres ensures that only farmers and active market gardeners are included. This approach eliminated from the study retired or inactive farmers who had carved out a small piece of property from their children's fields. It also eliminated anyone who was not listed as a farmer, with the exception of what appear to be dual-function households. The census listed Roger Ptolomy, for example, as a carpenter even though he produced a wide variety of crops on twenty-two acres on lot 15 in the fourth concession. Twenty-two individuals did not have an occupation listed, even though nine were evidently farmers with property ranging from ten to 163 acres. These nine were included in the agricultural analysis, but the remaining thirteen were excluded. To qualify for this analysis, the property of agriculturists not classified as farmers must be larger than five acres and must contain a reasonable amount and variety of produce. Defining reasonable is somewhat subjective. To qualify for inclusion in this study, an individual farm, for example, must produce more than simply a guarter acre of potatoes. The production of any grain, or a combination of roots, corn, and a vegetable or two was deemed to be sufficient to include within this analysis. Only one individual, Thomas Badger, listed as either a farm hand or farm labourer, owned property larger than five acres and produced a reasonable variety and amount of produce.¹⁸ Fifteen others were eliminated. These minimum qualifications

¹⁸ Thomas Badger lived on concession V, lots 33 and 34.

also eliminated thirty of forty-five labourers, leaving fifteen for the study. Eleven widows, whose farms complied with the above requirements, were also included. Ultimately, the process of structuring and qualifying the data contained in the 1871 census resulted in 321 agricultural heads of household being included in the data set. That is a little over half of the 605 heads of household listed in Schedule four of the 1871 census. The information gathered from this census appears in Chapter 5.

Geographical Information Systems (GIS) Mapping

The process of tying information derived from primary sources to computer-aided spatial analysis begins with finding an appropriate map. I chose the *Illustrated Historical Atlas Map for Saltfleet Township* (1875) because this map provides basic political and geophysical information, namely lot and creek locations (see Figure 1-1). The map is surprisingly accurate. The dimensions of the township map closely match those of the modern soil and topographical maps. The shoreline, for example, is very similar to the "1967 Soil Map for Wentworth County" produced by the Ontario Agricultural College.¹⁹ The location of the escarpment, which presumably did not dramatically change over the century, was also accurately depicted in the *Illustrated Historical Atlas*. However, as the Atlas map did not display the varying widths of the escarpment as it crossed the township, I used the soil map's depiction of the escarpment in my digital map. I then created a polygon grid that represented each lot within the township, along with

¹⁹ "Soil Map of Wentworth County, Ontario," *Soil Survey Report No. 32*, Department of Soil Science, Ontario Agricultural College, Guelph and the Research Branch, Canada, Department of Agriculture, Ottawa, 1967.

shorelines, rivers, towns, and the Great Western Railway. Each of these polygons was coded with a unique identifier, which was later linked to lot and concession references within other primary documentation (see Figure 1-2).



Figure 1-1: *Illustrated Historical Atlas of the County of Wentworth, Ont.,* for Saltfleet Township, 1875.



Figure 1-2: Digital Polygon Grid with Unique Identifiers for each Lot, Saltfleet Township. Note, for example, that Lot 5, Concession VII has the Identifier "G5."

This digitized version of the historical Saltfleet map opens up a world of computer mapping possibilities. By incorporating the map into ArcView, a GIS mapping program from Environmental Systems Research Institute Ltd (ESRI), comparisons of the primary census and assessment roll information to specific spatial references are possible. The production of wheat per acre, for example, can be readily mapped across the township. As ArcView is capable of running standard database queries in conjunction with spatial analyses, such as distance to water, the production of various maps can be very complex. Before accurate spatial measurements can be accomplished, however, the polygon grid must be tied to real-world coordinates and distances. I did this by aligning my map with four northing and easting coordinates from the 1:50,000 topographical maps produced by the Ministry of Natural Resources, which used North American Datum (NAD) 27 as a locational reference point. This process, called "geo-referencing," provided my digital map with an accurate scale and the proper longitude and latitude.²⁰

The importance of geophysical features in influencing agricultural and settlement patterns is easy to assert but challenging to quantify. The emergence of computerassisted mapping technologies has given geographers a powerful tool in analyzing the landscape. Historians can also benefit from GIS mapping by incorporating an analysis of spatial patterns through the isolation of environmental variables, which can then be incorporated into statistical or qualitative analyses. I chose to isolate four variables I hypothesized would be significant influences on nineteenth-century farm productivity: a property's location relative to the Niagara Escarpment; the distance to a reliable aboveground water supply; a property's percentage of well-drained soil; and a farm's location relative to the Red Hill Creek Valley. I will briefly discuss the importance of each of these features to nineteenth-century farmers as well as the steps taken to map them.

The Niagara Escarpment

The geophysical history of southern Ontario began with the formation of the North American continent 450 million years ago. During this period, known as the Ordovician, erosion of the Taconic Mountains deposited enormous quantities of material, some of which were laced with iron oxide. This material, compacted over millions of

²⁰ The process of geo-referencing also compensates for the slight curvature in the earth (called projection), which is very difficult to represent with a two-dimensional map. Imagine trying to flatten the entire surface area of an orange peel on a table. This difficulty is more challenging when dealing with regions larger than a township.

years, would form the Queenston Shale that underlies almost all of southern Ontario. Subsequent geological eras deposited more and more material on top of both the Queenston Shale and the underlying Precambrian rock. Each of these layers, including the Manitoulin and Grimsby formations, the Goat Island Member, and the Vinemount Shale Beds, can readily be seen in the vertical cliffs of the Niagara Escarpment (see Figure 1-3).²¹ The "Mountain," as Hamilton residents call the escarpment, is not a mountain at all, but was formed by thousands of years of erosion. Each deposited layer possessed a different resistance to eroding forces, creating shelves and prominences that give each section a unique profile. The escarpment is capped by erosion-resistant layers, which collapse when the underlying layers erode sufficiently, creating the remarkably steep cliffs well known to southern Ontario residents.

²¹ Brian Laing, "The First Landscape: The Red Hill Creek's Physical Environment," Ed. Walter Peace, *From Mountain to Lake: The Red Hill Creek Valley*, (Hamilton: W.L. Griffin Printing Ltd), p. 28.



Figure 1-3: The Red Hill Creek Flows over the Niagara Escarpment at Albion Falls, Barton Township (Immediately West of Saltfleet). Long-Term Erosion Exposed many Layers of Sediment.²²

The Niagara Escarpment slices through the township from east to west, angling slightly southward. Below the escarpment, the Iroquois plain, a glacial till plain smoothed

by wave action, runs from the Niagara to the Trent River. West of Grimsby, the plain

²² Laing, "The First Landscape," p. 34. I produced this map with Brian Laing for his chapter in *From Mountain to Lake.* Picture by Walter Peace.

exhibits a combination of well-drained light-textured soil and a heavier textured soil that dries quickly, retaining little water. Both of these soils overlay the red clay typical of lands above the Queenston shale.²³ Between Stoney Creek and Hamilton, a number of broad gravel ridges lie under excellent, well-drained loams, which provide excellent soils for growing fruits and vegetables.²⁴ Above the escarpment, the Haldimand clay plain stretches all the way to Lake Erie, covering an area of 2970 square kilometers.²⁵ The ice lobe that occupied the Lake Ontario basin built a number of east-west moraines, with the Vinemount moraine stretching across Saltfleet Township.²⁶

A farm's position relative to the escarpment determined a number of geophysical and climatic characteristics, evident in soil type, drainage, and temperature patterns. With respect to climate, the Great-Lakes region comprises an amalgam of continental and maritime climates. Lake Ontario moderates the ranges of temperature and precipitation. The escarpment contains part of this moderating effect, bringing spring a little earlier and autumn a little later to the lands below the escarpment. The thirty-year "climatenormals," published by Environment Canada, report a number of climatic and precipitation summaries from weather stations throughout Canada. Two of these,

²³ L.J. Chapman and D.F. Putnam, *The Physiography of Southern Ontario* (Second Edition), (Toronto: University of Toronto Press, 1973), p. 325. Literature on the importance of geology to grape growing, in particular those grapes best suited to wine making, is plentiful. See, for example, the series of articles in *Geoscience Canada* that begin with the December 1999 issue, in particular, Simon J. Haynes, "Geology and Wine," *Geoscience Canada*, Vol. 26, No. 4 (December 1999), pp. 189-194; and Simon J. Haynes "Geology and Wine 2. A Geological Foundation for *Terroirs* and Potential Sub-*Appellations* of Niagara Peninsula Wines, Ontario, Canada," *Geoscience Canada*, Vol. 27, No. 2, (June 2000), pp. 67-87.

²⁴ Chapman and Putnam, The Physiography, p. 325.

²⁵ Chapman and Putnam, The Physiography, p. 255.

²⁶ Chapman and Putnam, *The Physiography*, p. 257. Brian Laing, "The First Landscape," p. 54.

"Grimsby," located below the escarpment (43° 12'N, 79° 34'W) and "Grimsby Rock Chapel" located above the escarpment (43° 11'N, 79° 35'W) are in Grimsby township adjacent to Saltfleet, and conveniently indicate the effects of the escarpment on climate (see Figure 1-4). These normals calculate average climatic and precipitation levels over a thirty-year period, providing a good summary of a region's weather.²⁷ As seen in Table 1-1, lands below the escarpment experienced warmer days in both summer and winter, translating into 2345.9 growing degree-days as compared to 2092.1 for lands above the escarpment.²⁸ These lands also experienced less temperature extremes during the winter. The average minimum temperature below the escarpment, for example, was -27.2°C compared to -29.4°C for lands above the escarpment. Both of these extremes could winter-kill fruit trees, but the chances were less for the warmer lands. Additionally, the lower lands received more rainfall during the summer months, although the lands above the escarpment received more snowfall, which might have better protected some crops, such as winter wheat, from harsh winter winds and temperature extremes.²⁹

²⁷ Canadian Climate Normals – Temperature and Precipitation, 1951-1980, Canadian Climate Program, Environment Canada, Government of Canada, 1981. This collection of climate data was the oldest I could find that conducted a rigorous and scientific accumulation of climate data. Although the temperature in nineteenth century Ontario might have been slightly colder or warmer (probably a little colder), the variation between lands above and below the escarpment would have remained.

²⁸ Growing degree-days is defined here as the sum of the number of degrees above 5°C for each day from April to October, inclusive.

²⁹ Environment Canada, "Great Lakes Project," http://www.cciw.ca/glimr/water-e.html, as seen on March 15, 2000.



Figure 1-4: Location of Grimsby Weather Stations and Proximity to Saltfleet Township. Note Niagara Escarpment Running North-South between Stations.

 Table 1-1: A Sample of Climate and Precipitation 'Normals' by Location Relative to Escarpment, Grimsby Township, 1951-1980.

	Location	February	May	August	November	Year
Daily Temperature (°C)	Above	-5.9	12.1	20.3	3.6	7.6
	Below	-3.7	13.2	21.4	5.1	9.0
Extreme Minimum Temperature (°C)	Above	-29.4	-4.4	1.1	-15.6	-29.4
	Below	-26.1	-2.8	4.4	-13.9	-27.2
Rainfall (cm)	Above	27.2	71.3	86.4	57.1	738.1
	Below	30.3	72.2	90.4	59.9	747.0
Snowfall (cm)	Above	36.7	0.2	0.0	11.6	169.0
	Below	31.4	0.0	0.0	6.7	137.7

E.D. Smith initially had a productive farm above the escarpment with cleared lands and good drainage. He appreciated the difficulties associated with growing produce, fruit in particular, on top of the escarpment, noting how a cruel unexpected frost had devastated new buds or late-harvest fruits.³⁰ Comparing farms above and below the escarpment also contrasts variations in soil-type, topography, and drainage. Within Saltfleet, the majority of the 136 lots located below the escarpment are in the western end of the township while most of the 151 lots above the escarpment are in the eastern end of the township (See Figure 1-5). The lots listed as below or above the escarpment fall either completely or mostly (above 70%) within their respective area. I considered lots as split by the escarpment if less than seventy percent lay either above or below the escarpment. Out of a total of 306 lots, there were nineteen that straddled the zones (see Table 1-2).

Concession	Lot Numbers Below the Escarpment	Lot Numbers Split by the Escarpment	Lot Numbers Above the Escarpment	
Broken Front	1-34			
1	1-34			
[]	1-34		-	
111	13-34	1-12		
IV	27-34	24-26	1-23	
V	31-34	29,30	1-28	
VE		33,34	1-32	
VII	-		1-34	
VIII			1-34	
Total	136	19	151	

Table 1-2: Individual Lots Relative to Niagara Escarpment, Saltfleet Township

³⁰ E.D. Smith, *Diaries*, E.D. Smith Company Family Archives. October 5, 1883 and November 21, 1883. Smith's experiences with frost and fruit will be discussed in much greater detail in Chapter 6.



Figure 1-5: Location of Lots Relative to the Niagara Escarpment, Saltfleet Township.

Distance to Water

While the escarpment was perhaps the most visible environmental factor that influenced agricultural patterns in the township, it was not the only one. Access to a reliable water source played a significant role in the success of farms, particularly in the raising of stock. The Smith family had four shallow wells on their farm and a nearby creek, but during the rainless summer of 1880, they all went dry. This forced the Smith family to sink new wells all over their property. The first few came up empty. They were more fortunate when, after drilling for two hours in the middle of the farm, the well topped over. Damaris Smith, E.D. Smith's mother, no longer had to walk the cattle for miles to get to a water source. She commented on how fortune favoured the industrious:

Thus ended for us one of the relics of old time superstition, namely that a well was a sort of chance, a fairy gift, or a providence. A providence it undoubtedly is

to have a good supply of water on a farm but like most other comforts and conveniences of life, faith must be wedded to works to possess it.³¹

An analysis that attempts to create a variable based on historical distance to water faces a number of obstacles. While the most thorough examination of access to water should include both surface and underground courses, most farmers probably preferred water that was easily accessible. This desire would have been particularly true for farmers who raised stock, especially cattle, which needed large quantities of water. This study determined the availability of a reliable water supply using ArcView, the 1875 Illustrated Historical Atlas for data on water sources, and the census for settlement information. The shoreline depicted in the Atlas was very similar to the 1967 soil map for Wentworth County and the small variations may be attributed to shoreline erosion.³² The use of modern maps for locating historic rivers is unwise given the propensity of river and streambeds to meander over time. Additionally, the building of storm sewers in Saltfleet changed many underground watercourses that altered the traditional watershed. Given the accuracy of other features on the 1875 township map, there appeared no reason to doubt the atlas' placement of historic rivers. Unfortunately, these maps do not show the location of wells that could have provided water to cattle for farms that lacked a readily available surface source.

After assembling the data in the census and the historic atlas, I produced a map showing all lots in Saltfleet Township within 250 metres of water (see Figure 1-6). The

³¹ Damaris Smith, Pioneer Wife, E.D. Smith Company Family Archives, 1944, p. 5.

³² "Soil Map of Wentworth County." *Soil Survey Report No. 32*, Department of Soil Science, Ontario Agricultural College, Guelph and the Research Branch, Canada, Department of Agriculture, Ottawa, 1967.

Government of Ontario, in its guidelines for archaeological assessments, uses a distance of 200 metres to extant or relict watercourses as a guide for finding potential archaeological sites, because most human settlements tended to be located within that distance.³³ This study expanded that figure to 250 to accommodate certain facts: that livestock were capable of finding their way to water without human intervention, that creeks in Saltfleet would often cut a new path to Lake Ontario after a large storm, and that a certain margin of error exists in the *Illustrated Historical Atlas* map.³⁴ There were 191 lots located within 250 metres of water and 115 lots which were not.



Figure 1-6: Location of Lots Relative to 250 Metres of Water, Saltfleet Township.

³³ The Ministry of Citizenship, Culture and Recreation oversees archaeological investigations in the province.

³⁴ John Nugent, a resident of Saltfleet in the 1940s and 1950s, stated that the Red Hill Creek, which was over fifty metres from his house, suddenly ran by the door of their house after a significant rainstorm (John Nugent, Personal Communication, July 27, 1998).

Drainage

Few agricultural practices generated as much ink in nineteenth-century farm journals as the necessity of good artificial drainage. Apart from quickly removing surface water that could lead to rot and mildew, it was believed that good underdraining promised other advantages: warmer soil to prevent frosts and promote airflow, healthier plants to resist drought and fight insects, and drier fields to ease ploughing and speed growth.³⁵ William Weld, editor of the *Farmer's Advocate*, bubbled with praise for proper underdraining:

Draining makes the farmer, to a great extent, master of his vocation. With a sloppy, drenched, cold, uncongenial soil, which is saturated with every rain, and takes days, and even weeks, to become sufficiently dry to work upon, his efforts are continually baffled by unfavourable weather, at those times when it is most important that his work proceed without interruption. Weeks are lost, at a season when they are all too short for the work to be done. The ground must be hurriedly, and imperfectly prepared, and the seed is put in too late, often to rot in the over-soaked soil, requiring the field to be planted again at a time which makes it extremely doubtful whether the crop will ripen before the frost destroys it.³⁶

A lecture by Mr. Fisher Hobbs, in August 1859 at the Council of the Royal Agricultural Society of England, reprinted in the Canadian Agriculturalist, noted that good drainage was a vital and relatively inexpensive weapon in the improved-husbandry arsenal.³⁷ A respondent to the Canadian Agriculturalist, for example, related the experience of a friend who drained five acres of a ten-acre field with ditches 4.5 feet deep and then sowed both lands with Soule's wheat. The drained land, according to the author, produced

³⁵ Canadian Agriculturalist, May 1859, Vol. XI, 5, p.110; September 1859, Vol. XI, 9, p. 211. The Canadian Agriculturalist was also the Journal of the Board of Agriculture.

³⁶ Farmer's Advocate, October 1871, Vol. VI, 10, p. 149.

³⁷ Canadian Agriculturalist, August 1859, Vol. XI, 8, p.169-71.

forty bushels/acre and ripened ten days earlier than the poorly drained lands, which only produced fifteen bushels/acre being much affected by the midge.³⁸ The perception throughout the nineteenth century, therefore, was that lands with good drainage provided the best growing conditions for virtually all crops and that farmers whose lands were naturally well drained had an inherent advantage over those who did not.

Although mapping man-made drainage on nineteenth-century farms is probably impossible, measuring the natural drainage of each lot within the township is not. The process, however, does require a number of steps. The digital "Soil Map of Wentworth County, Ontario," provides information on, among other things, natural drainage patterns. I collapsed the four (Very Poor, Poor, Imperfect, Well) classifications of drainage into two – "poor" and "good" (see Figure 1-7). By intersecting the polygon grid (Figure 1-2) with the drainage pattern map, a percentage of land classified as "poor drainage" emerges for each lot. I created a variable based on this percentage such that any single lot with more than thirty percent poor drainage was classified as "poor;" the remainder being deemed "good" (see Figure 1-8). From this process, sixty-nine lots emerged as having poor drainage, while 237 had good drainage.

³⁸ Canadian Agriculturalist, September 1859, Vol. XI, 9, p. 211.



Figure 1-7: Drainage Patterns in Saltfleet Township.



Figure 1-8: Relative Drainage by Lot, Saltfleet Township.

The Red Hill Creek Valley

As the Wisconsin glacier finally retreated to the northeast, enormous quantities of meltwater pooled, creating a succession of large lakes. As the water from these lakes found its way to the Atlantic, rivers and waterways, such as Stoney Creek and Buttermilk Creek, began taking a form that would be familiar to nineteenth century farmers. One such channel was the Red Hill Creek. Taking its name from the oxidized ferrous material of the Queenston Shale exposed by erosion, the creek flows through lands that combine an interesting mix of topography, soil, and drainage (see Figure 1-9).³⁹ Eight principal geophysical elements shape the valley, as indicated in the figure: one, the steep ridges of the Niagara Escarpment; second, low ridges that direct water towards Albion Falls; third, moderate slopes arising from erosion resistant sedimentary layers; fourth, an alluvial fan spreading out from the base of the escarpment; fifth, a low ridge running east to west; sixth, a gently sloping plain; seventh, the Red Hill marsh, which once served as the outlet to Lake Ontario before the sand bar blocked its course; and eighth, the drainage system. This particular amalgam of features proved unique in Saltfleet, resulting in patterns of settlement in the valley that differed from the rest of the township. Early agriculturalists cleared most of the trees that covered the steep slopes and shallow soil, typical of most riverine valleys that plunge over the escarpment.⁴⁰ This land could be quickly eroded by over-farming, but it served as good pasture lands. Isolating this particular environmental variable simply required noting the lots that were in contact with the valley (see Figure 1-

³⁹ The falls itself is located in Barton Township. "The First Landscape," p. 31.

⁴⁰ "Soil Map of Wentworth County, Ontario." See also Chapman and Putnam, *The Physiography*, p. 184.



10). There were nineteen lots within the Red Hill Creek Valley.

Figure 1-9: Map Showing Landscape Elements of the Red Hill Creek Valley.⁴¹

⁴¹ Laing, "The First Landscape," p. 26. I produced this map with Brian Laing for his chapter in the book.



Figure 1-10: Lot Location Relative to Red Hill Creek Valley, Saltfleet Township.

Presenting the Mapped Data

Each unique identifier on the digital map corresponded to a similar identifier in the primary documents. I summarized, either through counts, sums, or means, the agricultural and settlement characteristics for all the properties that shared the same unique identifier weighted (usually) by the size of the farms. If two farms were located on lot 5, concession VII, then the production of bushels of wheat, for example, would be averaged for the two farms weighted by total number of acres for the farm. This mean data would appear on the digitized map at the polygon with the corresponding identifier, (for example G5 in Figure 1-1). Alternately, in a discussion of fruit production in the township, a map might show the value of all fruit produced on a lot per orchard acre. In this case, the figure presented on lot G5 would represent the average value of fruit produced by all farms on lot G5, weighted by the total number of orchard acres rather than total farm size. This point offers a convenient entry into a caution regarding the maps and the visual presentation of data. Each map presents data on a lot by lot basis and not a farm by farm basis (although if there was only one lot on a farm then this would be true). The maps provide insights into patterns of agricultural characteristics and the distribution of wealth indicators, such as total acreage and assessed value, but do not necessarily provide direct information on individual farms. In contrast, the information in the text and the statistical analysis analyzes average distributions for individual farms and not lots.

ArcView offered five means of dividing the data into bins for presentation. Only two, "equal intervals" and "natural breaks", were suitable for this thesis. The former method broke the data down into equal units, so that the size of each bin is the same. If the total number of bushels of wheat for the farms on each lot, for example, ranged from one to 500 bushels and there were five bins, then the first bin would capture all the lots that produced one to 100 bushels, the second would capture those that produced 100 to 200, and so on. This particular approach is effective in its simplicity, but it has drawbacks. Imagine, using the same example, that the farms on most lots produced between one and 100 bushels of wheat, but one farmer on one lot produced 500 bushels. A map depicting such a data range would have a very large number of lots corresponding to the first bin (1-100), no lots corresponding to the next three bins (100-200, 200-300, and 300-400), and one lot depicting the extraordinary production of the one farmer. Any patterns or variations in wheat production amongst farmers in the first bin would be completely lost, swept aside by the one outlier.

To avoid this difficulty, I used "natural breaks" to group the data for mapping throughout the thesis. This approach distinguished breakpoints and patterns in the data that would be otherwise lost, providing a more realistic representation of the data.⁴² ArcView employs a complex statistical algorithm that minimizes the numerical differences between classes with a statistically significant difference between data points appearing on either side of the classification groups. This is "Jenk's optimization."⁴³ Continuing with the wheat example, the "natural breaks" binning method might create five unequal bins. The first, for example, might count all the farms on lots that produced one to ten bushels, separating farmers that pursued very little wheat. The next three bins (10-20, 20-50, and 50-100) would separate most of the remaining lots into statistically significant groups, leaving one last bin for the farmer that produced 500 bushels. This approach compensated for data groups that contain a small number of very large entries that might swamp significant variations in the data at the smaller end of the scale. However, each map must be examined carefully to ensure that the bin-scale is understood.

Statistics

The quantitative analysis presented in this thesis depends heavily on statistical models applied to the examination of various routinely generated primary records. I used

⁴² Environmental System Research Institute Inc (ESRI), ArcView GIS: The Geographic System for Everyone, Software manual that came with ArcView 3.0a, 1996, p. 103-109.

⁴³ ESRI, ArcView GIS, p.103.

a statistical program called Arc (not to be confused with ArcView, the GIS mapping program) by Cook and Weisberg, which is based on the Lisp-Stat software language.⁴⁴ John Fox provided a number of very useful add-ons to this pack (such as *F*-tests and data sheets) for his graduate statistics courses in Sociology at McMaster University.⁴⁵ Arc's particular strength is its ability to allow direct interaction between regressions and data plots. Arc also does a good job of creating graphs for analysis, but they are not of presentation quality. For this thesis, graphs were reproduced in Excel 2000 or redrawn in CorelDraw 9. Additionally, I conducted statistical tests for contingency tables (sometimes called pivot tables or cross tabs) in Arc, but I used Excel to construct the actual tables for presentation within the text.

A problematic aspect of employing regression and inference on complete populations as opposed to a sample, as I did with the censuses and assessment rolls, is the potential to compromise statistical inference. Variables in a simple random sample, especially when n is large, are more likely to be normally distributed and the conditional variance of Y on said Xs will more likely be constant. A population, by definition, is not a random sample. However, it is random in that it is one outcome of many historical possibilities. Fox, in a hypothetical discussion of crime statistics in American cities, noted,

⁴⁴ Arc, R.D. Cook and S. Weisberg, (New York: Wiley, 1994).

⁴⁵ The process that I followed in preparing and analyzing quantitative primary material generally follows the process outlined in John Fox, *Applied Regression Analysis, Linear Models, and Related Methods*, (Thousand Oaks: Sage Publications, 1997). I became familiar with the author and this book by completing two graduate statistics courses at McMaster University (Sociology 6Z03 and 740) in 1998/99. The process of analyzing and preparing statistical data for this thesis also comes from class notes, handouts, and lectures presented in these courses. John's patience, experience, and pedagogical approach proved invaluable in helping me better understand the complexities of statistical analysis.
Were we to replay history conceptually, we would not observe precisely the same crime rates and population density statistics, dependent as these are on a myriad of contingent and chancy events; indeed, if the ambit of our conceptual replay of history is sufficiently broad, the identities of the cities themselves might change...It is, in this context, reasonable to draw statistical inferences to the process that produced the currently existing population.⁴⁶

Although using regression tools to analyze whole populations rather than a simple random sample is valid, care still must be taken to ensure that variables present in the population and employed in the analysis conform to the conditions of normality, constant variance, and linearity.

Univariate Plots

The process I followed in preparing data for a linear regression began with a univariate display of individual variables. The importance of initially graphing single variables cannot be overstated. For quantitative variables, a histogram and a quantile comparison plot, in particular, effectively compare data to theoretical distributions, such as normality, while a boxplot can quickly illustrate the presence of outliers as well as information on centre, spread, and skewness. Beginning an analysis with these initial graphs can also help identify data-entry errors.⁴⁷

⁴⁶ Fox, Applied Regression Analysis, p. 12.

⁴⁷ Fox, Applied Regression Analysis, p. 35-48.

Bivariate and Multivariate Plots

Mapping bivariate relationships before proceeding to a regression can also help identify outliers and assess linearity. Simple bivariate plots for two quantitative variables and parallel boxplots for one quantitative and one categorical variable are most effective. Mapping multivariate data proves slightly more problematic given the restrictions of two-dimensional output. A scatterplot-matrix can help by successively contrasting pairs of variables in one convenient graph. These plots can help diagnose problems with linearity that might detract from the effectiveness of the general linear model. This approach is limited by the fact that other variables included in the regression can be illustrated graphically in some software programs that mimic a third-dimension by rotating the three variables within a two-dimensional plane. The benefits for examining trivariate relationships graphically are immediately apparent to any observer of such a model: linearity, outliers, and the strength of a relationship are readily visible.⁴⁸

General Linear Model

As the majority of statistical models in this thesis employed both quantitative (assessed value, acreage, age) and categorical variables (location relative to environmental variables, owner/tenant, religion), I used the general linear model for most of the regression analysis. A number of diagnostic tools helped verify that outliers with high leverage and influence, which might otherwise skew a regression, do not overly influence the analytical tool. Hat values, for example, effectively denote individual data points that have an unusual combination of independent variables, which can have a substantial effect on the regression. Studentized residuals, on the other hand, can identify outliers that are not readily apparent in univariate and multivariate displays. And finally, Cook's D Statistic provides a clear indication of data points that have both a high-leverage and a large studentized residual.⁴⁹ Graphing these tests can be combined with numerical cutoffs to help identify difficulties with a particular regression. Table 1-3 provides the formulae for rough numerical cutoffs for analyzing the outcomes of these tests.

Test	Numerical Cutoff	
Hat Values ⁵⁰	$\bar{h}=\frac{(k+1)}{n}$	
Studentized Residuals	$\left E_{i}^{*}\right \leq 2$	
Cook's D Statistic ⁵¹	$D_i > \frac{4}{n-k-1}$	

 Table 1-3: Numerical Cutoffs Guides for Tests of Outliers and

 Leverage in Linear Regression.

The purpose of these tests is not to identify and then eliminate unusual data points from the regression in the hopes of conducting a more efficient analysis. These unusual points are often the most interesting as they often provide insight into particular individuals and farms in Saltfleet. Occasionally, I eliminated some dramatically

⁴⁸ Fox, Applied Regression Analysis, p. 50-56.

⁴⁹ Fox, Applied Regression Analysis, p. 267-298.

⁵⁰ Where *n* is the number of data points and *k* is the number of independent variables.

⁵¹ Where *n* is the number of data points and *k* is the number of independent variables.

influential points from the regression but not from summary tables. These points are noted in the footnotes. Diagnostic tools are also generally applicable to logit models, which are used for qualitative dependent variables, such as "tenant/owner." In this thesis, I have employed only a few logit regressions, but have used similar diagnostic approaches for assessing the model. Unfortunately, it is much more difficult to correct problems in a logit model than in the general linear model.

Diagnosing problems of normality, constant-variance, and linearity is more challenging, but equally necessary. Generally, the central limit theorem provides some safeguards against the dangers of non-normality under broad conditions, especially when the sample size is quite large (n > 100). However even in these situations, distributions with particularly heavy tails and highly leveraged outliers can minimize the effectiveness of linear regression. The most helpful tool for appreciating non-normality is a quantile comparison plot, which compares the studentized residuals with the normally distributed quantiles.⁵² Heavily tailed distributions, as well as outliers and skewness, are readily apparent when a ninety-five percent confidence envelope is included on the plot. Correcting non-normality can usually be accomplished by transforming the independent variable prior to the regression up or down the ladder of roots and squares according to Tukey's "bulging rule."⁵³ Such transformations for individual regressions are noted in the footnotes. Non-constant variance is most readily detected by plotting studentized residuals against fitted values rather than through an equation. Fox suggested plotting

⁵² Fox, p. 295-296.

⁵³ Fox, p. 71.

absolute studentized residuals or squared studentized residuals against *Y*-hat (the fitted values of *Y*). As variance often gets larger as *Y*-hat gets larger, for example, the plot would typically indicate a fan-shaped distribution. A transformation of either the dependent or independent variable through squares, roots, and starts can correct this problem.⁵⁴

Two other difficulties need to be addressed before an analysis of a regression can proceed. Partial-residual plots can usually detect non-linearity between a regression of *Y* on the *X*s, which can reduce the efficiency of a linear model. These plots indicate not only non-linearity and simple and monotone relationships, but can also suggest a transformation to correct the problem.⁵⁵ Collinearity can hamper the effectiveness of a statistical model. Finding an effective method of dealing with the problem is very difficult. Short of eliminating the offending variable, there is not a particularly effective solution in dealing with historical documents, as a researcher cannot redesign the census to avoid the problem.⁵⁶ Where warranted, I have included comments regarding the difficulties with a particular regression in the footnotes.

The challenges, vagaries, and inconsistencies inherent in any analysis of quantitative historical data might warrant abandoning them completely. There are, to be sure, a sufficiently large number of problems that need to be addressed before an

⁵⁴ Fox, p. 301-3.

⁵⁵ Fox, p. 309-317.

⁵⁶ Fox, p. 337-8.

historian can use these resources. However, there are also many challenges and difficulties in an effective use of modern censuses and statistical models. As Lewis and McInnis noted, "one should not just presume ... that older censuses are necessarily weaker sources of information than the various compilations that currently are so widely used almost unquestionably. All statistical data need to be cautiously assessed."⁵⁷ The most important aspect of using these sources is to examine and understand their internal consistencies. An inherent advantage of studying one township rather than sampling from many different regions is that only one enumerator or assessment officer completed each document, which goes a long way to ensuring that this internal consistency is met. As Donald Akenson noted in his work on the Irish in Leeds and Lansdowne, "although the data of a given township in Upper Canada often are not compatible with those compiled for a neighbouring one, the data *within* a township are at least compatible with themselves."⁵⁸

⁵⁷ Lewis and McInnis, "Agricultural Output," p. 49.

⁵⁸ Akenson, *The Irish*, p. 356. Emphasis is Akenson's.

-- Chapter 2 --

The Foundations of Inequality and Diversity: Early Settlement to the 1830s

Well, first they plundered Stoney Creek and then John Gage's Farm. They cut his fences for their fires although the day was warm. They bound my brother Isaac up and took him from his home; They pillaged all the countryside, no mercy there was shown...

With men and guns we then set forth the enemy to see, Across the beach at Burlington and then to Red Hill Creek. We came upon their sentries we surprised them everyone. One died upon my sword, and all the others off they run.

> "Billy Green" Song by Stan Rogers

A number of studies, most notably William Cronon's Changes in the Land, have

successfully discussed the relationship between the land and its Native occupants and

how it changed and evolved with the arrival of Europeans, with source material arising

mostly from settlers' writings and commentaries. In Saltfleet, however, the destruction

of the Neutral by the Iroquois League in 1651-2 and the dispersal and/or adoption of the

survivors, created a settlement vacuum in the lands at the head of Lake Ontario (see

Figure 2-1).¹ While native hunters and travelers continued to use the area for resource extraction and transportation corridors, the particularly fertile lands of Saltfleet remained unsettled when Europeans began arriving in the late eighteenth century. This absence of permanent native settlements produced a fundamentally different history than other areas in the province where native occupations proved longstanding, such as the Iroquoian settlements around the Grand River. In Saltfleet Township, Europeans settled a land that

¹ Richard White, The Middle-Ground: Indians, Empires, and Republics in the Great Lakes Region, 1650-1815, (Cambridge: Cambridge University Press, 1991), p. 3. Ideally, a study of the relationship between the land and its people should include a description of the first inhabitants and their relationship with the environment. This is beyond the scope of this thesis, but a brief summary is presented below. Native occupation of the territory that would become southern Ontario stretched back more than 11,500 years. A basic (though debatable) time frame for these divisions, which occurred after the retreat of the Wisconsin Glacier, is as follows: Paleo-Indian (9000-6000 B.C.); Archaic (6000-600 B.C.); and Woodland (600 B.C.) to 1650 A.D.). Archaeologists have divided each of these cultural groupings into a number of sub-groups, a discussion that is too vast to be included in this thesis. Pre-Clovis settlement in Ontario, that is, settlement prior to the canonical date of 11,500 years ago, remains controversial, with most evidence coming from the Sheguindah site. The discoveries in Monte Verde, Chile have rekindled the debate over more than one migration path from Europe, Asia, and/or Africa. The cultural group most associated with Saltfleet Township that is contemporaneous with European settlement and conquest would be the Neutral. The Neutral people, generally assigned a territory located between the Huron and the Iroquois League, were an Iroquoian culture that descended from what archaeologists called the Uren substage of approximately 1450 A.D. The Neutral emerged as one of four groups from this complex, which also included the well-documented Huron, the Petun, and the Erie. Neutral settlements ranged in size from small hunting and fishing camps to two-hectare villages. Much like the Huron, the Neutral occupied longhouses and palisaded villages that reflected an increasingly sedentary life. The cultivation of corn, beans, squash, sunflowers, and tobacco coupled with some continuation of hunting and gathering practices provided sustenance for the Neutral, who numbered approximately 40,000. For a discussion of this period in southern Ontario history see James V. Wright, "Archaeology of Southern Ontario to A.D. 1650: A Critique," The Archaeology of Southern Ontario to A.D. 1650, Eds. C.J. Ellis and N. Ferris, (London, Ontario: Occasional Publication of the London Chapter of the Ontario Archaeological Society, 1990), p.498; P. G. Ramsden, "A Refinement in Some Aspects of Huron Ceramic Analysis," National Museum of Man, Archaeological Survey of Canada, Mercury Series Paper 63, (Ottawa: National Museum of Man. 1977) p. 341; C.F. Dodd et al., "The Middle Ontario Iroquoian Stage," The Archaeology of Southern Ontario to A.D. 1650, Eds. C.J. Ellis and N. Ferris, (London, Ontario: Occasional Publication of the London Chapter of the Ontario Archaeological Society, 1990), p. 355; and W.C. Noble, "Van Biesien: A Study in Glen Meyer Development," Ontario Archaeology Vol. 24 (1975), p. 37; William S Donaldson, "The King's Forest Park Site," Ontario Archaeology, Series B, No. 3 (June 1965), pp. 3-10; William A. Fox, "A Hillside Midden, King's Forest Park Site," Ontario Archaeology, Vol. 10 (June 1867), pp. 18-28.

was not only unoccupied, for all intents and purposes, but also had been unaltered for some time.²



Figure 2-1: Location of some Neutral and Huron Sites and Findspots in part of the Great Lakes Basin.

The early qualitative history of Saltfleet Township and Wentworth County has already been conscientiously documented by a number of historians and writers. These works emphasized Governor John Graves Simcoe's vision, pioneer triumphs, economic

development, housing conditions, and the early legislation that shaped the settler

² The Township of Saltfleet emerged as a political entity on January 1 1800 through "An Act for the better division of this province" (*38 Geo. 3* [1798], c.5 s.27) as part of Lincoln County. In 1816, Saltfleet, Barton, Binbrook, Glanford, and Ancaster Townships, as well as Burlington Beach and Coote's Paradise, were sectioned off from Lincoln County to become Wentworth County (*56 Geo. 3* [1816], c.19, s.11) (Thomas A. Hillman, "A Statutory Chronology of Central Ontario, 1792-1984," Ed. Donald Akenson, *Canadian Papers in Rural History V*, (Gananoque: Langdale Press, 1986), p. 320-1).

experience in the late eighteenth and early nineteenth centuries. The most thoroughly researched and academic of these works is Charles M. Johnston's excellent The Head of the Lake, which pulls together a wide variety of primary and secondary material, and provides an effective amalgam of the personal experiences that shaped Saltfleet's early development.³ While some qualitative material will serve to introduce farming in Saltfleet, the primary function of this chapter is to provide a benchmark of the basic agricultural and settlement characteristics of the township shortly after settlement began in earnest to approximately 1830. Through an examination of the available primary documents, principally an 1819 assessment roll, the index to the land registry records, travel literature, and the War of 1812 losses claims, a statement regarding the general state of agriculture in the township can be made. This early period in the township's history laid the foundations of inequality. Individuals who arrived first claimed the best land, usually found below the escarpment, while subsequent settlers farmed less desirable lands above the escarpment. This initial advantage influenced the success and failure of subsequent settlers. A good end point is 1830 as it is approximately one generation after most of the land in the township had been patented. It also falls a number of years after the War of 1812, but prior to the upcoming years of heavy immigration into the province. From this established base-period, a better understanding of changing agricultural conditions in the rest of the nineteenth century can be obtained.

³ Charles M. Johnston, *The Head of the Lake: A History of Wentworth County*, (Hamilton, Ontario: Wentworth County Council, 1958).

Taking up the land

Steps to improve Saltfleet's agricultural productivity began when the first pioneer cleared the first tree to create room for his crops. As loyalists flooded into the township between 1790-1795, many trees gave way to the woodsmen's axe. The Land Office, which approved a settler's petition for settlement, required an oath of allegiance and fidelity.⁴ A settler then received a certificate that was to be shown to the Surveyor-General or other authorized party, who then proceeded to register the property in the settler's name. The certificate of settlement required the settler to take up the land and begin improvements within one year of the date of certificate. Generally, the allocation of land was limited to 200 acres per settler, although loyalists were entitled to more if they appealed to the board. The Land Office also instructed the Surveyor-General to prevent individual settlers from obtaining large quantities of lands that would give them a monopoly over minerals, fossils (presumably to protect coal resources), convenience, and mills. These limits were often waived for government officials as part of the remuneration of office. Augustus Jones, the Deputy Surveyor, for example, obtained the patent to extensive landholdings in both Saltfleet and neighbouring Barton in the early 1790s. The best agricultural lands were to be given to agricultural settlers to promote good husbandry, while sites suitable for ports and harbours were to be reserved for these navigation and military purposes.⁵

⁴ "Extract from the Rules and Regulations for the conduct of the Land Office Department, dated Council Chamber, 17th February 1789." *Township Papers*, RG I, C-IV, No. 3, Archives of Ontario.

⁵ "Extract from the Rules," *Township Papers*, VII.

In Saltfleet, unlike some other settlements, neither Thomas Ridout, the Surveyor-General, nor Augustus Jones necessarily assigned lots to prospective pioneers in all instances. Traditionally, the settler presented his location ticket (sometimes called 'Land Board Ticket') to the Deputy Surveyor, who then assigned a surveyed lot to the petitioner.⁶ Saltfleet Township papers indicate, however, that many residents in Saltfleet located their own lots, based on availability, access, soil-type, drainage, proximity to relatives, and other factors deemed important.⁷ Military men also chose the lots they wished to settle, holding a raffle amongst both officers and enlisted men to see who would choose first. The petitions and patents indicated that land was taken up quite quickly (see Figure 2-2 and Figure 2-3). The dates recorded in the Land Registry records should not, however, be taken at face value. Settlers occupied some of Saltfleet's lots long before the patent system was put in place in 1796.⁸

⁶ David T. Moorman, "The 'First Business of Government': The Land Granting Administration of Upper Canada," Ph.D. Thesis from University of Ottawa, 1998, p. 25. A detailed list of the process of claiming land in Canada prior to 1818 can be found in Widdis, "Tracing Property," p. 85.

⁷ Township Papers, RG I, C-IV, No. 80.

⁸ Upper Canada Land Book A, 1792-1796, Archives of Ontario.



Figure 2-2: Date of First Settlement Petitions for Saltfleet Township.



Figure 2-3: Date of Crown Patents for Saltfleet Township.

The logic behind individuals' choices of where to stake their claim is difficult to reconstruct. Some settlers may have followed the advice of travel literature and emigrant handbooks to find the best property, but few of these guides were in general circulation in Upper Canada prior to 1820. These books, however, probably reflect traditional wisdom regarding drainage, swamplands, and soils. The most ready indicator of a property's ability to sustain profitable mixed-agriculture could be found, according to these guides, in the type of trees that covered the lands. Edward Allen Talbot advised the following:

Land, upon which Black and White Walnut, Chestnut, Hickory, and Basswood grow, is esteemed the best on the continent. That which is covered with Maple, Beech, and Cherry, is reckoned as second-rate. Those parts which produce Oak, Elm, and Ash, are esteemed excellent wheat-land, but inferior for all other agricultural purposes. Pine, Hemlock, and Cedar land is hardly worth accepting as a present. It is, however, difficult to select any considerable tract of land, which does not embrace a great variety of wood: but, when a man perceives that Walnut, Chestnut, Hickory, Basswood, and Maple are promiscuously scattered over his estate, he need not be at all apprehensive of having to cultivate an unproductive soil.⁹

It is likely that loyalists and other migrants with previous settlement experience from the United States had knowledge of what soils made the best farmlands long before this information was widely disseminated in emigrant literature. G. Elmore Reaman, in *The Trail of the Black Walnut*, stated that many early settlers, including former officers in Butler's Rangers, had previous farming experience in New York and specifically chose lands on which the black walnut grew, usually associated with good limestone soil.¹⁰ A

⁹ Edward Allen Talbot, Five Years' Residence in the Canadas, including a tour though part of the United States of America, in the year 1823, (London: Longman, Hurst, Rees, Orme, Brown and Green, 1824), p. 59.

¹⁰ G. Elmore Reaman, *The Trail of the Black Walnut*, (Toronto: McClelland & Stewart), 1957, p. 65. J. Clarke and G.F. Finnegan noted, in an excellent article, the correlation between tree types and moisture levels in the soil in Essex County. The trees that indicated the best lands were frequently associated with

variety of documents, including the 1819 assessment roll and Robert Gourlay's *Statistical Account of Upper Canada*, indicate that the township remained uncleared well into the 1820s, which permitted subsequent settlers to use the guideline for some time, although the clustering of relatives throughout the township would suggest that familial ties proved a strong factor in shaping settlement choices.¹¹

Unfortunately for early settlers familiar with this traditional tree-wisdom, Saltfleet did not appear to have a significant number of walnut trees. Augustus Jones, in his survey of the township in 1788, noted the type of trees prevalent on many of the lots, which were dominated by oak and pine trees. As seen in Figure 2-4, oak and pine, which Talbot deemed as indications of land that was "good for wheat" land and "pretty much useless" respectively, comprised the majority of tree species throughout the centre of the township, running from approximately lot 9 through lot 30. The most valuable land, according to traditional wisdom, was marked by the hickory, oak, and ash stands clustered around the future town of Winona. The patent dates indicate that the first settlers followed the folk wisdom as the lots with concentrations of the more prized indicators were claimed first. As indicated in Table 2-1, the average year of patent for lots populated with hickory, oak, and ash was 1800, as compared to 1810 for the land dominated by cedar or water ash and elm.¹² Pine and oak lands varied in patent date

less swampy lands and therefore provided the best lands for agriculture (J. Clarke and G.F. Finnegan, "Colonial Survey Records and the Vegetation of Essex County, Ontario," *Journal of Historical Geography*, Vol. 10, No.2, (April 1984), pp.119-138.

¹¹ Assessment Roll for the Township of Saltfleet, 1819, Archives of Ontario; Robert Gourlay, Statistical Account of Upper Canada: compiled with a view to a grand system of emigration, (London : Simpkin & Marshall), 1822, p. 397.

¹² Note that there were only two data points for cedar lands and only one for water ash and elm.

depending on which species Jones listed first in his description, but in general settlers patented these lands in 1804, four years after the best lands were taken. Early Saltfleet settlers appeared to follow the traditional wisdom.

Tree Species	Year of Patent	
Cedar	1811 (2)	
Hickory, Oak, Ash	1800 (19)	
Oak	1807 (2)	
Oak and Pine	1804 (73)	
Pine and Oak	1802 (25)	
Water Ash, Elm	1810 (1)	
Blank	1805 (184)	
Total	1804 (306)	

Table 2-1: Average Year of Patent by Tree Species as Described by Augustus Jones in 1788.¹³

¹³ Counts are in parentheses.



Figure 2-4: Distribution of Tree Species in Saltfleet Township, August Jones's Survey Notebook, 1788.

More than simply tree species figured into the decision-making processes of early settlers. Jones's notebook also provided information regarding the presence or absence of swamplands on lots in the township. Of the two hundred lots in Saltfleet patented before 1806, Jones listed almost thirty percent as being swampy to some degree. However, as seen in Table 2-2, only 3.7 percent of lots patented in 1796 were considered swampy and none of these lots were below the escarpment. The settlers who arrived first chose the best lands, namely those that were below the escarpment and supporting the species of trees that served as land-quality indicators. These individuals used the settlers' rule of thumb to choose the best land, made use of Jones's survey notes prior to purchasing a particular plot, or asked Jones directly as to what were the best lands. This initial advantage of having occupied the best locations would later be transformed into greater levels of wealth and further accumulations of land.

Year of	Location Relative to Escarpment		Total
Patent	Above	Below	TUtar
1796	33.3%	0.0%	3.7%
	(3)	(24)	(27)
1797	31.3% (16)	(0)	31.3% (16)
1798	48.0%	26.5%	35.6%
	(25)	(34)	(59)
1801	33.3%	25.0%	27.3%
	(6)	(16)	(22)
1802	50.0%	23.5%	39.5%
	(26)	(17)	(43)
1803	33.3%	27.3%	30.0%
	(9)	(11)	(20)
1804	(0)	16.7% (6)	16.7% (6)
1805	0.0%	66.7%	28.6%
	(4)	(3)	(7)
Total	40.4%	20.7%	29.5%
	(89)	(111)	(200)

Table 2-2: Percentage of Lots Patented from 1796-1805 described as 'Swampy' by Augustus Jones in 1788.¹⁴

¹⁴ Using the first row as an example, this table should be interpreted as follows: of the three individuals who received crown patents on lands above the escarpment in 1796, one-third were on swampy land, whereas, of the twenty four individuals who received patents on lands below the escarpment, none were on swampy land. Counts are in parentheses.



Figure 2-5: The Presence of Swampy Soil in Saltfleet Township, Augustus Jones's Survey Notebook, 1788.

Early Agriculture in Saltfleet

Early in the District of Gore's history, Simcoe worked to improve the agricultural development in the colony by establishing a society to promote improved husbandry in 1792. Parliament did not, however, provide financial subsidies to agricultural societies until 1830.¹⁵ The district's residents near Hamilton established their own agricultural organization, the Burlington Board of Agriculture, as early as 1806. Formed to promote "the Science of Agriculture and carrying into effect the improved Art of Husbandry within our respective circle,"¹⁶ the Society's laws required that members be both

¹⁵ H.H. Robertson (ed.) "The First Agricultural Society within the Limits of Wentworth County," *Papers and Records of the Wentworth Historical Society, IV*, (Hamilton: The Griffin and Kidner Co., Limited, 1905), p. 93.

freeholders and "actual cultivators of the soil."¹⁷ From a very early period, a variety of hawkers, peddlers, and traders provided early settlers with a contact to nascent urban centres as did more established merchants, such as Robert Hamilton.¹⁸

Prior to approximately 1830, descriptions of efforts to improve agriculture indicated variable success.¹⁹ British and American travellers offered interpretations of the state of agriculture in Canada, and of areas in and around Saltfleet. William Philips, who settled in Ancaster, noted that there was no variety of fruits and vegetables, "as they plant very little but French beans and potatoes, the winters being too cold and summers too hot."²⁰ Joseph Pickering, who spent six years in Canada between 1824 and 1830, felt that while most farmers in Canada pursued a general policy of mixed-agriculture, the level of husbandry paled greatly in comparison to English farmers. He felt that the

¹⁹ An excellent description of the activities and costs associated with making a farm can be found in Robert E. Ankli and Kenneth J. Duncan, "Farm Making Costs in Early Ontario," Ed. Donald Akenson, *Canadian Papers in Rural History IV*, (Gananoque: Langdale Press, 1984), p. 42.

¹⁶ William Canniff, *History of the Settlement of Upper Canada*, (Toronto: 1869), p. 580 and H. H. Robertson, "First Agricultural Society," p. 94. The Head-of-the-Lake region near present day Hamilton and Burlington was interchangeably known as either Hamilton or Burlington, although the latter appears to have been the first designation.

¹⁷ H. H. Robertson, "First Agricultural Society," p. 94.

¹⁸ Bruce C. Wilson presented a remarkable history of the intricacies of Robert Hamilton's commercial empire between the Revolutionary War and the War of 1812 in *The Enterprises of Robert Hamilton: A Study of Wealth and Influence in Early Upper Canada*, 1776-1818, (Ottawa: Carleton University Press, 1983). A description of the role of trade can be found in McCalla, *Planting the Province*, Chapter 8. See also Brian S. Osborne, "Trading on a Frontier: The Function of Peddlers, Markets, and Fairs in Nineteenth-Century Ontario," Ed. Donald Akenson, *Canadian Papers in Rural History II*, (Gananoque, Ontario: Langdale Press, 1980). p. 60. York established a formal market in 1814 followed by Niagara three years later (Osborne, "Trading on a Frontier", p. 69).

²⁰ "Letter from William Philips, late of Singleton, near Medhurst, Sussex, Shoemaker, Ancaster, August 5th, 1832," *Emigration: Letters from Sussex Emigrants, who sailed from Portsmouth in April 1832, on board the ships, Lord Melville and Eveline, For Upper Canada: extracts from various writers on emigration to Canada, and from Canadian newpaper[sic] with references to the letters. Ed. Thomas Sockett, (Petworth: Petworth Emigration Committee, 1833), p 141.*

system of management in Canada was "too deteriorating" for effective farming.²¹ This unwillingness of farmers to implement even the most rudimentary of English agricultural practices stemmed not from ignorance of these practices, but from the lack of economic incentive. It was not only impractical to farm intensively, but also expensive. When land was cheap and plentiful, extensive farming was a more appropriate response to the circumstances. Intensive farming proved a waste of manpower and capital.

Even though the critical appraisal of general agricultural practices in Canada by outsiders failed to appreciate the economics of new world agriculture, some of the descriptions of practices seems sound. In Saltfleet, for example, some farmers employed crude agricultural approaches. In reporting to Robert Gourlay's questions regarding the state of agriculture in the various townships, Hugh Willson, a Saltfleet settler of Loyalist descent, outlined the basic approach settlers took when settling the land:

The common method of treating new land is to sow a crop of wheat in the autumn, without ploughing (which would neither be necessary nor practicable, as in a state of nature there is neither grass nor weeds to prevent the growth of grain for the first season after clearing away the timber) ... The land may be worked five or six years successively to advantage, after breaking up the sod, and will need no manure.²²

²¹ Joseph Pickering, Inquiries of an Emigrant: being the narrative of an English farmer from the year 1824 to 1830; with the author's additions, to March, 1832; during which period he traversed the United States and Canada, with a view to settle as an emigrant; containing observations on the manners, soil, climate, and husbandry of the Americans; estimates of outfit, charges of voyage and travelling expenses, (London: E. Wilson), 1832, p. 64. Lemon noted similar comments made about agriculture in southeastern Pennsylvania, where many agricultural commentators criticized American farming techniques without considering the inappropriateness of British and European improved farming models to the new environment (Lemon, Poor Man's Country, p. 183). See also Kenneth Kelly's "The Evaluation of Land for Wheat Cultivation in Early Nineteenth Century Ontario," Ontario History, Vol. 62, No. 1 (1970), p. 57-64 and "The Changing Attitude of Farmers to Forest in Nineteenth Century Ontario," Ontario Geography, Vol. 8, (1974), p. 64-77.

²² Robert Gourlay, Statistical Account of Upper Canada: compiled with a view to a grand system of emigration London: Simpkin & Marshall, 1822), p. 398-9.

When the soil's nutrients did wane, farmers were more likely to let the land lie fallow for three or four years to "recover its strength."²³

The description of the state of settlement and agriculture in the region was generally positive, offsetting the critical accounts of Pickering and Philips. In addition to the fact that they did not understand extensive agriculture, they probably did not visit Saltfleet. There were pockets of striking progress and prosperity in this township. Adam Fergusson, who travelled in Canada and the United States in 1830-31, noted the relatively advanced state of settlement around Hamilton and Grimsby, presenting a very idealized view:

The romantic limestone ridge, covered with fine wood, and the thrush, straining his throat from the peach and apple trees loaded with blossom, with the tinkling bells of the village cows, as they went forth to pasture, formed altogether a refreshing commencement of a delightful day...The country was in many places romantic and beautiful, with fine farms and rich orchards of peach, plum, cherry, apple, & c. The wheat was remarkably fine, and the oat beard looked fresh and well.²⁴

Other more idyllic descriptions emphasized the ease with which settlers could succeed.

"So fertile is the soil of Canada," enthused Isaac Fidler, "[that] the first crop, with proper management, generally repays the purchase money, the expense of clearing and fencing, the cost of seed sowing and harrowing and the ezpense [sic] of reaping, thrashing, and carrying to the mill."²⁵ Rev. Andrew Bell provided another description. He answered an

²³ Gourlay, Statistical Account, p. 400.

²⁴ Adam Fergusson, Practical Notes Made During a Tour in Canada, and a Portion of the United States, in MDCCCXXXI; dedicated by permission to the Highland Society of Scotland, (Edinburgh: W. Blackwood and T. Cadell, 1833).

²⁵ Isaac Fidler, Observations on Professions, Literature, Manners, and Emigration, in the United States and Canada, Made During a Residence there in 1833, (New York: J. & J. Harper, 1833), p. 204.

advertisement for a teacher in Barton and Saltfleet Townships. He roomed with the Secord family at Albion Falls, teaching ten children in the area for three years. Upon first arriving in the area he set about exploring his new surroundings, which he described to his father, Rev. William Bell, in a letter dated Sept. 26, 1825. The positive description described a high state of settlement in at least some parts of Saltfleet:

It is about thirty years since this place was first settled on account of the famous mill-seat; but it is not above ten years since a clearing of any consequence was made when Mr. Secord came here. He has now between one and two hundred acres cleared, and keeps a farmer who farms it on shares. He has a gristmill, a sawmill, a potash manufacturer, a distillery and a store, in all of which he keeps men, and looks over the whole himself. Besides these, he has a blacksmith, carpenter's and cooper's shops on his farm, for his own convenience and provides them with tools. All these, with the people's houses, a tavern, a public schoolhouse, and my school-house, all on the farm, and his own dwelling house, storehouses, and offices, make something of a village. The dwelling house consists of two stories, and except that it is a good deal larger, is the very same as yours, as to the appearance, the placing of the windows, and the internal plan. Besides, there are a wing-kitchen and a back place for some bedrooms. I have a large and very handsome bedroom upstairs in front, in the same corner of the house as Robert's and mine at home.²⁶

Clearly some Saltfleet settlers were quite advanced in their agricultural and related

industrial pursuits prior to the 1830s.

The penetration of improved agricultural techniques into the Hamilton and Niagara area is evident from a number of pre-1830 sources. William Claus, army officer and politician, had an extraordinary garden and orchard in Niagara that was renowned throughout the region. The family papers detailed an impressive variety of fruits and vegetables. In 1806, for example, Claus planted two types of cauliflower, three varieties of peas, asparagus, onions, lima beans, lettuce, turnips, cabbages, carrots, celery,

²⁶ "Letter from Rev. Andrew Bell to Rev. William Bell, Albion Falls, September 2, 1825," *Miscellaneous Personal Papers*, Archives of Ontario.

radishes, sugarloaf, Guinea and red peppers, kale, red and white potatoes, musk melons, blackeyed watermelons, grapes, and apples.²⁷ He also tended a wide variety of flowers. By 1818, his garden had expanded to include a much wider variety of fruits, such as quinces, currants, raspberries, pippins, cherries, and peaches, many of which had been grafted from imported cuttings.²⁸ Claus used other more advanced horticultural techniques. In his 1822 diary, he noted that he used hot beds and frames in March to give his plants a head start on the growing season.²⁹ Richard Beasley, who lived even closer to Saltfleet than Claus, had a large apple orchard of almost 200 trees and a peach orchard "said to be the best in the province"³⁰ at his estate near Burlington Heights. The property of both men illustrate what was available for cultivation in the Hamilton area in the early nineteenth century.

Claus was probably an exceptional enthusiast, but others also had access to seeds and nursery stock from local suppliers by at least 1830. The availability of this produce prior to 1830 was not restricted to a pseudo-landed gentry or to individuals with contacts in Britain or the United States. In 1827, a Toronto nursery began wide dissemination of its catalogue in Upper Canada. William Custead's *Catalogue of Fruit & Ornamental Tree, Flowering Shrubs, Garden Seeds and Green House Plants, Bulbous Roots and Flower Seeds* offered a virtual cornucopia of fruits, vegetables, and flowers to the general

²⁷ Claus Papers, "Garden Book 1806 - 1818," Vol. 21, Part 2, Item 14, Archives of Ontario.

²⁸ Claus Papers, "1818 Diary," Vol. 21, Part 2, Item 17, Archives of Ontario.

²⁹ Claus Papers, "1822 Diary," Vol. 22, Part 1, Item 29, Archives of Ontario.

³⁰ Robert L. Fraser, "Richard Beasley," *Dictionary of Canadian Biography VII, 1836-1850*, (Toronto: University of Toronto Press, 1988), p. 57. Beasley's orchards were apparently ruined by the occupation of British troops at the heights between June 1813 and September 1815.

public. He had twelve agents scattered throughout the province, including one in Dundas and another in Niagara. Custead noted that horticulturalists and farmers had few options for good produce in the 1810s and early 1820s, but by the end of the decade, an abundant supply was available. The catalogue offered an impressive variety: seventy-nine varieties of apples, twenty-five pears, seventeen plums six cherries, nine peaches, eight grapes vines, and seven currants. There were also varieties of gooseberries, raspberries, strawberries, flowers, ornamental trees, medicinal herbs, and seeds of almost every type of vegetable imaginable.³¹ He guaranteed the variety and thriftiness of his goods insisting that "all the business is done by my own hands" and that he would "be accountable for all mistakes of [his] own making."³² However, as useful as these qualitative reports are for describing an individual farmer's state of husbandry, they cannot provide an overall quantification of settlement and farming in Saltfleet prior to 1830.

³¹ Catalogue of Fruit & Ornamental Tree, Flowering Shrubs, Garden Seeds and Green House Plants, Bulbous Roots and Flower Seeds, (York: William Lyon Mackenzie, 1827), p. iii. Reprinted in Eileen Woodhead, Early Canadian Gardening: An 1827 Nursery Catalogue, (Montreal and Kingston: McGill-Queen's University Press) 1998, pp. 8-16.

³² Catalogue of Fruit, p. 21.

War of 1812 Damage Claims³³

The War of 1812 claims records offered glimpses into the specific property holdings and agricultural practices of Saltfleet's farmers and settlers. After the defeat of General Proctor's army in October 1813, the retreating British Army and their native allies wintered at the Head-of-the-Lake in small clusters scattered throughout the area, including Saltfleet. Damage to Saltfleet property came at the hands of natives, British troops, and enemy attacks, which provide a convenient entry into an examination of claims records. Native warriors and their families resorted to foraging for goods throughout the countryside, generally finding the easiest prey conveniently penned up on the farms of local settlers, not to mention grain, clothing, firewood, and other necessities. While many of these settlers successfully defended their property, others were forced to seek compensation through the arduous war claims losses tribunal.³⁴ The accompanying

Fluctuating: 1£ sterling = £1.111 Halifax currency (to 1820) 1£ sterling = £1.217 Halifax currency (from 1820) 1£ sterling = \$4.8667 (from 1858)

³³ The claims of loss made after the war raises the issue of the type of currency used in the region. Prior to 1858, the monetary system was based on the Halifax standard which was in place throughout the British North America. However, the New York standard was also common throughout this region of Upper Canada. There were a number of conversion rates between currencies (taken from McCalla, *Planting the Province*, p. 246):

Fixed: £1 Halifax = \$4.00 £1 New York = \$2.50

As McCalla pointed out, converting between currencies was not straightforward as documents may not indicate the type of currency, officials may have used government conversion rates and not market rates, or the figure might already have been converted from another system. See also, A.B. McCullough, *Money and Exchange in Canada to 1900*, (Toronto: Dundurn Press Limited, 1984) and Angela Redish "Why was Specie Scarce in Colonial Economies? An Analysis of the Canadian Currency, 1796-1830," *Journal of Economic History*, Vol. 44, No. 3 (September 1984).

³⁴ As noted by George Sheppard in *Plunder*, *Profits, and Paroles: a Social History of the War of 1812 in Upper Canada*, these native foraging parties often ended in bloodshed. John Rymal, a settler in Saltfleet, reported to the tribunal that "'His wife came running to him with the information that two Indians had stolen a couple of pigs, and made off with the porkers. Rymal, rifle in hand was instantly in pursuit. He

petitions included a detailed account of lost personal property. John Green, for example, presented an exhaustive list of property losses said to have been the results of actions by "Indians attached to the British Army...done in the presence of Captain Norton and Mr. Augustus Jones who beheld the same with apparent indifference."³⁵ His losses included

1 young horse 2700 feet of pine boards 1200 feet of walnut boards 300 feet of cherry boards 1 set of harness upper leather calf skin I rifle and 1 shotgun 7 bushels of buck wheat 5 bags and 10 bushels of potatoes 13 vds of new linen 1 pair of sheets - 5 pillow cases 1 bed spread, 12 kitchen knives and forks $\frac{1}{2}$ doz. spoons, 6 tea spoons crockery ware, decanter, tumbler men's wearing clothes 6 ft bees wax, 3 hives of bees 4 gallon of honey, 2 axes, cash 1 pair silver stock buckles 1 set of shoemaking tools 5 hogs, cash, butter

Total damages amounted to £157.16.3, which was verified by a number of Saltfleet's more important settlers. Similar petitions by Adam Green, Peter Swarz, Ebenezer Jones, Augustus Jones, Abraham Snook, Thomas Petit, John Utter, Edward Brady, and Phebe Hennis detailed losses from natives attached to the British Army. They indicated that some farmers in Saltfleet at the time of the war possessed lands and personal property

shot one of the Indians dead. The other returned fire shooting the pursuer in the hand." He managed to recover the pigs (Montreal and Kingston: McGill-Queen's University Press, 1994) p. 121.

³⁵ War of 1812 Claims Records, RG 19 E 5 (a) Vol. 3745, File 3, Claim No. 385, Archives of Ontario.

enough to maintain at least a reasonable standard of living and were pursuing a variety of agricultural interests.³⁶

The British soldiers in Canada also contributed their fair share of damage to Saltfleet property. Referred to by William Dunlop as "the rubbish of every department in the army,"³⁷ the British regulars wintered in the township and survived, in part, by foraging on the property of local farmers. Ebenezer Jones's claims provide a good example of the wide variety of agricultural pursuits conducted in the early part of the nineteenth century. His livestock included geese, pigs, and sheep. His crops included oats, wheat, hay, Indian corn, potatoes, and apples. Including the destruction of a barn and a boat, Jones losses totalled £170.5.0.³⁸ Additional losses at the hands of British troops, indicating similar levels of productivity and wealth, were reported by Benjamin Johnson, John Wilson, Thomas Pettit, William Davis, Freeman Green, Stephen Jones, Jacob Springsted, Amos Smith, John Biggar, Samuel Nash, John Galbreath, John Leflar, Edward Brady, and Letitia Gage.³⁹ All in all, the British troops confiscated or destroyed all types of livestock, over fifteen different crop varieties, many forms of transportation, and a variety of houses and outbuildings.

³⁶ Claims Records, RG 19 E 5 (a) Vol. 3745, File 3, Claim No. 393; File 1, Claim No. 424; Vol. 3747, File 2, Claim No. 427, 428, and 513; Vol. 3748, File 1, Claim No. 580; Vol. 3755, File 1, Claim No. 1488; Vol. 3756, File 1, Claim No. 1635; Vol. 3757, File 2, Claim No. 1790; Vol. 3746, File 2, Claim No. 403.

³⁷ William Dunlop, Recollections of the War of 1812, with a biographical sketch of the author by A. H. U. Colquhoun, Toronto: Historical Pub., 1908, p. 63.

³⁸ Claims Records, RG 19 E (a) Vol. 3746, File 2, Claim No. 427.

³⁹ Claims Records, RG 19 E (a) Vol. 3741, File 2, Claim No. 91; Vol. 3747, File 3, Claim No. 530, Vol. 3748, File 1, Claim No. 580, Vol. 3749, File 1, Claim No. 693; File 3, Claim No. 776; Vol. 3750, File 1, Claim No. 836; Vol. 3751, File 1, Claim No. 1047 and 1058, Vol. 3754, File 2, Claim No. 1372; Vol. 3755, File 1, Claim No. 1455; File 2, Claim No. 1552; Vol. 3756, File 1, Claim No. 1635; and Vol. 3757, File 2, Claim No. 1792.

American troops destroyed the lands and personal property of settlers, in battle, vengeance, or pillage. Ebenezer's brother Augustus claimed damages resulting from the war. This claim also emphasized the mixed agriculture that existed in the township. In addition to losing twenty-six hogs, forty-five geese, one sheep, and thirty fowl, enemy troops destroyed eighty bushels of potatoes, numerous bales of hay and bushels of wheat, two hundred bushels of apples taken from a cider mill, and "fruit trees destroyed by cattle occasioned by the fences being burnt by the troops of the best kind of grafted fruit."⁴⁰ A barn, windmill, outbuildings, and fence rails were also destroyed, as were a large looking glass, an English dirk, a number of Windsor chairs, a French book on the history of North America, and, among other things, a new hat. Jones seemed most annoyed at the destruction of his porch, "the spike nails taken out of the cornices and drove into the walls of the rooms to hang their accoutrements up which broke the said inside walls.⁴¹

The lands of William and James Gage suffered during the Battle of Stoney Creek and subsequent wintering of British troops. James stated that he incurred over £1017 worth of damages, including the burning of a building and the loss of fencing, livestock, crops, and 10 gallons of whiskey. It should be noted that his property was not typical of Saltfleet settlement. His residence was in fact the King's Head Inn and served as the stopping point between Niagara and York as early as 1796. A traveller in 1799 noted that the inn was "erected for the accommodation of travellers, by order of his excellency Major General Simcoe…it is beautifully situated at a small portage which leads from the

⁴⁰ Claims Records, RG 19 E (a) Vol. 3747, File 1, Claim No. 499.

⁴¹ Claims Records, RG 19 E (a) Vol. 3747, File 1, Claim No. 499.

head of a natural canal connecting Burlington Bay with Lake Ontario, and is a good landmark."⁴² William Gage suffered losses amounting to £166.17.6.⁴³

Court of Probate Records

Other rich sources that provide a detailed look at the personal property holdings of nineteenth-century settlers are the papers filed with the Court of Probate to ensure a valid will. Established in 1793 (33 George III, C. 8, U.C.), the Court of Probate had jurisdiction over any estate in which the personal property of the deceased was valued at over £5 in any district other than the one in which the deceased had died. By 1827, the Court was expanded to include guardianship. It was not abolished until 1859 when the Surrogate Court assumed responsibility for all probate matters. These records quite often included a detailed inventory of an estate in addition to the will and other legal filings. Many factors, however, limit the usefulness of these records when dealing with early nineteenth century individuals. First, the records, by definition, deal only with individuals whose wealth justified drafting and registering a will. Second, the dead, especially the probated, tend to be older and therefore wealthier than the average living individual.⁴⁴ Third, even if a will was drafted, the executors might not pursue the matter through the Court of Probate. Finally, many of the cases found in the records do not include an inventory of the estate. The wills for sixteen individuals who died in Saltfleet in or prior to 1830 appeared in the Court of Probate records and only four of these

⁴² David William Smyth, A Short Topographical Description of His Majesty's Province of Upper Canada, in North America: to which is Annexed a Provincial Gazetteer, 1799, (London: W. Faden, 1813), p.28.

⁴³ Claims Records, RG 19 E 5 (a), Vol. 3747, File 1, Claim No. 498.

⁴⁴ Rothenberg, "Capital Market," p. 785.

provided an inventory of the estate: James Carpenter (1820), Jeremiah London (1826), William Davis (1830), and Peter Pottruff (1830). All but the last were from loyalist families, and all but the first owned 200-acres of property or more.

These four inventories, despite their unrepresentative depiction of wealth, at least provide an interesting indication of what could be accumulated and what was being raised in Saltfleet prior to 1830. James Carpenter's possessions, valued at £52.19.3, included clevises, scythes, cradles, chains, ploughs, sleighs, augurs, planes, harnesses, and whiffle trees, two walnut tables, shoemakers tools, and some livestock.⁴⁵ He was the poorest of the four, apparently owning no land at the time of his death. The remaining three possessed a very impressive list of goods. Davis, in particular, had accumulated a diverse assemblage of farming equipment, including numerous ploughs, harnesses, harrows, chains, sleighs, forks, fanning mills, kettles, tubs, axes, saws, bells, saddles, and guns. He also had accumulated four bedsteads, four feather beds, six Windsor chairs, one writing desk, one dining room table, and a patent clock. Pottruff, in addition to farming equipment, left his heirs over £610 in cash. All told, London, Davis, and Pottruff left their heirs £150, £306, and £1667 respectively.⁴⁶

The agricultural commodities listed in these inventories downplay the significance of wheat on successful farms. Similar to the war losses records, the inventories, which stated what livestock and produce remained near the time of death, indicate that three of the four individuals practiced a diversified, mixed-agriculture (the

⁴⁵ Records of the Court of Probate, RG 22-6-2, No. 19, Archives of Ontario. It is difficult to be sure, but records seem to indicate that James Carpenter was young when he died.

⁴⁶ Court of Probate, RG 22-6-2, No. 58, 95, and 106.

inventory for Carpenter did not include crop production). Livestock included sheep, hogs, milk and beef cattle, geese, and horses. Crops included oats, hay, corn, wheat, and rye. Two had apiaries.

Wheat, common to all three inventories, did not appear to comprise an overly large component of the farms' crop and animal value. Davis' inventory, the most complete in terms of listing the agricultural elements of the farm, provides a good example. At the time of his death, Davis had accumulated a large holding of livestock, valued at over £115 (see Table 2-3). The value of crops at the time of the inventory was £41.6.0, comprised of corn, hay, oats, rye, and wheat. The last item comprised approximately thirty-one percent of the total agricultural output for the farm. This was certainly a significant contribution to the farm's economy, but not evidence of monoculture. Hay accounted for more.

Livestock	Value (£)	Crops	Value (£)
Oxen	25.0.0	Corn	3.15.0
Milch Cows	12.0.0	Rye	4.10.0
Heifers	4.10.0	Oats	5.0.0
Steers	2.15.0	Hay	15.0.0
Calves	3.10.0	Wheat	13.1.0
Sheep	10.0.0		
Horses	45.0.0		
Hogs	12.10.0		
Total	115.5.0		41.6.0

Table 2-3: Livestock and Produce for William Davis's farm, 1830.

This pattern of diversified crop production, based on only a few farms, does reinforce conclusions in recent scholarship that have de-emphasized the importance of wheat as the staple product of Ontario agriculture. Here, as in the rest of Upper Canada, the economy

was driven by a variety of produce. Most farmers grew wheat, but within the context of mixed farming.⁴⁷ This theme will be examined in greater detail later in the thesis.

The Assessment Roll of 1819

While the war losses claims and probate records provide insights into specific farms, the 1816 assessment roll provides the first real opportunity to understand township-wide patterns of wealth and land distribution. The roll lists 105 early settlers and all their land holdings in the Gore District, and includes a brief summary of cleared lands, livestock, and buildings. The 1819 assessment provides the same type of information, but for 145 names.⁴⁸ I decided to use the later roll to examine patterns of early settlement in the township given the larger number of names and its contemporaneousness with Robert Gourlay's statistical account of the province. Unfortunately, neither roll indicated the lot and concession for the individual settlers. The general location of the property can be found by cross-referencing the names and size of property with the *Abstract Index to the Land Registry Records*.

A number of difficulties arose from the process of linking the abstract index to the assessment roll, and in some cases these problems compelled me to drop a settler from the database. Among the linkage problems were the following. First, the handwriting in the document was very difficult to decipher. Second, settlers may have divided their

⁴⁷ McCalla, *Planting the Province*, p. 6.

⁴⁸ The accuracy of the roll depended on the assessor, who could be fined if the data in the roll proved particularly inaccurate. There was no punishment for settlers who underreported their property holdings in order to lessen their tax burden. The assessor received £4 for every £100 collected, suggesting that part of the underreporting might be offset by the assessor's desire to avoid fines and collect the most tax possible [Peter A. Russell, "Upper Canada: A Poor Man's Country? Some Statistical Evidence," Ed. Donald Akenson, *Canadian Papers in Rural History III* (Gananoque, Ontario: Langdale Press, 1982), p. 132.

property amongst various sons (rarely daughters), who then appeared as multiple owners in the abstract but only as single entries in the assessment roll. This might explain why family names matched across the two documents even if the given names did not. For example, prior to 1811 lots 23 and 24, Concession III belonged to Stephen Jones. In that year, lot 24 had been transferred to Philip and Sarah Jones. Even though Philip and Sarah, possibly a son and daughter-in-law, held free and clear title to the property until 1824, they do not appear in the 1819 assessment roll.⁴⁹ Third, settlers occasionally owned non-adjacent parcels of land but the rolls merely report one lump sum assessment. This practice made the placement of settlers difficult, especially considering that the roll does not specifically indicate which parcel of land the settler called home. I resolved the problem by designating a settler's largest land holding as the place of residence. This is not a perfect solution, but it is a plausible expedient. Fourth, some farmers leased lands in addition to their land holdings. John MacDavid, for example, owned property on lot 21, Concession II, but also leased one hundred acres on lot 14, Concession IV from Charles Moore. And finally, a number of lots were not patented. This delay in patenting probably stemmed from an economic interest of farmers to put their capital into stock, seed, equipment, and labour and delay completing the patenting process in order to save on the legal fees, or in the case of clergy reserves, save on payments. In this manner the land could be used, but since it was not patented, it was not taxed.⁵⁰

⁴⁹ Abstract Index to the Land Registry Records – Saltfleet Township, Land Registry Office, Hamilton, Ontario; 1819 Assessment Roll.

⁵⁰ Abstract Index.

The map of the property size appears somewhat sparse (see Figure 2-6). The coloured blocks should best be viewed as representative of larger properties; they do not always describe just that lot. The combined information from the assessment roll and the index provide only general location information. A 100-acre property, for example, might have been assigned by my record linkage to lot 2, concession 10. However, this does not indicate that the whole property was necessarily contained within that specific lot and concession. In fact, most early settlers carved out properties much larger than the 100-acre lots. These flaws make this map deceptive, and prevent its use in conjunction with other maps for 1819. For example, the inability to restrict a property's location, even reasonably accurately, prevented an effective analysis of settlement characteristics as compared to soil drainage and distance to water in 1819.



Figure 2-6: Property Size for Landholders, Saltfleet Township, 1819

These limitations aside, the 1819 data suggest a basic, tentative understanding of how farmers shaped settlement patterns and agricultural practices in Saltfleet. Of the 140 names used from the assessment roll, one hundred owned property in the Gore District. The average landowner held approximately 187 acres of which thirty-five (18.7%) were under some type of cultivation. When the properties of Levi Lewis and James Gage, both of whom owned very large parcels of land in the second concession, are temporarily removed from the calculation, the average property size of Saltfleet landowners dropped to approximately 167 acres. As indicated in Figure 2-7, only a few settlers owned properties smaller than one-hundred acres (16%), whereas many settlers held properites larger than two-hundred acres (43%).⁵¹ When the distribution for acreage is grouped by relative location to the escarpment, a pattern of inequality becomes apparent. Properties below the escarpment were much larger with the mean size being larger than the third quartile value for those properties above the escaprment. The distribution for properties below the escarpment is heavily skewed by the two farms belonging to James Gage and Levi Lewis.

⁵¹ The average number of cleared acres was 35, which is slightly higher than the average of fifteen townships (33.6) calculated by Russell in "Upper Canada," p. 133.


Figure 2-7: A Boxplot of Total Acres in Gore District for Saltfleet Landowners by Location Relative to Escarpment, 1819.⁵²

Squatting and Patenting

Saltfleet certainly experienced practices that might technically be considered squatting. Approximately thirty percent of individuals who petitioned the government did not receive the patent until after the five-year period had passed. There was very little incentive for petitioners to complete the patenting process. Rather than expending their limited capital in making the numerous required trips and closing the deal, early

⁵² A boxplot is a univariate display that provides summary information on centre, spread, skewness, outliers, and with a small addition, the overall mean. The rectangle represents the inter-quartile range (also known as the hinge spread), while the solid line inside the box is the median. The thin lines that extend past the rectangle, called the fence, are drawn at 1.5 times the hinge spread. Any data points outside the fence are considered outliers. I have added a dashed line to represent the mean for the entire township. In this particular graph, the distribution of acress for the entire township positively is skewed, with two prominent outliers pulling the mean quite far from the median value. The distribution of acreage for Below the escarpment is even more skewed, with the same two prominent outliers. The distribution for Above and Split is less problematic.

settlers (poor settlers in particular) probably found their monies better spent in clearing the land, hiring labour, and increasing their livestock. The arduous nature of travel at the turn of the century certainly provided enough incentive for pioneers not to complete their patenting obligations: "[a] farmer, once safely located on his land and secure in the promise of the Constitutional Act, put off from month to month the journey to the office of the Attorney General or Clerk of the Peace for his district."⁵³ The centralization of the land administration process, which disbanded the local land boards in 1794, did not help matters. Settlers seeking to claim their patent now had to travel to York to finalize the patenting process, or hire an agent to do the same. This additional deterrent meant that many poorer settlers did not patent their lands until absolutely necessary, such as when they wished to pass title to succeeding generations.⁵⁴

The period between when an individual filed a petition for lands above the escarpment and when the patent was registered was quite short in comparison to lands below the escarpment (3.3 years). Rather than the result of diligent settlers, the short period suggests the activities of land speculators and large-land holders.⁵⁵ By quickly

⁵³ Lillian F. Gates, Land Policies of Upper Canada, (Toronto: University of Toronto Press), 1968, p. 53

⁵⁴ Moorman, p. 48.

⁵⁵ Unfortunately, there is insufficient surviving primary documents to divine which lands were owned by speculators and which were owned by individuals seeking simply to delay the patenting process in order to invest capital in other farming activities. In Akenson's study of Leeds and Lansdowne, a convenient treasurer's return of lands held by absentees provided a relatively easy way of determining speculators. Akenson considered any absentee that had not paid their taxes in eight years to be a speculator (Akenson, *The Irish*, p. 149 and Map 13). There were no such surviving documents for Saltfleet. In addition, there were an insufficient number of primary documents (assessment rolis) to employ Randy Widdis' more complex "motivation and scale" procedure [R.W. Widdis, "Motivation and Scale: A Method of Identifying Land Speculators in Upper Canada," *Canadian Geographer*, Vol. 23 (1979), p. 339-45]. Arbitrary limits of 500 acres, as was used by A. G. Brunger, would suggest that only two individuals in the township engaged in speculation, according to the 1819 assessment roll. It seems highly unlikely that speculatory activities were restricted to only James Gage and Levi Lewis, especially considering that many farmers engaged in

obtaining the patent for additional tracts of land in the township, individuals could enforce their property rights and get better rates for loans.⁵⁶ A patent proved a valuable tool for the purposes of collateral. Further, once patented, the lands could then be leased to prospective farmers or held for speculation. In fact, the Proclamation of 1763 required that proof of settlement obligations only be produced if a petition for additional lands was made, a pattern continued by the Constitutional Act of 1791.⁵⁷ Therefore, the quick satisfaction of settlement obligations was most necessary for individuals who owned multiple properties.

The 1791 Act limited the number of acres any single individual could own to 1200, including individuals that had made arrangements to found and settle entire townships. Exceptions were made for military men: field officers received 1000 acres; captains received 700; and subalterns, staff officers, and warrant officers received 500.⁵⁸ However, with Simcoe's departure, "the new province fell under the control of less generous men bent on preserving distinctions between the original loyalists and later arrivals."⁵⁹ Lillian Gates, whose thorough work on land policy recounted the settlement of Upper Canada, concluded that English officials sent over to manage the province

small-scale speculation to enhance their economic position (Widdis, "Motivation and Scale," p. 342; A.G. Brunger, "A Spatial Analysis of Individual Settlement in Southern London District, Upper Canada, 1788-1815," Ph.D. thesis, University of Western Ontario, 1973.)

⁵⁶ John Clarke outlined the strategies of one particular land speculator in Essex County in "The Activity of an Early Canadian Land Speculator in Essex County, Ontario: Would the Real John Askin Please Stand Up?" Ed. Donald Akenson, *Canadian Papers in Rural History III*, (Gananoque, Ontario: Langdale Press, 1982). Many of Askin's contemporaries viewed his approaches as questionable and low-handed, but still within the law. However, his use of friends in positions of power to obtain patents to his holdings was, according to Clarke, perfectly understood amongst his peers (p.106).

⁵⁷ Gates, Land Policies, p. 7.

⁵⁸ Gates, Land Policies, p.15.

⁵⁹ Gates, Land Policies, p.38.

identified wholeheartedly with the maintenance of loyalist distinctions as the defining element of the new province. John Elmsley felt that increasing patenting and surveying fees was the only effective way to promote additional labour in Upper Canada. Elmsley stated that the continued practice of cheap or free land grants would prove disastrous: "Instead of opulent farmers we will have miserable cottagers who cannot afford to cultivate their land properly, scraping a subsistence from an acre or two."⁶⁰

The increased fees associated with the Proclamation of October 31, 1798 echoed this opinion. The Crown Land Department now required a settler to pay £5 for a twohundred acre property (6 pence/acre) up from £2.18.8, plus the cost associated with surveying the lands. One-half of the fee plus the survey fee were required up front, the remainder due when the land was patented. The insistence on half the cost patent fee being paid upfront resulted directly from the inability of the Land Office to collect the ever increasing fees associated with the patent process. By July 1799, over £4000 worth of patents remained incomplete despite the fact that the settlement obligations had been met. The time and capital associated with completing the final stage was deemed too burdensome by farmers who felt secure in their claim to the land even without the patent. Under the administration of General Peter Hunter, these fees increased to £8.4.1 for a two-hundred acre lot, with payment for the whole amount due at the time of petition. Loyalists and their children were not subject to this new fee system, although those individuals who qualified as loyalist settlers were severely curtailed under Hunter's

⁶⁰ Upper Canada State Book B, p. 130-5, as seen in Gates, Land Policies, p. 47.

administration.⁶¹ For the most part, however, loyalists and settlers of influence obtained large tracts through "Dorchester's bounty," which allocated additional lands to true loyalists, and through petitions to the government for additional lands based on military rank, civilian duties, and in particular, number of children. Many of these loyalists and other large land-holders kept these lands for speculative purposes.⁶²

Robert Gourlay, the most systematic critic of Upper Canadian land policy prior to 1820, saw a lack of immigration, rampant speculation, and largely unworked public lands as the root of all that was evil in Upper Canada. Inefficient exploitation, he argued, increased rural poverty. His previous literary efforts in Scotland, full of vituperation and invective, focused on the plight of the landless and disenfranchised. When he arrived in Canada to rekindle his dwindling fortunes, he noticed the large tracts of uncultivated lands in Upper Canada and set a course to right this wrong. He set about compiling a set of statistics designed to shed light on the difficulties each township faced in maximizing its economic potential. Many of the questions invited respondents to vent and echo Gourlay's own particular concern that the prime impediment to development was the large unfarmed tracts of land held in public and speculative hands against the speculators and public land holdings. The thirty-first question, for example, asked "What, in your opinion, retards the improvement of your township in particular, or the province in

⁶¹ Gates, *Land Policies*, p. 70. Much of the motivation for demanding up front fees stemmed from the desire of the Lt. Governor and the officers of the Land Department to increase the number of patents being issued. Much of their pay depended on the number of completed patents and not the issuing of land grants. If the money for patenting were demanded up front, then settlers would have fewer disincentives to finalize the patent process.

⁶² Gates, Land Policies, p. 17-21.

general: And what would most contribute to the same?⁶³ As many of Gourlay's respondents were originally sympathetic to his vision, the answers were predictable.⁶⁴ Richard Beasley of Barton Township (immediately west of Saltfeet), for example, emphasized the want of capital, absentees' landholdings that were not subject to taxation, the failure to promote immigration, and the abundance of crown lands "lying in the unimproved state.⁶⁵

Hugh Willson, when reporting to Gourlay in 1817, noted that in Saltfleet, "It would be impossible to ascertain the quantity of lands in this township for sale; but from its extent, and the thinness of the population, and a considerable quantitity being owned by non-residents, there is no doubt a great deal for sale."⁶⁶ The 1819 assessment roll bears out this assertion, as seen in Figure 2-6, which indicates that comparatively less farming was occurring on lots above the escarpment than on those below. The southeast corner seems particularly bereft of settlement activity, although most of it had been patented by this time. Additionally, the aforementioned short time between petition and

⁶³ Robert Gourlay, Statistical Account, p.128.

⁶⁴ S.F. Wise, "Robert Fleming Gourlay," *DCB 1861-1870, Vol. IX* (Toronto: University of Toronto Press) 1976, p. 331. Gerald Bloch argued that Gourlay's efforts in Canada and the questionnaire in particular were part of a continuous process of reform that sought to alleviate the plight of the rural poor, rather than a new concern [Gerald Bloch, "Robert Gourlay's Vision of Agrarian Reform," Ed. Donald Akenson, *Canadian Papers in Rural History III*, (Gananoque, Ontario: Langdale Press, 1982), p. 110-1].

⁶⁵ Gourlay, *Statistical Account*, p. 203. Beasley paid heavily for his involvement with Gourlay. Beasley, who chaired the Barton meeting that responded to the questions, also served as an elected representative to Gourlay's convention, in which Beasley chaired the opening meeting. When the administration responded in 1819 to Gourlay's efforts, Beasley found himself the target. He was dismissed from the militia and was summarily dishonoured at a court of inquiry into his conduct during the war, an enquiry in which he was not allowed to speak or call witnesses (Fraser, "Richard Beasley," p. 58).

⁶⁶ Gourlay, *Statistical Account*, p. 400. Little is known of Hugh Willson. He probably was related to John Willson, the politician and Justice of the Peace, although he was not his son, who had the same first name.

patent for lands above the escarpment (3.3 years) suggests that these lands were purchased and patented for speculative and collateral purposes.

The environmental and cultural benefits of life below the escarpment clearly attracted settlers who had the first opportunity to buy the lands. As outlined in the previous chapter, the nature of GIS mapping allows for a spatial analysis of the data presented in the various primary materials. Topography, specifically the location of a farm relative to the escarpment, certainly played a large role in influencing the decisions farmers made regarding where and how much land to buy. On average, settlers chose properties below the escarpment approximately four years earlier than lands above the escarpment. More dramatically, the average property size below the escarpment in 1819 was much larger than the properties above (see Table 2-4). Properties below the escarpment, as they appeared in the assessment, were on average almost 115 acres larger. When the outlier properties of William Gage and Levi Lewis were removed from the calculation of the mean, below-escarpment properties were still over fifty acres larger than their elevated counterparts.⁶⁷ Those who bought the land below purchased much more, much earlier than those who came later. Also, a slightly greater percentage of the property was cleared. The original patentees of the land appeared to appreciate the advantages their properties gave them, as approximately thirty percent of these settlers still held their properties in 1819, compared to approximately twenty-one percent of their above-escarpment peers. The early average patent data for land split by the escarpment

⁶⁷ 1819 Assessment Roll. After removing the outliers, the average size of property below the escarpment was approximately 202 acres, as compared to 149 acres for properties above the escarpment.

reflects efforts to lock-up rights to the mill seats. Water pouring off the escarpment proved a powerful lure to early settlers.

Characteristic	Location	A		
	Above	Below	Split	Average
Average date of patent	1807	1803	1802	1805
Total property (acres)	148.8	260.7	124.2	208.9
Land Cleared (%)	21.4	23.5	26.5	23.1
Assessed value (£)	85.6	190.3	152.7	152.1
Value / acre (£)	0.63	0.86	0.95	0.80
Original Patentees (%)	21.1	30.3	50.0	29.3

 Table 2-4: Property characteristics with respect to

 'Location Relative to Escarpment', Saltfleet Township, 1819.⁶⁸

The assessed value presented in the roll is not an exact indicator of wealth, but is a rough surrogate. A farmer's overall assessed value was based on a very simple formula that taxed land according to the number of cleared and uncleared acres, houses according building materials and number of stories and chimneys, and number and type of livestock. This categorized valuation is not based on the market value for the assets, but a fixed assessment. One hundred acres on excellent soil near a constant water supply, for example, had the same assessed value as one hundred acres of swampland, nor does it consider the quality of particular livestock. Additionally, the assessment does not take into account personal savings, rental properties, mortgage payments, or crop production, instead emphasizing a land-based tax. While it did not cover all aspects of wealth, it did indicate improvements taking place throughout the township: bigger houses, better building materials, and improved lands.

⁶⁸ The value / acre should be read as a percentage of a pound and not pound.shilling.pence notation For the 1819 Assessment Roll, there are only six farms that fall into the "split" category. The category is kept only for interest sake as six data points are insufficient to make effective generalizations, although the early average dates can probably be attributed to the rush to claim the best lands for mills.

The pattern of this improvement throughout the township in 1819 indicates settlers' preference for lands below the escarpment. The drive of families to improve their lot in life can be seen in the distribution of housing. As indicated in Table 2-5, there were markedly fewer houses above the escarpment (10) than below (19).⁶⁹ Over fortyfive percent of the properties below the escarpment had framed buildings of one story or more. Nine of these homes had additional fireplaces and some had two or three. Only twenty percent of the homes above the escarpment were framed and none of these had additional fireplaces. Thirty percent of the properties above the escarpment had homes described as shanties, while only approximately nine percent of the properties below the escarpment had similarly described buildings. This distribution, as seen in Figure 2.7, indicates the lack of development or improvement above the escarpment and, in particular, the southeast corner of the township. The cluster of framed houses below the escarpment in the east end of the township correspond with the future town of Winona. Similarly, the two framed houses, mill, and merchant store near the west end corresponds with the future town of Stoney Creek. Neither of these groupings would even be considered hamlets in 1819.

⁶⁹ As mentioned previously, only one hundred of these families owned land and only sixty could be positively cross-referenced with the land-registry records to obtain a lot and concession.

Data		Т				
		Nothing Listed	Shanty	Squared Timber	Framed	Total
Location Relative to	Above	50.0% (10)	30.0% (6)	0 (0)	20.0% (4)	100.0% (20)
Escarpment	Below	42.4% (14)	9.1% (3)	3.0% (1)	45.5% (15)	100.0% (33)
Total		45.3% (24)	17.0% (9)	1.9% (1)	35.8% (19)	100.0% (53)

 Table 2-5: Ownership by Location Relative to Escarpment and

 Time of Settlement, Saltfleet Township, 1819.70



Figure 2-8: Houses, Merchants, and Mills in Saltfleet Township, 1819.

That not even twenty percent of the land was under cultivation and that more than

forty-five percent of the properties did not have any buildings worthy of assessment

⁷⁰ Five houses appeared on properties considered split by the escarpment. I excluded these from the table to avoid confusion.

suggest a number of land-use strategies and demographic realities. Emigrant literature and agricultural handbooks from the time indicate that one man could clear approximately five to seven acres per year.⁷¹ If this were the case, then Saltfleet should have had a much greater amount of land under cultivation.⁷² The low-exploitation rate in 1819 indicates that farmers were probably employing the agricultural methods mentioned earlier. Land was cleared, farmed continuously until yields declined and then abandoned for adjacent lands, although it is unlikely that the former lands were allowed to revert to forest. This practice resulted in only a small percentage of the overall lands being under active cultivation. The disruption of immigration caused by the Napoleonic Wars and the War of 1812 had an impact on the availability of farm labour, resulting in farmers clearing, ploughing, and cultivating fewer acres.

Indications from Willson's response to Gourlay's questionnaire suggested that

farmland was available throughout the township:

The price of land in this township, at the first settlement thereof, rated so low as to make it no object with many. A lot of 100 acres might be purchased for £5. or £6. 5s., and large quantities were actually bought and sold at these prices; it has gradually rose from that time to the year 1812, since which time it seems stationary for want of purchasers. But the average price of wild land may be rated at £1. 5s. per acre. A farm of about 300 acres of land, one-third of which cleared, and a comfortable house and good barn, with a bearing orchard of one or two hundred apple trees, the whole premises being in tolerable repair, may be purchased from £1,000 to £1,500, according to the situation. A farm nearly

⁷¹ Michael Williams, Americans and their Forests: A Historical Geography, (Cambridge: Cambridge University Press, 1989), p. 63. Accounts varied widely. Some accounts in Williams's work suggest that a skilled axe-man could clear an acre a day, which seems unlikely, while others asserted that a settler could only clear three acres in a year. Williams settled on five to seven acres, depending on tree type and density and also ground conditions. Robert Jones settled on four to five acres [Robert L. Jones, *History of Agriculture in Ontario, 1613-1880* (Toronto: University of Toronto Press, 1946), p. 71].

⁷² Russell noted similar findings, suggesting that the average clearance rate for his township was only 1.23 acres per farm per year in 1822 (Russell, "Upper Canada," p. 136).

answering to this description was actually sold for the highest sum here mentioned.⁷³

If a settler had the money, he (rarely she) could find land below the escarpment, with all the environmental benefits that came with it. Lands above the escarpment remained for other settlers. These elevated lands were still amongst the best in the country, but they lacked some of the climatic advantages of lakeside properties, and their residents, as mentioned previously, suffered from having to navigate the often treacherous roads down the escarpment to get to Hamilton, York, or Niagara markets.⁷⁴

The description of livestock in the *1819 Assessment Roll* provides an additional point of comparison regarding settlement in the township. The number of oxen and horses provides a good indication of a farm's ploughing capacity. Admittedly, farmers used horses for travelling the country's primitive roadways, but they also used them for pulling farm equipment, including wagons, ploughs, and harrows. Livestock distribution in the township suggests that farmers above the escarpment were as well equipped – in terms of numbers – with draught animals as the farms below the escarpment, but lacked the same level of agricultural diversity. Both groups of farms had 2.2 oxen per farm, an animal vital to clearing and breaking the land (see Table 2-6). The farms below the escarpment, however, had a greater number of other livestock, and that could indicate a greater variety of agricultural pursuits (see Figure 2-9 and Figure 2-10).

⁷³ Gourlay, Statistical Account, p. 399-400.

⁷⁴ An brief summary of early transportation trials and tribulations can be found in Thomas F. McIlwraith's "Transportation in Old Ontario: Some Themes," *By River, Road, and Rail: Transportation in Old Ontario, Essays in Technological and Logistical History*," Ed. Thomas F. McIlwraith, (Toronto: Ontario Museum Association, 1984), pp. 1-16.

Livestock	Location '	Average		
	Above	Below	Split	Average
Oxen over 4 years	2.2	2.2	2.0	2.2
Horses over 3 years	1.4	2.2	2.0	1.9
Milch cows	2.9	4.3	3.8	3.7

Table 2-6: Livestock by 'Location Relative to Escarpment', Saltfleet Township, 1819.



Figure 2-9: The Distribution of Beasts of Burden (Horses and Oxen) in Saltfleet Township, 1819.



Figure 2-10: Milch Cows in Saltfleet Township, 1819.

The distinction between oxen as draught animals and milch cows as milking animals does not include cattle as beef animals. In 1819, there was unlikely to be a high degree of specialization in beef production, so farmers probably did not make the distinction between working animals and beef animals. Settlers probably slaughtered for meat draught animals, unproductive milch cows, or animals just getting too old.⁷⁵

Inequality

The preceding discussion has focused mostly on landholders in the township, accounting for 100 of the 140 names appearing on the assessment roll of 1819. The remaining forty did not purchase property for a variety of possible reasons, including a lack of funds, skills, and/or desire, but appeared on the roll. These individuals were

⁷⁵ Lewis and McInnis, "Agricultural Output," p. 83.

probably tenant or share farmers, similar to the individual described in Andrew Bell's letter. Alternately, they might not have worked any land but held some taxable property. Many individuals in Saltfleet were transient labourers, working as farmhands or loggers. D. Slater, for example, arrived in the township from Ireland in December of 1818 after a four-month journey. The next year he spent chopping wood and clearing land for many of Saltfleet's most prominent residents without settling on any piece of land himself.⁷⁶ He also served as a schoolteacher to make ends meet. Individuals like Slater generally slipped through the anecdotal and quantitative analysis that appears to portray Saltfleet as a place of great opportunity. In fact, the distribution of wealth in Saltfleet was remarkably unequal.

Economists, sociologists, and historians use a number of standard tools to measure inequality within a population. The Lorenz curve charts a structured population (in deciles, for example) on the horizontal axis against some measure of wealth, such as income, of the same population (see Figure 2-11). The difference between the resulting curve and a hypothetical 45° line (representing a perfectly egalitarian society) illustrates the level of inequality within any given society. The Gini coefficient quantifies this Lorenz curve into a single measurement. In a community in which every person had an equal share of wealth, the cumulative value of income would be matched by a corresponding increase in the cumulative population, resulting in a Gini coeffecient of

⁷⁶ D. Slater, "An Old Diary," ed. J. Rose Holden, *Papers and Records of the Wentworth Historical Society*, Vol. 5 (Hamilton: The Griffin and Richmond Co., Ltd., 1908), p. 31. Some of the families that he worked for and boarded with included Robert Land, Samuel Green, Isaac Corman, and Henry Van Wagner.



In Saltfleet, the assessment roll of 1819 indicates that there was a high degree of

inequality within the township, with a Gini coefficient of 0.491:⁷⁸

$$G = 1 - 2\sum_{i} P_{i} \sum_{i} Y_{i} + \sum_{i} P_{i} Y_{i}$$

= 1 - (2 * 0.29018) + 0.07143
= 0.49107
= .491

As development and resource extraction in Saltfleet had only recently begun, it should

not be surprising that the Gini coefficient was quite high.⁷⁹ The land granting system and

⁷⁷ Charles M. Dollar and Richard J. Jensen, *Historian's Guide to Statistics: Quantitative Analysis and Historical Research*, (New York: Holt, Rinehart and Winston, Inc., 1971), pp.123-6.

⁷⁸ The Gini index drops to .393 when the 40 individuals without property are omitted from the calculation. Unfortunately, the assessment roll does not provide the age of the settler, resulting in a Gini coefficient that does not take into account the differences in wealth accumulation over an individual's lifespan (see Bittermann, MacKinnon, and Wynn, "Of Inequality," p. 23-26). I have included the formula and the calculation for this equation, as it is the first time that I have used the coefficient. Future calculations of the Gini coefficient will only include the final result.

its supporting assumptions alloted large tracts of land to army officers and government officials, such as Augustus Jones, which contributed to the township-wide inequality. Wealth, or more accurately assessed value, was concentrated in the hands of a small number of settlers. The calculation of the Gini coefficient based on the 1819 assessment roll has limitations. First, the roll does not list every head of household in the township as many transients and farm labourers were not listed. The roll's approach also ignores most women, counting them simply as part of a household. This failure to account for every resident in Saltfleet, whether transient labourers or women, suggests that inequality within the township was even greater than that indicated by the Gini coefficient of 0.491. Second, while many characteristics such as land and houses are factored into the assessment, many other elements that determine a household's wealth are not. Unpaid domestic labour, bartered goods, and most crops in production failed to find their way into the assessor's calculations.⁸⁰ It is difficult to estimate how to accommodate this limitation or to determine *a priori* whether it would make much of a difference. The tentative conclusion to be derived is that inequality pervaded early settlement of Saltfleet,

⁷⁹ Provided only as a point of comparison, the distribution of family gross income in Canada in 1990 produced a Gini coefficient of 0.374, while the distribution of family net income was 0.348 [Michael O'Higgins, Gunther Schmaus, and Geoffrey Stephenson, "Income Distribution and Redistribution: A Micro-Data Analysis for Seven Countries," *Poverty, Inequality, and Income Distribution in Comparative Perspective: The Luxembourg Income Study (LIS)*, Eds. Timothy M. Smeeding, Michael O'Higgins, and Lee Rainwater, (New York: Harvester Wheatsheaf, 1990), pp 20-56, as seen in Dr. Paul Stevenson, *Globalization and Inequality: The Negative Consequences for Humanity* as seen at www.uwinnipeg.ca/as/sociology.stevenson.page4.htmi, p. 5]. Remember, the Canadian results are for income while the 1819 results are assessed value, so the indices are measuring the distribution of different characteristics.

⁸⁰ A number of excellent works have dealt with the importance of unpaid domestic labour. The first half of Marjorie Griffin Cohen's Women's Work, Markets, and Economic Development in Nineteenth-Century Ontario, (Toronto: University of Toronto Press, 1988) covers this topic admirably, as does Bettina Bradbury's Working Families: Age, Gender, and Daily Survival in Industrializing Montreal, (Toronto: McClelland & Stewart, 1993).

not surprising considering the township was in the early stages of development. However, studies in the United States, admittedly for a later period, indicate that Saltfleet possessed a more equal distribution of wealth. Jeremy Atack and Fred Bateman's study on the rural Antebellum North, for example, provided an average Gini coefficient of 0.62, a noticeably higher level of inequality.⁸¹ As the decades advanced and as the level of inequality changed, interesting comparisons of the distribution of property between the residents of Saltfleet, Ontario, and the United States emerge.

This chapter set out to provide a baseline for understanding subsequent patterns of settlement and agriculture that will be examined more fully in later chapters; however, a number of general conclusions concerning the early history of the township can be made. The first decades of life in Saltfleet were demanding, requiring years of backbreaking labour to clear the land. The first to arrive petitioned the Land Office to settle what they perceived as the best lands; dry lands sheltered by the Niagara Escarpment. As these lands filled up and large tracts were taken by government officials and prominent loyalists, subsequent settlers assumed title to the lands above the escarpment. Prior to the 1830s, wheat played an important, but not all-important role in the general farm economy. This small-scale pattern supports more recent scholarship which has downplayed the importance of wheat in the early nineteenth century. The primary documents that describe the lives of these settlers, particularly the war losses claims, early travel literature, and probate records, generally depict prominent farms in a general

⁸¹ Atack and Bateman, *To Their Own Soil*, p. 89-90; see also Rothenberg, "Capital Market," p. 783-5, which produced a Gini Coefficient of .675 obtained from probated documents of 512 individuals from 1730-1838 in Middlesex County, Massachusetts.

state of good cultivation. The settlers on these farms possessed a wide array of personal goods that helped ease the tribulations of farm life. These farms were exceptions. Assessed wealth in the township was highly skewed. Farms below the escarpment were larger, richer, and had more livestock than those farms above the escarpment. In addition, forty of the 140 names appearing on the assessment roll owned no land at all, working as either tenant farmers or farm labourers. This assessment roll also ignored those transient labourers who passed through the township unnoticed by the assessor. These environment and economic inequities would remain throughout the nineteenth century. As cultural patterns changed the landscape, the environmental landscape, in turn influenced cultural adaptations. This changing relationship altered the patterns of inequality in the township, taking different forms as the century wore on.

-- Chapter 3 --

The Seeds of Change: Agriculture and Settlement in Saltfleet, 1830 to 1851

Some living, no one time for giving, I ain't got a dime, Winds are blowing, wheat fields are growing, but none of it's mine... A good living, extra bit forgiving someone like me, I tell you I'm almost through, I'm tired as a man can be.

> "After Fifty" Song by Stan Rogers

It is often difficult to look past survey lines when examining farming patterns within a township or county as lots and concessions organize the data. Any examination of agricultural patterns based on these lines remains tied to the arbitrary political framework. The fact that farmers in Saltfleet produced more fruit than those in neighbouring Grimsby Township, for example, is not a particularly important fact because the township alone conveys no environmental information. Looking past the political unit is essential. Natural divisions, such as valleys, mountains, and distance to water, provide realistic indicators of agricultural tendencies, but these often fail to be incorporated in historic studies. When environmental variables are reinserted into an analysis of Saltfleet's agricultural endeavours, the importance of cultural factors so often used to explain variations in settlement fade in significance.

As part of their careful examination of the 1871 census, Darroch and Soltow explored religious and ethnic variations in the size of farm holdings, as a way of considering variations in farm wealth. They found that, on average, Baptists and Methodists held farm acreage which exceeded that of Catholics and Anglicans by a margin of twenty percent and ten percent, respectively. In their view, such differences in acreage were very significant, and would have represented "considerable differences in investments and in margins of potential production."¹ Darroch and Soltow considered some alternative explanations, but concluded that "farm size differed considerably among some of the province's main ethnic and religious communities, and the differences could not be accounted for by demographic or settlement factors, as far as they are able to determine."² The two scholars concluded their examination by suggesting that "there is some evidence to suggest the continuing importance of an evangelical moral order in fostering an emergent agrarian middle class."³

In this and the next two chapters, I explore differences in farm wealth, measured in several different ways, among settlers in Saltfleet township. In a study of a single township, it is possible to consider more detailed differences in environmental and settlement factors than was possible in a province-wide study. What emerges from this analysis is that where you farmed and how long you farmed proved far more important than your religious or ethnic background. This conclusion, which is based on a relatively small data set, is a first step in casting suspicion on assertions drawn from province-wide data that disregard variables too important to exclude. The results presented in this

¹ Darroch and Soltow, *Property and Inequality*, p. 52.

² Darroch and Soltow, *Property and Inequality*, p. 64.

³ Darroch and Soltow, Property and Inequality, p. 64.

chapter will be confirmed in an analysis of the 1861 and 1871 censuses in the following two chapters.

Farming is a local affair. The township and its agriculturalists, however, did not grow up in isolation. The City of Hamilton, which would prove the most important market in the region at mid-century, grew from approximately 1000 in 1830 to 14,112 by the time of the 1851-2 census.⁴ Over the period in question, ties between the farming community of Saltfleet and the City of Hamilton would grow. The town's council, like many in Ontario, enacted a series of market by-laws that forced the citizenry to purchase most of their foodstuffs in a centralized market, which was built in 1837.⁵ In addition, political events would see Saltfleet farmers raise arms to vote or fight in support of local patrons, as many did for Sir Allan Napier MacNab during the 1837 Duncombe Rebellions. Economic and political events such as these cemented ties between the town and the surrounding farming communities.⁶

There are remarkably few sources that provide more than cursory insights into the lives of this Saltfleet community prior to the 1851/52 census, although wills registered with the Court of Probate provide an interesting glimpse into patterns of inheritance and

⁴ Frederick H. Armstrong, *Handbook of Upper Canadian Chronology, Revised Edition* (Toronto: Dundurn Press, 1985), p. 272. Toronto (York) would increase from 2860 to 30,775 in the same period. A province wide overview of settlement and agriculture at this time can be found in J. David Wood, Peter Ennals, and Thomas F. McIlwraith's "A New Agriculture: Upper Canada to 1851 – Plate 14," Ed. R.L. Gentilcore, Historical *Atlas of Canada Volume II, the Land Transformed, 1800-1891* (Toronto: University of Toronto Press, 1993).

⁵ Weaver, *Hamilton*, p. 39. A discussion of the impact of market bylaws can be found in Sean Gouglas, "Produce and Protection: Covent Garden Market, the Socioeconomic Elite, and the Downtown Core in London, Ontario, 1843-1915," *Urban History Review*, Vol. XXV, No. 1 (October 1996).

⁶ An excellent examination of the role of patrons in influencing local issues can be found in S.J.R. Noel's *Patrons, Clients, and Brokers: Ontario Society and Politics* (Toronto: University of Toronto Press, 1988).

wealth in the township.⁷ One traditional approach to the transfer of land in Upper Canada held that the lion's share of the wealth would go to the eldest son, who was then responsible for providing some land or yearly income to his mother, sisters, and younger brothers. This primogeniture pattern appeared in Saltfleet, especially if the father died when the eldest son was still relatively young. However, fathers often had a habit of living well past the age at which young sons were ready to strike out on their own. To cope with this occurrence, families would set up each son elsewhere as he came of age as best they could, using money or a mortgage to help finance the purchase of land. Levi Green, for example, had four sons when he died in 1849. The three eldest had, with the financial help of their parents, purchased farms before their father's death: James near the family farm in Saltfleet, John in Caistor Township, and Andrew in Durham Township. Levi willed the family farm to William, his youngest, "when he comes of age."⁸ Quite often, farmers who lived below the escarpment would set up their eldest sons on top of the escarpment. John Bates's will, for example, divided the property on lot 32 in the second concession (below the escarpment) amongst his three youngest children Joseph, George, and Julia. But before his death, Bates had set up his eldest sons, Samuel and Stephen, on lots on top of the escaroment.⁹

⁷ The inclusion of inventories in the Court of Probate (and later Surrogate Court) declined after the late 1850s. For this reason, this study does not make a systemic examination of these inventories after the mid 1850s. Fortunately, the 1861 and 1871 censuses take up where the inventories left off. Although this chapter uses the 1851 census as a general stop point, the systematic examination of inventories includes all the inventories from 1830 to the mid 1850s. A few inventories in 1854 and 1855 used dollars instead of pounds. A conversion rate of £1 Halifax currency to four dollars was used for these inventories.

⁸ Court of Probate, RG 22-6-2, No. 786.

⁹ Court of Probate, RG 22-6-2, No. 489.

Families often took great pains to ensure that the son who inherited the bulk of the wealth looked after younger siblings and mother. Wills spelled out this obligation. Obadiah King, for example, specifically outlined what his son Hugh was to provide for his mother, essentially fulfilling the marriage vows that Obadiah could not. Hugh was to furnish his mother with

a comfortable and plentifull [sic] maintenance in sickness and in health as she may need, and a woman or girl to wait upon her and also furnish her with fire wood and _____ [unreadable] prepared for the fireplace and also shall furnish keeping and tend her cows, horse and sheep, winter and summer, and she shall have as much fruit from the orchard as she may need.¹⁰

Should Hugh fail to provide satisfactorily for his mother, portions of the land he received in the will were to be rented out to make up the difference.

Of the twenty-three probated wills that included detailed inventories between 1830 and 1855, twenty-one came from farmers who lived below the escarpment. While this makes statistical comparisons between regions impossible, the discrepancy itself speaks volumes. The absence of above-escarpment probate records suggests that a discrepancy of wealth existed between the two regions. As mentioned in the previous chapter, the reasons for drafting a formal will are numerous, although generally only estates with inventories of a reasonably significant worth would bother with the process. At the time of death, the average estate left almost £260 to heirs, not including real property. Much of this amount was personal property, such as clocks, bedding, furniture, etc., with livestock, crops, and farm implements comprising the remainder. Generally, the single most expensive item that appeared in the inventories prior to the 1850s was a

¹⁰ Court of Probate, RG 22-6-2, No. 582.

thresher. Costing approximately £20 the thresher could easily account for more than half the value of a farmer's investment in farm implements. Joseph Pettit, for example, who appeared reasonably well off, purchased a threshing mill cooperatively with two other farmers.¹¹

A few more tentative conclusions can be reached from an examination of the probate records. First, the inventories, keeping in mind that not all the agricultural products for a farm over a year were present at the time of death, indicate that wheat was still a very important but not dominant crop in Saltfleet. Wheat accounted for approximately twenty percent of the crop inventory. Second, a number of these inventories included fertilizers such as guano, suggesting that at least some Saltfleet farmers had knowledge of improved husbandry techniques.¹² The inventories, unfortunately, do not give a complete picture of an individual's property. The family, prior to the inventory being conducted, might have divided up personal items. Samuel Dean, for example, left an extensive amount of livestock and farming implements, but no personal items. These more than likely ended up in the hands of his wife or children before or shortly after his death.¹³ And third, the importance of local trade is apparent. The expenses farmers incurred came mostly from local shops and businesses. The accounts against the estate of Michael Lafey in 1848, for example, came from sixteen different blacksmiths, shoemakers, wagon makers, and merchants in Stoney Creek, Grimsby, and Hamilton. While probate records are silent about the sources of farmers'

¹¹ Court of Probate, RG 22-6-2, No. 810.

¹² Court of Probate, RG 22-6-2, No. 443.

¹³ Court of Probate, RG 22-6-2, No. 448.

incomes (receipts from market sales are rare), farmers in other regions of southern Ontario generated the majority of their income from selling their wares at the local markets.¹⁴

Comparative Demographics

Unlike probate records, the 1851/52 census offers a systematic description of the Saltfleet farming community. Contrasting the demographic profile of Saltfleet farmers with similar characteristics for the county and province provides a better understanding of the representativeness of the township. The following tables provide a breakdown of the township's cultural and demographic attributes, in conjunction with similar figures from the county and the province. A word of caution is in order. The reader should understand the headings used in the following tables to avoid confusion. The second column in each table, entitled Heads of Household Saltfleet, refers to the data I collected from the original census manuscripts. As the heading suggests, this data includes only the heads of household for each family; it does not capture spouses, children, domestic servants, and many farm labourers. These data, linked to the digital township map (as described in Chapter 1), provide the information that will be used for most of the statistical analysis. The three columns that present the Aggregate totals for Saltfleet, Wentworth, and Ontario refer to the summary reports published by the government

¹⁴ Gouglas, "Produce and Protection," p. 6-7. McCalla, in *Planting the Province*, emphasized the importance of these local markets on a province wide scale.

shortly after the census was taken.¹⁵ These data include everyone in the census, including spouses, children, domestic servants, and all farm labourers. These documents summed up the demographic and agricultural characteristics of the country, organizing the information by township, county, and province and offer insights into how the Heads of Household data compare to the Aggregate Saltfleet data, and how the township compared to the county and province. Similar tables will be found in chapters four and five, each dealing with the 1861 and 1871 censuses respectively.

According to the aggregate published reports, the majority of Saltfleet residents (64.3%) were born in what was at this time the United Provinces of the Canadas, slightly more than both the county and provincial rates (see Table 3-1). Most of the remainder of the population came from the British Isles, although the aggregate numbers indicate that Saltfleet had a lower percentage of individuals born in Ireland than either Wentworth or Ontario. The cultural distribution of Heads of Household data (the information taken directly from the manuscripts) varied dramatically from the aggregate statistics. There was a much smaller percentage of farmers born in the Canadas (48.6%) than in the township's aggregate population. In contrast, a much higher percentage of Saltfleet's heads of household were born in the United States (21.5%) than appeared in the summary statistics for the township (6.4%), county (5.5%), or province (4.6%). This difference probably stemmed from many family heads in Saltfleet having been loyalists, late loyalists, or descendents of these migrants

¹⁵ Between 1847 and 1867, the province of Ontario was known as Canada West, one of the United Provinces of Canada East and Canada West. In the next three chapters, I will refer to the province as Ontario.

Country of Birth	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
England-Wales	9.7%	10.7%	9.9%	8.7%
Ireland	6.3%	11.3%	18.4%	18.5%
Scotland	7.6%	4.6%	10.4%	8.0%
Rest of Europe	0.0%	0.1%	0.3%	1.2%
The Canadas	48.6%	64.3%	54.6%	58.1%
Rest of BNA	6.3%	1.4%	0.7%	0.7%
United States	21.5%	6.4%	5.5%	4.6%
Other	0.0%	0.6%	0.2%	0.2%
Not Given	0.0%	0.5%	0.1%	0.1%
Total	99.9%	99.9%	100.1%	100.1%
Count	143	2801	28508	992004

Table 3-1: Country of Birth by Percentage for Saltfleet Township,Wentworth County, and Ontario, 1851.16

In 1851, the township was overwhelmingly Protestant, although the specific religion of Saltfleet residents, as seen in the aggregate statistics, differed from broader county and provincial trends. As reported in Table 3-2, there was a greater percentage of Methodists in Saltfleet (51.2%) than in either Wentworth (30.9%) or Ontario (21.8%). There was a similar percentage of Anglicans amongst all three areas, but a smaller percentage of Presbyterians in the township. The religion of the heads of household varied slightly from broader demographic trends. Sixty-two percent of heads of household were Methodist, more than double the county average and almost triple the provincial average. The Anglican population was similar to the percentages presented in the aggregate figures, but the percentage of Catholic farmers (0.7%) was remarkably smaller than the county and provincial averages. Again, at least some of this variation stemmed from the loyalist heritage of Saltfleet's early residents.

¹⁶ Census of Canada, 1851-52, p. 28-31 and xx. Sums do not total 100% due to rounding.

Country of Birth	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
Anglican	24.5%	22.8%	19.9%	23.5%
Baptist	3.5%	2.4%	5.4%	4.8%
Catholics	0.7%	6.2%	15.4%	17.6%
Lutherans	0.7%	0.0%	0.1%	1.3%
Methodist	62.2%	51.2%	30.9%	21.8%
Other NC	0.7%	1.0%	1.9%	5.1%
Presbyterian	4.2%	10.1%	22.0%	21.5%
None	3.5%	5.2%	3.2%	0.7%
Other	0.0%	0.7%	0.6%	
Not Given	0.0%	0.3%	0.4%	3.8%
Total	100.0%	99.9%	99.8%	100.1%
Count	143	2801	28508	950964

Table 3-2: Religion by Percentage for Saltfleet Township,Wentworth County, and Ontario, 1851.17

In the aggregate report, there appeared little difference in the age of male Saltfleet residents over fifteen when compared to those in Wentworth or Ontario. The largest bin was the '21-30' year olds for all three groups, with the population percentage steadily declining for each subsequent age group (see Table 3-3). The heads of households, not surprisingly, differed significantly from the previous figures that captured all males over fifteen. The age distribution of the heads of household clustered in the '31-40' and '41-50' age groups because these data only counted individuals who headed a distinct family unit, which could be anything from a bachelor living alone to a married man with ten children and two domestic servants to an elderly widow looking after the family farm.

¹⁷ Census of Canada, 1851-52, p. 64-67. Sums do not total 100% due to rounding.

Age Range	Heads of Household Saltfleet	Aggregate Saitfleet	Aggregate Wentworth	Aggregate Ontario
15-20	0.0%	19.2%	19.7%	22.4%
21-30	17.5%	33.5%	31.7%	30.7%
31-40	28.7%	18.6%	21.2%	19.6%
41-50	25.2%	13.4%	14.3%	13.4%
51-60	16.8%	8.0%	7.6%	8.1%
61-70	8.4%	4.4%	3.9%	4.0%
71-80	2.8%	2.4%	1.4%	1.4%
81-90	0.7%	0.4%	0.3%	0.3%
91+	0.0%	0.1%	0.0%	0.0%
Total	99.9%	100.0%	99.9%	99.9%
Count	143	822	8685	413475

 Table 3-3: Age of Male Settlers Fifteen Years and Older in

 Saltfleet Township, 1851.

By 1851, variations in agricultural characteristics between Saltfleet and the rest of the province had emerged. As presented in Table 3-4 and Table 3-5, the average farm in Saltfleet (108.8 acres) was larger than the average farm in either the county (94.6 acres) or the province (98.4 acres). Reflecting their earlier access to the land, Saltfleet farmers had cleared twenty-five percent more of their land than their peers in the rest of the province, and ten percent more than other farmers in the county. The township's agriculturalists also used their lands in different ways. Where Wentworth and Ontario farmers allocated 39.1 percent and 36.8 percent of their property to pasture, Saltfleet farmers only turned 16.3 percent over to grazing. This agricultural choice may reflect either the greater maturity of agriculture in the township, as farmers who had cleared grazing lands would need less pasture than farmers who had loosed their cows onto treed

¹⁸ Census of Canada, 1851-52, p. 308-317. Sums do not total 100% due to rounding. Although the aggregate numbers only examined men, the heads of household included two women, 'Widow Lee' and 'Mrs. Pettit'. They were sixty-one and fifty-five years old, respectively.

grazing lands. Alternately or perhaps concurrently, farmers in Saltfleet may have tailored their agricultural endeavours to their particular locale, emphasizing other crops over the raising of livestock, as seen in the higher percentage of lands dedicated to gardens and orchards.

Farm Characteristic	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
Number of Farms	177	231	2496	99906
Average Farm Size (Acres)	114.4	108.8	94.6	98.4
Percentage under Cultivation	66.2%	63.3%	53.1%	37.7%
Percentage Pasture	16.9%	16.3%	39.1%	36.8%
Percentage Garden	2.1%	2.3%	2.1%	1.6%

Table 3-4: Farming Characteristics for Saltfleet Township,Wentworth County, and Ontario, 1851.19

 Table 3-5: Number of Farms by Acreage of Farm, Saltfleet Township,

 Wentworth County, and Ontario, 1851.20

Farm Size (Acres)	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
Less than 10	3.4%	5.2%	10.1%	9.8%
10-20	0.6%	10.4%	3.5%	2.7%
20-50	12.3%	16.0%	23.1%	19.2%
50-100	47.5%	35.5%	35.3%	47.5%
100-200	32.4%	30.3%	24.4%	17.5%
200+	3.9%	3.9%	3.6%	3.4%
Total	100.1%	100.0%	100.0%	100.1%
Count	177	231	2496	99906

Reflecting its early period of settlement, Saltfleet's agricultural and demographic

characteristics proved distinct from patterns in the county and province. Stemming

¹⁹ Census of Canada, 1851-52, Vol. II, p. 56-9. Sums do not total 100% due to rounding.

²⁰ Census of Canada, 1851-52, Vol. II, p. 56-9. Sums do not total 100% due to rounding. I placed farms that straddled bins into the lower group. A farm of 20 acres, for example, went into the 10-20 group. Probably some of the variations in bin percentages between the aggregate numbers and the heads of household numbers stem from the binning process. The bin sizes are those that appear in the aggregate summary statistics.

largely from their loyalist heritage, Saltfleet farmers were more likely to have been Protestants born in the United States. Also, as agricultural activities had been taking place in the township since the late 1700s, farmers had cleared more land than their average peer in the rest of the province. By 1851, much of the farm-making process had been completed in parts of the township, with many long-settled, mature farms dotting the landscape.

Indicators of Wealth

Preliminaries

The 1851 census provides a systematic source for the examination of patterns of wealth, settlement, and agriculture in the township. Although there are errors in the manuscript, many of these can be corrected by common sense. Ensuring that the sum of farm acres did not total an amount larger than the township's actual size is a good example. An inherent difficulty in the analysis of census returns from multiple townships stems from the differing abilities and tendencies of numerous census takers, which is less of an issue in the examination of a single township. Any systemic errors or omissions within Saltfleet's returns are at least consistent.

This thesis uses three separate indicators derived from the census to better understand the distribution of wealth throughout the township and how that distribution changed over time. Two of these are relatively straightforward. Total acreage often stands as a surrogate indicator of wealth in historical studies. Darroch and Soltow, for example, used farm size as a measure of wealth in their province wide study, beginning

with the assumption that more land stood for more wealth.²¹ The assessed valued of properties in Saltfleet provides another gauge. The assessment process in the first half of the nineteenth century used a fixed system of appraisal, with certain values assigned to cultivated and uncultivated acres, type of housing, number of fireplaces, and some livestock.²² Unfortunately, no assessment rolls for Saltfleet Township for mid-century survived to the present day; however, an estimate of the data that would have been found in an 1851-2 assessment roll for the township can be partially reconstructed. By using the fixed estimates found in other Ontario rolls for cultivated and uncultivated acres and type of housing (which appears in the 1851/2 Census), I reconstructed the values that would have appeared in an assessment roll, if one had survived. The assessment and collector rolls for Peel County in 1850 assessed a cultivated acre at one pound, while an uncultivated acre was assessed at four shillings. This roll also provided guidelines for assessing the value of built structures, depending on the materials used in construction, the number of stories, and the number of additional fireplaces. A two storey framed structure, for example, was assessed at $\pounds 40^{23}$ The clear limitation with mid-century assessment rolls is that, like the 1819 roll, there is no difference in valuation based on land quality. The best agricultural land in the township had the same per acre assessed

²¹ Darroch and Soltow, Property and Inequality.

²² In the latter half of the nineteenth century, the system changed. The process of deriving an assessed value for a property was based on a market value of the lands and fixed assets in a hypothetical forced sale conducted to relieve debt. This process provided a more accurate reflection of the market value of the land and the condition of the buildings, but was still not a direct indicator of the worth of a property, as the value would likely be higher if the assumption of debt relief was not made.

²³ Assessment Roll for the Township of Chinguacousy, 1850, Brampton Public Library – Chinguacousy Branch, Local History Collection. The census provided information on a principal dwelling only, making no mention of barns and other outbuildings.

value as the worst. A discussion of assessed values that consider land quality must wait until the next chapter.²⁴

The third measure of wealth employed in this thesis is a statistic that I call "farm worth." Defining this figure can best be done by beginning with a statement of what it is not. This variable is neither a measure of a farm's yearly productivity nor a measure of its marketable surplus.²⁵ Also, it is not a measure of a household's yearly income. Instead, farm worth is more a "settling up" of a farm if all crops and livestock were forcibly sold in a competitive market on one day. It does not include a value for real property, which could readily swamp significant variations in other assets being measured. Real property and other fixed assets are covered by the first two measures, assessed value and total acreage. Unfortunately, even this figure – farm worth – does not include a number of sources of wealth, specifically family savings or monies owed from outstanding loans or mortgages. This omission is not insignificant, but, like other researchers interested in wealth accumulation, I could find no effective way to address the difficulty. The calculation of the worth of farm livestock and produce depends on the pioneering work of Frank Lewis and Marvin McInnis, which is based on a number of

²⁴ A market value for land could be derived from the Abstract Index to Deeds, as was done by John Clarke and D.L. Brown in their study of the land market in Essex County in their paper "The Upper Canadian Land Market: Insights from Essex County," *Canadian Historical Review* Vol. 69, No. 2 (June 1988), pp. 222-234. In this study, the authors obtained the actual prices for land sales from individual transactions which were averaged for the year. Even though many transaction did not provide a list price or were transferred "in love and affection," (p.224) the authors were able to derive an average price for land throughout the township. Future research for Saltfleet might be able to use a variation of this approach to determine an average price for regions in the township, in particular for above and below the escarpment.

²⁵ As such, farm worth would not be directly comparable to "net farm output" used by McInnis in his 1851 study of Ontario agriculture (McInnis, *Perspectives*, pp. 47-83) or his 1861 study of marketable surpluses ("Marketable Surpluses," p. 395-7). This latter work focused on calculating the net output of households from the 1861 Census from "The Canada West Farm Sample," derived from a sample of seven or eight farms from 148 townships in Ontario. The sample was stratified by date of settlement.

formulae based on agricultural "good practices" to deduct fodder costs, seed requirements, and household consumption from productive output as indicated in the 1851/52 census.²⁶ A detailed explanation of the procedure I used in the calculation of farm worth can be found in Appendix A.

To gauge accurately the distribution of land holdings in the township, it was necessary to know who farmed occupant-owner land and who farmed leased land. This step required comparing the census records to the Abstract Index to Land Registry *Records* because the 1851/2 census does not provide information on land ownership. I cross-referenced the names in the census with the Abstract Index to Land Registry Records in order to ascertain ownership. If the family name in the Abstract matched the family name in the census, then I concluded that the family owned the land, even if the given names were not the same. A popular history of Saltfleet helped clear up some genealogical questions in order to verify that lands had been transferred to sons and daughters and not strangers with the same last name.²⁷ This approach captured descendents who were landowners but who had not yet registered the property in their name, a situation which resulted from families developing land transfer mechanisms that saw a farm change hands in practice if not in deed. Using the Abstract Index in this manner did not capture all landowners for a few reasons. If land was transferred to a daughter and son-in-law, then the last name would likely be different from the family name. Also, some land transfer arrangements did not appear in the Abstract Index

²⁶ Lewis and McInnis, "Agricultural Output," p. 78. The authors based much of their calculations on L.H. Bailey, Ed. Cyclopedia of American Agriculture (New York: Macmillan, 1908).

²⁷ Saltfleet, Then and Now, Stoney Creek Council, Ontario (Stoney Creek, 1975).

because of the terms of the deal. A deed-exchange mortgage, for example, saw the seller maintain possession of the deed until a part or all of the mortgage payments were made. Only then would the official transfer of title take place. As such, the process for identifying landowners probably underreported ownership rates in the township.²⁸

Ownership

The relationship between landowner and tenant farmer varied from contract to contract. Richard London, for example, found that by 1839 he could no longer farm his land on lot 16 in the III concession. He decided to lease his farm to Jacob Henry. Henry agreed to provide half the seed and all the labour required to bring the grain to market, which was to be equally divided between Henry and London. Henry also agreed to seed, harvest, cut, and stack all the hay necessary for the farm, half of which was to be handed over to London. Henry also pledged to cut the firewood, fix the fences, and provide any additional labours needed to keep the farm in order. In exchange for these services, London gave Henry access to the land and the use of a span of horses for farming. Presumably, being able to keep half of the fruit of his labours was sufficient recompense.²⁹

²⁸ I had considered deducting twenty-five percent of the gross value of produce from tenant farmers to simulate rental or leasing fees and applying this value to the farm worth of the land's owner, assuming the individual lived in the township. Although this approach would have partially captured a legitimate expense of tenant farmers, it might have unfairly exaggerated the distinction between tenants and owners given the fact that there was no means of accurately deducting appropriate mortgage costs from landowners.

²⁹ Court of Probate, RG 22-6-2, No. 366. For a detailed discussion of the differences between tenants and owners, including the various types of leasing arrangements popular in Ontario, see William L. Marr, "Tenant vs. Owner Occupied Farms in York County, Ontario, 1871," Canadian Papers in Rural History *IV*, Ed. Donald Akenson (Gananoque: Langdale Press, 1984).
There are a number of conclusions that can be drawn regarding the distinction between owner farms and tenant farms in Saltfleet. Approximately seventy percent of farmers in 1851 owned the land they farmed.³⁰ The farms of owners were, on average, almost sixteen percent larger than those of tenant farmers and this distinction remained true when comparing farmers of similar ages.³¹ The variation in total acreage accompanied an additional \$45 in the produce component of farm worth and almost \$70 in the livestock component. The difference in crop worth did not come predominantly from a larger number of acres dedicated to traditional crops like wheat and oats (both groups dedicated approximately the same number of acres to these principal crops). Instead, the difference in crop value came from secondary crops, such as hay, apples, and clover, which figured more prominently in the plantings of owner farmers than in that of tenant farmers. The larger livestock value of owner farmers might explain the larger hay crop, but it also seems that owner farmers planted a greater diversity of secondary crops. Tenants farmers seemed more interested in growing traditional grains and root crops, lacking either the time, manpower, inclination, capital, or experience to diversify their crops. The last of these reasons, experience, seems less likely given that owner farmers were on average only three years older than tenant farmers. More likely, tenant farmers, especially in the farm-making period of Saltfleet's history, focused on crops that could produce an immediate return. Apples, and most orchard crops, require a number of years before a satisfactory return can be obtained. There would be little incentive for a tenant

³⁰ As mentioned earlier, the figure is probably higher given the means of ascertaining ownership.

³¹ This pattern of difference between tenant and owner farms differs from the results found by William Marr in his study of farm tenancy in York County for 1871 (Marr, "Tenant vs. Owner," p. 68).

farmer engaged in a short-term contract to expend capital on fruit trees when he or she would be unlikely to reap the benefit.

A binomial regression can help clarify the influence of certain variables on ownership patterns. Using effect coding for the categorical variables, I regressed the three wealth indicators on four environmental characteristics (distance to water, location relative to escarpment, location relative to Red Hill Creek Valley, and relative drainage), two cultural variables (religion and country of birth), and two temporal variables (age and settlement persistence). As discussed in Chapter 2, the four environmental variables are defined as follows: distance to water can be either within 250 metres of water or not within 250 metres of water; location relative to the escarpment can be above, below, or split; location relative to the Red Hill Creek Valley can be either within the valley or not within the valley; and relative drainage can be either good drainage or poor drainage. I condensed the cultural variables into broader categories. For country of birth, for example, all individuals born in Upper Canada, Lower Canada, New Brunswick, Nova Scotia, and Prince Edward Island (one person) were listed as having been born in British North America (BNA). The small population size of Catholics and Baptists required grouping religions into larger groups. For the 1851 analysis, I divided the population into three groups: Methodists, Baptists, and Presbyterians; Catholics and Anglicans; and other. This grouping, which contrasts the wealthier landowners against the less wealthy as outlined in Darroch and Soltow's 1871 study, also echoes William Westfall's distinction between the world of order and world of experience.³²

³² This grouping does not completely capture Westfall's distinction between the "virtue of order" and the "virtue of experience." Westfall described the Presbyterian theology as one that favoured order over

Finally, I coded a settlement persistence variable as a yes/no value based on whether the 1851 settler had the same family name as a settler in 1819 and lived on the same or adjacent lot in the Township. It captured the advantages obtained by individuals who either farmed the same property for decades or inherited all or part of the same property. If Henry Spera, as an hypothetical example, lived on lot two in the third concession in both 1819 and 1851, then he was deemed to have exhibited settlement persistence. If Henry's son, Peter lived on lot three in the same concession in 1851, (presumably having inherited or purchased the farm from his father), then he too exhibited settlement persistence. If Peter Nash appeared as the farmer on the same or adjacent property in 1851 then he was deemed to not exhibit settlement persistence. This procedure could be viewed as too restrictive as there were undoubtedly sons and daughters set up by families in other parts of the township. A very detailed genealogy of almost every family in Saltfleet would be required to systematically include these individuals in accounting for settlement persistence. This procedure ensures, however, that individuals coded as exhibiting settlement persistence would almost certainly have spent a significant amount of time on the same piece of land in the township.³³

experience [William Westfall, *Two Worlds: The Protestant Culture of Nineteenth-Century Ontario* (Kingston and Montreal: McGill-Queen's University Press, 1989), p. 45]. I included Presbyterians in the "evangelical" category because Darroch and Soltow noted a significant difference in property accumulation amongst Baptist, Methodists, and Presbyterians over Catholics and Anglicans. The label "evangelical" is as much a coding convenience as a statement of theological disposition.

There were numerous types of Methodists, but Weslyan Methodists comprised fifty-three percent of these individuals. There was one Catholic landowner.

³³ Of course, this procedure would not capture as persistent a daughter who had married (taking a new last name) and inherited the family farm. A coding error would also result if a stranger with the same last name purchased the farm. Only a detailed knowledge genealogy of the entire township, which is well beyond the scope of this thesis, could overcome this difficulty,.

The results of the statistical examination indicate that only a farmer's settlement persistence proved significant in the regression of land ownership on environmental, cultural, and temporal variables. The longer an individual farmed a property, the more likely he or she would be able to generate sufficient capital to purchase it. As seen in Table 3-6, if a farmer or his family had worked the same piece of land since 1819, he or his heirs were approximately twenty-seven percent more likely to own their property than other farmers. Other variables, in particular a farmer's location relative to the escarpment, suggested some measure of influence over tenancy rates, but were not statistically significant. A farmer who lived below the escarpment was approximately seven percent more likely to own his or her land than a farmer who did not. Farmers who lived below the escarpment and had lived on the same property for some time were approximately thirty-three percent more likely to own their land than an individual who had only recently begun farming lands atop the escarpment. Cultural factors, such as religion and country of birth, played no perceptible role in shaping patterns of ownership in the township as indicated in the 1851/52 census.³⁴

³⁴ Many studies, including Darroch and Soltow's province-wide study of Ontario in 1871, have found that Irish immigrants (both Catholic and Protestant) tended to have a greater propensity towards homeownership than others (Darroch and Soltow, *Property and Inequality*, p. 56-7). This confirms Akenson's assertion that the American historical tradition of Irish Catholics being urban and disadvantaged is not appropriate in nineteenth-century Ontario (Akenson, *The Irish*). The raw numbers in Saltfleet indicate that the Irish (all of whom were Protestant) were three percent more likely to own their land than the average farmer. This propensity did not prove statistically significant, which might be attributed to the small population size of Irish in the township in 1851 (nine).

Data		Settlement Persistence		Total
		No	Yes	
	About	61.8%	87.5%	66.3%
Location Relative to	ADOAG	(76)	(16)	(92)
Escarpment	Balani	66.7%	94.7%	73.4%
	Below	(60)	(19)	(79)
Total		64.0% (136)	91.4% (35)	69.6% (171)

 Table 3-6: Percentage of Ownership by Location Relative to Escarpment and Settlement Persistence, Saltfleet Township, 1819 – 1851.

Inequality

Understanding variables that influenced the distribution of wealth in the township should begin with a discussion of the level of inequality in the township. Using the three wealth indicators discussed previously provides a means of comparing inequality in the township, and, as the farmer's age is included in the 1851/2 census document, the calculations can be stratified to provide an indication of the distribution of wealth as it is accumulated over a lifetime.³⁵ The calculation of Gini coefficients, unlike the regression analysis that follows, includes both tenants and farmers. The farm-worth Gini considered the level of inequality amongst heads of household with respect to value of farm products. The total-acres Gini examined the acreage distribution of each farm, making no distinction between whether the farmer owned the land or not. In contrast, the Gini coefficient based on assessed value assigned a value of zero to all tenant farmers. This figure attempts to capture the level of inequality between all members in the Saltfleet

³⁵ As per Bittermann, MacKinnon, and Wynn, "Of Inequality," p. 18. Given the small population size, the Gini calculations were stratified into two categories: forty years and younger and over forty. The Gini calculations, unlike the regression analysis that follows, include tenants and landowners. Chapter 7 provides a summary of inequality in the township between 1819 and 1890, providing insights into patterns and trends that appeared over the century.

community in terms of wealth rather than acres occupied or value of farm produce and livestock. As Gini coefficients measure the distribution of wealth between the richest and poorest, there is a certain latitude in contrasting coefficients derived from different data sources. Whereas a direct comparison of the average value of probate records to average assessed value would clearly be an unsuitable exercise, contrasting Gini indices that measure the distribution of wealth between the two types of data is much less so. In this study, no single Gini coefficient should be viewed as the correct indicator of inequality in the township, but taken together the values should provide an overall impression of the distribution of wealth in the township.

The Gini coefficient derived from assessed value clearly indicates the presence of inequality in the township. The Gini for younger heads of household (20-40 year olds) is 0.404, while the coefficient for older farmers is 0.426 (see Table 3-7). These figures are remarkably low given the results from studies in other parts of North America, for example, Atack and Bateman's work for 1860 produced an average Gini coefficient of 0.62, which indicated a much higher level of inequality in the northern United States. Ironically, Atack and Bateman concluded that the Gini coefficient showed that inequality in the northern United States was less than that "in other places and at other times."³⁶

³⁶ Atack and Bateman, *To Their Own Soil*, p. 87 and 89-90. Atack and Bateman's Gini coefficients are based on estimates of personal and real wealth reported directly in the census that differ from the three measures used in this study of the 1851/2 census, although it is probably closest to the estimate of assessed value. For additional comparisons see Rothenberg, "Capital Market," p. 783-5.

	Age of Settler			
Data	40 Years Old and Younger	Over 40 Years Old		
Farm Worth	0.258	0.242		
Total Acres	0.214	0.246		
Assessed Value	0.404	0.426		

Table 3-7: Gini Coefficients for Total Acres and Farm Worth by Age of Heads of Household, Saltfleet Township, 1851.

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The distribution of average total acres amongst farmers revealed that the size of farms throughout the township had become much more evenly distributed than had been the case in 1819. This pattern of equality appeared in both younger and older groups, the former having a Gini index of 0.214 while the latter distribution produced a value of 0.246. This decline in inequality in farm size makes sense as the immense property holdings accrued by some of the township's first inhabitants had now been sold to new settlers or used to set up sons and daughters on lands of their own, which distributed wealth into more hands. The estimated total farm worth produced slightly higher results, but still well below the averages of other studies. The distribution of farm worth amongst younger heads of household produced a Gini coefficient of 0.258, while the distribution amongst the older group produced a result of 0.242. Again, much of this reduction in inequality can probably be attributed, at least in part, to the dispersal of lands that were so highly concentrated in a few hands in 1819. This lower level of inequality was also consistent within regions of the township.

The fact that both young and experienced possessed similar levels of inequality in all three Gini coefficients suggests an interesting point. Summary tables (not presented here) indicate that young heads of household possessed properties of similar size and equal levels of farm worth, combined with the results from the Gini index, suggests that families at mid-century had developed effective means of dividing property and capital amongst their children as they came of age, either by arranging for lands to be settled prior to the parents' death or through wills when one or both parents had passed away. The impact of age on property accumulation is discussed later in the chapter.

Total Acreage, Farm Worth, and Assessed Value³⁷

Stating that inequality was an inherent component of life in Saltfleet is much easier than understanding the basis for this inequality. The hypothesis that the strict, moral elements of Evangelical Protestantism, where work itself was a duty to God and success a reflection of his grace, somehow translated into larger landholdings for the faithful provides a temptingly simple explanation. It has a certain logic that is hard to avoid. A preliminary examination of some of the wealth indicators for Saltfleet in 1851 would tentatively support this claim, although conclusions should be viewed quite cautiously given the small population size of all denominations except Methodist and Anglicans. Both Baptists and Methodists had a farm worth larger than their Anglican

³⁷ After numerous long discussions with committee members, I decided to exclude tenants from the statistical examination of wealth indicators as these factors relate to environmental and cultural variables. There were some reasons against this choice. First, despite having smaller average properties than owner farmers, there was no statistically significant relationship between tenancy and cultural, environmental and age variables, suggesting that the inclusion of tenants would make no obvious difference in the regression analysis. Second, given the already small population size, I was reluctant to eliminate thirty percent of the data. And third, the process of identifying tenants, as mentioned earlier, probably underestimated the number of landowners in the township. However, I chose to exclude tenants for two reasons. First, one of the principal aims in this thesis is to explore the importance of cultural factors as determinants of wealth when land quality is included in the analysis. The religion and country of birth of the individual farming the land can readily be associated with farm worth. The same cannot be said of total acreage and assessed value because the size of the property reflects the wealth of the owner and not the tenant (although the ability to lease a larger property does reflect a certain measure of the tenant's wealth). And second, this thesis (Chapter 3, 4, and 5 in particular) questions the suitability of using acreage alone as a direct surrogate for wealth. It is important that comparisons across the three distinct wealth indicators compare apples to apples. The inclusion of tenants in the calculation of farm worth would not have allowed a direct comparison with total acreage and assessed value, two variables which presents the cultural information of the tenant and not the landowner.

counterparts, although their farms were smaller and assessed at a lower overall value (see Table 3-8).³⁸ Presbyterians had larger farms and a higher assessed value than their

Anglican counterparts, but a smaller farm worth.

Religion	Farm Worth (\$)	Total Acreage	Assessed Value (\$) ³⁹	Count
Anglican	604	130	598	29
Baptist	800	89	406	3
Methodist	689	120	545	65
Presbyterian	537	138	642	4
Other	682	104	481	7
Blank	609	104	452	16
Total	656	119	541	124

Table 3-8: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Owner Farmers by Religion of Heads of Household, Saltfleet Township, 1851.

The country of birth of Saltfleet residents also provides interesting points of comparison with respect to indicators of wealth, although similar caution must be taken given the small population size. Perhaps the most obvious distinction that emerges from the wealth variables is the remarkably low level of farm worth, total acres, and assessed value of owner farmers who were born in England (see Table 3-9). The average English farmer had a farm worth of \$374 compared to the township average of \$656 and farmed an average of eighty-three acres compared to the township average of 119.⁴⁰ Farmers born in the United States fared best, having a farm worth and total acreage that was

³⁸ Darroch and Soltow used the term Evangelical to distinguish Baptists, Presbyterian, and Methodist denominations from Anglicans, although they acknowledge that each denomination had sects that were more "evangelical" than others (Darroch and Soltow, *Property and Inequality*, p. 47-53 and 63-4).

³⁹ The similarity in variations of total acreage and assessed value can partly be attributed to the method of calculating the latter figure. Assessed value depended heavily on the number of total and cleared acres, although the value of the principal dwelling could distinguish the value of similar sized properties. As mentioned earlier, the process of calculating assessed value changes in the late 1850s, which will provide a more distinct measure of wealth in the next chapter.

⁴⁰ Note that there were only six heads of household born in England.

approximately nine percent higher in both categories. The Irish-born members of the Saltfleet farming community, on the other hand, had larger farms than average, but a lower farm worth.⁴¹ These variations in material success based on country of birth could be associated with the time of settlement of succeeding waves of immigrants. In older agricultural communities, like Saltfleet, new arrivals found much of the crown land already patented. As Rusty Bittermann pointed out in his study of land settlement in Cape Breton, "as the lines of private property encircled land assets of sharply varying potential value, ... each successive wave of settlers encountered the diminished crown assets left by the choices of those who had proceeded them."⁴² Many of the loyalists – and late loyalists – had some of the first opportunities to access the land. These individuals could then pass on this advantage to their descendents, which might account for relatively high level of wealth of those born in the United States, who arrived first.⁴³ The Irish-born, on the other hand, held lands that were thirty-one acres larger than the average. An explanation of this variation is difficult, although it does agree with Darroch

⁴¹ Don Akenson, in his study of Leeds and Lansdowne Township, noted that the Irish (in 1861) had the greatest accumulation of wealth, as indicated in the value of lands and buildings. Akenson emphasized this point to show that there was no penalty for foreign-born settlers (Akenson, *The Irish*, p. 240-263).

⁴² Rusty Bittermann, "The Hierarchy of the Soil: Land and Labour in a 19th Century Cape Breton Community," *Acadiensis*, Vol. XVIII, No. 1 (Autumn 1988), p. 39. See also Clarke, "Aspects of Land Acquisition," p. 118-9. Here, Clarke argued that the initial environmental advantages of townships with well-drained soil lost their advantage as the economic focus of the region turned towards Hamilton and Toronto.

⁴³ See also Chad Gaffield, Language, Schooling, and Cultural Conflict: The Origins of the French-Language Controversy in Ontario (Kingston and Montreal: McGill-Queen's University Press, 1987) pp. 68-72.

and Soltow's conclusion from their 1871 study regarding a possible propensity among the Irish born for larger properties.⁴⁴

Country of Birth	Farm Worth (\$)	Total Acreage	Assessed Value (\$)	Count
British North America	688	120	547	61
England	374	83	381	6
ireland	600	144	666	7
Scotland	517	120	553	8
United States	734	128	581	26
Blank	609	104	452	16
Total	656	119	541	124

Table 3-9: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Owner Farmers by Country of Birth of Heads of Household, Saltfleet Township, 1851.

There are two important patterns that emerge from these summary tables. First, a larger number of farm acres did not directly translate into a larger farm worth. In fact, Anglicans and/or those born in Ireland or Scotland owned farms that were larger than average, but they had a farm worth lower than the average. This finding, although based on a small population, suggests that total acreage is not a direct indicator of agricultural potential. This pattern, which also appears in subsequent chapters, suggests that caution must be taken in interpreting studies that depend on only one measure. Rather than stating that one measure of wealth is more accurate than the other, it seems sufficient to note at this point that neither total acreage nor farm worth can serve as a direct surrogate of wealth. Second, a preliminary analysis indicates a statistically significant relationship between cultural factors and the various wealth indicators. A regression of farm worth on country of birth and religion, for example, produced a result significant at the $\alpha = 0.1$ level (n = 143, df = 133, $R^2 = 0.11$, p = 0.061) suggesting that, perhaps, the assumed

⁴⁴ Darroch and Soltow, Property and Inequality, p. 55.

moral rectitude and capital acquisitiveness that can be read into theological elements of some Protestant sects may have translated into material wealth in the township. The key question, however, is whether variations in the three wealth indicators, as delineated by cultural factors, remain statistically significant when environmental and settlement persistence variables are included in the analysis. Or, could the differences in wealth have arisen by chance?

Immediately apparent is the failure of a farmer's religion to prove significant (see Table 3-10). The differences in farm worth, total acreage, and assessed value between farmers of different religions in Saltfleet could readily have arisen by chance. Country of birth also failed to prove statistically significant, although the regression on total acreage and assessed value is only just insignificant.⁴⁵ Only two variables proved statistically significant in regressions of all three indicators of wealth.⁴⁶ The relationship between both a farm's location relative to the escarpment (p < 0.001) and settlement persistence (p = 0.011) and farm worth, for example, was clearly significant. As seen in Table 3-11, heads of household below the escarpment had an average farm worth of \$803 as compared to only \$523 for settlers above the escarpment, a difference of \$280. When the time of settlement is also taken into consideration, the difference is even more dramatic. Farmers long-settled on lands below the escarpment possessed an average farm worth of \$490 more than newly-settled farmers above the escarpment. Figure 3-1 clearly shows

⁴⁵ The similarity in significant variables in the regression on total acres and the regression on assessed value is not surprising considering that the calculation of the latter variable depends heavily on the former.

⁴⁶ A regression of only these two variables and the age of farmers on farm worth (which excluded the cultural and other environmental variables) produced a significant result (n = 107, df = 102, $R^2 = 0.258$, p < 0.0011).

that the majority of farms with a high farm worth were located below the escarpment, with most clustered in the northeastern section of the township, which is the same location as the earliest patents for the township. Similar patterns for total acreage and assessed value tell the same story. A farmer with a history of time on the land who lived below the escarpment owned an average of 140 acres and had an assessed value of \$626, compared to the average farmer above the escarpment who had not persisted on the same land who owned only ninety-six acres and had an assessed value of \$436. These are dramatic differences. This pattern of statistically significant variables across all three measures is difficult to summarily dismiss.⁴⁷

⁴⁷ Note that drainage proved significant with respect to total acreage and assessed value. The average farm size for properties with poor drainage was approximately fifteen acres larger than farm's without poor drainage. This variation might result from the need for larger properties given the poor state of the soil on some parts of the property.

	D	ependent Variab	le
Independent Variable	Farm Worth ⁴⁸	Total Acreage ⁴⁹	Assessed Value ⁵⁰
п	105	104	104
df	91	90	90
R^2	0.332	0.253	0.253
p	< 0.001 *	0.001 *	0.001 *
Constant	< 0.001 *	< 0.001	< 0.001
{C} Country of Birth	0.227	0.105	0.112
{C} Religion	0.841	0.259	0.235
{C} Escarpment	< 0.001 *	0.040 *	0.034 *
{C} Drainage	0.265	0.038 *	0.040 *
{C} Red Hill Creek	0.195	0.301	0.246
{C} 250 Meters from Water	0.191	0.630	0.728
{C} Settlement Persistence	0.011 *	0.004 *	0.008 *
Age of Settler	0.660	0.765	0.842

Table 3-10: Results of Regressions of Three Measures of Wealth on Environmental, Cultural, and Temporal Variables on, Saltfleet Township, 1851.

* Significant at the $\alpha = 0.05$ level

** Significant at the $\alpha = 0.1$ level

⁴⁸ There were two case with high leverage that were deleted from the regression: A. Swazey, a Methodist farmer born in Ontario, lived on a nine-acre farm above the escarpment; and William Spera, an Anglican farmer born in the United States, who lived on ninety acres on a property split by the escarpment. To correct for a non-normal distribution, the dependent variable was transformed by a square-root function.

⁴⁹ The deletion of three high-leverage cases and applying a square root function the dependent variable cleared up problems of non-normality and non-constant error variance. The three cases were William Blaikie, an Anglican farmer from Scotland who lived on 300 acres below the escarpment; Charles Carpenter, a Methodist born in Upper Canada who lived below the escarpment on 344 acres; and Jonathon Pettit, a Methodist farmer from the United States who also lived below the escarpment on 360 acres and had a very large value of livestock.

⁵⁰ The same three cases mentioned in the above footnote were deleted here. To correct for a non-normal distribution, the dependent variable was transformed by a square-root function.

Data		Settlement	Settlement Persistence	
	Data		Yes	IUtai
Earm Worth (\$)	Above	469	708	523
	Below	732	959	803
Total		590	849	660
Aaroo	Above	96	132	102
Acres	Below	123	140	127
Total		108	137	114
Accessed Value (f)	Above	436	600	465
Assessed value (a)	Below	562	626	577
Total		491	614	516
Count	Above	47	14	61
COUNT	Below	40	18	58
Total		87	32	119

Table 3-11: Average Farm Worth (\$) of Owner Farmers by Location Relative to Escarpment and Settlement Persistence, Saltfleet Township, 1851.



Figure 3-1: Average Farm Worth (\$) per Farm by Lot, Saltfleet Township, 1851.

The above analysis calls attention to an unusual element of the distribution of wealth in Saltfleet. Most statistical studies of settlement in Ontario have noted the correlation between property value and the age of the head of household. Generally,

farmers began their agricultural pursuits owning little or no land, increasing their holdings as they approached middle-age.⁵¹ When children were old enough to strike out on their own, some families divided their property amongst sons and daughters with provisions to ensure the long-term care of spouses. The distribution of total acreage by age in Saltfleet in 1851 captured some of this pattern (see Table 3-12). There is a gradual accumulation of property after thirty years of age, with sixty to sixty-nine year olds having the largest number of acres, followed by a sharp drop off in the oldest age group. Quite remarkably, however, the youngest farmers in the township (20-29 year olds) owned more land on average than farmers in the next older age-group. This aberration in the distribution of wealth is complemented by similar trends in farm worth and assessed value. The larger than expected total acreage held by young men suggests that they had a head start in the beginning of their farming lives. It appears that at least some parents were able to purchase additional lands for their children away from the farm without compromising the financial integrity of the family. This situation would explain why age does not appear as significant in the regression analysis (see Table 3-10). Also, it might explain the Gini indices that found the level of inequality amongst both old and young to be almost equal.

⁵¹ For example, Darroch and Soltow noted that thirty to thirty-nine year old men possessed much greater wealth than their peers in the age group ten years younger (Darroch and Soltow, *Property and Inequality*, p. 45).

Age	Farm Worth (\$)	Total Acreage	Assessed Value (\$)	Count
20-29	672	116	527	12
30-39	572	105	483	36
40-49	690	127	584	22
50-59	727	129	589	19
60-69	817	152	690	13
70+	525	96	446	5
Total	663	120	551	107

Table 3-12: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Owner Farmers by Age of Heads of Household, Saltfleet Township, 1851.

Age did play an important role in the regression, although in a less obvious manner. When age was left out of the analysis of all the variables on total acres, the country of birth of a farmer suddenly became statistically significant at the $\alpha = 0.1$ level (p = 0.052). The generally large property holdings of American-born farmers suggest a possible cultural or early settlement advantage (see Table 3-9). This interpretation is misleading. The average age of heads of household, around forty-two years old, remained similar across cultural and environmental variables, with one notable exception. Saltfleet heads of household born in the United States were approximately twenty years older than those born in British North America, England, and Scotland (see Table 3-13). As many of the American-born farmers were probably from loyalist families that came to Saltfleet quite early in the Township's history, this is not surprising. The relevance of this fact is that when age was returned to the regression (in other words, when age was held constant in a regression of total acreage on cultural and environmental variables) the significance of country of birth disappeared.

Country of Birth	Total	Count
BNA	39	61
England	40	6
Ireland	45	7
Scotland	41	8
United States	59	26
Blank		16
Total	45	124

Table 3-13: Age of Owner Farmers by Country of Birth of Heads of Household, Saltfleet Township,1851.

Land Quality and Agricultural Productivity

The statistical relationship that existed between total 'farm worth' and location relative to the escarpment was more than simply a significant correlation. It captured a causal association. The escarpment, which affects the movement of humidity and warm air, as well as soil quality, provided a distinct advantage to farms nestled below it. As indicated in Figure 3-2, the per acre production of wheat, oats, corn, barley, and potatoes were higher for farms below the escarpment than for those above. Wheat, barley, and potatoes in particular appeared to benefit from the environmental advantages associated with the escarpment. Farms below the escarpment, for example, produced almost two bushels more of wheat per acre than farms above the escarpment. This figure would probably be even more dramatic in years that featured a particularly bitter frost, with the escarpment mitigating some if not all of the damage. The statistical correlation between environmental factors and the production of wheat/acre is quite strong with the escarpment proving significant to the , = 0.05 level, and drainage and distance to water proving significant at the , = 0.1 level (n = 163, df = 158, $R^2 = 0.069$, p = 0.022).⁵²

⁵² The R^2 is obviously quite low.



Figure 3-2: Crop Yields by Location Relative to Escarpment, Saltfleet Township, 1851.

Agricultural Specialization⁵³

To be clear, farmers in Ontario to mid-century followed traditional mixed-

agricultural practices, with particular emphasis on the breaking of new ground rather than improving what was already cleared. McInnis concluded that most historians realize that mid-century Ontario was still a "pioneer economy, undergoing agricultural settlement. It has been less clearly appreciated that a major implication of that is that farm making was the central feature of such an economy. One of the leading agricultural products was

⁵³ The term "specialization," which is used throughout this thesis, is probably misleading. At no time in mid-century could farmers in Saltfleet be said to have specialized in one particular crop over another. All farming in the township was done within an overall context of mixed-agriculture. However, even at mid-century certain farmers in the township were *emphasizing* some crops over others or one type of livestock over another. By the end of the nineteenth century, some farmers had specialized in certain crops, most notably, farmers below the escarpment were dedicated to fruit growing. When exactly this *emphasis* became *specialization* is difficult to pin down. As such, I use the term specialization throughout the following chapters as a convenience.

cleared farm land."⁵⁴ Keeping this in mind, it still seems evident that the agricultural specialization that characterized farming at the end of the nineteenth century, which was tailored to market demand and a farm's particular environmental characteristics, had roots decades earlier.⁵⁵

An incipient specialization associated with environmental influences can be seen in the production of fruit, which was as influenced – even at mid-century – by a farm's location relative to the escarpment. Unlike later censuses that provided a number of clues as to orchard and garden production, the *1851 Census* asked only how many gallons of cider a farm produced.⁵⁶ The responses can reasonably be associated with apple production, as eight bushels of apples produced one barrel of cider.⁵⁷ Only 8.7 percent of farms above the escarpment produced cider as compared to 30.3 percent of farms below the escarpment. As reported in Table 3-14, farms below the escarpment dedicated more than three times as many acres to orchards and gardens, which resulted in the production \$2.71 of cider per farm, compared to \$0.34 of cider for each farm above the escarpment. The concentration of cider production below the escarpment is evident in Figure 3-3.

⁵⁴ McInnis, *Perspective*, p. 82-3. See also Ankli and Duncan, "Farm Making Costs," pp. 42-45. J. David Wood stated that farm making and land clearance was the defining characteristic of the emerging Ontario economy rather than the railway (J. David Wood, *Making Ontario: Agricultural Colonization and Landscape Re-Creation before the Railway* (Montreal and Kingston: McGill-Queen's, 2000), p. xvii-xxi.

⁵⁵ Chapter 7 describes in much more detail individual farmer's responses to changing markets and environmental influences.

⁵⁶ These figures do not reflect the total value of fruit production in the township, as there was certainly more than apples being grown in the township.

⁵⁷ Paul W. Gates, *The Farmers' Age: Agriculture 1815-1860*, (New York: Holt, Rinehart and Winston, 1960), p. 255.

The production of fruit, seen here in the production of apples, reflected a trend in

Saltfleet agriculture that would accelerate in following decades.

Data	Relative to	Relative to Escarpment	
	Above	Below	Iotai
Orchards & Gardens	0.81	2.65	1.68
(acres)	(92)	(79)	(171)
Cider (gallons)	10.2	81.1	42.49
	(8)	(24)	(32)
Cider (\$)	0.34	2.71	1.40
	(8)	(24)	(32)

 Table 3-14: Average Acres Dedicated to Orchards & Gardens and Gallons and Value of Cider by Location Relative to Escarpment, Saltfleet Township, 1851.58



Figure 3-3: Average Cider Production in Gallons per Farm by Lot, Saltfleet Township, 1851.

The Red Hill Creek Valley also provides a good example of how farmers began to

tailor farming practices to specific, local environmental characteristics, although the

⁵⁸ Counts in parentheses. The average number of acres dedicated to orchards and gardens only includes individuals who dedicated at least some property to this pursuit.

results are less dramatic than those influenced by the escarpment. The valley's high sides made growing crops in places challenging, but fluvial deposits, a reliable water supply, and protection from winds created excellent grazing lands below Albion Falls, which was located just outside Saltfleet in Barton Township. Farmers in the valley began focusing their agricultural efforts on livestock rather than wheat, oats, and barley. The beginning of this specialization was visible as early as 1851. As depicted in Table 3-15, the average farm within the Red Hill Creek Valley had more of every type of livestock, with a much larger number of sheep, while the average estimated value of livestock was almost ten percent higher for farms within the valley than elsewhere in the township. These differences might not seem substantial in 1851, but the seeds of specialization were just taking root. The adaptation of valley farmers to their localized environments would accelerate as the century progressed.

Data	Red Hill Cr	eek Valley	Total
	Outside	Inside	
Bulls	1.7	2.1	1.8
Milch Cows	4.1	4.2	4.1
Calves	2.5	3.1	2.8
Horses	3.4	3.5	3.4
Pigs	7.3	9.1	7.4
Sheep	19.4	23.6	19.8
Total Value of all Livestock (\$)	324	354	327
Count of Farms	164	15	179

 Table 3-15: Average Number of Livestock and Total Value of Livestock

 by Location Relative to Red Hill Creek Valley, Saltfleet Township, 1851.

Conclusions

What emerges from the study of the 1851 census for Saltfleet is that land quality and climatic advantage (represented by the surrogate of farm position relative to the

escarpment) and a farmer's settlement persistence were the only statistically significant variables in regressions on all three measures of wealth. The broader significance of introducing settlement persistence and environmental variables is not exclusively to show that the escarpment was an important factor in shaping life in nineteenth-century Saltfleet, although that is the case. Instead, this particular analytical model, based as it is on one township, casts suspicion on large-scale studies that do not include land quality and time on the land in the examination of the distribution of wealth in nineteenthcentury Ontario. If province-wide studies were to find that cultural influences still proved significant when the above variables are held constant, then conclusions asserting cultural difference would be difficult to refute.⁵⁹ As the analysis in this chapter is based on a relatively small population size, this assertion should be viewed cautiously. The evidence suggesting the insignificance of cultural factors and the difficulty of using only total acreage as a surrogate for wealth are apparent, but the evidence is not conclusive, especially considering the small population size. This first step, however, is substantiated by similar results from an analysis of the 1861 and 1871 censuses, which form the basis of the next two chapters.

An additional qualification regarding conclusions drawn regarding the role played by the escarpment is required. In this thesis, the escarpment serves as a surrogate variable for climate and soil quality; however, as the average farm below the escarpment

⁵⁹ Some excellent work has already been done in this area for the study of 1851. As noted in the introduction, Lewis and McInnis attempted to account for environmental variations in farm property by incorporating a variable into their assessment of agricultural output (dLQ) that captured soil quality. Based on the Canada Land Inventory agricultural land classification system, the system takes the area of classes I-III as a percentage of classes I-IV. They found that land quality did prove significant in accounting for variations in "Total Factor Productivity" in Lower Canadian agriculture in 1851 (Lewis and McInnis, "Agricultural Output," p. 64-5 and 82 N16).

was settled before the average farm above, the escarpment variable could, in 1851, be capturing farm maturity rather than climate or land quality. The distinction is not readily apparent, but a number of points suggest that the variable is capturing the intended characteristic. First, the pattern of settlement in Saltfleet suggests that the lands below the escarpment were settled first because they offered better soils and a better climate as indicated by Jones' survey notebooks and tree type, so climate factors into the equation at least in some manner. Second, although the lands below the escarpment were settled earlier, there was much overlap. Some farms above the escarpment, in particular those along the brow of the escarpment, were settled at similar times as those below. Third, a few short years after the 1851/52 census was taken, some farmers noted a decline in agricultural yields associated with long-occupied farms, arising principally from overfarming. Farm maturity was not necessarily a positive element. This decline in yields on older farms will be discussed in more detail in the next chapter. Finally, even if the escarpment was only capturing farm maturity, it would emphasize the importance of including a time of settlement variable in an evaluation of the distribution of wealth in a township.

It could be argued that the failure of cultural variables to account for significant differences in wealth in Saltfleet Township in 1851 could be attributed to the relative cultural homogeneity of Saltfleet. One would expect to find no differences in wealth between religious denominations if the vast majority of settlers all practiced a religion with a similar theology. In Saltfleet, Methodists were clearly in the majority. One might not see variation amongst these farmers as most (theoretically) practiced the same mode of living: hard work, thrift, and capital acquisitiveness. However, when other religious

groups, specifically Anglicans, appeared in greater numbers later in the century, religion continued to provide no sign of real economic advantage. The low number of farmers from other religions in this particular census year means that the 1851 figures must be read cautiously but they should not be dismissed. Although there was much regional overlap in the settlement of the township, in simple terms the average farmer who settled below the escarpment in the township's earliest days possessed advantages that the average new arrival, left primarily with less desirable lands elsewhere in the township, could not easily match.

-- Chapter 4 --

The Fruits of their Labour: Evolving Patterns in Saltfleet Agriculture, 1851-1861.

Poor old Kuzyk down the road, The heart-ache, hail, and hoppers brought him down, He gave it up, and went to town. And Emmett Pierce, the other day, Took a heart attack and died at forty-two. You could see it coming on, Cause he works as hard as you...

> "The Field behind the Plow" Song by Stan Rogers

The ten years after the 1851 census saw appreciable change in the province's

agriculture, particularly in wheat exports, which peaked at a net of twelve million bushels

in 1856 and 1861.¹ Agriculture also continued to be the primary economic pursuit in

Saltfleet. The cultivation of the land was, according to some, the most noble of

endeavours, as it allowed a man to be master of his own domain. Stephen King, a farmer

in Wentworth County, believed that the dignity of agriculture and the success of recent

crops elevated farmers to a distinct and privileged cohort:

there is no class of men so healthy and long-lived as farmers, none who have more time for visiting with their friends, none suffer so little in times of epidemics, or by failure of crops. The farmer secures a sufficiency for himself and family first, and if any be left then others may share with him.²

¹ McCalla, *Planting the Province*, p. 221.

² Canadian Agriculturalist, Vol. XII, No. 7, April 1860, p. 147.

The county's good soils, moderate climate, and the character of the citizenry provided, according to some, the opportunity of recreating Eden on earth. Problems for farmers in Saltfleet, however, were close at hand. The crop failures and difficulties of which King spoke would soon materialize and cast doubt on his grand vision. The 1861 crops in southern Ontario, and in the Saltfleet region in particular, were not as abundant as the previous year.³ A long cold spring that did not break until mid-May left the editor of the *Spectator* to fear that much damage had been done.⁴ Although a warm spell by June had given some confidence in a crop recovery, overall yields were down.⁵

This chapter discusses farmers' continuing efforts to adapt to environmental change resulting from both decades of over farming and the incursion of two particularly troublesome pests, the midge and the Hessian fly. The importance of these local adaptations suggest that searches for the average farmer gloss over substantive differences in the choices farmers made within a single township. McCalla acknowledges this limitation of large-scale statistical studies and emphasizes the importance of examining patterns of agriculture through time for small areas such as individual farms in order to reveal the complexity of agriculture.⁶ The analysis of the evolution of farming in Saltfleet is consistent with other studies in emphasizing and exploring the diversity and complexity in the rural countryside, steering clear of the

³ Between 1847 and 1867, the province of Ontario was known as Canada West, one of the United Provinces of Canada East and Canada West. Like the previous chapter, I continue to refer to the province as Ontario for the sake of consistency.

⁴ The Daily Spectator and Journal of Commerce (Hamilton), May 16, 1861, p.2.

⁵ Daily Spectator, June 12, 1861, p. 2.

⁶ McCalla, *Planting the Province*, p. 222.

analytical "chimera" of the average farmer.⁷ This chapter also reiterates the importance of environmental and settlement persistence variables in an examination of the distribution of land ownership and wealth in Saltfleet based on the 1861 census. When these variables are included in the analysis of settlement, the influence of cultural variables as a factor in the economic success of the township's farmers remains questionable.

Comparative Demographics

The ten short years between censuses at mid-century witnessed dramatic demographic and agricultural changes in the province. Immigration would help boost Hamilton's population to 19 096, by 1861 ensuring a reliable market for Saltfleet farmers.⁸ Other cities, like Toronto, London, Woodstock, Brantford, St. Catharines, and many smaller towns and villages also experienced considerable population growth. As with the discussion of 1851 settlement, a preliminary outline of basic demographic and agricultural characteristics of Saltfleet farmers as compared to county and province distributions provides a framework for understanding the cultural makeup of the township.

The country of birth for Saltfleet residents, for example, followed Wentworth and Ontario distributions, although there were more Canadian-born residents in Saltfleet

⁷ McCalla, *Planting the Province*, p. 222. McCalla is making reference to W.H. Graham's *Greenbank: In the Country of the Past*, (Peterborough: Broadview Press, 1988), p. 16. Graham traces the activities of a number of individual families in Greenbank, near Oshawa, noting the diversity of agricultural activities within a small area.

⁸ The population of Hamilton was actually higher in 1857, reaching 25,000 people. An economic downturn in the late 1850s, however, saw many of Hamilton's citizens, mostly new arrivals, leave for the United States (Weaver, *Hamilton*, p. 55-59). In fact, the overall population growth rate declined in this period (McCalla, *Planting the Province*, p. 219).

(70.3% - see Table 4-1) than in the county (63.8%) or province (64.7%). This slight over-representation of native-born settlers came at the expense of Irish and Scottish born. The origins of the heads of household in Saltfleet differed from the origins of the entire population of the township, in that there were approximately sixteen percent fewer individuals born in Ontario or Ouebec. As the heads of household were older than the general population, it follows that fewer would be born in what was, at the time of the census, the United Provinces. The religious affiliation of Saltfleet settlers also mirrored broader population trends. Table 4-2 indicates that Saltfleet remained a predominantly Protestant township in 1861, composed primarily of Anglicans, Methodists, and Presbyterians. Anglicans (42.2%) were more strongly represented in the township than either in the county (23%) or province (22.3%). In contrast, there were very few Catholics in Saltfleet (7.4%) compared with Wentworth (13.5%) or Ontario (18.5%). The distribution of the heads of household followed the distribution for the aggregate township data, although the proportion of Catholics amongst household heads was less than the proportion for the whole population of Saltfleet. Finally, the age of settlers in Saltfleet closely follows the county and provincial distributions. Relative to the county and province, there was a slightly higher percentage of 15-20 year old males and a slightly lower percentage of 50-60 year old males in Saltfleet (see Table 4-3). The heads of household were on average older than the rest of the population in the township.

Country of Birth	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
England-Wales	12.3%	9.7%	9.4%	8.2%
Ireland	8.2%	8.4%	12.3%	13.7%
Scotland	9.1%	5.0%	7.9%	7.1%
Rest of Europe	0.4%	1.7%	2.0%	1.9%
United Provinces	53.9%	70.3%	63.8%	64.7%
Rest of Canada	3.3%	0.8%	0.3%	0.6%
United States	7.8%	3.8%	4.0%	3.6%
Other	0.0%	0.0%	0.1%	0.1%
Unknown	0.0%	0.1%	0.1%	0.1%
(blank)	4.9%	0.1%	0.0%	0.0%
Total	99.9%	99.9%	99.9%	100.0%
Count	243	2740	31832	1396091

Table 4-1: Country of Birth by Percentage for Saltfleet Township,Wentworth County, and Ontario, 1861.9

Table 4-2: Religion of Residents by Percentage for Saltfleet Township,Wentworth County, and Ontario, 1861.10

Religion	Heads of Household Saitfleet	Aggregate Saitfleet	Aggregate Wentworth	Aggregate Ontario
Anglican	39.1%	42.2%	23.0%	22.3%
Baptist	2.1%	2.1%	4.7%	4.4%
Catholic	4.1%	7.4%	13.5%	18.5%
Methodist	33.7%	31.6%	31.5%	24.5%
Other NC	0.0%	1.5%	1.4%	5.7%
Presbyterian	16.0%	14.7%	23.4%	21.7%
None	0.0%	0.0%	0.2%	1.2%
Other	0.0%	0.0%	1.8%	1.0%
Not Given	4.9%	0.6%	0.5%	0.6%
Total	99.9%	100.1%	100.0%	99.9%
Count	243	2740	31832	1396091

⁹ Census of the Canadas, 1860-61, Personal Census. Vol. I, (Quebec: S.B. Foote, 1863), p. 76-79. Sums do not total 100% due to rounding.

¹⁰ Census of the Canadas, 1860-1 – Saltfleet Township; Census of the Canadas, 1860-61, Vol. I, p. 155-159. There is an unusual fluctuation in the religious persuasion of Saltfleet settlers that appears in the 1861 census. In 1851 and 1871, the percentage of Anglicans in both the heads of household and the aggregate reports did not rise above 25%. However, in 1861, the percentage of Anglicans as reported in the aggregate reports is 42.2%. This discrepancy can probably be attributed to the inclusion of Episcopalians in the Anglican category, which I have done in this table to facilitate comparisons.

Age Range	Heads of Household Saitfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
15-20	0.4%	21.4%	19.6%	19.3%
21-30	16.0%	28.3%	28.7%	31.1%
31-40	25.5%	19.9%	20.0%	20.4%
41-50	24.7%	15.1%	15.1%	12.8%
51-60	14.8%	7.8%	9.3%	8.8%
61-70	10.3%	5.1%	5.0%	5.1%
71-80	2.9%	1.6%	1.7%	1.9%
81-90	0.4%	0.6%	0.4%	0.5%
91+	4.9%	0.1%	0.1%	0.1%
Total	99.9%	99.9%	99.9%	100.0%
Count	243	816	9493	413475

 Table 4-3: Age of Male Settlers Fifteen Years and Older in Saltfleet Township,

 Wentworth County, and Ontario, 1861.¹¹

A number of important variations between Saltfleet and the rest of the province appear in a comparison of agricultural characteristics. First, there were proportionately more large farms in Saltfleet, for example, than in either the province or county. As seen in Table 4-4, almost thirty-six percent of Saltfleet's farms were over one hundred acres in size, compared to only 28.4 percent for Wentworth and 25.3 percent for the province. Second, the average assessed value of an acre of land in Saltfleet, as seen in Table 4-5, was almost two-and-one-half times the average in Ontario and seven dollars more than the average farm in Wentworth County. Third, the township's long settlement history and higher than average proportion of cleared lands probably deterred newly arrived farmers from putting down roots (both figuratively and literally) within the township. A decline in population in Saltfleet (2801 to 2740) from 1851 to 1861 suggests this possibility, especially when it is contrasted with the modest increase in Wentworth

¹¹ Census of the Canadas, 1860-61, Vol I., p. 500-509; 520-529. Sums do not total 100% due to rounding.

County (28 507 to 31 832) and the large population increase in Ontario (992 004 to 1 396 091) over the same ten-year period. Certain areas in Saltfleet were less valuable than others, which might have allowed less wealthy settlers to move into the township, but this does not appear to be the case. The ten percent increase in the number of farms in the township (231 to 255) despite the drop in population could be attributed to farmers setting up sons and daughters on their own farms as they came of age. Fourth, the average farm in Saltfleet, when compared to others in the county, had a higher proportion of cleared land. Fifth, Saltfleet farmers had more capital invested in farm equipment than the average county or provincial farm. Finally, the township farmers dedicated more than twice the percentage of their total acreage to gardens and orchards than the provincial average.

Farm Size (Acres)	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
Less than 10	1.6%	2.7%	2.7%	3.4%
10-20	2.1%	1.6%	3.0%	2.0%
20-50	21.0%	21.2%	23.1%	20.2%
50-100	39.5%	38.8%	42.8%	49.2%
100-200	31.7%	31.4%	23.4%	21.5%
200+	4.1%	4.3%	5.0%	3.8%
Total	100.0%	100.0%	100.0%	100.1%
Count	243	255	2446	131983

 Table 4-4: Number of Farms by Acreage of Farm, Saitfleet Township,

 Wentworth County, and Ontario, 1861.¹²

¹² Census of the Canadas, 1860-61, Agricultural Produce, Mills, Manufacturies, Houses, Schools, Public Buildings, Places of Worship, &c. Vol.II, (Quebec: S.B. Foote, 1864). Sums do not total 100% due to rounding. Similar to the previous chapter, I placed farms that straddled bins into the lower group. A farm of twenty acres, for example, went into the '10-20' group.

Farm Characteristic	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
No. of Farms	243	255	2446	131983
Average Farm Size (Acres)	105.4	103.6	99.9	101.2
Percentage under Cultivation	71.2%	68.4%	64.9%	45.3%
Percentage Pasture	16.6%	13.9%	16.3%	13.9%
Percentage Garden	2.5%	1.5%	1.2%	0.7%
Average Assessed Value (\$)	5637	5569	4608	2236
Average Value per Acre (\$)	55	54	46	22

Table 4-5: Farming Characteristics for Saltfleet Township,Wentworth County, and Upper Canada, 1861.13

Though Saltfleet proved culturally and demographically similar to the rest of the province in some ways, it varied dramatically in its agricultural maturation. Farmers had cleared more land, invested more capital, and possessed slightly larger farms than the hypothetically average farmer in the province. The investment of labour and capital into the land resulted in a much higher per-acre-value for the township's farms than for those generally found in the county or the province. The high cost of land, coupled with the settlement persistence of many Saltfleet families, prevented at least some newer immigrants and settlers from finding affordable lands.

Indicators of Wealth

Preliminaries

The 1861 Census of Canada provides a number of additional categories that simplify the calculation of assessed value and farm worth. Although there are no surviving assessment rolls for this period, the census required enumerators to provide an estimated assessed value of property and fixed assets of each farm. Unlike the

¹³ Census of the Canadas, 1860-61, Vol.II.

assessment of property in 1851 that depended on a set of assigned values for acreages and types of buildings, assessments after the late 1850s were based on the assumption of a forced sale in a competitive market conducted to relieve debt.¹⁴ The assessed values provided in the census of 1861 consider important influences on property value, such as distance to markets, soil conditions, and so forth, and therefore, provide an approximated market value of the property.¹⁵ The census also provides two categories that indicate the value of horses over three years old and the remainder of the livestock. As farm worth seeks to capture the entire value of livestock and produce and not a marketable surplus or net output, I used these two categories in the census to generate part of the relevant statistic. A more detailed outline of the steps used in the calculation of farm worth for 1861 can be found in Appendix A.

Ownership¹⁶

Several classic social histories based on southern Ontario observations emphasized the remarkably fluid nature of work in nineteenth-century Ontario, with individuals following seasonal patterns, such as farming during harvest time, lumbering during the winter, and ploughing during the spring.¹⁷ A succession of tenant farmers might try their hand at a new piece of land, only to give up, move on, and be replaced by a new settler who repeated the process, scratching the surface of the same property. The

¹⁴ The instructions that accompanied the census does not explicitly state how enumerators were to calculate this figure (Gagan, "Enumerator's Instructions," p. 365).

¹⁵ The assumption regarding the relief of debt indicates that this is not a perfect market price.

¹⁶ The process for determining land ownership in 1861 again required cross-listing the census with the *Abstract Index*. The cautions and limitations outlined in the previous chapter apply here.

¹⁷ For example, Michael Katz, *The People of Hamilton*, p. 122-134.

first (and still vital) study of transiency in Ontario was Michael Katz's work on Hamilton, which stated that only thirty-five percent of men that appeared in the 1851 census reappeared in the next decennial census. Only approximately thirty percent of those who appeared in that census appeared in the next.¹⁸ Gagan uncovered similar numbers for his Peel County study, with only 38.7 percent of settlers staying on the land from 1851 to 1861.¹⁹

The most plausible interpretation of this transiency stems from the dichotomy inherent in a settled township. According to Gagan, approximately one-quarter of the population saw their future inextricably entwined with the region's. They put down both familial and agricultural roots in the early days and remained there for generations. The remainder, according to Gagan, felt that the future lay in the promise of social betterment, which could be found elsewhere. The impressive rate of transiency in nineteenth-century Ontario is probably even higher according to these studies given that some families which arrived, farmed, gave up, and moved on between 1852 and 1860 would not have been recorded in the decennial censuses.

Given the vagaries and omissions inherent in modern census enumerations, let alone nineteenth-century efforts, the search for identical individual names after ten years is only one way to look for transiency. Another approach is to take the names of the heads of household in the 1861 census and the lots upon which they lived, and compare these names to familial names and lots in the 1851 census. When this is done, a pattern

¹⁸ Katz, *The People of Hamilton*, p. 122-134. See also Katz, Doucet, and Stern, *The Social Organization*, p. 108-9. McCalla, *Planting the Province*, p. 219.

¹⁹ Gagan, Hopeful Travellers, p. 115.

of familial persistence appears in conjunction with transiency. In Saltfleet, this pattern indicates the persistence of well-established families who owned land early in the township's history. Of the 242 heads of households in 1861, 118 (or 48.8%) either farmed the same land ten years previously or apparently descended from individuals who farmed the same land (see Table 4-8). The data also indicate a clear relationship between persistence and land ownership because 85.6 percent of these "persistent" individuals owned their land rather than rented or leased it. This association is not surprising. Gagan and Katz emphasized this pattern in their respective works, as did a number of smaller studies on Ontario townships that appeared in the *Canadian Papers in Rural History*.²⁰

An analysis of the 1861 data shows that, as in 1851, there were differences in wealth between farmers who rented or leased their land and farmers who owned their land. The average owner farmer had a farm more than twenty acres larger and an average farm worth that was \$300 greater than the average tenant farmer (see Table 4-13). This variation in farm size remained constant across age groups, meaning that tenants had smaller farms when compared to owners of a similar age. In Saltfleet, both tenants and owners occupied farms where approximately seventy percent of the land was cleared an in production, although younger tenant farmers worked farms that had sixty-five percent of the land cleared.²¹ Farms occupied by tenant farmers had an assessed value much

²⁰ R.S. Dilley, "Migration and the Mennonites: Nineteenth-Century Waterloo County, Ontario," Ed. Don Akenson, *Canadian Papers in Rural History IV*, (Gananoque: Langdale Press, 1984), pp. 108-29; Darrell A. Norris, "Migration, Pioneer Settlement, and the Life Course: The First Families of an Ontario Township," Ed. Don Akenson, *Canadian Papers in Rural History IV* (Gananoque: Langdale Press, 1984), pp. 130-52; Glenn J. Lockwood, "Irish Immigrants and the 'Critical Years' in Eastern Ontario," Ed. Don Akenson, *Canadian Papers in Rural History IV* (Gananoque: Langdale Press, 1984), pp. 130-52; Glenn J. Lockwood, "Irish Immigrants and the 'Critical Years' in Eastern Ontario," Ed. Don Akenson, *Canadian Papers in Rural History IV* (Gananoque: Langdale Press, 1984), pp. 153-78; McCalla, *Planting the Province*, p. 426, N10.

²¹ Like the results from Chapter 3, this first point regarding age and farm size differs from Marr's findings in his study of tenancy in York County, which found that a difference in farm size only existed in farmers
lower than the farms of owners, which might be attributable, at least in part, to the tendency of tenant farmers to treat their land harshly. As Robert Jones noted in his history of agriculture in Ontario, if a tenant had entered into a short term lease, he or she often felt "there was no point in repairing buildings and fences, in planting shade trees, or making other changes from which his successor would receive the most of the benefit."²² This failure to maintain aspects of a property's fixed assets may have detracted from the overall assessed value, although it is also plausible than owners of these income properties invested little toward their upkeep. This difference in wealth indicators between tenants and owners can also be seen in the capital invested in farm implements.²³ The census enumerator placed the value of farm implements for the average tenant farmer at approximately \$141, compared to \$215 for the average owner farmer. This difference between the two groups remained quite large between age groups, narrowing slightly as farmers aged.

Religion	Farm Worth (\$)	Total Acreage	Assessed Value (\$)	Count
Owner Farmers	1653	118	6844	147
Tenant Farmers	1320	86	3788	96
Total	1521	105	5637	243

Table 4-6: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Farmers by Ownership of Heads of Household, Saltfleet Township, 1861.

over forty years old (Marr, "Tenant vs. Owner," p. 69). This difference may be attributable to the population size of this study compared to Marr's county study. The similarity in clearance rates between tenants and owners of all ages agrees with Marr's conclusions.

²² R.L. Jones, *History of Agriculture in Ontario, 1613-1880*, (Toronto: University of Toronto Press, 1946), p. 46. Also cited in Marr, "Tenant vs. Owner," p. 51.

²³ Enumerators for the 1861 census provided an estimate of the value of all farm implements for each household, which appeared as a distinct entry.

Wald tests from a binomial regression of land ownership on the same cultural, environmental, and temporal variables used in the previous chapter continue to emphasize the success of staying put.²⁴ Settlement persistence proved overwhelmingly significant (p < 0.001 – see Table 4-7). Settled farmers (those who lived on the same piece of land for over ten years or who seemingly descended from such a farmer) were much more likely to be owners of the property (86%) than other farmers (37% – see Table 4-8). This pattern confirms results from the 1851 census, highlighting the importance of time on the land in understanding property ownership patterns in Ontario. It also confirms the merit of including such a variable in an analysis of wealth indicators. The only environmental variable that seemed to play a statistically significant role in land ownership was a farm's location relative to the Red Hill Creek. Most of the farmers in the valley were tenants (58.3%), which was significant at the $\alpha = 0.1$ level, although care must be taken in interpreting this data as the population size was very small (n = 12).

Independent Variable	Dependent Variable Owner / Tenant
	243
df	232
Constant	0.071
{C} Country of Birth	0.049 *
{C} Religion	0.493
{C} Location	0.984
{C} Drainage	0.273
{C} Red Hill	0.056 **
{C} 250m of Water	0.591
{C} Settlement Persistence	< 0.001 *
Age	0.262

Table 4-7: Wald Tests for Logistic Regression of Owner-Tenant on Environmental, Cultural, and Temporal Variables, Saltfleet Township, 1861 (n = 230, df = 207).

* Significant at the $\alpha = 0.05$ level

** Significant at the $\alpha = 0.1$ level

²⁴ Like the previous chapter, I condensed religion into a binomial variable of "evangelical" and "nonevangelical" because of insufficient numbers in some groups.

Settlement	Ov	vner	Total
Persistence	Yes	No	IUlai
Yes	85.6%	14.4%	100.0%
No	36.8%	63.2%	100.0%
All	60.5%	39.5%	100.0%
Count	147	96	243

 Table 4-8: Percentage of Land Owners by Settlement Persistence,

 Saltfleet Township, 1861.

In contrast to the results obtained in the examination of the 1851 data, there was a statistically significant correlation between a farmer's country of birth and ownership. Unlike other studies which saw increased ownership for the Irish, in Saltfleet, only those farmers born in what was at the time of the census Canada West had ownership rates higher than average.²⁵ Over seventy-five percent of those farmers born in this province owned their land, compared to forty percent for those born in England, thirty-five percent for those born in Ireland, and forty-five percent for those born in Scotland. Farmers born in the United States had ownership rates just slightly below average. With the exception of American settlers, foreign-born farmers in Saltfleet seemed to have been at a disadvantage.²⁶ Why farmers born in Ontario seemed to have an advantage in this most important indicator of social betterment might again be attributable to the time of settlement of successive waves of immigrants. The first settlers in Saltfleet were loyalists from the United States who would have passed settlement advantages on to their children, most of whom by this time may have been born in Canada. This might explain, at least partially, the relatively high ownership rates of the native born and high ownership rates

²⁵ For example, Darroch and Soltow noted the following land ownership proportions amongst adult male farmers for 1871 based on country of origin: Irish – 66%, German – 63%, Scottish – 61%, English/Welsh – 60%, and French – 60% (Darroch and Soltow, *Property and Inequality*, p. 56-7).

²⁶ This pattern differs with Akenson's findings for Leeds and Lansdowne for the same time period (Akenson, *The Irish*, p. 240-263).

of the American born. Other variables did not appear to play a role in influencing ownership patterns in Saltfleet. Considering the importance of a farm's location relative to the escarpment in influencing wealth in the township (which will be discussed later in the chapter), it is surprising that this variable played no statistically significant role in ownership rates, although there was a small difference in raw percentages. Approximately sixty-three percent of farmers who lived below the escarpment in 1861 owned their land compared to approximately fifty-nine percent of those above the escarpment.

Country of Birth	Ownership	Count
England	40.0%	30
Ireland	35.0%	20
Scotland	45.5%	22
Ontario	75.6%	131
United States	57.9%	19
Other	38.1%	21
Grand Total	60.5%	243

 Table 4-9: Percentage of Landowners by Country of Birth of Heads of Household,

 Saltfleet Township, 1861.

Inequality

An examination of factors that influenced the distribution of wealth in the township should begin with a description of the level of inequality in the township. The 1861 census, like the 1851 census, offers three different variables for examining patterns of inequality in the township: total acreage, farm worth, and assessed value (see Table 4-10). The first, total acreage, suggests that the decline in inequality that occurred between 1819 and 1851 had reversed slightly.²⁷ The Gini coefficient for the distribution of total acreage for young men, for example, had increased from 0.214 to 0.293, while for older men it had increased slightly 0.246 to 0.284. As average farm size and population in Saltfleet remained similar to 1851 levels, the distribution of average farm acreage should have remained relatively stable. The Gini coefficients for farm worth similarly show a slight increase in inequality from 1851 to 1861. For younger men, the level of inequality rose from 0.258 to 0.330, while for older men, the level rose from 0.242 to 0.291.

	Age of Settler		
Data	40 Years Old and Younger	Over 40 Years Old	
Total Acres	0.293	0.284	
Farm Worth	0.330	0.291	
Assessed Value	0.617	0.608	

 Table 4-10: Gini Coefficients for Total Acres, Farm Worth, and Assessed Value

 by Age of Heads of Household, Saltfleet Township, 1861.

The change in the Gini coefficient based on assessed value is more difficult to place in context because the means of calculating the statistic for 1861 is different from the previous census. The calculation of the 1861 figure depended on figures more in line with market prices, meaning that the separation in value between the most and least desirable lands in the township was much greater than figures generated for 1851. The Gini coefficient for assessed value for both age groups considered together increased dramatically, and the value between age groups is quite similar: 0.617 for younger farmers and 0.608 for older farmers. This high level of inequality falls much more in line with Atack and Bateman's study of the northern United States. Their data originated

²⁷ A graph showing the Gini coefficients for all three variables over the entire period in question can be found in Chapter 6, Figure 6-7.

from the estimated real and personal property assessments in the decennial American census.²⁸ Using all three Gini categories as a guide, it appears that the level of inequality in the township rose slightly in the ten years between the two decennial censuses, and that there still appeared to be no prominent distinction between the distribution of wealth amongst older and younger farmers.

Interpreting these patterns of inequality is more difficult than the relatively simple task of producing the numbers. The economic boom associated with the mid-1850s might explain the increase in inequality as some individuals were well-positioned to take advantage of market opportunities, as the few years of high wheat prices allowed some farmers who had purchased land to pay off their mortgages earlier than expected.²⁹ E. D. Smith, a nineteenth-century farmer in Saltfleet, although only a child in the 1850s, came to believe that the decade illustrated an important lesson about the opportunities and costs of high wheat prices: "Many a thrifty industrious farmer, paid off the debts which most owe when they commence business. Many of the reckless though plunged into land speculation, which resulted in the most disastrous consequences in a few years."³⁰ Those who came even a few years later to cash in on this agricultural boom found high land

²⁸ Atack and Bateman, *To Their Own Soil*, p. 89-90. See also Jeremy Atack and Fred Bateman, "The 'Egalitarian Ideal' and the Distribution of Wealth in the Northern Agricultural Community: A Backward Look," *Review of Economics and Statistics*, Vol. 43, No. 1 (February 1981), p. 125.

²⁹ E.D. Smith, *Diaries*, 1855. E.D. Smith Company Family Archives, p. 80.

³⁰ E.D. Smith, *Diaries*, 1855. E.D. Smith Company Family Archives, p. 80. Of course, Smith would have been two years old if this passage had been actually written in 1855. The first few entries of the "Diaries" of Smith were actually retrospective comments probably derived from conversations with his parents. Entries directly attributable to Smith's experiences probably started in 1872. Unlike Abram Lee (another Saltfleet farmer), Smith did not write a brief daily description of his activities, but instead wrote long descriptive passages that reflected on recent events. His entries appeared irregularly, sometimes only once a year.

prices and declining wheat yields. Given Smith's comments regarding the disastrous outcome that many speculators and rash agriculturalists met, one might have expected that inequality would have been much higher than it actually was.

Farm Worth, Total Acreage, and Assessed Value

Two important patterns immediately appear from the distribution of wealth statistics organized by owner farmers' religion and country of birth. As seen in Table 4-11, Methodists in Saltfleet clearly had the highest total acreage, farm worth, and assessed value when compared to farmers of other religious denominations. Anglican farmers had levels of wealth that were close to the township average, while Presbyterians had the lowest levels of wealth.³¹ The differences between religious groups can be quite considerable, as seen in assessed value, for example, where Presbyterians had only sixty-three percent the value of their Methodist peers. The one Baptist farmer had a farm size and assessed value slightly higher than the average Saltfleet farmer, but a farm worth that was lower. Much like the results obtained in the analysis of the 1851/2 census, the distinctions in wealth can produce statistically significant results. A regression of farm worth on religion, for example, proved significant at the $\alpha = 0.1$ level (n = 139, df = 136, p = 0.085, $R^2 = 0.042$).

³¹ Note that the count of Baptists and Presbyterians is quite low when compared to other religious groups, which may have affected the averages.

Religion	Farm Worth (\$)	Total Acreage	Assessed Value (\$)	Count
Anglicans	1610	113	6536	62
Baptists	1110	120	7000	1
Methodist	1891	127	8003	56
Presbyterians	1300	109	5039	23
Other	1253	112	5960	5
Total	1653	118	6844	147

Table 4-11: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Owner Farmers by Religion of Heads of Household, Saltfleet Township, 1861.

The second pattern that emerges from the summary tables is that owner farmers born in Ontario and in the United States appeared to have a clear advantage over owner farmers born elsewhere (see Table 4-12).³² Farmers born in Ontario had the highest farm worth and assessed value and the largest properties in the township, while farmers born in Scotland owned the smallest properties and had the lowest assessed value. Those born in Ireland had the lowest farm worth. Again, the variations in wealth indicators, which can be quite noteworthy, proved statistically significant in a simple regression of assessed value on country of birth (n = 137, df = 132, p = 0.002, $R^2 = 0.119$) These variations can probably be attributed – as they were in the previous chapter – to the advantages of early settlers (mainly Americans) obtaining the best land and devising land inheritance strategies that passed the fruits of their wise selections on to succeeding generations. Concluding the analysis of the distribution of wealth in Saltfleet at this point, however, would be incomplete and would neglect the most significant aspects of settlement in Saltfleet. The key question that needs to be addressed is whether these variations in wealth remain statistically significant when soil quality and time on the land are included

³² This pattern echoes the similar advantage in land ownership discussed earlier.

in the analysis. If they do, then the results would invite a cultural interpretation. If they do not, then attributing these differences to religion or country of origin would be premature.

Country of Birth	Farm Worth (\$)	Total Acreage	Assessed Value (\$)	Count
England	1528	101	3967	12
Ireland	1193	94	4400	7
Scotland	1265	76	3225	10
Ontario	1758	126	7845	99
United States	1638	123	6558	11
Other	1448	103	5835	8
Total	1653	118	6844	147

Table 4-12: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Owner Farmers by Country of Birth of Heads of Household, Saltfleet Township, 1861.

Much like the findings from the previous chapter, a regression for 1861 illustrates the failure of religion to prove statistically significant across any of the three measures of wealth when land quality and settlement persistence are held constant (see Table 4-13). The summary table (Table 4-11) that showed higher levels of wealth for Methodists when compared to Anglicans and Presbyterians could readily have arisen by chance. In fact, religion proved statistically insignificant when coded as a binomial variable (evangelical/non-evangelical) or when each principal faith was considered distinct.³³ Country of birth, on the other hand, appeared to influence the distribution of total acres in the township. This pattern reflects the increased wealth of those born in Ontario and the United States in terms of accumulated property, and appears to confirm the advantage these individuals had in terms of land ownership.

³³ As mentioned previously, the description of Presbyterians as "evangelical" is more a coding convenience rather than a statement of theological disposition. Farmers of this faith were included with Methodists and Baptists because Darroch and Soltow found higher levels of wealth for Presbyterians across the province than for Anglicans and Catholics. Westfall, on the other hand, described the Presbyterian theology as favouring a "virtue of order" (Westfall, *Two Worlds*, p. 45).

	De	ependent Variab	le
Independent Variable	Farm Worth ³⁴	Total Acreage ³⁵	Assessed Value ³⁶
n	137	135	104
df	123	121	89
R ²	0.174	0.252	0.300
ρ	0.046 *	0.016 *	< 0.001 *
Constant	< 0.001 *	< 0.001 *	< 0.001
{C} Country of Birth	0.715	0.019 *	0.196
{C} Religion	0.584	0.152	0.501
{C} Escarpment	0.047 *	0.016 *	< 0.001 *
{C} Drainage	0.826	0.790	0.169
{C} Red Hill Creek	0.238	0.437	0.815
{C} 250 Meters from Water	0.095 **	0.009 *	0.894
{C} Settlement Persistence	0.576	0.752	0.088 **
Age of Settler	0.334	0.518	0.676

Table 4-13: Results of Re	gressions of Three I	Measures of Wealt	n on Environmental,
Cultural, and	Femporal Variables	, Saltfleet Townshi	p, 1861.

* Significant at the $\alpha = 0.05$ level

** Significant at the $\alpha = 0.1$ level

Settlement persistence appears less influential in the 1861 census than in the analysis of the previous census. A relationship between a farmer's time on the land and assessed value does appear to be significant, as long-standing members of the community possessed an assessed value \$300 higher than more recent occupants. In terms of total acreage and farm worth, however, there was not a statistically significant difference when other variables were held constant. Part of the change in the significance of this variable

³⁴ There were no case deletions. The dependent variable was transformed with a square root function to correct for a non-normal distribution.

³⁵ Two case deletions and a transformation of the dependent variable with a square root function fixed problems with non-normality and non-constant error variance. The two case deletions were William Nash, an Anglican farmer born in Ontario who had the second largest farm in the township (332 acres below the escarpment); and Alexander Carpenter, an Anglican farmer also born in Ontario who had the largest farm in the township (413 acres above the escarpment).

³⁶ I deleted the same two data points mentioned above in this regression. Similarly, the dependent variable was transformed by a square root function.

may be attributed to the change in which settlement persistence was calculated. For the 1851 census, a farmer was deemed to have exhibited a persistence on the land if his or her family name appeared on the same lot in the 1819 census, a difference of thirty-two years. This procedure would likely only capture successful landowners who had established deep roots in the township. For this chapter, a farmer or his or her offspring need only have farmed the same plot of land for ten years. This approach would certainly include many long-term members of the Saltfleet community, but it included others that the previous method would have excluded. Also, recall that this analysis of the distribution of wealth only examines owners, the majority of whom had spent at least ten years in Saltfleet. A comparison between well-settled owners and newly arrived tenants produced dramatic differences in farm worth, acreage, and assessed value.

The only cultural, environmental, or temporal variable to prove significant across all three measures of wealth is a farm's location relative to the escarpment. The average farm below the mountain was twenty-six acres larger and possessed a farm worth of \$656 more than the average farm above it. More dramatically, the assessed value for farms below the escarpment (\$9251) was more than twice the value of farms above (\$4544 – see Table 4-14). The distribution of assessed value per acre across the township can be seen in Figure 4-1. The collective impact of statistically significant variables on the distribution of wealth in the township can be quite extraordinary. The cumulative influence of the Niagara Escarpment and distance to water on farm worth, for example, highlights the environmental advantage that some farmers had over others. A farmer whose property was above the escarpment and away from a reliable water source had an average farm worth of \$1281 (see Table 4-15). In contrast, a farmer who benefited from the escarpment's climatic influence and who lived near water had an average farm worth of \$2179; almost \$900 more in livestock and produce. Location clearly influenced the distribution of wealth in the township, much more than cultural factors.

Table 4-14: Average Farm Worth (\$), Total Acreage, and Assessed Value (\$) of Owner Farmers by Farm's Location Relative to Escarpment, Saltfleet Township, 1861.³⁷

Location Relative to Escarpment	Farm Worth (\$)	Total Acreage	Assessed Value (\$)	Count
Above	1334	105	4544	74
Below	1990	131	9251	71
Total	1655	118	6849	145

Table 4-15: Average Farm Worth (\$) by Farm Location Relative to	Escarpment
and 250 Metres of Water, Saltfleet Township, 1861.	

Within 250 Metres	Escar	pment	Total
of Water	Above	Below	IULAI
No	1281	1471	1351
	(33)	(19)	(52)
Yes	1376	2179	1825
	(41)	(52)	(93)
Total	1334	1990	1655
	(74)	(71)	(145)

³⁷ The two farms split by the escarpment were excluded for clarity.



Figure 4-1: Assessed Value per Acre per Farm by Lot, Saltfleet Township, 1861.³⁸

Crop Choices and Agricultural Productivity

A general consensus has emerged that farmers in Ontario were always oriented at

least in some way to market activity. McInnis argued that an examination of the

changing structure of agriculture from the 1860s to the end of the century illustrated the

market awareness of Canadian agriculturalists.

Farmers were, on the whole remarkably sensitive to the changing profitability of different lines of production; that profitability was importantly influenced by supply conditions in Canada; that domestic market conditions played a larger role in influencing the direction of agricultural production than previously had been supposed; and that mixed farming had emerged as the predominant form of agriculture in Canada by an earlier date than usually recognized.³⁹

³⁸ Values for each lot are weighted by total acreage.

³⁹ McInnis, Perspectives, p. 90.

This assessment is supported by evidence from Saltfleet. The awareness of market opportunities and the decision made by some farmers regarding the planting of certain crops should begin with a discussion of the role of wheat in a farmer's decisions about what to plant in Saltfleet and in the rest of the province.

Wheat

The amount of land an individual farmer decided to allocate to wheat depended on soil type, fertility, insect depredations, and climate. What farmers did with individual plots in one township does not necessarily reflect county or provincial trends. As Gagan readily acknowledges, Peel was peculiar in its dedication to wheat and other grains, as it "continued to be evaluated by the pioneer's rule of thumb – 'a farm incapable of producing [wheat] was practically valueless' – and was bought and sold on the strength of this productivity."⁴⁰ In Peel, farmers allocated approximately thirty-three percent of their farms to wheat, raising the number of acres dedicated to this grain from 14.5 to approximately 20.8 between 1851 and 1861. This is a substantial increase in raw acreage, but amounted to only a three percentage point increase in the amount of land allocated to wheat when the increase in average farm size in Peel County over the same period is considered (see Table 4-16).⁴¹ Typical farmers in Ontario increased the percentage of acres dedicated to wheat only marginally (1.3 percentage points) between 1851 and 1861. Significantly, farmers in Wentworth County and in Saltfleet, in

⁴⁰ Gagan, Hopeful Travellers, p.43. The internal citation is from Rev. G.W. Warr, Canada as It Is: or, The Emigrant's Friend and Guide to Upper Canada, (London, 1847), p. 78.

⁴¹ Gagan, Hopeful Travellers, p. 60.

particular, reduced the number of acres they dedicated to wheat by 0.3 and 3.5 percentage points respectively.

 Table 4-16: Acres Dedicated to Wheat as Percentage of Improved Acres in

 Saltfleet Township, Wentworth and Peel Counties, and Ontario, 1851-1861.42

Acres Dedicated to Wheat	Saltfleet	Wentworth	Peel	Ontario
1851	21.5%	22.1%	29%	21.6%
1861	18.0%	21.8%	32%	22.9%

The decision of farmers to grow certain crops stemmed from an appreciation of local environmental and market conditions. The planting decisions of Sylvester and Damaris Smith, the third generation of Smiths in Saltfleet illustrated the complexities associated with farming, and the possibilities for planting crops other than grains. In 1853, they borrowed \$900 from their parents and purchased a 170-acre property just above the escarpment for \$2400.⁴³ Though the farm they purchased had some improvements, they quickly set about investing labour and capital in their farm by clearing trees, up-rooting stumps, and draining swampy lands. Their son, Ernest D'Israeli, noted that his father believed strongly in wheat and the high price obtained during the Crimean War bolstered this opinion. The younger Smith noted the "price remained high the succeeding year and these two years my father paid off the bulk of the debt which still existed upon the place."⁴⁴ In 1853, the family produced 525 bushels of

⁴² The number of acres for 1861 was the sum of the dedicated acres for fall and spring wheat.

⁴³ E.D. Smith, *Diaries*, 1853. E.D. Smith Company Family Archives, p. 80.

⁴⁴ E.D. Smith, *Diaries*, 1855. E.D. Smith Company Family Archives, p. 80. In contrast to the opinion of Smith (which was probably derived from information from his father), McCalla points out that the rise in wheat prices began before the Crimean War. In fact, McCalla argues that much of the success of exports to the United States and the high prices derived for many goods were somewhat independent of the three main events traditionally used to account for changes in the Canadian agricultural economy: Reciprocity, the Crimean War, and the American Civil War (McCalla, *Planting the Province*, p. 240-3).

wheat, which they sold for \$1.85 per bushel and 17 bushels of clover seed, which they sold for \$8.00 per bushel. In Saltfleet, only thirteen of the 243 farms in the population did not dedicate at least some acres to the growing of wheat.

Unfortunately, the particular soil and climatic conditions associated with the high wheat yields in 1851 did not carry over to 1861 for farmers throughout the township. Yields for farms below the escarpment declined significantly from 17.9 bushels per acre to 9.8 bushels per acre. The yields for farms above the escarpment also declined, though less dramatically. In contrast to 1851, farms above the escarpment in 1861 had much higher wheat yields than farms below. As Table 4-17 indicates, a farmer above the escarpment obtained 15.0 bushels of spring wheat from each planted acre as compared to only 11.3 bushels per acre for farms below the escarpment. Less dramatically, farmers above the escarpment obtained an average yield of half a bushel more per acre for fall wheat than their counterparts below the escarpment.

Data	Relative to	Total	
	Above	Below	I Utar
Fall Wheat	7.2	6.7	6.9
Bushels per Acre	(80)	(66)	(165)
Spring Wheat	15.0	11.3	12.9
Bushels per Acre	(114)	(106)	(220)
All Wheat	11.7	9.8	10.6
Bushels per Acre	(116)	(107)	(223)
Wheat Farms Infected with	40%	91%	61%
Insects as Percentage	(116)	(107)	(223)

Table 4-17: Fall and Spring Wheat Yields and Insect Infestations,Saltfieet Township, 1861.45

⁴⁵ Counts in parentheses. Includes tenant and owner farmers.

The decline in yields from 1851 to 1861 for only part of the township may reflect elements of over-farming and soil exhaustion. These lands, many of which had been farmed continually since the early 1800s, may have been showing signs of poor husbandry. An increase in wheat pests, the wheat midge in particular, and rust compounded the effects of apparent over-farming.⁴⁶ Conrad Smith noted that the midge "destroyed the wheat crop for the first time and altogether in a pecuniary point-of-view"⁴⁷ for his farm in Saltfleet in 1859, noting that farmers throughout the township faced tough times. Farms below the escarpment were particularly hard hit. The 1861 census enumerator for Saltfleet (God bless him!) studiously used the remarks column to note if insects had infested a farmer's wheat. Mapping these farms clearly indicates that wheat crops below the escarpment were much more likely to be affected (see Figure 4-2). Some, according to the enumerator, were completely wiped out. Much of the difficulty, according to Hamilton experts, stemmed from the appearance of the midge as early as June 3, which meant that there was "no real possibility of growing wheat early enough to escape this plague."48 They also noted that specialized varieties of wheat said to be resistant to the midge, such as Kentucky and Mediterranean, proved completely ineffective. At least one estimate placed the county's losses at approximately fifty percent.⁴⁹ Unlike farmers in Peel County, farmers in Saltfleet reacted to the impact of

⁴⁶ Canadian Agriculturalist, Vol. XII, No. 14, (June), 1860, p. 244-5.

⁴⁷ E.D. Smith, *Diaries*, 1855. E.D. Smith Company Family Archives, p. 85. Despite the tough times, E.D. Smith noted that the local farmers managed to raise \$1400 for a new schoolhouse in the same year.

⁴⁸ Canada Agriculturalist, Vol. XII, No. 16, August, 1860, p. 398.

⁴⁹ Canada Agriculturalist, Vol. XII, No. 11, June 1, 1860, p. 244-5.

declining wheat yields by reducing the number of acres dedicated to wheat as a percentage of overall cultivated acres. Below the escarpment, farmers reduced the percentage of wheat acres from approximately 25.0 percent to 21.0 percent. Similarly, farms above the escarpment also planted less wheat, changing from 20.6 percent of cultivated acres to 16.5 percent.



Figure 4-2: Location of Lots Affected by Wheat Pests According to Census Enumerator, Saltfieet Township, 1861.

As a result of these declining wheat yields throughout the township, Saltfleet farmers turned their attention to a number of other crops. Peas, corn, oats, rye, and turnips poked through the soil of Saltfleet's farms. Damaris Smith, though, noted that the mid-nineteenth century saw few families on top of the escarpment growing vegetables and fruits for household consumption. The tension between traditional farmers who saw their future in growing more wheat versus those who believed an accelerated diversification was most advantageous could be seen within families. Sylvester Smith seemed sceptical about his wife's desire to grow a wider variety of crops:

There did not appear to be any place according to his showing even on a twohundred acre farm, for a few vegetables and flowers. But I [Damaris] did not give up the cherished idea. I planted here and there, around fences, under trees and in out of the way corners with much better results than the first year. There was a wreck of a plum tree - the only one on the place. It had been blown over, but ripened several quarts of delicious plums. I took this for a sample of what could be produced and kept fast hold of a determination to raise plenty of similar ones when Conrad once got his fields and yards arranged.⁵⁰

In spite of her husband's seeming indifference, she planted currant cuttings in the garden, selling nine dollars worth of the little berries in her fourth year.⁵¹ She also planted beans, onions, beets, parsnips, peas, and celery, which were used both in the home and sold at the local market.⁵²

In addition to declining wheat yields, the lands below the escarpment (the earliest of settled lands and those which had been producing wheat and other crops for the longest period in Saltfleet) were beginning to show other signs of over-farming. Recall that in 1851 the lands below the escarpment provided farmers with higher yields in all five of the crops examined in detail in this study: wheat, oats, barley, peas, and potatoes. By 1861, per acre yields from these crops for the whole township appeared to have increased in oats and barley and dramatically in potatoes and peas.⁵³ More interestingly,

⁵⁰ Damaris Smith, "Pioneer Wife," p. 3. For some reason that has been lost in the family lore, Damaris called her husband Conrad, even though his first name was Sylvester.

⁵¹ Damaris Smith, "Pioneer Wife," p. 10

⁵² Damaris Smith, "Pioneer Wife," p. 10

⁵³ The staggeringly higher yields of potatoes and peas may reflect change from extensive to intensive farming, changes in farming technology, such as the application of new fertilizers (such as superphosphate of lime - which will be discussed in Chapter 5), or, alas, a change in the enumeration process. This last option is most likely. In 1851, the enumerator for Saltfleet only recorded whole numbers for the acreage

the per acre productive capability of lands below the escarpment was now lower than farms above the escarpment, despite averaging higher summer temperatures, cooler winters, and increased rainfall. Figure 4-3 clearly indicates that farms above the escarpment produced more bushels per acre in all five key crops. Continuous farming from the township's earliest days coupled with localized insect depredations appear to have affected farming potential below the escarpment. This decline prompted many farmers to accelerate their migration to agricultural pursuits more suited to their particular environmental conditions and emerging markets and away from more traditional crops. These alterations to planting decisions indicate the market awareness of Saltfleet farmers, emphasizing McInnis's conclusions.

for each crop. In a hypothetical example, imagine a farmer produced fifty bushels of potatoes on 1.5 acres, but the census-taker rounded up the acreage to 2, resulting in a lower (and inaccurate) estimate of yield. In 1861, the enumerator noted fractions of acres, reflecting a higher (and more accurate) crop yield in the above example.



Figure 4-3: Crop Yields by Location Relative to Escarpment, Saltfleet Township, 1861.

The Niagara Escarpment

In response to various pressures affecting farming in Saltfleet, such as over farming and insect depredations that resulted in declining crop yields, farmers below the escarpment accelerated their specialization in crops that would fare well in their particular environmental conditions. The aggregate census data suggests that Saltfleet was more environmentally suited to growing orchard crops than most other places in Wentworth and Ontario. Farmers in the township produced fruit worth an average \$47.93 per year as compared to \$24.96 for the county and \$9.88 for the province.⁵⁴ However, only parts of the township possessed the environmental and climatic variables suited to this pursuit. The production of fruit in the township was heavily concentrated

⁵⁴ Census of the Canadas, 1860-61, Vol. II.

below the escarpment. The number of acres farmers allocated to fruit growing was 4.5, almost two and a half times the 1.9 acres cultivated by farmers above the escarpment (see Table 4-18). Some dedicated a very large number of acres to growing fruit. Henry Pettit, for example, who lived on lot 5 in the second concession, allocated thirty-three acres of his two hundred acre farm to orchards and/or gardens. The suitability for fruit growing is readily apparent in a comparison of the income derived from growing fruits normalized by the number of acres dedicated to orchards. Farmers below the escarpment averaged \$105 for their orchard produce, or approximately \$30 per orchard acre, while farmers above the escarpment received \$41 from their gardens and orchards, or approximately \$14 per orchard acre. Perhaps even more telling, twenty three of the eighty three farmers above the escarpment who stated they had allocated at least some land to orchards did not produce enough fruit to merit mentioning in the census. Of the ninety farmers below the escarpment who devoted acreage to orchards, all reported deriving at least some value from their fruit.

Data	Relative to	Total	
	Above	Below	i Uldi
Average Value of Orchard	41	105	79
Produce (\$)	(60)	(90)	(150)
Average Orchard Acres	1.9	4.5	3.4
	(83)	(90)	(173)

Table 4-18: Average Value (\$) and Acreage of Orchards, Saltfleet Township, 1861.55

⁵⁵ Counts in parentheses. Includes tenant and owner farmers.



Figure 4-4: Average Orchards Acres per Farm by Lot, Saltfleet Township, 1861.⁵⁶

Including other environmental factors (distance to water and drainage) into the examination of orchard production emphasizes the cumulative importance of environmental characteristics within a political unit as small as a township. The average farmer who benefited from the protective mantle of the mountain, a reliable nearby water supply, and good drainage allocated approximately 4.6 acres to orchards. He or she produced an average of \$122 worth of fruit for his troubles, or approximately \$31 per orchard acre. Silas Hopkins, for example, was a Ontario-born Methodist farmer who owned sixty-five acres on lot twenty four, in the first concession, which was below the escarpment and near a reliable water source. Fifty-four acres of the farm had been cleared, of which thirty-two acres (or 59%) were allotted to orchards, a substantial

⁵⁶ Results weighted by total orchard acres per lot.

amount. In 1861, he produced over \$500 worth of fruit. By comparison, the average farmer who lived above the escarpment and away from water allocated an average of 1.3 acres to orchards. In recompense, this farmer obtained only \$14 for his efforts, or approximately \$10 per orchard acre; less than one-third the per-acre income of a farmer below the escarpment.

The allocation of fewer acres to orchards by farmers not living on lands suitable to such crops does not indicate their unwillingness to take advantage of what many perceived as an ever-increasing market for fresh fruit. Rather than squander resources on crops that would probably fare poorly or die in a harsh frost, these farmers concentrated on crops more appropriate to their own particular conditions. As seen in Table 4-19, farmers above the escarpment dedicated 14.2 percent of their cultivated lands to oats and 11.5 percent to peas, compared to farmers below the escarpment who dedicated only 7.9 percent to oats and 6.8 percent to peas.

Data	Relative to	Total	
	Above	Below	
Pasture	23.3%	22.4%	22.9%
Orchards	1.6%	5.3%	3.3%
Fall Wheat	6.8%	6.6%	6.7%
Spring Wheat	15.0%	15.2%	12.4%
Oats	14.2%	7.9%	11.2%
Barley	5.0%	6.4%	5.6%
Peas	11.5%	6.8%	9.3%
Potatoes	1.9%	2.2%	2.0%

 Table 4-19: Percentage of Cultivated Acres Devoted to Particular Crops,

 Saltfleet Township, 1861.

Farm size also influenced the choices farmers made. On average, small farms (5 to 50 acres) located below the escarpment dedicated approximately six percent of their total acreage to orchards while large farms (100 to 200 acres) allocated only 2.2 percent

(see Table 4-20). In other words, the larger the farm below the escarpment, the lower the percentage of total acres dedicated to orchards. In contrast, there is remarkably little change in the allocation of acres to orchards for farms above the escarpment. All farms dedicated approximately 1.2 percent of their total size to orchards. The importance of this step towards specialization, which only becomes apparent with the inclusion of local environmental variables in the analysis, suggest a variation from conclusions drawn in other studies. McInnis in his examination of the "Canada West Farm sample of 1861" database, emphasized the homogeneity of agriculture choice in Ontario based on farm size, concluding that "small and large farms were just smaller and larger versions of the same sort of thing and there was little indication of functional differentiation related to size."⁵⁷ William Marr reached a similar conclusion in his examination of the 1851 census.⁵⁸ In Saltfleet, variation in farm size, especially for farms below the escarpment, resulted in distinct approaches to dealing with declining yields and new markets. These distinctions in crop allocation are not particularly large in 1861, but they do exist and become more prominent in an examination of the 1871 census.⁵⁹ As McInnis and Marr

⁵⁷ McInnis, "The Size," p. 328. William Marr also noted little variation in the allocation of acres to particular crops based on farm size in his study of examination of land use for the 1851 census.

⁵⁸ William Marr also noted little variation in the allocation of acres to particular crops based on farm size in his study of land use for the 1851 census (Marr, "The Allocation of Land," p. 202). Marr made another interesting observation which was that farms on the frontier (those counties with less than 30% of their lands cleared) were more similar in their allocation of crop lands (cultivated, wooded, pasture) across all sizes of farms than older, more settled counties (p. 199).

⁵⁹ Notice that the percentage of acres dedicated to orchards for farms below the escarpment produces approximately the same number of acres allocated to orchards for each farm regardless of size. The average fifty acre farm, for example, had three acres in orchards and gardens (6%), while the average 200 acre farm had 4.4 acres in orchards (2.2%). So, each farm planted approximately the same number of acres which might suggests that labour and/or crop management considerations were also at work, limiting the number of orchard acres that could be effectively cultivated on a mixed farm.

sampled farms from across the province, this variations found in Saltfleet may be

restricted to fruit growing regions below the escarpment in the Niagara Peninsula.

Size of Farm Data (Acres)	Relative to	Total		
		Above	Below	i vlai
5 to 50	Cultivated Acres of Total Acres (%)	70.5%	88.7%	78.2%
	Orchard Acres of Total Acres (%)	1.0%	5.9%	3.1%
	Count	34	25	59
51 to 100	Cultivated Acres of Total Acres (%)	69.2%	73.6%	70.8%
	Orchard Acres of Total Acres (%)	1.3%	4.4%	2.5%
	Count	60	35	95
101 to 200	Cultivated Acres of Total Acres (%)	66.9%	67.4%	67.2%
	Orchard Acres of Total Acres (%)	1.3%	2.8%	2.2%
	Count	31	44	75
200 +	Cultivated Acres of Total Acres (%)	51.1%	60.1%	58.3%
	Orchard Acres of Total Acres (%)	1.0%	2.2%	1.9%
	Count	2	8	10
Total	Cultivated Acres of Total Acres (%)	68.7%	73.6%	71.0%
	Orchard Acres of Total Acres (%)	1.2%	4.0%	2.5%
	Count	127	112	239

 Table 4-20: Cultivate Acres and Orchard Acres as Percentage of Total Acreage by

 Size of Farm and Location Relative to Escarpment, Saltfleet Township, 1861.

The Red Hill Creek Valley

Agricultural specialization was not limited to an increasing focus on fruit below the escarpment. Although the dramatic influence of the mountain makes divining more subtle specialization difficult, the climatic characteristics of the Red Hill Creek Valley continued to influence farmers with respect to raising of livestock. Farmers in the valley devoted more of their land to pasture (30.6%) than those who were not in the valley (22.5%). Despite having farms that were approximately fifteen acres smaller than the average farm in the township, the focus of Red Hill settlers on livestock resulted in higher beef and pork production. The value of barreled pork and beef for the average farmer in the valley in 1861 was \$38 and \$50 respectively. William and John Spera, for example, were two Anglican brothers who farmed adjacent properties in the valley. Although their farms were relatively small, thirty-nine and thirty acres respectively, combined they produced 1300 pounds of barreled beef and 2550 pounds of barreled pork, which had a total value of almost \$200.⁶⁰ The average farmer outside the valley, by comparison, reported barreled pork and beef production of twenty-seven and fifteen dollars. These differences are not dramatic, but they do reflect the efforts of farmers to tailor crops and livestock to their particular environment as a means of capitalizing on market opportunities and combating the declining yields in traditional crops.

Conclusions

After mid-century, new arrivals to Saltfleet found land more difficult to come by than in many other places in Ontario, but not because established farmers were increasing their property holdings to farm more wheat. Farmers in Saltfleet were planting less wheat than ten years previously. New arrivals found it difficult to purchase land in Saltfleet because it was expensive when compared to other lands in the province. Good homes, high clearance rates, established fields, and close proximity to markets and raillines drove up the price of land in Saltfleet. Established farmers, who better appreciated the particular environmental advantages of good land over poor and who were in a better position to take advantage of land sales when they arose, developed coping strategies to provide for their sons and daughters as they came of age. Early occupation and persistence translated into land ownership. The high price of land coupled with the importance of persistence for ownership explains the decline in population in Saltfleet

⁶⁰ This production might have simply been one good year and not an indication of what could be produced annually, although both brothers possessed a large number of livestock in addition to the barreled meat products. The brothers were not the largest beef and pork producers in the valley.

and marginal increase in number of farms in the face of an population increase in the province. The township appeared stable and prosperous for the propertied farmers and successful tenants. Here, perhaps, a landed gentry came close to reality, but membership in this class was not based on an Evangelical moral order. Environmental forces, coupled with settlement persistence, appeared the only factors to shape the distribution of wealth in the township.

All, however, was not perfect. Two important factors would change the relatively traditional mixed-farming patterns of Saltfleet. First, the high Gini co-efficient associated with assessed value emphasizes the substantial inequality in the township and the continued deterrent to landownership inherent in the high price of land. The remarkable increase in land prices over those of a decade earlier likely prevented newly arrived settlers from owning farms in Saltfleet. When one tenant farmer failed to cultivate successfully the poorer agricultural lands in the township and moved on, another took up the plough in his place. While persistence of settlement existed for landholders, transiency typified the experience of most others. Second, the declining yields for farms below the escarpment, especially when compared to those above, prompted many to look for alternatives. Saltfleet could not depend on traditional crops. Instead, farmers quickened their experimentation with fruit and vegetables as more than a familial dietary supplement. They hoped to take advantage of growing demand in nearby Hamilton and regional markets. This specialization would occur mostly below the escarpment. The initial advantage of location and prosperity inherited by the families of the first settlers would be channelled into this new endeavour. Other farms in Saltfleet, less suitable to

fruits and vegetables, such as those within the Red Hill Creek Valley, continued to emphasize the raising of livestock, although still within the context of mixed-agriculture.

-- Chapter 5 --

Apples and Peaches and Pears, oh my! The Acceleration of Fruit Farming in Saltfleet, 1861-1871.

And if the harvest's any good, The money just might cover all the loans. You've mortgaged all you own. Buy the kids a winter coat, Take the wife back East for Christmas if you can. All summer she hangs on, When you're so tied to the land.

> "Field Behind the Plow" Song by Stan Rogers

In 1872, William Weld, the editor of the *Farmer's Advocate*, provided a number of maxims that would ensure good returns on the labour of farming. The first and most important was that "only good farming pays. He [a farmer] who sows or plants, without reasonable assurance of good crops annually, had better earn wages of some capable neighbour than work for so poor a paymaster as he is certain to prove himself."¹ The success of some Saltfleet farmers in raising successful crops helped distinguish one farmer from another. This chapter, like chapters three and four, examines the factors that contributed to this distribution of wealth.

By contrasting various agricultural and settlement characteristics with cultural, temporal, and environmental variables derived from the 1871 census, this chapter continues the emphasis on the importance of both local environmental factors and

¹ Farmer's Advocate, Vol. VII, No. 8, p. 115. The article was a reprint from *The Boston Journal of Chemistry*.

settlement persistence as keys to understanding the various levels of success of Saltfleet's farmers. Over-farming and insect depredations, and larger local markets left many farmers looking for new crops that were better suited to their specific climatic, environmental, and market conditions. The township's agriculturalists, specifically those below the escarpment, accelerated their move towards fruit farming to fill the void. Although it took a few more years to produce results, many younger farmers also found fruit a viable option, as they needed fewer acres for a successful farm than traditional mixed-agriculture. These younger farmers purchased or leased smaller farms below the mountain, dramatically changing the overall distribution of farm acreage within the township. Environmental and settlement persistence variables continued to be important for explanations of wealth distribution among township farmers, and, as a corollary, religious factors still did not provide an appropriate interpretive paradigm for understanding nineteenth-century wealth patterns in the township. The significance of religion continued to appear negligible when environmental and settlement persistence factors were taken into consideration.

Comparative Demographics

The local markets that served as the principal place of trade for most of Saltfleet's farmers continued to grow quickly, despite a province-wide annual growth rate of only 1.5 percent between 1861 to 1871. Hamilton grew from approximately 19 000 to more than 26 000. Other cities, such as Toronto and Brantford, continued to grow, as did many

smaller towns, such as Oakville, Woodstock, and Berlin.² Road and rail construction helped bring produce to these and more distant markets.³

The cultural makeup of the settlers of Saltfleet in the early 1870s continued to differ from both county and provincial patterns in some ways. As indicated in the aggregate census reports, the vast majority (75.4%) of Saltfleet settlers stated that Ontario was their place of birth, approximately five percent higher than the Wentworth and Ontario averages (see Table 5-1) and approximately five percent higher than ten years previously.⁴ Most of the remaining individuals (23.1%) were born in the British Isles. The declared ethnicity of Saltfleet's residents also differed from the wider population distributions. Over forty-three percent of the township's heads of household stated that they were of English descent, compared to only 30.6 percent for the county and 27.1 percent for the province (Table 5-2).⁵ This discrepancy can probably be attributed to the UEL origins of many of the township's earliest settlers. The higher English ethnicity came at the expense of Scottish and, to a lesser extent, Irish origins when compared to the ethnic distribution of the wider population. The heads of household (the population of heads of household compiled for statistical analysis in this chapter) of Saltfleet was predominantly English. There were fewer Irish proportionately than found in the province generally. The ethnicity of the heads of household compared to the aggregate

² Census of Canada, 1870-71, Vol. I, (Ottawa: I.B. Taylor, 1873), p. 336-365.

³ The *Historical Atlas of Canada, Volume II* provides some plates that illustrate road and rail developments at this time (Plate 26) and population increases and agricultural development (Plate 41).

⁴ Census of Canada, 1870-71, Vol. I., p. 336-365.

⁵ Census of Canada, 1870-71, Vol. 1, p. 252-281.

Saltfleet population, however, proved quite similar, with almost half the heads of

household claiming an English origin.

Country of Birth	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
England-Wales	15.2%	9.4%	9.0%	7.7%
Ireland	1.4%	5.5%	8.4%	9.4%
Scotland	8.7%	3.7%	6.7%	5.6%
Rest of Europe	5.4%	1.1%	1.3%	1.6%
Ontario	59.9%	75.4%	70.6%	69.8%
Quebec	0.4%	0.4%	0.6%	2.5%
Rest of Canada	1.4%	0.8%	0.3%	0.5%
US	7.6%	3.5%	2.9%	2.7%
Other	0.0%	0.2%	0.2%	0.2%
Not Given	0.0%	0.1%	0.0%	0.1%
Total	100.0%	100.1%	100.0%	100.1%
Count	277	2783	30883	1620851

Table 5-1: Country of Birth by Percentage for Saltfleet Township,Wentworth County, and Ontario, 1871.6

Table 5-2: Ethnicity by Percentage for Saltfleet Township,Wentworth County, and Ontario, 1871.7

Ethnicity	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
English	49.1%	43.3%	30.6%	27.1%
Welsh	0.7%	0.9%	0.7%	0.3%
Irish	19.9%	22.6%	25.4%	34.5%
Scottish	9.0%	12.3%	21.0%	20.3%
Rest of Europe	20.6%	19.8%	21.4%	15.8%
African	0.4%	0.6%	0.5%	0.8%
Other	0.0%	0.4%	0.1%	0.8%
NG	0.4%	0.2%	0.3%	0.3%
Total	100.1%	100.1%	100.0%	99.9%
Count	277	2783	30883	1620831

⁶ Census of Canada, 1870-71, Vol. I, p. 336-365. Sums do not total 100% due to rounding.

⁷ Census of Canada, 1870-71, Vol. I, p. 252-281. Sums do not total 100% due to rounding.

Data for the religious origins of the township's settlers remain somewhat troubling given the odd numbers produced in the aggregate summary statistics for 1861, which were quite different from the 1861 heads of household. The aggregate numbers for 1871 were much more similar to the heads of household for the same year, which again suggests that the 1861 aggregate numbers were miscalculated or produced in an unusual manner.⁸ Both the heads of household and the aggregate numbers for 1871 indicate that the population in Saltfleet remained overwhelmingly Protestant. The percentage of Methodists for the aggregate township population (57.1%) was much higher than either the county (38.5%) or the province (28.8%). The difference between the number of Methodists in the heads of household and the aggregate county and provincial distributions was even greater. The age distribution of Saltfleet settlers follows the general distributions for the county and the province almost exactly.⁹ As before, there is significant variation in age distribution for the aggregate numbers and the heads of household. As the latter group is composed exclusively of heads of household, the '41 to 51 year olds' in the largest age group for the heads of household whereas '21 to 31 year olds' comprise the largest age group in the aggregate distributions (see Table 5-4).

⁸ Census of Canada, 1870-71, Vol. I, p. 86-145.

⁹ Census of Canada, 1870-71, Vol. II, p. 2-61.

Religion	Heads of Household Saltfieet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
Anglican	17.3%	19.3%	19.5%	20.6%
Baptist	1.1%	2.0%	4.7%	5.3%
Catholics	2.5%	5.9%	11.3%	17.1%
Lutherans	0.0%	0.3%	0.8%	2.0%
Methodist	61.4%	57.1%	38.5%	28.8%
Other NC	1.4%	0.4%	1.2%	2.9%
Presbyterian	11.6%	12.0%	22.7%	22.2%
None	0.0%	0.1%	0.2%	0.3%
Other	0.0%	0.0%	0.0%	0.0%
Not Given	4.7%	2.9%	1.0%	0.9%
Total	100.0%	100.0%	99.9%	100.1%
Count	277	2783	30883	1620851

 Table 5-3: Religion of Residents by Percentage for Saltfleet Township,

 Wentworth County, and Ontario, 1871.¹⁰

Table 5-4: Age Group of Male Settlers by Percentage, Saltfleet Township,Wentworth County, and Ontario, 1871.11

Age Group	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
16 - 21	0.4%	17.3%	18.7%	18.7%
21 - 31	17.0%	27.3%	26.7%	28.0%
31 - 41	22.0%	19.7%	18.8%	19.5%
41 - 51	26.0%	14.4%	14.6%	14.7%
51 - 61	17.7%	10.9%	10.9%	9.9%
61 - 71	10.8%	6.0%	6.9%	5.9%
71 - 81	3.6%	3.1%	2.6%	2.5%
81 - 91	1.4%	1.1%	0.6%	0.6%
91+	0.4%	0.1%	0.1%	0.1%
Not Given	0.7%	0.0%	0.0%	0.1%
Total	100.0%	99.9%	99.9%	100.0%
Count	277	813	8964	461998

¹⁰ Census of Canada, 1870-71, Vol. I, p. 86-145. Sums do not total 100% due to rounding.

¹¹ Census of Canada, 1870-71, Vol. II, p. 2-61. Direct comparisons with previous censuses are not possible as the bins used for classifying age groups are slightly different. I placed data points that spanned bins in the younger one; for example, a head of household that was thirty-one years old was placed in the '21-31' age group rather than the '31-41' age group. Sums do not total 100% due to rounding.

Between 1861 and 1871, the average farm size in Saltfleet decreased, with many farms being smaller than fifty acres and over ten percent smaller than ten acres. This tendency towards smaller farms in Saltfleet generally followed provincial and county trends, although the township had more farms between ten and fifty acres than either the county or province, but proportionately fewer farms smaller than ten acres.¹² Although the aggregate numbers indicate that Saltfleet had a proportion of 200-acre farms roughly equivalent to the county and province, the heads of household had only half the number of such large farms.¹³ The average farm size in the township decreased dramatically in the ten years following the 1861 census, from 103.6 acres to 87.9 acres, which was larger than the county average but smaller than the provincial (see Table 5-6). The aggregate summary statistics for Saltfleet indicate that Saltfleet farmers dedicated approximately the same percentage of their improved acres to pasture as farmers across the county and province, up from 20.3 percent to 23.9 percent over the previous decade. The heads of household, on the other hand, allocated 29.9 percent to pasture. Finally, according to the aggregate reports, Saltfleet farmers continued to dedicate a much higher percentage of their improved acreage to orchard production, more than three times the provincial average and more than twice that of the county.¹⁴ The heads of household, in contrast, allocated slightly fewer acres than the aggregate results.

¹² Census of Canada, 1870-71, Vol. III, p. 20-49.

¹³ This discrepancy may be the result of the binning process between my calculations regarding the heads of household and the numbers produced in the aggregate reports.

¹⁴ Saltfleet farmers also dedicated more than twice the percentage of their cleared acres to orchards than farmers in York County, who allocated approximately four percent of their land (see William L Marr, "Did Farm Size Matter? An 1871 Case Study," Ed. Donald Akenson, *Canadian Papers in Rural History VI*, (Gananoque: Langdale Press, 1988). p. 282.
Farm Size	Heads of Household Saltfleet	Aggregate Saltf iee t	Aggregate Wentworth	Aggregate Ontario
Less than 10	2.9%	10.2%	16.4%	11.6%
10-50	30.0%	27.0%	24.8%	22.6%
50-100	40.4%	36.3%	35.3%	41.7%
100-200	24. 9 %	22.4%	19.9%	19.7%
More than 200	1.8%	4.0%	3.5%	4.4%
Total	100.0%	99.9%	99.9%	100.0%
Count	277	322	3213	172275

Table 5-5: Number of Farms by Acreage, Saltfleet Township,Wentworth County, and Ontario, 1871.15

 Table 5-6: Farming Characteristics for Saltfleet Township,

 Wentworth County, and Ontario, 1871.¹⁶

Farm Characteristics	Heads of Household Saltfleet	Aggregate Saltfleet	Aggregate Wentworth	Aggregate Ontario
Number of Farms	277	322	3213	172275
Average Farm Acres	86.7	87.9	81.9	93.8
Improved Acres	61.7	71.9	72.1	54.7
Pasture as percentage of Improved	29.9%	23.9%	21.2%	23.6%
Orchards as Percentage of Improved	6.6%	8.1%	3.8%	2.3%

Culturally, Saltfleet generally resembled the province, with a few exceptions.

There were more Ontario-born heads of household and more claiming English descent. Religion also generally followed provincial trends, although there were more Methodists and fewer Presbyterians. Agriculturally, the specialization that had begun in the early to mid-nineteenth century revealed differences. The township's farmers, taking advantage of their particular climatic and environmental conditions, specialized in fruit production. An in-depth examination of the 1871 census illustrates the form of this change and how it affected the distribution of wealth in the township.

¹⁵ Census of Canada, 1870-71, Vol. III, p. 20-49. Similar to the binning process for age groups, I placed data points that straddled the bin size, such as a one hundred acre farm, in the smaller bin. Sums do not total 100% due to rounding.

¹⁶ Census of Canada, 1870-71, Vol. III, p. 206-212.

Indicators of Wealth

Preliminaries

The 1871 Census of Canada, unlike the previous one, did not provide an assessed value of each property in the township, and, unfortunately, the only surviving assessment roll for the period in question is for 1877. Thus, only total acreage and farm worth can be used as indicators of wealth for the analysis. Additionally, the 1871 census did not provide a convenient estimate of the value of livestock. The calculation of the value of farm worth, therefore, required a separate formula in order to calculate the value of all farm animals, similar to the procedure done for the 1851 census. A list of the process and prices used in this calculation can be found in Appendix A. Although the 1871 census does provide less information in some areas than the previous decennial census, it does note whether individuals owned the land they farmed or whether they were tenants. This notation eliminated the need to cross-reference the census with the Abstract Index to the Land Registry Records to obtain ownership information. Finally, the procedure for determining settlement persistence followed that of the previous chapter. If the full or family name of a farmer in the 1871 census lived on the same or adjacent lot ten years previously (as described in the 1861 census), then that individual was deemed to have exhibited settlement persistence. This variable contrasts farmers and/or most of their descendents who have lived and farmed the same property against newcomers to the township and individuals recently settled on different properties in the township.

Ownership

In 1871, slightly less than seventy-five percent of Saltfleet farmers owned the property they farmed, which was less than county and provincial averages.¹⁷ Much like patterns established in the previous chapters, there remained significant differences in wealth between tenants and owners in Saltfleet. Tenant farmers had slightly smaller farms and a lower farm worth than farmers who owned the land they cultivated (see Table 5-7). There was much similarity in the allocation of land to certain crops, with the exception of orchards. Tenants and owners apportioned approximately twenty percent of their total acreage to pasture and approximately seventeen percent to spring and fall wheat. Owners, on the other hand, allotted more than twice the percentage of their total acreage to orchards and gardens (9%) than tenant farmers (4%). These slight differences in land use translated into unusual differences in terms of the value of produce and livestock. For tenant farmers, only twenty-six percent of the value used in the calculation of farm worth came from crops compared to thirty-six percent for owners.¹⁸ Tenant farmers seemed to have invested a higher percentage of their capital in livestock, assuming that all the livestock listed in the census actually belonged to the tenant listed as the head of household, which may not have been the case. This preference for livestock

¹⁷ The ownership rate for Wentworth County was 77.5% and for the province was 83.7% (taken from the aggregate statistics).

¹⁸ The value of crops does not include deductions for rent which could be quite substantial. I could find only one contract for Saltfleet, which was presented in Chapter 3. As outlined in Jones's provincial history of agriculture, the most common arrangement was for tenant farmers to provide their own implements and livestock, giving half the yearly produce to the landlord (Jones, *History of Agriculture*, p. 68; also cited in Marr, "Tenant vs. Owner," p. 51).

among tenant farmers is unusual when compared to Marr's findings in York County,

where tenants had fewer number of all types of livestock.¹⁹

Farm Characteristic	Owners	Tenants	Total
Total Acres	88	82	87
Farm Worth	\$ 1535	\$ 1438	\$ 1513
Percentage of Total Acres Improved	76%	75%	75%
Percentage of Total Acres in Pasture	20%	18%	19%
Percentage of Total Acres in Wheat	18%	16%	17%
Percentage of Total Acres in Orchards	9%	4%	8%
Value of Fruit	\$ 110	\$ 47	\$ 96
Value of all Crops	\$ 551	\$ 368	\$ 510
Value of Livestock	\$ 917	\$ 1012	\$ 938
Count	214	63	277

 Table 5-7: Agricultural and Wealth Indicators of Farmers by Land Ownership of Heads of Household, Saltfleet Township, 1871.

Take, for example, the case of George Churchill, an Ontario-born, Methodist tenant farmer who lived atop the escarpment on lot five in the seventh concession. At the time of the 1861 census, Churchill was twenty-eight years old and was leasing a small, fifty acre farm, thirty five of which had been cleared. He and his family allocated six acres to pasture and twenty nine to wheat, oats, potatoes, peas, and hay. They had a fairsized herd of livestock, including four cows under three years old, two milk cows, two horses, 10 sheep, and five pigs. By 1871, despite having lived in the township for over ten years, the family were still tenants on the same property, although now they leased ninety-nine acres of land. The number of livestock they owned apparently had increased over the ten years since the last decennial censuses, amounting to an impressive number

¹⁹ Marr, "Tenant vs. Owner," p. 68. See also, William L. Marr's "The Distribution of Tenant Agriculture: Ontario, Canada, 1871, *Social Science History*, Vol. 11, No. 2 (Summer 1987). In this article, Marr used a sample of farms from the census manuscript for York County for 1871 and township level data for townships in Ontario. He concluded, in part, that there was evidence to suggest that young farmers and foreign farmers used tenancy as a means to gain experience and climb the economic ladder, especially considering that land grants were a thing of the past (p. 184-5).

of animals, including two horses, one colt, four milk cows, eight other heads of cattle, twenty sheep, and two pigs. They also exported twelve sheep and three swine. To feed all their animals, they allotted twenty acres of their land to growing hay. This accumulation of animals, given the mean tendencies of tenant farmers in the township, suggest that livestock provided a profitable means of farming in the township.

Other evidence suggests a relationship between the willingness to invest in larger, more expensive farm machinery and land ownership. Prior to the late 1850s, few if any farmers in Saltfleet possessed horse drawn mowers and reapers.²⁰ The analysis of the three decennial censuses showed that proprietors had a higher level of wealth than tenant farmers, as embodied in total acreage, farm worth, and assessed value. These differences can also be seen in invested capital, illustrated by the differences in farm tools. In his study of tenancy in York County in 1871, Marr found that tenants were less likely to own wagons, plough, reapers or mowers, horserakes, thrashing machines, and fanning mills. This disparity was true across farmers of similar age. It seems that a lack of capital associated with tenant or share farming inhibited these individuals from purchasing farming equipment.²¹ Alternately, the landowner may have supplied the tools as part of the leasing contract and, therefore, the tools might not have been noted under the tenant's entry in the census. Owner farmers certainly seemed more willing to invest in large, expensive farming equipment. Based in Hamilton, Ontario, L.D. Sawyer and Co. manufactured a wide variety of farming equipment in the mid to late nineteenth century.

²⁰ Damaris Smith recalled that the 1850s that all the grain in the township was being cut by men with scythes, as the mowers and reapers had not worked their way into the township (Damaris Smith, "Pioneer Wife," p. 5).

²¹ Marr, "Tenant vs. Owner," p. 68.

Two of their most successful machines were "Ball's Ohio Combined Mower and Reaper" and "Wood's Mower."²² The Ohio, according to *The Globe* on July 21, 1864, "was the best mower at the previous trial, and we regard it as having proved itself yesterday the best reaper. It made a good clean cut, left the standing grain in fine order, delivered a good sheaf, and was of light draught."²³ This impressive machine was a significant investment for farmers. The company's 1868 sales catalogue listed individuals who had purchased one of their machines over the past ten years. Thirty of the forty-one names appeared in the 1871 census manuscript for Saltfleet. Of these thirty, twenty-six were purchased by landowners, leaving only four purchased by tenants. Circumstantial evidence, certainly, but still interesting.

The influence of cultural factors on tenancy again follows patterns discussed previously. Farmers born in Canada (mostly in Ontario) and the United States possessed ownership ratios higher than average, as did farmers born in Scotland (see Table 5-8). Individuals born in Ireland and England were much less likely to own land. There still appeared to be a penalty for non-native born residents in Saltfleet, with the exception of those born in the United States. Religious differences, by contrast, appeared not to have influenced ownership patterns. Approximately eighty percent of Anglicans, Methodists, and Presbyterians owned the land they farmed, indicating little difference amongst

²² "Sales Catalogue for Ball's Ohio Combined Mower and Reaper and Wood's Mower," L.D. Sawyer and Co., 1868, The Ontario Agricultural Museum, Milton, Ontario.

²³ "Sales Catalogue for Ball's Ohio," p. 14.

Protestant faiths (see Table 5-9). Only farmers in the "Other" category differed

significantly from the average, for only fifty-six percent of them owned farms.²⁴

Country of Birth	Ownership	Count
England	59.5%	30
Ireland	70.8%	20
Scotland	80.0%	22
Canada	80.6%	131
United States	90.5%	19
Total	77.3%	243

 Table 5-8: Percentage of Landowners by Country of Birth of Heads of Household,

 Saltfleet Township, 1871.

Table 5-9: Percentage of Landowners	by Religion of	f Heads of Household
Saltfleet Town	ship, 1871.	

Country of Birth	Ownership	Count
Anglican	79.2%	48
Methodist	79.4%	170
Presbyterian	81.3%	32
Other	55.6%	27
Total	77.3%	277

The variations in wealth did not have a statistically significant relationship with cultural factors when other variables were taken into consideration. Only settlement persistence and a farmer's age proved significant in a logistic regression of land ownership on the usual environmental, cultural, and temporal variables (see Table 5-10). The individuals most likely to own land (93%) were farmers over forty years old who had farmed the same or adjacent property for over ten years or who descended from a Saltfleet farmer (see Table 5-11). The least likely (52.1%) were twenty to forty year olds who had farmed the same land for fewer than ten years or had not descended from a local farmer. The importance of settlement persistence is clear and seems greater than the

²⁴ The "Other" category included a number of individuals with no religion or none given, as well as three Baptists and five Catholics.

impact of age, as older farmers were only fourteen percent more likely to own land than

their younger peers.

Independent Variable	Dependent Variable Owner / Tenant
n	241
df	226
Constant	0.795
{C} Country of Birth	0.314
{C} Religion	0.843
{C} Location	0.682
{C} Drainage	0.594
{C} Red Hill	0.272
{C} 250m of Water	0.784
{C} Settlement Persistence	< 0.001 *
Age	0.013 *

Table 5-10: Wald Tests for Logistic of Owner-Tenant on	
Environmental, Cultural, and Temporal Variables, Saltfleet Township,	1871. ²⁵

* Significant at the $\alpha = 0.05$ level

** Significant at the $\alpha = 0.1$ level

Table 5-11: Percentage of	Ownership by A	ge and Settlemer	nt Persistence of
Heads of Househ	old, Saltfieet To	wnship, 1861 - 1	.871. ²⁶

Data		Settlement	Tetel	
	No Ye		Yes	rotar
	20 40	54.3%	76.2%	68.4%
Farmers Age Group	20 - 40	(35)	(63)	(98)
	52.1%	93.0%	81.8%	
	Over 40	(48)	(128)	(176)
Тс	otal	53.0% (83)	87.4% (191)	77.0% (274)

The fact that young men with strong community ties had quite a high ownership rate when compared to others farmers in the township suggests that, between 1861 and 1871, parents in Saltfleet had implemented land transfer strategies quite different from

²⁵ Religion proved statistically insignificant when each faith was coded separately (as in Table 5-9 – "Other" was excluded) or when faiths were coded as "evangelical" and "non-evangelical."

²⁶ Counts in parentheses.

farmers in Peel County.²⁷ Rather than accumulate larger properties, it seems that Saltfleet parents were dividing properties amongst their children, quite often long before the death of the father. For example, Elisha Harris, a New Connexion Methodist born in the United States, owned 155 acres of land in 1861 on lots 33 and 34 in the broken front and first concession. By 1871, he had divided some of his rather large farm amongst four of his sons: John gained title to thirty-five acres of the family farm, while George, Alfred, and Elisha Jr. each farmed as tenants twenty, twenty-five, and twenty acres, respectively on adjacent farms. William was set up with ninety acres elsewhere in the township. In a traditional wheat farming district, four of the five son's properties could hardly be considered sufficient to produce satisfactory returns on their labour.²⁸

Voor	Relative to Escarpment		Total
i edi	Above	Below	TUtal
1851	66.0%	71.6%	68.5%
	(94)	(74)	(168)
1861	58.7%	63.4%	60.9
	(126)	(112)	(238)
1871	78.9%	74.4%	76.8
	(142)	(90)	(263)

Table 5-12: Ownership Ratios Relative Location to Escarpment, Saltfleet Township, 1851-1871.²⁹

Inequality

As there appear to be no surviving assessment rolls for Saltfleet Township near 1871, measures of inequality (and wealth indicators) are restricted to two of the three statistics used in prior chapters, total acreage and farm worth. The distribution of wealth

²⁷ See Gagan, Hopeful Travellers, Ch. 3.

²⁸ It is highly unlikely that a family would have been able to derive sufficient income from twenty acres regardless of the crops being raise. More than likely, a farmer tilling twenty acres supplemented their income through off-farm wage labour. See Darroch, "Scanty Fortunes," p. 626 and McInnis, "Marketable Surpluses," p. 411 and Table 4.

in 1871, as indicated by the Gini coefficient of farm acreage amongst Saltfleet residents, suggests that the distribution of land in 1871 remained similar to previous decades (see Table 5-13). The distribution was consistent across age groups. The similarity in inequality between the two census years is somewhat peculiar given that recent scholarship has noted distinct methods of recording landed families between the two census years. Gordon Darroch noted that the 1861 census was more interested in propertied families "that were locally known to be established on the land, rather than as estimates of the full array of forms of land occupancy."³⁰ Enumerators for the 1871 census appeared more willing to include all forms of agricultural occupancy including very small farms, which Darroch noted were far more represented in the 1871 census than 1861.³¹ Part of the effect of this broader inclusion policy might have been mitigated by this study's exclusion of all farms smaller than five acres; however, one would still expect the overall measure of inequality for 1871 to be higher than the previous year.

	Age of Settler		
Data	40 Years Old and Younger	Over 40 Years Old	
Total Acres	0.286	0.297	
Farm Worth	0.457	0.475	

Table 5-13: Gini Coefficients for Total Acres and Farm Worth by Age of Heads of Household, Saltfleet Township, 1871.³²

The level of inequality based on the distribution of farm worth, in contrast,

increased significantly when compared to 1861 levels. For farmers over forty years old,

²⁹ Counts in parentheses.

³⁰ Darroch, "Scanty Fortunes," p. 628.

³¹ Darroch, "Scanty Fortunes," p. 628.

³² A complete graph of Gini coefficients for the entire study period can be found in Chapter 7, Figure 7-7.

the index of inequality rose from 0.291 in 1861 to 0.475 in 1871. This increase paralleled the rise in inequality that took place amongst younger men over the previous decade, which rose from 0.330 to 0.457. Any attempt to account for this increase in inequality of farm worth over the previous decade will be problematic. At least part of the difference might lie in the changing nature of land use with respect to crop choices, particularly for farmers below the escarpment, who were in a better position to take advantage of increasing markets for fruit than those above the escarpment. This level of inequality amongst farmers in the township proved remarkably similar to those obtained by Livio Di Matteo and Peter George in their study of probated documents in Wentworth County for 1872, although it should be noted that probated records do not necessarily include only heads of household. Their study, based on a measure of the disparity in wealth amongst inventories at the time of death, produced a Gini coefficient of 0.472.³³

Farm Worth and Total Acreage

The analysis of wealth indicators for the 1871 census for Saltfleet allows for a direct temporal comparison with Darroch and Soltow's broader study. At first blush, comparisons of mean farm acreage and farm worth based on religious affiliation suggest that Saltfleet's farmers did follow provincial trends. Both Methodist and Presbyterian farmers owned properties slightly larger, and possessed a farm worth approximately \$100 higher, than their Church of England brethren (see Table 5-14). An analysis of variance (ANOVA) of total acres on religion, for example, produced a statistically significant

³³ Di Matteo and George, "Patterns and Determinants," p. 23. The distribution of wealth in Saltfleet and rural Wentworth was much lower than that within the City of Hamilton (0.732). Although probated wills are a fundamentally different measure of wealth than farm worth, the distribution between the richest and the poorest allows for some comparison.

result (n = 214, df = 208, $R^2 = 0.067$, p = 0.017). These results generally coincide with Darroch and Soltow's conclusions, in that the average Baptist, Methodist, and Presbyterian farmer held more acreage then his/her Anglican and Catholic counterpart. This observation would suggest a link between wealth and the perceived moral rectitude of the more evangelical in Saltfleet.³⁴

Religion	Total Acreage	Farm Worth (\$)	Count
Anglicans	88	1481	38
Methodist	92	1583	135
Presbyterians	94	1584	26
Other	45	1146	15
Total	88	1535	214

 Table 5-14: Average Total Acreage and Farm Worth (\$) of Owner Farmers by

 Religion of Heads of Household, Saltfleet Township, 1871.35

The results of the influence of ethnicity and nativity on average levels of wealth, by comparison, provide a different perspective from the conclusions drawn from the larger study. When contrasted directly, the average owner farmer living in Saltfleet but born outside Canada worked a farm of seventy-four acres and had a farm worth of \$1219. This compares with the average Saltfleet owner farmer born in Canada who worked a ninety six acre property and had a farm worth of \$1701 (see Table 5-15 and Table 5-16). This considerable gap suggests that native born farmers in Saltfleet had some advantage. Additionally, when based solely on farmers' country of birth and not ethnicity, there remained a strong association between high levels of wealth and those born in Canada and the United States. As indicated in Table 5-17, farmers born in the England, Scotland,

³⁴ Darroch and Soltow, Property and Inequality, p. 51,

³⁵ There were only two Baptists and three Roman Catholics that owned farms in Saltfleet in 1871. Because of the small numbers, I grouped these five individuals into the 'other' category along with ten others for this table.

and Ireland had smaller properties and a lower farm worth than farmers born in Canada and the United States, supporting conclusions drawn in chapters three and four. This finding differs from other studies which found no penalty for foreign born settlers.³⁶ Notice, again, that larger property holdings did not translate directly into greater farm worth. For example, although Irish-born farmers owned, on average, twenty-nine acres less than their English or Welsh-born neighbours, their farm worth was greater.

Foreign Born Total Data No Yes English / 87 78 84 Welsh (73) (31) (104) 115 57 88 Irish (35) (19) (41) 75 80 89 Origin Scottish (21) (8) (13) 103 103 103 German (37) (45) (8) 57 57 ---Other (0) (3) (3) 96 74 88 Total (140) (74) (214)

Table 5-15: Total Acreage by Origin and Foreign-Born of Owner Heads of Household, Saltfleet Township, 1871.³⁷

³⁶ As mentioned previously, this would include Darroch and Soltow, *Property and Inequality*, p. 55 and Akenson, *The Irish*, p. 247. For example, in this study of Saltfleet the average settler of Irish descent born in Canada had 115 acres, while the average Saltfleet settler of Irish descent born in Ireland had fifty seven acres.

³⁷ Counts in parentheses.

Data		Foreig	Foreign Born	
_	Jala	No	Yes	
	English / Welsh	1767 (73)	1106 (31)	1570 (104)
	Irish	1742 (35)	1151 (19)	1468 (41)
Origin	Scottish	1573 (8)	1324 (13)	1419 (21)
	German	1576 (37)	1851 (8)	1625 (45)
	Other	 (0)	672 (3)	672 (3)
T	otal	1701 (140)	1219 (74)	1535 (214)

Table 5-16: Farm Worth by Origin and Foreign-Born of Owner Heads of Household, Saltfleet Township, 1871.38

Table 5-17: Average Total Acreage and Farm Worth (\$) of Owner Farmers by Country of Birth of Heads of Household, Saltfleet Township, 1871.³⁹

Religion	Total Acreage	Farm Worth (\$)	Count
England - Wales	84	1059	25
Ireland	55	1142	17
Scotland	70	1253	12
Ontario	96	1709	136
United States	82	1513	19
Other	84	1273	5
Total	88	1535	214

Variations in patterns derived from means in Saltfleet based solely on cultural factors do not negate or even cast real doubt on the findings from the provincial study. A micro study would rarely find results directly in line with a macro study. The question which this and the previous two chapters seeks to address is whether the variations in wealth associated with cultural factors remain significant when settlement persistence and land quality are included in a statistical analysis. As presented in Table 5-18, the answer,

³⁸ Counts in parentheses.

³⁹ There were only two Baptists and three Roman Catholics that owned farms in Saltfleet in 1871. Because of the small numbers, I grouped these five individuals into the 'other' category for this table.

at least for religion, is clearly no. With respect to both farm worth (p = 0.409) and total acreage (p = 0.207), the religion of heads of household appear statistically insignificant in the regression, meaning that variations in wealth between farmers of different faith could readily have arisen by chance. The same is true for the country of birth of heads of households with respect to farm worth. The relationship between country of birth and total acreage, however, does appear significant. The advantage of farmers born in Ontario, and to a lesser extent the United States, reinforces the conclusion that there existed a penalty for foreign born farmers, at least in Saltfleet.

	Depender	nt Variable	
Independent Variable	Farm Worth ⁴⁰	Total Acreage ⁴¹	
n	189	189	
df	175	175	
R² p	0.196 < 0.001 *	0.187 < 0.001 *	
Constant	< 0.001 *	< 0.001 *	
{C} Country of Birth	0.179	0.005 *	
{C} Religion	0.409	0.207	
{C} Escarpment	0.007 *	0.846	
(C) Drainage	0.442	0.011 *	
{C} Red Hill Creek	0.394	0.910	
{C} 250 Meters from Water	0.825	0.133	
{C} Settlement Persistence	0.033 *	0.031 *	
Age of Settler	0.051 **	0.013 *	

 Table 5-18: Results of Regressions of Two Measures of Wealth on Environmental, Cultural, and Temporal Variables, Saltfleet Township, 1871.

* Significant at the $\alpha = 0.05$ level

** Significant at the $\alpha = 0.1$ level

⁴⁰ There were no case deletions. The dependent variable was transformed with a square root function to correct for a non-normal distribution.

⁴¹ There were no case deletions. The dependent variable was transformed with a square root function to correct for a non-normal distribution.

If this study had been limited to the 1871 census and total acreage was the only gauge of wealth, then the influence of the Niagara Escarpment could also be challenged. Not only did f-tests for the above regression produce a *p* value of 0.846 for the escarpment variable, but an examination of means showed a parity in farm size between the two regions. The average farm below the escarpment (88 acres) was actually one acre smaller than the average farm above the escarpment (89 acres). This had not always been the case. The average property size below the escarpment was decreasing over time as increased demographic and agriculture pressures made smaller fruit-oriented farming a practical reality. The average property size above the escarpment remained relatively constant over the same time period, as farmers continued traditional mixed-farming more suitable to their particular environmental situation. The distribution of farm acreage across the township can be seen in Figure 5-1. The three largest farms in the township were below the escarpment but there were also a large number of very small farms.⁴²

⁴² The farms belonged to Peter Mortimer, John Smith, and Albert Carpenter.



Figure 5-1: Average Farm Size in Acres, Saltfleet Township, 1871.

The equality of average farm acreage, however, did not mean that the farm worth for both groups of farmers was similar. The environmental and settlement persistence advantages associated with farms below the escarpment were not eliminated because of the increased number of smaller farms that emphasized fruit growing that appeared over the past ten years. In fact, the average farm worth below the escarpment was \$1900 compared to \$1239 for farms above the escarpment. The cumulative advantage of significant variables in the regression of farm worth presented in Table 5-17 is dramatic. A young farmer who owned a new property above the escarpment had an average farm worth of \$897 (see Table 5-19). John Bedell was one such farmer. A twenty-two year old Anglican farmer of English descent, Bedell owned one hundred acres on lot six in the seventh concession, of which eighty had been cleared. In 1871, he had a farm worth of \$978, of which \$550 came from livestock, \$382 from produce, and \$46 came from animal products and domestic production. He did not appear to grow any fruit. By comparison, the average older farmer who spent at least ten years on a farm below the escarpment possessed a farm worth of \$2191, or approximately 220 percent more. Samuel Green, for example, owned one-hundred acres on lot 20 in the third concession, which he had farmed for at least ten years. He was a Methodist farmer of German descent, born in Canada. His farm worth totaled \$1872, which was comprised of \$956 from livestock, \$830 from produce (of which \$225 was derived from fruit), and \$86 from other sources. Both Green and Bedell had one-hundred acre properties, but Green's farm worth was almost double Bedell's. The difference stemmed not from the two farmer's cultural differences, but came from their time on the land, age, and the location of their farm.

Settlement	Condensed Age	Relative to Escarpment		Total
Persistence	(Years)	Above	Below	IUIdi
	20 - 40	897 (9)	961 (8)	927 (17
INO	Over 40	953 (17)	1037 (7)	978 (24)
Vaa	20 - 40	1240 (25)	1821 (21)	1505 (46)
165	Over 40	1375 (59)	2191 (53)	1761 (112)
Т	otal	1335 (84)	2086 (74)	1687 (2158)

 Table 5-19: Estimated Total Farm Worth of Owner Heads of Household by Location

 Relative to Escarpment, Age, and Settlement Persistence, Saltfleet Township, 1871.

A Crisis in Land

Before attempting to explain the changes in farming practices and land use in Saltfleet that resulted in decreasing farm size in Saltfleet between 1851 and 1871, it would be helpful to look at other interpretations of settlement patterns in southern Ontario. The historiographical discussion regarding the availability of land in southern Ontario after mid-century remains unresolved. David Gagan, in his groundbreaking work on Peel County, argued that access to a reasonably priced and productive farm was becoming more difficult. A scarcity of desirable land affected family inheritance strategies. In earlier decades, property was plentiful and parents could provide for the future of all their children without sacrificing the family's security. Yet, at the close of the 1850s, there was a change in the expectation of all family members, especially after the enormous period of farm expansion in the previous decades. As the land crisis and economic slump developed concurrently, children remained longer within the family home, depending on the family income. Furthermore, the second, third and fourth sons and probably all of the daughters could not be sure of inheriting a sizeable allotment of land or capital after the death of their parents.⁴³ According to Gagan, newly arrived settlers who lacked this familial-social safety net had an even more difficult time breaking into the landed class in Peel County. Land, if not inherited,

required a slow process of vocational and, if ... successful, economic mobility which in turn was dependent on persistence in this place where there was a fairly high drop out rate, even among established farmers. Yet few of the landless migrants who passed through Peel willingly endured this time-serving. They came and left at a great rate, temporarily finding a niche vacated by some previous drop-out following the same well-worn paths to full employment and as yet unfulfilled dreams of economic security and social standing.⁴⁴

Essentially, there was too little land and there were too many people.

In Peel County, farmers maintained larger holdings in response to changes in the wheat economy, increasing the average size of their farms from 100 acres to 130 acres between 1851 and 1861, and from 130 to 142 between 1861 and 1871 in order to

⁴³ Gagan, Hopeful Travellers, p. 147.

⁴⁴ Gagan, Hopeful Travellers, p.148.

maximize farm productivity.⁴⁵ These landed families could no longer replicate this process for their children. They adapted to the increasing demographic pressure by making alternative inheritance arrangements, delaying marriage, and reducing family size, while others sold out and moved the family elsewhere, to America or the newly opened-up Rupert's Land. Despite the increased population and economic pressures, these families resisted splitting the land into smaller and smaller parcels.⁴⁶ This crisis in land, according to Gagan, had political implications at the national level, including pressures to annex Rupert's land for the purposes of expanding Canada West's frontier.

Darroch and Soltow's provincial sample of the 1871 Census suggests that mid-Victorian Ontario did not see a crisis in land. The availability of new lands throughout the province generally supported the increasing population. Instead of a crisis, new farmers and sons who had come of age were able to obtain land:

The evidence suggests that ... farmers tended to become landholders at a rate of about three percent per year, while the population of farmers also increased about three percent per year, with few of the youngest having initial ownership. A largely unchanging structure of landed inequality was compatible with relatively visible and open processes of individual and family access to land.⁴⁷

For the province, according to Darroch and Soltow, there was no single instance of crisis in land availability. They argued that there was room within the province, although one suspects that many individuals within this three percent found marginal land in or near the Shield, the back townships, and isolated tracts on the colonization roads of eastcentral Ontario. Because Darroch and Soltow viewed raw acreage as a surrogate for

⁴⁵ Census of the Canadas, 1860-61, Vol. I, p. 155-159. Gagan, Hopeful Travellers, p. 44-48.

⁴⁶ Gagan, *Hopeful Travellers*, p. 40-60.

⁴⁷ Darroch and Soltow, Property and Inequality, p. 39.

wealth in their chapter on rural farming communities, the accumulations of farmland in these less desirable areas would not be problematic for their model.⁴⁸ However, homesteading one-hundred acres in Bruce County, for example, may not have been a satisfactory solution for the individuals involved to the increased inter-generational land pressures in Peel or Saltfleet.

Peel County offered farmers a particular set of conditions for growing wheat. Not only was the county climatically and environmentally well suited to growing wheat, but rail lines gave farmers access to burgeoning local markets and fluctuating overseas markets. Farmers assessed this potential through their intimate understanding of their own soil, and tailored their property acquisitiveness and crop choices to this particular set of conditions. Their assembly of larger properties increased the pressure on land in Peel County, which had become more focused on wheat than most other counties. As the 1870s approached, Peel farmers decided not to subdivide their properties in order to provide farms for their children or to raise capital by selling parts to newcomers. What was happening at the head of Lake Ontario?

Agricultural and settlement patterns in Wentworth and Saltfleet are not consistent with those found by Gagan for Peel County. While the average size of farms in Wentworth County increased from 1851 to 1861 by approximately five acres, it decreased by approximately seventeen acres between 1861 and 1871. This differs dramatically from the forty two acre increase in farm size in Peel over the same twenty year period. The average farm size in Saltfleet (including tenants) actually decreased

⁴⁸ As mentioned previously, Darroch and Soltow do not assume that lands in the north were the same value of lands in the south. They did exclude this fact from their statistical analysis, concluding that their settlement model was sufficiently robust to regional variations.

between 1851 and 1861 from approximately 114 acres to 105 acres and decreased again over the next ten years by an additional 17.5 acres. Although Saltfleet farmers did not increase the size of their farms to dedicate more land to wheat, they, like Peel farmers, acted out of their intimate understanding of their own farms and the economic potential their land offered. Hurt already by declining wheat yields stemming from over eighty years of farming and increased insect depredations, Saltfleet farmers had little incentive to try to maximize wheat yields and returns by increasing property size. Instead, the environmental characteristics that Saltfleet presented farmers prompted different decisions. The rural entrepreneurs who intimately understood their land tailored their crops to suit the environment. They addressed their crisis in land by emphasizing crops that required fewer acres. Fruit farming, particularly appropriate to the lands below the escarpment, involved smaller tracts because a fruit farm of twenty acres, for example, required a greater investment in time, initial capital, and labour than a twenty-acre wheat farm.

The volatility of the grain market and the decline in wheat yields troubled the Department of Agriculture in 1868. One of the Department's most important recommendations was that Ontario farmers should diversify by planting a wider variety of crops in order to be less dependent, as they saw it, on wheat. Tom Nesmith believed that the primary response to both the Department's call for change and the push for improved husbandry could be found in the betterment of livestock.⁴⁹ To a degree this is true, but it was certainly not universal. In Saltfleet, the seeds of change had already been planted. The township's farmers had begun diversifying their crops, growing more fruits

⁴⁹ Nesmith, "The Philosophy," p. 79.

and vegetables where it was appropriate. Specializing in the improvement of livestock only took place in townships and counties where that particular endeavour was appropriate; for example, the London region. In the Red Hill Creek Valley, where the land proved particularly amenable to grazing, farmers followed this course for some years. The peculiarities of crop allocation in individual townships suggest that provincial or county statements of agricultural patterns mask important variations. Saltfleet's particular climatic and geophysical characteristics presented its farmers with different prospects from those found elsewhere in the province. Increased wheat pests, overfarming, and the increased opportunities offered by fruit growing turned many farmers away from traditional wheat farming.

The patterns of landownership in Saltfleet, when compared to Gagan's study of Peel and the broader study of Darroch and Soltow, suggest an advancing crisis in land ownership that struck first at the oldest and most developed settlements. Saltfleet, one of the earliest settled townships in the province, faced the same difficulties that Peel County residents faced; namely, increasing population pressures from procreation and immigration with decreasing availability of land. Rather than increase land holdings as part of an overall inter-generational family strategy, farmers in Saltfleet, starting in the early 1860s, began dividing their properties into smaller farms, in particular those farms below the escarpment. They responded to opportunities offered by Saltfleet's environment and reacted against stand-pat practices that presented no opportunities for improving their family's prospects.

Agricultural Specialization

The patterns of specialization, influenced by local environmental and economic factors that appeared in earlier decades, accelerated between 1861 and 1871. A farmer's skill at recognizing these advantages and then tailoring efforts to conditions is difficult to examine by the direct evidence of diaries or letters. Such sources are rare. It is worth reiterating that, for the most part, this increased specialization was done within an overall context of mixed agriculture. Even the farmer most dedicated to wheat, livestock, or fruit-farming grew a variety of crops in order to ensure that a bad storm, an early frost, or a particularly invasive pest did not wipe out an entire year's efforts. Damaris Smith recalled

that it was one thing to be a good grain farmer and another to be a good stock farmer and a good grain farmer, and that both qualifications are rarely found in one and the same person. The more is the pity for both are necessary to any great degree of success on land.⁵⁰

Within this pattern of mixed agriculture, however, farmers concentrated their efforts on certain types of crops or livestock depending on the environmental characteristics they faced. The most dramatic environmental feature of the township continued to condition the most significant differences in how farmers interacted with the land.

The Niagara Escarpment

Most farmers in the township (sixty-four percent) grew at least some fruit. Apples, given their hardiness, proved popular amongst farmers both above and below the escarpment. Fruits that lacked the hardiness of apples, such as grapes, melons, and pears, were grown primarily, but not exclusively, below the mountain. The investment of time,

⁵⁰ Damaris Smith, "Pioneer Wife," p. 7.

labour, and capital in growing fruit satisfied both market and domestic needs. Damaris Smith's first efforts to increase the farm's diversity of crops emphasized the necessity of fruit and vegetables for the family.⁵¹ Her early efforts occasionally produced sufficient quantities in some years to sell at market. She recalled that in one year, she "raised thirty dollars worth of hubbard squash with no great amount of labour laid out either."⁵² The market opportunities offered by growing fruit accelerated the township's move towards fruit farming through to 1871. The total value of fruit production for the township in 1861 was, according to the enumerator, \$11,921 or approximately equivalent to fortythree percent of the value of the township's total wheat production. By 1871, the worth of the township's fruit production was \$26,122, or approximately equivalent to fifty-six percent of the township's total wheat production. The rapidly increasing importance of fruit to farmers below the escarpment can be illustrated with a similar comparison. In 1861, the income that agriculturalists below the escarpment derived from fruit was approximately equal to sixty-four percent of the income they derived from wheat. Just ten years later, the income from fruit approximated ninety-four percent of their wheat income. In contrast, farmers above the escarpment realized incomes from fruit equivalent to approximately nineteen percent (1861) and twenty-three percent (1871) of their income derived from wheat.

The environmental advantages of farming below the escarpment could best be seen in the per acre production of fruit. As seen in Table 5-20, fruit production below the escarpment was dramatically higher. The total value of grapes produced below the

⁵¹ Damaris Smith, "Pioneer Wife," p. 10.

⁵² Damaris Smith, "Pioneer Wife," p. 10.

escarpment (\$2025 – see also Figure 5-2), for example, was more than sixteen times that of the farms above the escarpment (\$124). The production of other fruit, such as pears and currants, was more than forty-five times larger, while apple production was more than two and a half times larger. Not only was more fruit grown below the escarpment, but these farmers also achieved much higher value per acre. The value of all fruit per orchard acre for the farmer below the escarpment was \$54.26 compared to only \$38.34 for those on the mountain.

Emile Turne	Dete	Relative to Escarpment			Total	
Fruit Type	Uata	Above	Below	Split	lotai	
	Pounds per Farm	77.50	259.62	113.33	221.70	
Granes	Value per Farm (\$)	0.87	16.74	5.67	8.06	
Giapes	Total Value (\$)	124.00	2025.00	68.00	2217.00	
	Count	8	39	3	50	
	Bushels per Farm	88.77	215.69	119.83	151.40	
Apples	Value per Farm (\$)	40.16	120.79	105.45	78.48	
Apples	Total Value (\$)	5702.40	14615.04	1265.44	21582.88	
	Count	73	77	12	162	
	Bushels per Farm	2.55	26.16	9.33	20.70	
(Pears, Currants, etc.)	Value per Farm (\$)	0.34	18.01	7.93	8.44	
	Total Value (\$)	47.60	2179.40	95.20	2322.20	
	Count	11	49	6	66	

Table 5-20: Fruit Production and Value by Location Relative to Escarpment,Saltfleet Township, 1871.



Figure 5-2: Value of Fruit excluding Apples, Saltfleet Township, 1871.

Although average farm size continued to decrease and the interest in fruit growing increased as indicated in the 1871 census, a preliminary examination of agricultural patterns suggests that small-scale farmers were not the prime movers in cultivating grape vines and apple trees. Almost all farms larger than one-hundred acres (91%) dedicated at least some land to fruit growing, whereas only forty-seven percent of farms smaller than fifty acres grew grapes, apples, or other types of fruit. Stated differently, the average farm size for fruit growers was approximately one-hundred acres, compared to only sixty-three acres for non-fruit growing farms. These mean tendencies belie an important aspect of the move towards fruit farming in Saltfleet. There were forty-one farms in Saltfleet between ten and fifty acres that, according to the census, engaged in some sort of fruit production, and sixty-seven farms larger than one-hundred acres which also produced fruit. The smaller farms, however, allocated 16.7 percent of their total acreage

to orchards or gardens, a substantial portion of their farm. The larger farms dedicated only 3.5 percent. More importantly, twenty-six of the forty-one small farms (63%) were located below the escarpment where farmers devoted almost twenty-three percent of their total acreage to growing fruit.⁵³ The conclusion to be drawn is that small-scale farmers who invested in fruit growing below the escarpment in Saltfleet committed themselves heavily, allocating a significant portion of their lands to these crops, although other crops and livestock were also cultivated. This shift was not a radical departure from previous agricultural pursuits, but an important acceleration of established trends. Furthermore, this reiterates the point made in the previous chapter that small farms were not necessarily smaller versions of big farms. The allocation of lands to certain crops could be quite different.

The small-acreage fruit farmers below the escarpment were relatively young, which suggests that subdividing the land into smaller parcels appropriate for fruit growing also gave heads of households an opportunity to provide farmland, either through purchase or lease, for their children. In other words, it seems plausible that Saltfleet farmers found a different remedy for demographic pressures and land scarcity than their contemporaries in Peel County. As seen in Table 5-21, the average size farm for twenty to forty year olds below the escarpment was 68.4 acres compared to 97.7 acres for those over forty, a difference of 29.3 acres. Farms above the escarpment, where fruit growing was far less pronounced, did not see the same dramatic difference in property

⁵³ Eleven of the forty-one small-scale farmers produced fruit on top of the escarpment. These farmers also devoted a higher percentage of their total acres to gardens, but only 11% compared to the 22% of those who farmed below the Mountain.

size between the two groups. Farmers above the escarpment, who were older than forty, had properties only 5.8 acres larger than their younger counterparts.

Average Farm	Age of Head	Age of Head of Household		
Size in Acres	20 - 40	<u>Over</u> 40	IUla	
Above Escarpment	82.5	88.3	86.3	
	(49)	(91)	(140)	
Below Escarpment	68.4	97.7	86.8	
	(45)	(76)	(121)	
Total	75.7	92.6	86.5	
	(94)	(167)	(261)	

 Table 5-21: Average Farm Size in Acres by Age of Heads of Households, and Location

 Relative to Escarpment, Saltfleet Township, 1871.54

As their land was not as suitable for fruit, farmers above the escarpment emphasized a more traditional form of mixed agriculture. Farms above the escarpment produced slightly higher yields of wheat per acre, fifteen bushels per acre versus fourteen (see Table 5-22). This per acre advantage generated a higher return of spring wheat for these farmers, who obtained an average of \$42 per farm compared to \$30 for farms below the escarpment. The vast majority of wheat farmers above the escarpment (88%) grew spring wheat, taking advantage of the suitability of the soil, whereas only fifty-four percent of wheat farmers below grew spring wheat. Additionally, the lands above the escarpment appeared more suitable to farmers wishing to sow oats, as they received approximately \$60 per farm compared to \$42 for farmers below the escarpment.

⁵⁴ Counts in parentheses.

Earming Characteristic	Relative to	Total	
	Above	Below	
Wheat per Acre	15.0	14.0	14.5
	(125)	(94)	(219)
Average Value of Spring Wheat	\$ 43	\$ 30	\$ 37
	(98)	(51)	(149)
Average Value of Fall Wheat	\$ 137	\$ 135	\$ 14
	(111)	(86)	(197)
Average Value of Oats	\$ 60	\$ 42	52
	(117)	(80)	(197)

 Table 5-22: Wheat and Oats Production by Location relative to Escarpment,

 Saltfleet Township, 1871.55

The continued dependence on grains especially on lands above the escarpment is supported by other, more indirect, evidence. As mentioned previously, L.D. Sawyer and Co. manufactured two successful machines, namely the Ball's Ohio Combined Mower and Reaper and Wood's Mower.⁵⁶ The company's 1868 sales catalogue listed the individuals who had purchased one of their machines over the past ten years. Thirty of the forty-one names listed in the Sawyer catalogue for Saltfleet appeared in the 1871 census. Almost twice as many farmers above the escarpment purchased a machine from the Hamilton company as farmers below the escarpment.⁵⁷

Red Hill Creek Valley

Farmers living in the Red Hill Creek Valley continued to emphasize the strengths of their particular agricultural setting by focusing on livestock. In 1871, the average farm in the valley was much smaller than the township average, each farm amounting to an

⁵⁵ Counts in Parentheses.

⁵⁶ "Sales Catalogue for Ball's Ohio Combined Mower and Reaper and Wood's Mower," L.D. Sawyer and Co., 1868, The Ontario Agricultural Museum, Milton, Ontario, p. 14.

⁵⁷ "Sales Catalogue for Ball's Ohio," p. 14.

average of sixty-nine acres compared to eighty-eight for the rest of the township (Table 5-23). Although the farms were smaller, farmers in the valley allocated 32.7 percent of this land to pasture where other farmers in the township allocated only 20.6 percent of their total acreage. This specialization in livestock, based on the appropriateness of the land, proved advantageous. Valley farmers possessed an average livestock value per farm acre that was 150 percent of that owned by farmers outside the valley. William Spera, for example, who was discussed in the previous chapter, had managed to increase the number of livestock in his farm since 1861. By the time of the 1871 census, he had thirty cattle, twenty-one sheep, twenty-five swine, two milch cows, five horses and one pony.

Earming Characteristic	Red Hill C	Total	
	Inside	Outside	Total
Average Total Acres	69.0 (22)	88.2 (253)	86.7 (275)
Average Total Pasture Acres	22.6 (16)	18.2 (209)	18.5 (225)
Percentage Average Pasture Acres of Average Total Acres	32.7%	20.6%	21.4%
Average Total Value of Livestock	\$ 1108	\$ 990	\$ 1000
Average Total Value of Livestock per Average Total Acre	\$ 16.05	\$ 11.23	\$ 11.54

 Table 5-23: Agricultural Characteristics by Location Relative to the Red Hill Creek Valley (All Farmers), Saltfleet Township, 1871.

250 Metres from Water

Farmers near a reliable surface water also practised relatively more intensive livestock production. Damaris Smith noted that and that its absence could add significant challenges to raising cattle, adding unrelentingly to the burdens of the farm wife.⁵⁸ She

⁵⁸ Damaris Smith, "Pioneer Wife," p. 5.

noted that after returning from market late in the evening, it would often take hours to round up the cows for milking as they would often wander more than a mile in search of grazing land and water. The Smiths, who had four shallow wells and a nearby river, found their property bereft of water in times of drought. They only solved their problems with the drilling of a deep well.⁵⁹ Being close to water gave some Saltfleet farmers an advantage upon which many capitalized. As seen in Table 5-24, farmers near a reliable water source possessed an average of \$1083 worth of livestock compared to \$829 for farmers away from the same resource. Even though both groups dedicated approximately the same percentage of their land to pasture, those farmers near water possessed an average total value of livestock per acre of \$12.79 compared to only \$ 9.14 for other farmers. Cattle and swine, in particular, thrived on the farms near water.

⁵⁹ Damaris Smith, "Pioneer Wife," p. 8. Damaris, in the same paragraph, provided a remarkably personal and touching observation regarding the toil of farm wives: "It was when coming home from some of those excursions to market - after being kept up till midnight the night before, getting things ready, and being obliged to get up at four o'clock in the morning, in order to secure a place in the market - and in driving through the suburbs on our way home, in the evening, I would notice mechanics' wives, sitting in their easy chairs in the front of their houses, enjoying their leisure in the quiet of the closing day, that I have contrasted their lot with mine much to their advantage, looking no farther than the present time. I had to drive many miles, and rush the work after I got home; there would be tea to get, perhaps fires to make, always milking to be done, and I was fortunate if I did not have to go a mile or more for the cows; milk to skim and heat for the calves, milk dishes to wash, besides the ordinary work of attending to the family's needs. Would it be possible for one person to do all of this and do it well and thoroughly? It would depend entirely upon the will power of any woman, aided and supplemented by a sound body. It is small wonder that many mothers come short of the apparent duty. Fortunately I had a constitution uncontaminated by inter-marriage, tight corsets, high heels, or any description of false living."

Earming Characteristic	Within 250	Total	
	Yes	No	
Average Total Acres	84.7 (185)	90.7 (90)	86.7 (275)
Average Total Pasture Acres	18.5 (157)	18.5 (68)	18.5 (225)
Percentage Average Pasture Acres of Average Total Acres	21.8%	20.4%	21.4%
Average Total Value of Livestock	\$ 1083	\$ 829	\$ 1000
Average Total Value of Livestock per Average Total Acre	\$ 12.79	\$ 9.14	\$ 11.54

Table 5-24: Agricultural Characteristics by Location Relative to250 Metres of Water, Saltfleet Township, 1871.

Conclusions

A number of important historiographical factors emerged from an examination of the 1871 census. First, the 1871 data confirm the principal conclusion drawn from the analysis of the two previous decennial censuses. The influence of cultural factors, particularly a farmer's religion, proved insignificant as a factor in shaping the distribution of wealth or land ownership in Saltfleet when environmental and settlement persistence variables are held constant in the analysis. If this conclusion had been reached from the examination of one census year on one measure of wealth (such as total acreage) then it could be challenged as a local aberration or perhaps as a consequence of an insufficient population size. However, the results come from three different measures of wealth and across three separate censuses, and that makes this conclusion much more difficult to dismiss.

Second, if this thesis had only examined the 1871 census then the township would appear relatively uniform in terms of the average acreage between the areas separated by the escarpment (see Figure 5-3). Farmers above and below the escarpment held

approximately the same number of acres, possibly indicating that a similar pattern of development had led to this parity. Without examining the earlier census documents and other primary material, the fundamental differences that shaped these two regions would be unknown. The lands below the escarpment were undergoing a remarkable transformation that resulted from farmers tailoring their crops to the specific environmental conditions in which they found themselves. Farmers, disappointed with declining wheat yields from over-farming and pest incursions, accelerated their shift towards fruit farming. This environmental advantage offered older farmers an opportunity to solve a problem that Peel farmers were not able to address satisfactorily. By purchasing, leasing or willing smaller plots of land, many farmers in Saltfleet proved capable of transferring land from one generation to the next. The lands above the escarpment experienced no such dramatic transformation. Here, the average farm acreage declined much more gradually between 1819 and 1871 (see Figure 5-3). The particular climatic and geophysical characteristics of this region were more suitable to traditional mixed-farming practices, particular grains such as rye, barley, and wheat. Without considering the decades previous to 1871, these distinctions, vital to understanding settlement and agriculture in Saltfleet and southern Ontario in general, might have passed unnoticed.



Figure 5-3: Average Total Acres and Average Orchard Acres (Tenants and Owners) by Location Relative to Escarpment, Saltfleet Township, 1819-1871 (Note Different Scales on Y-Axes).

Third, similarity in average acreage between the two escarpment regions suggests, if an historian used only land as a surrogate for wealth, that the two regions would have possessed relatively similar levels of prosperity. However, the dramatic difference in farm worth between the two regions shows this not to be the case. Clear distinctions emerge that belie the importance of land alone as a measure of wealth. The implications for rural social demographic studies are clear. A direct comparison of settlers' average acreage as a proxy for wealth, which ignores local and regional environmental characteristics that affect the per acre value of this land, could overlook factors too important to dismiss.

The tailoring of crop choices to particular environmental characteristics by farmers in Saltfleet should emerge as no surprise. This fact goes some way to explaining

Gagan's "crisis in land" in Peel County. A number of important factors placed pressures on agriculture shortly after the mid century in Ontario. Fluctuating wheat prices, declining wheat yields, troublesome pests, and questionable markets left many searching for alternatives. In 1868, the Department of Agriculture recommended the diversification of the Canadian farm, focusing less on wheat and more on other crops. Ironically, as has been shown by Douglas McCalla, the Ontario farm had never been truly dependent on wheat. Moreover, as shown in the last few chapters in this thesis, diversification from wheat, at least in Saltfleet, began early in the century. Most farmers continued to practice some form of mixed-agriculture. Within this general pattern, however, farmers tailored their efforts to their own particular environmental conditions. In Peel, the farmers remained dedicated to wheat, enlarging their farms through the 1850s and 1860s. This practice created a number of land-inheritance difficulties. In other regions of Ontario, farmers began specializing in improved livestock. In Saltfleet, fruit proved the key to diversification for those below the escarpment and grain for those above. No one crop in Ontario proved the answer to either the farmer's efforts to specialize or the historian's search for a settlement paradigm. The results here suggest the need for additional studies in different regions, like John Clarke's work on Essex County, that can refine our understanding of variations in settlement, agriculture, and the environment.
-- Chapter 6 --

Science without Progress: The Pseudo-Science of Agriculture in Ontario to the 1870s¹

Well, the track of my beginnings Has been buried 'neath the years For a dozen generations, We have toiled the land here.

> "Pocketful of Gold" Song by Stan Rogers

A popular and professional mania for science co-existed in early Victorian Canada. The prevalence of science, however, is difficult to gauge accurately. Many historians have outlined the importance of the country's participation in advancing technology in this "Age of Science."² W.L. Morton stated that the "true intellectual achievement of Victorian Canada was neither in literature nor theology but in the sciences,"³ with the Canadian government placing the future of the country squarely on science's shoulders. Suzanne Zeller noted in *Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation* that, through a proactive adoption and

¹ The following chapter, particularly in the discussion of agricultural science up to mid century, does not focus exclusively on Saltfleet because I could find only a few contributions to farm journals made by Saltfleet's agriculturalists. This chapter assumes that the debates that occupied farmers throughout the province were of interest also to farmers in Saltfleet.

² David Knight, The Age of Science, (Oxford: Basil Blackwell, 1986).

³ W.L. Morton, "Victorian Canada," *The Shield of Achilles: Aspects of Victorian Canada*, ed. W.L. Morton, (Toronto: McClelland and Stewart Limited, 1968), p. 330. See also Carl Berger, *Science, God, and Nature in Victorian Canada*, (Toronto: University of Toronto Press, 1983).

promotion of transportation and agricultural technologies, the government sought to build and forge a nation using science to "safeguard that existence."⁴ These policies promoted discussions amongst scientists and journalists attempting to reconcile new discoveries and theories with religious and philosophical values.⁵

Many scientists, experimenters, and agricultural technicians believed that the practice of farming would be revolutionized through new knowledge. Enthusiasts recommended that all agricultural practitioners should reject the outmoded farming habits of yesterday and seize new practices informed by science. A column in the *British American Cultivator*, one of Canada's first agricultural journals, noted that

There can be no excuse for the generality of farmers obstinately adhering to the old and often injurious practices of their forefathers by disregarding all new suggestions for an improved system of husbandry, as dangerous innovations upon old established customs.⁶

The editor of this journal, William Graham Edmundson, offered chemical analysis of the soil as an example, as it supposedly gave improving farmers a better understanding of the constituents that provided plants with nourishment. The farmer would derive enormous benefit from a knowledge of chemistry as it "will enable him to understand the chemical explanation of the numerous changes which are continually taking place in the natural actions which it is high privilege to call into his service, to direct in part, and modify

⁴ Suzanne Zeller, *Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation* (Toronto: University of Toronto Press, 1987), p. 269.

⁵ Martin Fichman "Science and Literature: A Bibliography," Victorian Studies Association (Ontario) Newsletter 42 (Fall 1988), p. 17.

⁶ British American Cultivator, Vol. III, No. 10 (October 1847), p. 298. Farm journals provide the majority of the source material for this chapter. As this qualitative material is supported, in places, with quantitative information from the decennial censuses, an effort was made to choose citations from the journals in or near these same years.

in degree."⁷ Much of this scientific knowledge came from the United States and Britain, as few homegrown scientists participated in the discovery process prior to 1850.⁸ Edmundson proposed that, with scientific advances so readily evident in chemistry, geology, and physics, the advent of an agricultural millennium was fast approaching. He declared confidently,

[We] will soon commence taking rapid and powerful strides; that we are about to remove the veil of obscurity and uncertainty, which hangs over so many operations in agriculture, understand every process, and so completely control the growth of plants, as almost to set man free from the labour of tilling the earth by the sweat of his brow.⁹

The agricultural press was enthusiastic about science, but what was the actual content of their pages and how did this material translate into farm practices?

The means of disseminating allegedly scientific information to the farmer was the farm journal. These monthly offerings printed the latest breakthroughs in improved husbandry while still catering to the practical farmer. This dichotomy of discovery and practicality presented an often-contradictory mix of science and folk wisdom. Despite claims of revolutionizing agriculture and easing the farmer's burden, the advice offered in these journals was generally confusing and quite often misleading. The readership, whose basic understanding of scientific principles was questionable, read descriptions of

⁷ The Cultivator, Vol. III, No.4 (June 1847), p. 68.

⁸ Bertram H. MacDonald, "Public Knowledge: The Dissemination of Scientific Literature in Victorian Canada as Illustrated from the Geological and Agricultural Sciences," Dissertation from The University of Western Ontario, London, Ontario, August 1990, p. 5 and 327. See also Derek J. Solla Price, "The Structures of Publication in Science and Technology," *Factors in the Transfer of Technology*, ed. William H. Gruber and Donald G. Marquis, (Boston: M.I.T. Press, 1969), p. 94.

⁹ British American Cultivator, Vol. III, No.2 (February 1847), p. 52.

scientific breakthroughs that were, in many ways, fundamentally flawed. In addition, the journals presented data that often contradicted advice presented the previous year or month. Sometimes conflicting practices were espoused on the same page. Inconsistencies and general ambiguities ensured that any farmer with even the most basic understanding of fertilizers, weed control, and crop rotation could probably have achieved crop yields similar to the most ardent practitioner of improved husbandry. The enthusiasm for science and the discussions about its relationship with theology may have stimulated journalists and religious writers, but its impact on the country's most significant economic activities – agriculture and animal husbandry – was slight.

It has been argued that increased literacy amongst some religious orders, Protestant denominations in particular, went hand in hand with education, increased land ownership rates, and greater property accumulations. Some historians, including Darroch and Soltow, support this point, noting that evangelical orders had a greater inclination towards formal schooling and literacy.¹⁰ One might expect that educated farmers would have a greater interest in improved husbandry, as presented in farm journals, and therefore have enjoyed greater material success. Whether some religious groups were more likely to support education or to participate in improved husbandry, however, is a moot point, for I will show that prior to 1871 improved husbandry gave no real advantage to its adherents.¹¹ The "first principles" of farming (manure, crop rotation, good seed)

¹⁰ Darroch and Soltow, *Property and Inequality*, p. 159. A supporting argument can be found in Katz's "Social Structure," p. 211. As mentioned in the introduction, a contrary position is taken by Denton and George in "Socio-economic Characteristics," p. 107.

¹¹ Additionally, it would have been impossible to use the 1871 census returns for Saltfleet to address material differences between literate and illiterate farmers as only five of the heads of household were listed as illiterate, nor is it clear that a larger township population would have produced results that differed

were all that was required. The complicated regimens of improving practitioners were simply not helpful. If literate farmers in Ontario appear to have had an advantage over their less educated peers, their advantage did not arise from the implementing what they had read.

Agricultural Science to the 1850s

Farm journals remained the most important and popular method of transmitting scientific ideas to farmers and agriculturalists, although they were not always successful businesses. The first farm journals in Upper Canada, the *Upper Canada Farmer* (Cobourg, first published in 1837) and the *Canadian Cultivator and Farmer's Magazine of Useful Knowledge* (St. Catharines, 1839) appeared to fail after their first issue.¹² Canadian farmers who wished to participate in the debates over improved husbandry had to resort to American sources, which had been active since John Stuart Skinner's publication of the *American Farmer* in Baltimore in 1819. *The Cultivator*, first published in Albany, New York in 1834, was probably the most widespread American journal in Upper Canada prior to 1850.¹³ Canadian farmers did not witness a successful, regular journal until Eastwood & Company and William Graham Edmundson published *The British American Cultivator* in Toronto in 1842. Taking the moto "Agriculture not only gives Riches to a Nation, but the only Riches she can call her own," the journal sought to

from Darroch and Soltow's conclusions regarding the association between literacy and wealth as they dealt with the topic in Chapter 4 of *Property and Inequality* with great care.

¹² Fred Landon, "The Agricultural Journals of Upper Canada," *Agricultural History*, Vol. 9, No. 4 (October 1935), p. 167.

¹³ The Cultivator published articles by William Evans, a prominent Lower Canadian farmer, which concerned the education of farmers in Canada.

"create a stimulus for improvement amongst the productive classes."¹⁴ Originally William Evans, a prominent Lower Canadian farmer, edited the journal, but financial difficulties forced Edmundson to take up these duties in April 1843.¹⁵

In January 1847, William McDougall, a Toronto lawyer, and Charles Lindsev. a newspaper editor, published the Canada Farmer in direct competition with the *Cultivator*. A petty, public dispute arose between the two journals, with both editors making snide comments about the other's inability to craft proper sentences, never mind their ability to farm effectively. Edmundson, who had sustained significant losses amounting to £500 by 1848, suggested amalgamating the two. McDougall agreed. Edmundson's misrepresentation of subscription revenue and his failure to hand over the list of subscribers to the new paper resulted in legal action, leading to the seizure of his interest in the journal.¹⁶ McDougall retained control, sharing editorial duties with George Buckland, a prominent Ontario farmer. Real competition to McDougall's paper, now called the *Canadian Agriculturalist*, did not appear until the publication of the *Canada* Farmer in 1864. Gauging the circulation and penetration of these journals into the countryside, especially prior to the 1850s is impossible, amounting to nothing more than "slightly informed speculation."¹⁷ Work in England that examined this problem concluded that

¹⁴ Landon, "Journals," p. 169.

¹⁵ Ann MacKenzie, "William Graham Edmundson," DCB, 1851-1860, Vol. VIII, p. 266.

¹⁶ MacKenzie, "Edmundson," p.267; Landon, "Journals," p. 169

¹⁷ G.E. Fussell, "Nineteenth-Century Farming Encyclopaedia: A Note," *Agricultural History*, Vol. 55, No. 1 (January 1981), p. 19.

Scarcely any direct information of the characteristics of the readers of each periodical exists. Those were not the days of market research and readership surveys. Some clues, indeed, can be obtained from descriptions and advertisements in the advertisers' handbooks and directories of the time. But in the main the readership has to be inferred from the periodical itself: its general appearance, its price, its style and tone, its opinions.¹⁸

The content of these periodicals, therefore, remains the most important means of assessing whether science percolated through the agricultural community.

With the introduction of Justus Liebig's mineral theory, journal editors in the United States believed that a new day was dawning in agricultural theory and practice. Liebig's theory, which featured prominently in the columns of *The Cultivator* and *Farmer and Mechanic*, outlined the basic chemical make-up of the soil and the necessity for farmers to replenish its basic constituents after each year's crop. Both Canadian and American journals championed the intellectual and scientific advances outlined by Liebig and others, awakening "a sense of the relation of sciences to agricultural practice and to stimulate a desire for information and education ... Few were the speeches in favour of agricultural education, which did not mention these early investigators."¹⁹ One article that appeared in the *Southern Agriculturalist* and was reprinted in the *British American Cultivator* portrayed science as the guiding professor to the students of Practice and Experiment. Kindly Science gently admonished Experiment's blunders of importing expensive fertilizer while throwing away valuable manures produced on his own farm. Science insisted that he could guide the other to a wealth of riches: "I [Science] have

¹⁸ Alvar Ellegard, "The Readership of the Periodical Press in Mid-Victorian Britain," *Goteborgs* Universitets Arsskrift 63 (1957): pp. 1-41, as it appears in Macdonald, "Public Knowledge," p. 3.

¹⁹ P. W. Bidwell and J. I. Falconer, *History of Agriculture in the Northern United States*, 1620-1860 (Washington), 1925, p.320, as seen in Landon, "Journal," p. 171.

lived with him [Experiment] since, and he finds the acquisition of knowledge quite simple and a pleasant thing; he smiles at his former blunders, and sees how much he has lost by not beginning my acquaintance sooner.²⁰

William Evans echoed the importance of education as a means to distinguish farmers. Farmers, according to Evans, "above all other classes of men," were steadfast and unyielding in their ways and quite closed to new ideas. This failure to strive for improvement had serious consequences:

The mere routine practitioner cannot advance beyond the limits of his own particular experience, and can never derive instruction from such accidents as are favourable to his object, nor guard against the recurrence of such as are unfavourable. He can have no recourse for unforeseen events, but ordinary expedients; while the educated man of science resorts to general principles, refers events to their true causes, and adopts his measures to meet each case. Mind was given to man for cultivation, and the means of cultivation is by education and reading. Like the soil of our mother earth, the more *judiciously* it is cultivated, the more abundant good fruits will be produced for the benefit of the individual and of society.²¹

Edmundson lamented the failure of local farmers to participate actively in improved husbandry, noting that most of the articles for the paper were taken from American farm journals. He believed that Canadian farmers possessed a wealth of information on every agricultural topic, but were "so indifferent to their country's welfare, that instead of allowing their light to shine, they put it under a bushel."²² William Garbutt, who wrote to the *British American Cultivator* agreed, insisting that much would be gained if every

²⁰ British American Cultivator, Vol. III, No. 4 (April 1847), p. 125.

²¹ The Cultivator, Vol. IV, No. 4 (June 1837), p. 71.

²² British American Cultivator, Vol. III, No. 2 (February 1847), p.46.

farmer would just note the successes and failures of small seed, tillage, and manure experiments, of which all could peruse the results.²³

Other writers acknowledged that a scientific understanding of farming at midcentury was far from complete. J. Thomas, in an address to the New York State Agricultural Society (published in the *British American Cultivator*), noted that the progress obtained in other sciences had not translated to the agricultural pursuits, as science had made few inroads into understanding life-chemistry, fertilizers, soils, and pests. With respect to chemistry, for example, Thomas noted that tabletop chemistry was far easier than determining "the intricate and combined relations existing between chemistry and vegetable physiology."²⁴ These limitations should not deter farmers from pursuing scientific examinations and they should not be discouraged by the failure of science's promise to materialize. The only recourse, according to Thomas, was practical experimentation by farmers for farmers, rather than scientific experimentation, which had no real-world application.

The best modern practices of agriculture are in nearly all cases much in advance of the theory. It is for this reason that the cause of agricultural improvement would be much better served by holding up for imitation the experience and management of the best farmers of the day, rather than a too frequent reference to chemical authorities. How many of our citizens might have avoided shipwreck of their property, and made handsome profits, if they had followed the bestestablished courses of cultivation. But, have any failed for want of knowing the sciences? ... [T]o hold up them [scientists] up as a means by which the young farmer is to conduct his business most profitably, while he yet remains wholly or practically ignorant of the most improved modern systems of practice and management, cannot be followed by the best results.²⁵

²³ British American Cultivator, Vol. III, No. 3 (March 1847), p. 71.

²⁴ British American Cultivator, Vol. III, No. 2 (February 1847), p. 52.

²⁵ British American Cultivator, Vol. III, No. 2 (February 1847), 1847, p. 58.

The real science of agriculture, as opposed to the application of science to agriculture, was the accumulated knowledge of centuries of farming, which explains the theory behind ploughing, draining, fertilizer, cultivation, and crop rotation.

Outright chicanery did not help matters. *The Albany Cultivator*, repeating a story that originally appeared in the *Genesee Farmer*, described a scientist who insisted that the power of electro-magnetism could accelerate growth in both crops and livestock. The scientist wagered that he could produce from seed a fine salad of mustard and cress before a chef could properly prepare a leg of mutton.

The process was to immerse the seed for a time in oxymuriatic acid, then sow it in a light soil, letting it be covered with a metallic cover, and bringing in contact with the whole of an electrical machine. By the same agent, hen's eggs, which require twenty or twenty-one days to hatch by animal heat, have been hatched in a few hours.²⁶

The only caution the paper made after noting that the scientist had won the bet was to state that, should these experiments be proven successful, society is one more step away from "drawing the veil which shrouds the mysterious operations in the inner courts in the temple of nature."²⁷ The dependence on questionable home-cures to address serious

²⁶ The Cultivator, Vol. III, No. 9 (November 1836), p. 147.

²⁷ The Cultivator, Vol. III, No. 9 (November 1836), p. 147. Frauds against farmers proved a real concern for farm journals, which often warned against a particular scheme that was operating in one are of the province or another. Although dealing with a period later in the century, Kerry Badgely detailed many of the frauds that caught farmers off-guard in "Then I saw I had been swindled': Frauds and Swindles Perpetuated on Farmers in Late Nineteenth-Century Ontario," *Canadian Papers in Rural History IX*, Edited by Donald Akenson, (Gananoque: Langdale Press, 1994). Badgely cited one farmer taken in by a confidence man offering a new strain of wheat supposedly developed by an American scientist. In explaining why he was duped, the victim noted, "any farmer knows when a scientist is employed to inoculate two kinds of wheat, such wheat is looked upon as valuable (p. 341)." Badgely concluded that, amongst farmers, "there was a faith in science that was exploited by the confidence men involved in this swindle (p. 341)." A number of additional sources outline the swindles against farmers including Graham, *Greenbank*, p. 204. Graham, as Badgely pointed out, probably overstated the issue when he said that an

agricultural pests also confused science's goal of education through rational experimentation. Rats, for example, proved a constant and unwelcome companion, a true threat to farmers' livelihood. Attempts to eradicate this pest often depended on some unlikely remedies: "A red herring firmly fastened by a string to any place where rats usually make their run will make them leave the place. It is said to be a fact that a toad in a house cellar will have the effect of expelling the intruders."²⁸ Farm journals contained hundreds of these cures, often presented without caution or comment.

Thus, although journalists editorialized about the importance of science, the bulk of their information had no connection at all with the scientific method. It was not backed by theory, there was little attempt to control variables, and it was not supported by experimentation that could be replicated. Instead, the practices promoted in the journals amounted to pseudo-science, an amalgam of home-cures, folk wisdom, and modern discoveries couched in the jargon of science. Unfortunately for mid-nineteenth century farmers, perhaps the only crops harvested from the seeds of pseudo-science were wasted time and capital. Four important examples emphasize the contradictory advice and erroneous assertions found in early Canadian farm journals: the use of lime and salt as a fertilizer, controlling insect pests, and the confusion that arose over a type of grass called chess.

entire industry revolved around farmers' simplicity. See also, Earl W. Hayter, *The Troubled Farmer*, 1850-1900: Rural Adjustment to Industrialism (Dekalb: Northern Illinois University Press, 1968), p. 11.

²⁸ British American Cultivator, Vol. III, No. 4 (April 1847), p. 127, reprinted from the Bangor Mercury.

Lime

The application of lime provides a good base for understanding the confusion farmers faced. Lime, found in Plaster of Paris and gypsum, was hailed as an effective fertilizer that "converts insoluble or solid vegetable fibre into soluble vegetable matter."²⁹ Detailed directions for applying lime to the soil were common, though usually contradictory. J. D. Ladd, in a letter to the Ohio Cultivator reprinted in the British American Cultivator, stated that he spread 2500-3000 bushels of lime on clover and wheat in the middle of winter, resulting in the most luxurious crop of clover he had ever seen, but wheat was helped not as much. He said, "this is the mode adopted by the best farmer with whom I am acquainted, and I think can be philosophically proven to be the best."³⁰ His advice, to sow in winter on clover and grasses, ran contrary to articles run the previous year, leaving subscribers to the magazine with little or no clear direction as to the proper application of this fertilizer. Others insisted that lime provided no benefit at all to wheat, despite advice published the previous month in the same journal stating the exact opposite course of action.³¹ And finally, others insisted that lime "enriches father and ruins sons,"³² meaning that the application of lime would eventually exhaust the soil.

²⁹ British American Cultivator, Vol. III, No. 3 (March 1847), p. 69. William Kent, who died in Saltfleet in November 1841, had eight bushels of plaster of Paris included in his inventory of agricultural items (Court of Probate, RG 22-6-2, No. 443).

³⁰ British American Cultivator, Vol. III, No. 3 (March 1847), p. 69.

³¹ The Cultivator, Vol. IV, No. 2 (April 1836), p. 35.; Vol. IV, No. 3 (May 1837), p.47. This advice came from Chancellor Livingstone, whom *The Cultivator* insisted was the first to introduce the use of gypsum among American farmers. The correspondence indicates that at least some Upper Canadian farmers received the journal; for example, Vol. IV, No. 3 (May 1837), p. 60.

³² The Cultivator, Vol. III, No. 9 (September 1837), p. 151.

Pseudo-scientific contradictions regarding the chemical makeup of the soil and its interactions with plant life cycles frustrated improving practitioners who sought to increase yields and reduce waste. Scientific discussions regarding the effects of gypsum on plants highlight this confusion. Gypsum, according to various scientific sources, formed with oxygen and carbon to become a compound essential to vegetable matter, improved the physical properties of the soil, was the saliva or gastric juices of a plant, proved a plant stimulant, supplied water to the plant, fixed ammonia in the atmosphere, supplied sulphur to leguminous plants, and assisted in decomposition.³³ Many scientists asserted that exhausted soils, prevalent in over-farmed areas of Canada West and the United States, could "by the application of lime alone, be made to yield fifty bushels of wheat per acre."³⁴ Clearly, this was not the case. These contradictions and exaggerations led many to dismiss altogether the potential advantages that science had to offer, with some lamenting, "who shall decide when doctors disagree?"³⁵

Journal editors did not help matters by contradicting the advice offered by some of their own columnists. In "A Treatise on Manure," for example, W.C. Spooner described the process for cutting lime into manure in order that the sulphuric acid "would leave the lime and unite with the ammonia, for which it had a stronger affinity, and fix it in the more durable form of a sulphate."³⁶ To promote the leaching of the lime, a process was recommended which required dissolving the lime in five-hundred times its weight of

³³ British American Cultivator, Vol. III, No. 2 (February 1847), p. 57.

³⁴ British American Cultivator, Vol. III, No. 4 (April 1847), p. 101.

³⁵ British American Cultivator, Vol. III, No. 2 (February 1847), p. 57.

³⁶ British American Cultivator, Vol. III, No. 10 (October 1847), p. 293.

water, which could be accomplished by leaving the mixture in a big pit in the middle of the farm and sprinkling the mixture with water to ensure it remained moist at all times. At the end of the article, the editor immediately contradicted this advice by suggesting that sprinkling the mixture daily and leaving it exposed to rain water would make the most soluble elements of the lime flow into "the neighbouring brook."³⁷ This process would leave the most injurious elements within the manure to be spread upon the crops. Instead, the editor suggested that farmers not employ lime in the leaching process, but rather use ten to twenty pounds of sulphate of iron to every ton of manure. What should a farmer do?

To add to the confusion, some improving agriculturalists cited lime as a deterrent against a number of difficulties, including smut, the Hessian fly, and the wheat midge. One common cure for pests proposed washing seeds in a brine-lime solution. Some of these seed concoctions were quite remarkable and very time consuming:

Soaked four hours in brine that would buoy up an egg; then scalded with boiling hot salt water mixed with pearl ashes, then through a sieve distributed thinly over the barn floor, and dry compost sifted on it, composed of the following substances: oyster-shell lime, charcoal dust, ashes, brown sugar, salt, Peruvian guano, silicate of potash, nitrate of soda, and sulphate of ammonia. The sun was permitted to shine upon it for about half an hour, then the articles became, as it were, chrystalized upon the grain.³⁸

Others suggested using horse urine instead of brine.³⁹ These home-cure formulae could often, as noted by some, destroy the vitality of seed.⁴⁰ Others insisted that some

³⁷ British American Cultivator, Vol. III, No. 10 (October 1847), p. 293.

³⁸ British American Cultivator, Vol. III, No. 3 (March 1847), p. 77.

³⁹ The Cultivator, Vol. IV, No. 2 (April 1837), p. 35.

ingredients, lime in particular, were only effective against the fly if it came in direct contact with the caustic substance.⁴¹

Salt

The application of salt as a fertilizer remained a staple of common farm wisdom throughout the nineteenth century, and provides an effective example of the lack of a basic understanding of chemical science among both farmers and journal contributors. The editor of the *British American Cultivator*, for example, advised his readers that a sick plum tree could be quickly brought back to life by the application of half a bushel of salt per tree.⁴² Wheat and most other grains would also benefit from an application of salt as fertilizer. Advice for application ranged from one bushel per acre to an astounding two-hundred bushels per acre.⁴³ Specific documentation of the use of salt in Saltfleet prior to 1850 is scant. Levi Lewis, who held extensive land holdings in the region, dedicated the majority of his agricultural efforts towards livestock and some hay, wheat, and oat productions. In his inventory at death, there were four bushels of salt, which could readily have been used for both cattle, preserves, and crops.⁴⁴

⁴⁰ British American Cultivator, Vol. III, No. 9 (September 1847), p. 285.

⁴¹ British American Cultivator, Vol. III, No. 3 (March 1847), p. 69.

⁴² British American Cultivator, Vol. III, No. 9 (September 1847), p. 269. He did note that "this might be an extreme case and that this abundant use should not be done every year."

⁴³ For example, see British American Cultivator, Vol. III, No. 7 (July 1847), p. 214-5.

⁴⁴ Court of Probate, RG 22-6-1-A. Coupled with its use as a fertilizer, salt provided an effective deterrent against a variety of pests. Not only could salt be used as a brine to wash smut from seeds, but also it could prevent wheat rust. Some of these applications do have merit as salt solutions can destroy unwanted fungal and bacterial pests. The belief that the salty flavour of the plant would deter locusts, mice, and other pests from preying on the crop was, however, highly questionable [*British American Cultivator*, Vol. III, No. 5 (May 1847), p. 129].

The application of salt as a fertilizer was at best a misguided attempt to restore nutrients to the soil. While short-term gains can be achieved with some soils and a few crops, the long-term repercussions of excessive salt applications can be disastrous. Most crops cannot tolerate a long-term salinity content greater than five parts per thousand (normal sea-water contains thirty-five parts per thousand).⁴⁵ As water leaves behind minerals when it evaporates, the long-term application of sodium chloride to the soil would likely have increased concentrations beyond the tolerance of most plants. The effects of increased salinity in the soil should have been readily apparent to farmers as many plants provide early indications of elevated levels of salinity before disaster strikes. The tips of the leaves of many plants, for example, turn brown and dry up when water evaporates from the leaves' surface, leaving behind salt deposits that burn the tips.

Despite the perils of salt as a fertilizer, the spreading of salt continued in southern Ontario throughout the nineteenth century. Many pseudo-scientific farmers conducted experiments on their fields, insisting that the salted fields produced crops that were more lush and vigorous than the control group. Some of these short-term successes can be explained. Some plants, called halophytes, have developed coping mechanisms at the root, leaf, and cell level that can deal with elevated salt concentrations better than others.⁴⁶ Although none of the agricultural crops listed in the various nineteenth-century

⁴⁵ Glenn, Edward P., J. Jed Brown, and James W. O'Leary, "Irrigating Crops with Seawater," *Scientific American*, Vol. 279, No. 2 (August 1998), p. 77.

⁴⁶ Glenn *et al.*, "Irrigating Crops," p. 80-1. The plant *Atriplex*, for example, is a true halophyte. It deals with salt by storing sodium ions (Na⁺) and chloride ions (Cl⁻) in vacuoles away from sensitive cell components, such as chromosomes and mitochondria. This process ultimately attracts water and maintains turgor pressure within the plant cell. This plant also stores sodium chloride in salt bladders, distinct cells

censuses were true halophytes, barley can quickly pass excess salt levels absorbed by the plant back into the soil through its root system. Sugar beet and manglewurtzel (a crop very similar to sugar beet) also do well in the short term when exposed to higher than normal salt concentrations.⁴⁷ This practice, however, is not sustainable over a long period as salt levels in the soil accumulate after years of cultivation, resulting in a drastic reduction in yields.

Pests⁴⁸

Despite assertions that science would ease the farmers' burden, agricultural pseudo-science provided no effective method of exterminating two troublesome pests in the mid-nineteenth century: the Hessian fly and the wheat midge. The year 1847 proved particularly harsh for wheat in Canada West, as the limited snowfall left winter wheat vulnerable to winds, while the constant freezing and thawing heaved many of the plants out of the ground.⁴⁹ Spring wheat fared no better, suffering greatly from the late spring

⁴⁹ British American Cultivator, Vol. III, No. 4 (April 1847), p. 110. A discussion of the seasonal cycle of farm activity can be found in James O'Mara, "The Seasonal Round of Gentry Farmers in Early Ontario: A

on the surface of the plant's leaves. When these bladders burst, a thin layer of salt dries across the face of the leaf leaving a silvery covering that reflects light and cools the leaf.

⁴⁷ Personal Communication, Dr. Elizabeth Weretilnyk, McMaster University, Department of Biology, August 18, 1998.

⁴⁸ Pests can refer to number of things, including insects, weeds, and rodents. This chapter's focus on pest management deals primarily with insects. A history of weeds and farmers' efforts to eradicate them can be found in a number of sources, including Alfred Crosby *Germs, Seeds, and Animals: Studies in Ecological History* (Armonk, New York: M.E. Sharpe, 1994; Alfred Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge University Press, 1986), in particular Chapter 7; Knobloch, Frieda, *The Culture of Wilderness: Agriculture as Colonization in the American West*, (Chapel Hill: University of North Carolina Press, 1996), in particular the chapter entitled "Weeds"; and Clint Evans, "The 1865 Canada Thistle Act of Upper Canada as an Expression of a Common Culture of Weeds in Canada and the Northern United States," Ed. Donald Akenson, *Canadian Papers in Rural History X* (Gananoque: Langdale Press, 1996).

and excessive rainfall. To add to this misfortune, farmers across Canada West began to truly appreciate the destructive nature of the Hessian fly and the wheat midge. Entomologists had understood the life cycle of both these pests for some time. The Hessian fly (*Mayetiola destructor*) has two distinct generations per year. It is active as a fly in both May and September, at which time it lays its eggs in the sheath of wheat a few inches above the ground (see Figure 6-1). Approximately one week later, the eggs hatch



Figure 6-1: Life stages of the Hessian fly: (a) – a female fly; (b) – larva; (c) – pupae forming in 'flaxseed' state; (d) – 'flaxseed' state; and (e) – insects emerging from infected wheat stem.

and the grubs attack the plant, becoming "so completely encased between the sheath and stalk, that no external application could possibly destroy them."⁵⁰ The midge (*Ceidomya tritici*), which made its first appearance in Upper Canada in 1831, had plagued farmers in Europe years previously. The adult midge is a

fly smaller than a mosquito. It lays its eggs in the scales of the chaff when the plant is in blossom. The eggs hatch and the pupae feed off the plant's circulatory system, leaving the grain a hollow, dry husk. The pupae then bury themselves in the ground to become chrysalis, emerging in the spring as adults to begin the cycle again.

Preliminary Analysis," Ed. Donald Akenson, Canadian Papers in Rural History II, (Gananoque, Ontario: Langdale, 1980), p. 105-6.

⁵⁰ British American Cultivator, Vol. III, No. 7 (July 1847), p. 193.

Attempts to combat the Hessian fly in the mid-nineteenth century failed miserably. Dozens of suggestions emerged as likely means of eradicating this pest, generally employing the maxim that if it was noxious to humans then it would likely prove the same to insects, "or at least worthy of a try."⁵¹ A few recommendations are provided as examples. First, lime mixed with hardwood ashes, broadcast on the young wheat when the insect was laying its eggs, would injure the flies. Second, a device known as "Crosskill's clod-crusher" could be passed over the fields, destroying the insect in its newly formed state. Third, a strategy of planting spring wheat as late as June would catch the fly between life-cycles. Unfortunately, this often left too little time for the plant to mature before harvest.⁵² And fourth, the constant application of manure would strengthen the plant and prevent the pest from overly damaging the plant. Suggestions for suitable manures included green seaweed, drifted sea-weed, a compost of barn-yard dung and turf, mud from creeks and swamps, leached ashes, and fish remnants.⁵³ In

The many home-cures offered to farmers for the eradication of the wheat midge created additional confusion. Preventative measures for defending against this pest were few; most involved attempts to plant the seed early or late enough so that the wheat blossom avoided the time that the eggs hatch. The editor of the *Cultivator* suggested that spring wheat should be planted as late as possible, well into May or even June. It was noted, however, that such wheat would likely be subject to rust. Winter wheat, on the

⁵¹ W.G. Tolton, "Pests and Pest Control in Ontario before 1900," unpublished essay at the Ontario Agricultural Museum, Milton, Ontario, p. 8.

⁵² British American Cultivator, Vol. III, No. 7 (July 1847), p. 193-5.

⁵³ The Cultivator, Vol. IV, No. 3 (May 1837), p. 47.

other hand, would best avoid the midge if it was sown early, coming to blossom long before the fly was ready to lay its eggs. Thomas Hillhouse, a farmer near Toronto, noted that the wheat planted in the first week of September was saved while almost everything planted after the 25th was lost.⁵⁴ Variable temperatures, rainfall, and soil conditions, however, would make province-wide planting dates impossibly inaccurate, leaving farmers little better off than before. The editor of the *British American Cultivator* admitted defeat: "the wheat fly is probably going to get most of what the Hessian fly, rust, frost, and damp weather does not."⁵⁵ His only consolation was to view this as an opportunity to experiment with a variety of control measures to find something that might work. He suggested sowing lime and building large smoky fires, but conceded that the cost of the cure would probably be more than the wheat was worth.⁵⁶

Some noted that God could do what man could not as a natural counter-weapon to the midge had emerged. A member of the *Icheumons* family preys upon the midge, but the editor could only offer the unhelpful remark that it had not yet been seen in Canada.⁵⁷ Certainly, the Hessian fly had natural enemies that helped farmers. Both *Eurytoma destructor* and *Platygaster* feasted upon the fly: the former laying its eggs within the shell of the fly in its chrysalis stage, the latter laying its eggs inside the fly's egg.⁵⁸

⁵⁴ British American Cultivator, Vol. III, No. 9 (September 1847), p. 283.

⁵⁵ British American Cultivator, Vol. III, No. 7 (July 1847), p. 197.

⁵⁶ British American Cultivator, Vol. III, No. 7 (July 1847), p. 197.

⁵⁷ British American Cultivator, Vol. III, No. 9 (September 1847), p. 283.

⁵⁸ British American Cultivator, Vol. III, No. 9 (September 1847), p. 274-5.

If we are humiliated by the reflection that the Author of the Universe should have made even small and feeble insects the instruments of His power, and that He should occasionally permit them to become the scourge of our race, ought we not to admire His wisdom in the formation of the still more humble agents that are appointed to arrest the work of destruction.⁵⁹

Nature could do what man and science could not. Unfortunately, these natural enemies to the two insects could not save the 1847 crop.

Ultimately, the only truly effective approach the journals could suggest to prevent the Hessian fly and the wheat midge from destroying the wheat crop was to not plant it.⁶⁰ A province-wide ban on wheat production for a number of years would starve the insects into submission, with farmers hoping that abstinence would make the farm grow stronger. This plan was never fully implemented, although individual farmers did plant other crops to mitigate the insects' predations. A list of alternatives, "in order of value for sustaining life," included maize, oats, rye, barley, peas, buckwheat, and rice. It was proposed that they would meet with success unless a "new tribe" of insects came and destroyed them.⁶¹

If our apprehensions regarding the failure of the wheat crop should ultimately prove correct, and our farmers should find a necessity of turning their attention more largely to the cultivation of other crops; it is obvious that the wants of the country demand that we must not be satisfied, as were the Lower Canadian farmers under a similar calamity, with simply *vegetating*. But we should produce from our lands sufficient to pay a large proportion of the imports of the country. Either this will have to be done, or else the inhabitants of the country will be obliged to adopt the simple and economical habits, that were characteristic of this country upwards of 40 years ago, when imported luxuries were used only by a

⁵⁹ British American Cultivator, Vol. III, No. 9 (September 1847), p. 275.

⁶⁰ British American Cultivator, Vol. III, No. 7 (July 1847), p. 200. A similar call went out in 1836 to combat the destructive nature of the wheat weevil. This program demanded that every farmer who grows wheat should thresh then burn their crops for two years, ultimately destroying the insect in its larval stage *The Cultivator*, Vol. III, No. 4 (June 1836), p. 65.

⁶¹ British American Cultivator, Vol. III, No. 7 (July 1847), p. 195.

few individuals, and the great bulk of the population were satisfied with what they produced on their own farms.⁶²

This return to the past denied man as a progressive being, deemed by many as unnatural and unholy. Instead, farmers should struggle with all their knowledge and might against these worms and flies. And if Canadian farmers still could not succeed then turning to flax and hemp, butter and cheese would be an honourable alternative.

Efforts to destroy the wireworm exemplified the multi-faceted yet ineffective approach to pest control adopted by mid-nineteenth century farmers. The wireworm (the larvae of the click beetle – Family *Elateridae*) proved an especially troublesome pest as it had a much broader appetite than most, which usually preyed on one particular crop.⁶³ Described by the *British American Cultivator as* "omnivorous," the larvae of the spring beetle become pupae around July and begin their depredations by eating the roots and then pulling the plant down into the earth to be devoured, leaving the impression that the plant had disappeared.⁶⁴ The *British American Cultivator* advised that an application of twelve bushels of salt mixed with twelve bushels of soot (which contains ammonia) spread as a top dressing would provide an effective control against the pest. The mixture also served as an effective fertilizer. In addition to chemical treatments, the journal urged farmers to employ a lengthened crop rotation scheme that included peas, beans, and potatoes, which are generally not on the wireworm's dinner menu.⁶⁵ Finally, a pressing

⁶² British American Cultivator, Vol. III, No. 7 (July 1847), p. 195.

⁶³ The click beetle was also known as the snapping or spring beetle and also as the skipjack.

⁶⁴ British American Cultivator, Vol. III, No. 8 (September 1847), p. 233.

⁶⁵ British American Cultivator, Vol. III, No. 8 (September 1847), p. 232-234.

alternative promised to stomp out the wireworm in larvae and pupae form. Farmers were advised to allow their livestock to graze the land, their weight compacting the soil and crushing the larvae. Alternatively, a farmer could use a heavy roller to accomplish the same goal.⁶⁶ Again, none of these treatments proved effective.

Chess

In addition to the enthusiasm for salt, the controversy about chess (a troublesome grass) exemplified the low level of scientific understanding of farmers and farm journalists. Throughout the nineteenth century, many farmers believed that the right environmental conditions could change a valuable wheat crop into a useless grass, called chess (or cheat). Cold soil, a late frost, or the use of pasturelands were often blamed for the transformation. The change occurred, it was believed, because wheat derived from this grass centuries ago, and particular conditions could make wheat revert to its former state. Egbert Smith, writing to *The Cultivator*, believed that a variety of valuable crops could be transformed into the worthless grass:

If this is a fact which the experience of farmers has proved in opposition to an accepted principle of natural law, (which may be wrong) so far as wheat, rye, and barley are concerned. It proves to me that these grains, in all their varieties of summer and winter, bearded and unbearded, are originally from the same *parent* stock – changed by cultivation and change of climate.⁶⁷

A consensus remained elusive. The editor of *The Cultivator* suggested that the only agreement that could be reached was that like produces like:

⁶⁶ British American Cultivator, Vol. III, No. 8 (September 1847), p. 233.

⁶⁷ The Cultivator, Vol. III, No. 9 (September 1837), p. 143.

The only practical benefit likely to grow out of the controversy, is the general admission, that as chess will produce chess, the less of it that is sown, the less likely to abound in the crop – and that consequently good farmers will be admonished to sow none but perfectly clean seed.⁶⁸

By the 1850s, some authors actively and ruthlessly sought to trample the idea that grass could come from wheat seed. Asserting that the plants were clearly two different species, some contributors insisted that the offending chess resulted from the farmer sowing unclean seed: "the doctrine of transmutation of grain is only entertained by those who are so indolent and careless as to sow the very seeds with their wheat, which they afterwards foolishly suppose were produced from the diseased plants of wheat."⁶⁹ These agriculturalists insisted that chess could never be transformed into wheat "a plant not only of a different species, beyond the boundary of which, a plant by no change ever passes, but is also of a different genus;"⁷⁰ a distinction that many farmers probably could not appreciate. Despite the journal's mocking assertions, the belief that chess would ruin the potential of a fine crop of wheat maintained adherents. Only in the late nineteenth century did the letters and personal affirmations asserting to the transmutation disappear from the letters to farm journals.

The drive towards improvement and the adoption of pseudo-scientific principles so prevalent within the text and tone of farm journals should be viewed more as a social issue rather than a pedagogical issue. Journal editors clearly sought to distinguish the educated, improved practitioner from the uneducated, soil-scratcher.

⁶⁸ The Cultivator, Vol. III, No. 11 (November 1837), p. 142.

⁶⁹ British American Cultivator, Vol. III, No. 9 (September 1847), p. 257.

⁷⁰ British American Cultivator, Vol. III, No. 2 (February 1847), p. 53.

A man of uncultivated mind may hold a plough, or drive a harrow ... in a sufficient manner; but he will seldom introduce an improvement, or be the means of effecting any change in the system of rural economy. In former times it was objected, that farmers were an obstinate and bigoted class of men – (as is too much now the case with us) averse to every kind of innovation upon established practice, and persisting in ancient practices, even after the deficiency and inutility had been ascertained in the most decisive manner. Whatever truth there might be formerly in the objection, its force is now completely removed; there being no set of men whatever more open to conviction, or more willing to adopt new practices.⁷¹

The social distinction was often based on the perceived intellectual capacity of improved practitioners. An intellectual farmer, who used the most advanced mechanical and scientific methods available, appeared more noble and patriotic when compared to those that used "the hoe, or the rudest machine of the plough … because the cultivator is ignorant and servile."⁷² However, the contradictory and confusing program of improved husbandry did not offer any significant advantage. A farmer who followed the "first principles" of farming, namely fertilizing the soil, choosing the best seed, and guarding against weeds, possessed sufficient knowledge to farm effectively. Instead of placing trust in the pseudo-scientific remedies of the farm journals, farmers would likely achieve the most benefit from the first principles found in *Brewster's Encyclopaedia of Farming*.

Were the operations of farmers regulated by its tenets; were their endeavours constantly directed to keep the land in their possession dry and clean, and as rich as possible, then the country would be progressively improved. In a word, these are the fundamental principles of agriculture, though several other things, such as rotation of crop and the like, may be regarded as minor inferior ones. All of them, however, are dependent upon the principles already noticed.⁷³

⁷¹ The Cultivator, Vol. IV, No. 11 (January 1838), p. 175.

⁷² The Cultivator, Vol. III, No. 6 (August 1836), p. 89.

⁷³ The Cultivator, Vol. IV, No. 2 (April 1838), p. 43.

Agricultural Science to the Early 1870s

Between the early 1850s and the early 1870s, a large number of Canadian farm journals appeared, spreading the gospel of improved husbandry. This period saw the crystallization of a dichotomy between book farmers and practical farmers, which came to a head in the late 1850s. In the vanguard of those who continued to stress the importance of both a liberal and scientific education for farmers was George Buckland, the editor of the British American Cultivator. He sought to create a class of farmers capable of not only understanding God's plan, but also appreciating and expressing its complexities. Through a technical understanding of the agricultural sciences, Buckland believed in the "great principle of the natural and moral government of the Deity, that causes and effects are so surely connected, that no judicious effort in a good work can be ultimately abortive."⁷⁴ He hoped to educate farmers' sons in these principles at agricultural classes offered through The University of Toronto in the 1850s. Tom Nesmith, in his Ph.D. dissertation The Philosophy of Agriculture: The Promise of the Intellect in Ontario Farming, 1835-1914, argued that this approach to the enlightened farmer was an intellectual-based philosophy that promoted education through liberal Christianity, scientific first principles, and a wide reading in poetry, literature, and history that combined a "Protestant, Baconian, and 'Common Sense' paradigm for the pursuit of knowledge in British North America."⁷⁵ It was Baconian because of the need to examine nature and make accurate observations, and Protestant because agriculture was man's

⁷⁴ Canadian Agriculturalist, (March 1852), p. 70.

⁷⁵ Nesmith, "The Philosophy," p. 16.

"constant, unyielding, eternal struggle to reap from the earth what God did in a word."⁷⁶ Or, as Lord Elgin stated, "Agriculture is the art by the cultivation of which, a gracious and merciful God, enables his fallen creatures to extract a blessing out of the primeval curse."⁷⁷

Scientific advances in the study of agricultural chemistry, Buckland forecast, would provide benefits to farmers in southern Ontario. The efforts of Justus Leibig, who emphasized the importance of nitrogen and the soil's mineral constituents, and J. B. Lawes and James Gilbert, who first manufactured superphosphates for general use in 1843, provided farmers with the promise of replenishing soils.⁷⁸ With sufficient scientific knowledge, a farmer could examine the chemical makeup of his soil, discover its deficiencies, and apply the appropriate remedy to restore its fertility. This promise carried a burden as well as boon.

The plain truth is, that the gross neglect of the principles of good husbandry, or the laws of nature, which in this instance are the same thing, is a sin which is certain to bring its own punishments the first year...[knowledge]...will yield in the long run, an abundant return to the skilful and industrious cultivator. Under a compliance with the above simple conditions, we should very seldom hear a miserable ten or dozen bushels of wheat per acre.⁷⁹

Failure to reap satisfactory profits from the soil could now be squarely laid at the feet of the farmer for failing to follow what were now thought to be well-established rules and practices.

⁷⁶ Nesmith, "The Philosophy," p. 17.

⁷⁷ Journal and Transactions of the Ontario Agricultural and Experimental Union (1856), Vol. 1, pg. 59.

⁷⁸ Nesmith, "The Philosophy," p. 21.

⁷⁹ Canadian Agriculturalist, Vol. V (August 1850), p. 169-171, as printed in Nesmith, "The Philosophy," p. 56.

William Weld, who emphasized the importance of good science to successful farming as editor of the *Farmer's Advocate*, turned the distinction between book farmers and practical farmers on its head. He argued that a truly practical farmer is a book farmer because dismissing the advantages that science offered was particularly foolish.

We should advise those who deride the ambitious and spirited investigators after truth by calling them book farmers, to convince themselves of their folly by employing lawyers and divines who are practical without ever having used books, unread judges, doctors who have their own experience alone, and who have scorned to take advantage by the printed experience of others. Take practical sailors from the canal boats, and make them commanders of national vessels, and you have a fair simile of a practical farmer - a practical farmer who is not a book farmer - a practical farmer who has no science.⁸⁰

Weld emphasized the importance of remaining up-to-date with the latest scientific advances and the value of experimenting (under strict scientific protocols) with new crops, fertilizers, crop rotation schemes, and reporting findings to other farmers through journals. He believed that the failure to combine both practice and science would leave farmers "the last of the body politic who will fairly investigate the truths of their own profession ... forever [to] be the tools of the more energetic classes of the community."⁸¹ The wheat boom of the 1850s created the impression that these principles delivered on their promise.

This vision of the intellectual-enlightened farmer contrasted with the positions of naysayers who believed that practice and experience were far more important to the average farmer than costly experimentation or enlightening poetry. The almost complete

⁸⁰ Farmer's Advocate, Vol. VI, No. 5 (May 1871), p. 68.

⁸¹ Farmer's Advocate, Vol. VI, No. 5 (May 1871), p. 68.

failure of the wheat economy in 1857 and 1858, coupled with the devastation of the wheat midge for which science had no answer, widened the gap between the two groups. Nesmith argued, correctly, that the backlash against science in agriculture stemmed from the fact that the average farmer did not need to understand fully every chemical reaction associated with his soil. Damaris Smith noted that most farmers did not have time to engage in any sort of discussion of scientific practices given their already heavy workload: "most farmers were obliged to work so hard that their faculties were more or less blunted or benumbed; enough so at any rate to avoid any experiments that involved more labor."⁸² A good practical farmer need only understand his land and learn from the experience that land taught him.⁸³ The failure of Buckland's course to attract farmers to the university emphasized this dichotomy. The course was withdrawn in 1860.

Between 1850 and 1871, the science of agriculture failed to change the practical application of farming in southern Ontario. The contradictions and vagaries associated with the presentation of scientific and pseudo-scientific knowledge to farmers and their responses highlighted this shortcoming. Two continuing debates leading up to the 1870s proved emblematic of the division. The discussion of whether wheat transformed into chess and the failure of effective pest management techniques practices show the split between book farmers and practical farmers, but also some of the complexities within each camp.

⁸² Damaris Smith, "Pioneer Wife," p. 5.

⁸³ Nesmith, "The Philosophy," p. 66-7.

Chess

By the 1870s, many journal contributors believed the debate regarding chess was over. Science clearly indicated that chess was chess and wheat was wheat and never would the twain meet. John Yates, writing to the Farmer's Advocate, noted, "There is no resemblance between wheat and chess in root, straw, or seed. Chess being much harder than the wheat, has a healthy looking blade and looks as well all the winter."⁸⁴ Although he could still be convinced otherwise, he believed the discussion reasonably well settled. And yet, other farmers still strongly disagreed. Abraham Moot, who lived in Clinton Township (immediately east of Saltfleet), believed that the issues of wheat turning into chess had not been satisfactorily concluded. This issue, as discussed in a number of journals he pursued, including the Genesee Farmer, Canada Farmer, Rural New Yorker, American Agriculturalist, Rural American, and Farmer's Advocate, remained unresolved. He believed there "have been many cases come under my observation which ... prove[d] that wheat does turn into chess during its growth."⁸⁵ Burning the wheat stubble or leaving fallow for an extended period of time ensured, according to Moot, a good supply of the useless grass. He insisted that many young farmers never believed this fact until their own wheat crop underwent this unfortunate transformation.

The importance of the chess-wheat discussion goes well beyond this Moot's point. There still existed a chasm between the science studied in agricultural colleges in the United States and Great Britain as delineated in the agricultural journals and the

⁸⁴ Farmer's Advocate, Vol. VI, No.6 (June 1871), p. 86.

⁸⁵ Farmer's Advocate, Vol. VI, No. 5 (May 1871), p. 58.

pseudo-scientific beliefs of southern Ontario farmers. This juxtaposition of hard science, which provided both accurate and inaccurate facts, and practical experience, which offered both useful and harmful advice, continued to be found within each issue of the agricultural journals. The pseudo-science even adopted hard science terminology to explain the traditional beliefs. A farmer from Brantford, known only as S. B., stated that wheat probably "derived through chess in terms of evolution."⁸⁶ He believed that Moot's examples were sensibly explained by the fact that the roots of the plant were too near the surface and subjected to the frost, which resulted in the deterioration of the grain as it reverted back to a previous evolutionary stage.

Pest Management

Journal editors viewed the work of farmers as the essential component of the economy. Often viewing themselves as the pinnacle of God's creation, these agriculturalists strove to recreate Eden in the New World. Pests threatened to relegate man to a less civilized way of life; a process unnatural and unholy considering man's "progressive" nature.⁸⁷ Farmers should struggle with all their knowledge and might against worms and flies, the rhetoric suggesting that the failure to eke out every head of grain from the ground was a slight against God, Queen, and country. It would not be overly-dramatic to suggest that journal editors approached the conflict as a holy war on

⁸⁶ Farmer's Advocate, Vol. VI, No.6 (June 1871), p. 87.

⁸⁷ British American Cultivator, Vol. III, No. 7 (July 1847), p. 194.

bugs, which would only end with the complete extermination of the enemy.⁸⁸ The importance which journal editors assigned to agriculture in the nation-building process played into

the rhetoric of pest management. Dr. Asa Fitch's address to the New York State Agricultural Society in 1860 (reprinted in the *Canadian Agriculturalist*) regarding the dangers of the plum curculio (*Conotrachelus nenuphar*) to peach and plum trees highlighted this religious struggle. Dr. Fitch insisted the curculio to be the most injurious creature to man's agricultural pursuits, believing that the wheat midge would eventually



Figure 6-2: The Dreaded 'Little Turk'.

be countered by a natural parasite. The curculio, unlike other injurious insects, was native to Canada, and had been destroying peach and nectarine trees since 1806.⁸⁹ The insect used a trunk-like appendage to make a crescent shape wound in the plant into which it

⁸⁸ Interestingly, there seems to be no middle ground when it comes to farmers' approach to pests. Either an organism was a friend to the agriculturalist, and could therefore be spared, or it was an enemy that must be obliterated. The editor of the *Canadian Agriculturalist*, for example, noted the following regarding the wireworm: "No doubt the wireworm fulfills some important and useful part in the economy of nature, but we have not been able to find any aspect in which it can be said to be otherwise than injurious to the farmer; there is, therefore, no reason why it should be spared by him, or any other means of prevention sought for than its utter extirpation." *Canadian Agriculturalist*, Vol. XII, No. 4 (February 16, 1860), p. 64-5.

⁸⁹ The pest was approximately a quarter inch long, primarily brown or grey with varying spots of white, ochre, yellow and black. It was distinguished by a shiny black and white spot on its back and a trunk-like appendage on its front end which it used to attack fruit, usually plums or peaches. The complete life-cycle of the bug was not entirely known by 1860. According to Fitch, it deposited its eggs in the fruit, which then fell to the ground. When the maggot fell out it buried itself in the ground, coming out as the perfect weevil in three weeks. Fitch felt that the beetle would then shelter in the bark of trees during the rest of the year [*Canadian Agriculturalist*, Vol. XII, No. 10 (May 15, 1860), p. 227-8).

deposited its eggs. The crescent shaped mark into which the insect deposits its eggs resulted in the pest being called the "'Little Turk' - as it appears to delight in seeing this symbol of Mahometanism everywhere inscribed - as though the little imp was aware how annoying the sight of it is to us 'Christian dogs.'"⁹⁰ The complete annihilation of this infidel was the responsibility of every farmer, especially considering the importance of farming to the nation building process.⁹¹

Despite the rhetoric, pest management prior to the 1870s remained remarkably unchanged from before mid-century. Proffered by both journal editors and practical farmers, the most effective means of securing a good crop from the attacks of various insects was a strict attention to the first principles of farming: draining and cleaning the land, manuring, early sowing, choosing the best seed, and picking and propagating the best crops.⁹² Against most pests, journal editors often trumpeted the first of these principles, effective drainage, as the most effective tool in the farmer's arsenal. It seemed that an enlightened farmer could, if he understood his land and paid a rigorous attention to these first principles, succeed no matter how poor a hand nature had dealt.

⁹⁰ Canadian Agriculturalist, Vol. XII, No.19 (October 1, 1860), p. 495.

⁹¹ In an interesting article, Arvarh E. Strickland described one community's tribute to the Boll Weevil, a devastating pest that attacked the cotton fields near Enterprise, Alabama. The insects rapacious appetite for cotton forced farmers to diversify their agricultural pursuits into dairying, corn, potatoes, sugar can, hay and peanuts. The townsfolk deemed this diversification so beneficial that they erected a statue in tribute to the weevil and the changes that it brought (Arvarh E. Strickland, "The Strange Affair of the Boll Weevil: The Pest as Liberator," *Agricultural History*, Vol. 68, No. 2 (Spring 1994), p.157].

⁹² Canadian Agriculturalist, Vol. XI, No. 11 (November 1859), p. 243. As in the period prior to the 1850s, farmers struggled to find the most advantageous time to plant wheat to circumvent the life-cycle of both the midge and Hessian fly. Depending on the crop and location, farmers debated the merits of early or late plantings, hoping to produce a crop that survived through its most vulnerable period while the insect was still an egg and/or hibernating in the ground [Canadian Agriculturalist, Vol. XI, No. 9 (September 1859), p. 195].

It is true that by means of great attention to, and a careful and judicious imitation of good farmers, a man of mean talents is sometimes known to make a tolerable figure in this line. He may raise good crops; and good crops are no bad criterion of good farming. Indeed, a man, otherwise a blockhead (at least one who has no notion of first principles) often excels those who adhere to them with scrupulous exactness; but this must be only where the knowing man wants the talent of strict application. This talent is an essential requisite for a Farmer: indeed, it is indispensable in every occupation where success is desired.⁹³

The editor of the *Canadian Agriculturalist* concluded that the "majority of failures are clearly attributable to the neglect of the ordinary principles of good husbandry, and are consequently more or less within the reach of human control."⁹⁴ However, the attacks of a wide variety of insects, including the midge and Hessian fly on wheat, the Colorado beetle on potatoes, the curculio on plum trees, and the wireworm on a variety of vegetables, revealed that even the most ardent improving practitioner fell victim to these and other invaders. To combat these attacks, farmers in southern Ontario continued to depend on a number of home cures, prescribed treatments, and perceived scientific advances.

Many of the struggles to wipe out a particular pest could best be compared to medicinal home cures passed down from generation to generation or from the affirmations of an experienced hand. Much like medicinal home-remedies, the recipes for pest-control concoctions required an accompanying story of affirmation. These stories of authentication followed a similar pattern: ongoing failures, brokering of a new idea, testing and implementation, and finally, continuing success over the past few years. Mr. Fisher Hobbs, for example, whose root crops were plagued by the turnip fly, hired a new

⁹³ Canadian Agriculturalist, Vol. XI, No. 11 (November 1859), p. 243.

⁹⁴ Canadian Agriculturalist, Vol. XI, No. 9 (September 1859), p. 195.

man who guaranteed, under penalty of unemployment, that he could rid fields of this predator with a combination of white gas ashes, lime, sulphur, and soot. In asserting the efficacy of this concoction, Hobbs related the hiring of this new man.

Mr. O. Hawkins, who came to me some nine years since with an especial recommendation on this point: in fact, he himself engaged to secure the Turnip plant from the ravages of the fly, adding that he was willing to give up his situation immediately if he could not do so. I can only add that for eight years, during the whole time he was with me, he fulfilled all he promised on the subject.⁹⁵

In providing a history to the cure, the recommendation is given merit and integrity. A common form of this affirmation usually involved the passing of knowledge from an old farm hand or quite often an immigrant or visible minority who had specific knowledge about a particular crop. A correspondent to the *Farmer's Advocate*, for example, suggested that sprinkling a mixture of hen-manure and water on cucumber plants could thwart the efforts of the striped cucumber bug. He uncovered this cure from "a Negro woman living on my place, who has some practical experience in gardening, and has used it forty years, and has never known the first application to fail to drive them off, and they never return."⁹⁶ The way farmers related their experiences with pest-control would suggest that the addition of a small narrative about an old or experienced farmer was intended to lend credence to their claim. The frequency with which African-Americans or Natives were cited as authorities for particular cures and concoctions would suggest that white farmers believed that these individuals possessed a certain intimacy with the ways of nature, more so than traditional European farmers. Blacks, however, never

⁹⁵ Canadian Agriculturalist, Vol. XI, No. 7 (July 1859), p.153.

⁹⁶ Farmer's Advocate, Vol. VII, No. 4 (April 1872), p. 59.

seemed to have obtained this knowledge from professional farming; instead these narratives suggest that the knowledge came from years of small-scale market gardening.⁹⁷ Not surprisingly, when these home cures failed to achieve the anticipated success, laments and criticisms were countered by questioning an individual's particular implementation. A farmer writing to the *Canadian Agriculturalist*, for example, noted that wireworm grubs do best in loose, sandy soil that has been recently ploughed up from old pasture, which exposed tender roots. Burning the roots after ploughing could, the correspondent insisted, prevent this infestation. Proponents of this technique attributed other farmers' failure with the technique to flawed implementation: "In all such cases we believe that the failure has arisen from its not being properly applied at the proper times, and in the proper manner."⁹⁸

Despite publishing these solutions, the editors of many farm journals dismissed most home-cures as fictitious creations that impeded the progress of improved husbandry. The editor of the *Canadian Agriculturalist*, for example, believed that a number of common treatments for wireworm, which plagued wheat fields in southern Ontario, were quite dubious.

Salt, chloride of lime, nitrate of soda, the refuse lime of gas-works, and other matters supposed to be disagreeable to the wireworm have been recommended, but we do not lay much stress upon them. Another curious recommendation is to sow pieces of rapecake, of which it seems the grubs are very fond, and feed upon them so ravenously that they die of repletion. We confess we have not much faith in this singular prescription.⁹⁹

⁹⁷ See, for example, Farmer's Advocate, Vol. VI, No. 5, (May 1871).

⁹⁸ Canadian Agriculturalist, Vol. XII, No. 4 (February 16, 1860), p. 65.

⁹⁹ Canadian Agriculturalist, Vol. XII, No. 4 (February 16, 1860), p. 66.
Other popular approaches to pest management included the use of kerosene, carbolic and carbonic acid, tobacco derivatives, whale soap oil, sulfur, lemon juice, buttermilk, hellebore, and others.¹⁰⁰ There is merit to using kerosene as it can effectively stop insect attacks by plugging the insect's spiracles (breathing holes) and/or displacing the water within cells preventing proper biological functions. Historically, fruit farmers sprayed the plums with kerosene or tied kerosene-soaked rags around trees in the orchard, which coated insects as they crawled up the tree.¹⁰¹ This particular approach had two significant drawbacks. First, flying insects obviously bypassed the kerosene rags, gaining ready access to the fruit. Second, kerosene displaced water in plant as well as animal cells often damaging or killing many of the trees that farmers sought to protect.

Journal editors added to the confusion regarding the efficacy of various treatments by contradicting many of the words of wisdom offered by learned colleagues and fellow

¹⁰⁰ Derived from petroleum, kerosene is still used in insecticide sprays, although it is primarily used as a fuel for rockets and jet engines. Carbolic acid (C_6H_3OH) is the legal name for phenol, a class of "organic compounds in which one or more hydroxy groups are attached directly to the benzene ring." Carbolic acid appears as a white powder when pure. It is soluble in many substances including water, alcohol, fixed and volatile oils and alkalies. Historically derived through benzene-based processes, the powder is white when pure, but appears pink or red when not. When ingested, inhaled, or absorbed through the skin, it is quite toxic with a Threshold Limit Value (TLV) of 5 ppm. Carbonic acid (H_2CO_3) is a weak acid formed by reacting carbon dioxide with water. Nicotine ($C_5H_4NC_4H_7NCH_3$), an alkaloid derived from tobacco, is one of the oldest pesticides and is still used today. It is white in a pure state, but turns dark on exposure to air. It is toxic whether ingested, inhaled, or absorbed through the skin, with a TLV of 0.5mg/m³ of air. Sulfur (S – atomic number 16) is a non-metallic element that is mined directly. It is still used as an ingredient in insecticides, but it is primarily used in explosives. All of the above from *Hawley's Condensed Chemical Dictionary, Eleventh Edition*, Revised by N. Irving Sax and Richard J. Lewis, Sr., (New York: Van Nostrand Reinhold Company, 1987).

¹⁰¹Farmer's Advocate, Vol. VI, No.12 (December 1871), p. 188. H. Gregg, of Downey Iowa, asserted that this method of protecting plum trees was very effective against the curculio, resulting in trees so heavy with fruit that the limbs needed bracing. His letter, published in the *Pomologist and Gardener*, was reprinted in the *Advocate*.

farmers. The editor of the Canadian Agriculturalist, for example, dismissed almost every

element of Dr. Fitch's advice for countering the curculio incursions.

Of the remedies for this insect, Mr. Fitch had nothing new to offer. He spoke of shaking the trees, but not with much confidence, as he said it sometimes failed, and the process bruised the bark and injured the tree. If the Doctor had more experience he would not talk so. Another remedy, which he appeared to favour, was a wash of whale-oil soap and tobacco water. The next day we heard the Doctor recommending plum growers to make troughs of water under their trees, as the cheapest and wisest way of saving their plums. If Mr. Fitch will obtain twenty-five plum trees, and take care of them for ten years, he will be able to talk more wisely on this subject. Practice is the only balance-wheel for such men.¹⁰²

The tone, of course, suggested the continued debate between practical and book farmers.

More confusedly, two articles in the next issue recommended control processes that the

editor had just dismissed, namely the effectiveness of dislodging the curculio by

knocking the tree with a large hammer under which sheets had been set to gather up the

little offenders.¹⁰³ The second article (a reprint from the Michigan Farmer) provided a

more involved course of action.

I usually put my leached ashes around my trees, and in the spring I wash them in a strong brine and let it run down well around the roots of the trees. And as soon as the brine dries off, whitewash them well. And about the time the plumbs set, tie a cloth around the body of the tree to form a ring, and keep it well wet with soft soap. The ring of soap is merely to keep any curculio or other insect from going up the tree. Then shake or jar the tree thoroughly two or three times a week early in the morning, until the plums are half or two-thirds grown.¹⁰⁴

These complicated prescriptions for salvaging orchards from the curculio made

their way to Saltfleet. Damaris Smith, who farmed a 170-acre property on top of the

¹⁰² Canadian Agriculturalist, Vol. XII, No. 10 (May 15, 1860), p. 228.

¹⁰³ Canadian Agriculturalist, Vol. XII, No. 12 (June 16, 1860), p. 279.

¹⁰⁴ Canadian Agriculturalist, Vol. XII, No. 12 (June 16, 1860), p. 280.

escarpment with her husband, struggled to increase the diversity of crops grown on the farm. In particular, she planted a wide variety of fruits and vegetables for the family table and for sale at the local market. Beginning with currants, Damaris then tried her hand at plums for approximately ten years, before abandoning the project. Her description of her efforts to thwart the little Turk warrants printing in full as it emphasizes the haphazard and generally ineffective approach to pest management that epitomized the period prior to 1870. Her recollections, made at the turn of the century, refer approximately to the late 1850s and early 1860s.

My plum trees were now old enough to bear and occasionally we had a crop, but oftener the east wind in blossom time or the curculio would cancel one. I began to take measures to thwart the latter according to all the plans I knew or could hear of, I even tried jarring, but I found it difficult to spread sheets beneath the trees and as I could see no good effects and was obliged to do it without help I did not pursue this plan to any great extent. But I could smoke the trees and smoke them I did, with all manner of foul smells from burnt leather to corncobs. Hundreds of times in the early morning or late in the evening after the milk business was settled, I would spend the charming twilight in trailing through the wet grass to keep the smokes alive and thus do my best endeavour to secure a crop of plums. As it was necessary to continue this until the plums were as large as peas - about every third night - one can judge the number of times necessary each season. But then, as now, the price of fruit is eternal vigilance, in addition to the work. It is much easier to sit here and write about it. I practiced these extra touches of work for four or five years when I tried throwing ashes and lime and all manner of disturbing agents into the trees - I could do that as the target was large. My final effort was an application to the soil of one bushel of ashes, one of chip manure, and one of horse manure to each tree, a useless task as the soil was already too rich but I did not know that then.¹⁰⁵

After five years of smoking and jarring the trees and enriching the soil, Damaris let the

trees go. Occasionally, the family was able to retrieve some plums from the trees, but

more often they relied on the success of their New Jersey pear trees.

¹⁰⁵ Damaris Smith, "Pioneer Wife - Personal Recollections of Damaris McGee Smith," *Farmer's Magazine* (1944), p. 10. Copy held in the E. D. Smith Family Archives.

Despite the affirmation of many that various tried and true methods were effective on a large scale, insect management proved almost completely ineffective. With the exception of manually picking off offending insects or burning entire crops, farmers possessed few if any weapons in their arsenal. The relatively complete failure of human intervention fostered a notion of dependency upon natural means of control. The impact of natural predators on the Hessian fly continued to aid the farmers in salvaging their wheat crops in the 1850s and 1860s. A number of other parasites had also emerged to combat the wheat midge, while ladybugs (family Cocinellidae) proved quite effective in ridding orchards of aphids.¹⁰⁶ Farmers also found allies in their own livestock. Ducks. chickens, and turkeys, they were told, should be encouraged to wander the fields, as they were quite fond of grubs, wireworm, and other insects.¹⁰⁷ E.D. Smith, when discussing his ideal farm in Saltfleet, (admittedly later than 1870), noted that a chicken population of over five hundred birds allowed to wander in and out of the orchards would help keep the curculio population to a minimum.¹⁰⁸ Other animals could be drafted from the away team to the home team on a moments notice if it was found to serve the interests of the farmer. The Canadian Agriculturalist stated that other natural enemies of the wireworm included the mole and the rook, which had previously been thought as only farm enemies: "Let us, therefore, be cautious in interfering with the operations of these two useful allies. We believe it will be found that, instead of being looked upon as enemies,

¹⁰⁶ Canadian Agriculturalist, Vol. XII, No. 6 (March 1860) p. 121-2.

¹⁰⁷ Canadian Agriculturalist, Vol. XII, No. 4 (February 16, 1860), p. 64-5. Interestingly, no mention was ever made of the dangers of these animals wandering amongst crops and seeds that had been sprayed with all varieties of agents, including carbolic acid, sulphur, lime, ash, etc.

¹⁰⁸ E.D. Smith, *Diaries*, Nov. 27, 1880.

and destroyed as such, they should rather be cherished as friends."¹⁰⁹ Farmers, for example, thought the owl a menace to good farming – "vermin to be exterminated" - but journal editors noted the importance the owl played in controlling rats and mice, urging farmers to "let the animal provided by God do its job and all will be better."¹¹⁰

Beginning in the late 1860s, a few journal editors and learned farmers began to resign themselves to never winning the war against pests. An atmosphere of acceptance in God's divine plan to provide a check against particularly voracious insects provided comfort and assurance. Rev. C.J.S. Bethune noted the following regarding the infestations of the midge: "There are three parasites which seem to have been ordained by the Author of the universe to limit the depredations of the wheat midge, and they so effectually execute their mission that ... a year or two after the midges were in excess, not a specimen could be found."¹¹¹ Articles in the *Canada Farmer* and the *Canadian Agriculturalist* echoed this sentiment. An holistic, natural regulatory system existed in the war on bugs that farmers should accept. The advice of Bethune, admittedly coloured by his religious calling, but not atypical of contemporary attitudes, was to "put your faith

¹⁰⁹ Canadian Agriculturalist, Vol. XII, No. 4 (February 16, 1860), p. 67.

¹¹⁰ Canadian Agriculturalist, Vol. XI, No. 7 (July 1859), p.161.

¹¹¹ Farmer's Advocate, Vol. VII, No. 7 (July 1872), p.100. Bethune does not explicitly state which three parasites keep the midge in check. One is probably a small wasp, *Macroglenes penetrans*, which emerges from its pupa stage at the same time as the midge. The wasp then lays its eggs inside the midge's eggs. The wasp larva grows slowly, over-wintering within the egg, finally eating its way out in the spring. (Department of Agriculture Home Page, Provincial Government of Manitoba, http://www.gov.mb.ca/agriculture/crops/insects/fad22s00/wmidge.html, as seen on July 21, 2000.)

in Providence."¹¹² The rampages of the curculio left Dr. Fitch wondering why no

countering parasite had come along to destroy the most recent problematic insect.

In view of the fact that our injurious insects are usually restrained from becoming excessively multiplied by their parasitic destroyers ... you will be inclined to inquire, why do not the destroyers of the curculio fulfill their office better, and prevent it from being so exceedingly numerous and destructive."¹¹³

Fitch attributed the peculiarities of the relationship between man, plant, and insect to the

wondrous hand of God and the remarkable system that shortly set right that which went

wrong.

And thus, wherever we fix our look in the wide domain of nature, whatever page we open in her "book of wondrous secrecy," we perceive unmistakable evidence that, even in all its minutest details, the vast framework of creation has been arranged by a hand that was omnipotent, that hand guided by an intelligence that was infinite.¹¹⁴

Undoubtedly, this dependence on nature's balance stemmed from the failure of synthetic

methods to accomplish any meaningful level of control.

The dichotomy between an apparent acceptance of God's balancing hand,

expressed by some editors and contributors, and a religious fervour to wage war against

insect incursions was swept aside with the development of the first truly effective

synthetic chemical pesticide in 1868, which achieved widespread use within five years.

Paris Green (copper acetoarsenite derived by reacting sodium arsenite with copper sulfate

and acetic acid) was developed first as a dye but proved remarkably effective in

eradicating the scourge of the potato plant, the Colorado potato beetle (Doryphora

¹¹² Farmer's Advocate, Vol. VII, No. 7 (July 1872), p.100.

¹¹³ Canadian Agriculturalist, Vol. XII, No. 19 (October 1, 1860), p. 499-500

¹¹⁴ Canadian Agriculturalist, Vol. XII, No. 19 (October 1, 1860), p. 500



Figure 6-3: The Colorado Potato Beetle, or 'Ten-Lined Spearman'.

deceno-lineata).¹¹⁵ The emerald-green powder, which is not soluble in water or alcohol, proved a cheap and effective control mechanism that held the potential to destroy an insect infidel that had already caused, by some estimates, millions of dollars of damage in the United States.¹¹⁶ Farmers used two to four pounds of Paris Green per acre, cutting the powder with flour or

gypsum at ratios ranging from 6:1 to 30:1. Promoters advised shaking a long pole with a tin box that contained the insecticide over the plants, which was best done while the dew was still on the plants. The poison would need to be re-applied after every rain.¹¹⁷

Concerns over dangers to the farmer during its application, plant residues, and soil contamination accompanied the arrival of Paris Green.¹¹⁸ A number of scientists and educated farmers were very concerned about arsenic's behaviour in the natural

¹¹⁵ Hawley's Condensed Chemical Dictionary, p. 308. The chemical composition is

⁽CuO)₃As₂O₃Cu(Cu₂H₃O₂)₂. There were a number of companies that sold variations of Paris Green. Scheele's Green was one of the more popular in the United States and Canada. It was adulterated with barites, gypsum, and/or carbonate of lime [*Farmer's Advocate*, Vol. VI, No. 7 (July 1871), p. 104-5]. Today, copper acetoarsenite is used in wood preservatives and marine anti-fouling paints. Most notably, lumber companies use the chemical in pressurized lumber, which accounts for the wood's particular green colour. The Latin name for the potato beetle means 'ten-lined spearman'.

¹¹⁶ Farmer's Advocate, Vol. VII, No.7 (July 1872), p. 104.

¹¹⁷ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 99

¹¹⁸ A very interesting account of the concerns raised in Britain over the application of Paris Green, and a history of the pesticides greatest supporters can be found in J.F. McDiarmid Clark's "Eleanor Ormerod (1828-1901) as an Economic Entomologist: 'Pioneer of Purity even more than of Paris Green," *The British Journal for the History of Science*, Vol. 25, Part 1, No. 84 (March 1992), p. 444-447. James Whorton provides a full account of early pesticide use in the Unites States in *Before Silent Spring: Pesticides and Public Health in Pre-DDT* America (Princeton: Princeton University Press, 1975). A review essay on historians' efforts to understand the impact of technology on agriculture and where the discipline should be heading is Deborah Fitzgerald's "Beyond Tractors: The History of Technology in American Agriculture," *Technology and Culture*, Vol. 32, No.1 (January 1991), pp. 114-126.

environment. Particular anxieties stemmed from the substance's insolubility in water, which promised to leave it in the soil for such a long time. Dr. W. W. Daniells of the University of Wisconsin urged against the use of Paris Green and its derivatives. He felt that Paris Green was a very dangerous poison that would "becom[e] as permanent an ingredient of the soil as if it were so much sand."¹¹⁹ Its use, therefore, was not simply a concern for the present. "The danger [was] not past when the substance ha[d] been sifted upon the plants and no one ha[d] been poisoned."¹²⁰ Daniells insisted that the poison, while unlikely to be absorbed by the plant, would remain in the soil as a deadly constituent. Additionally, he warned all individuals to be very wary in the application of the poison as the effects of arsenic on humans were well known. Daniells, and others, urged caution.

William Weld did not. In the spring and summer of 1871, he encouraged farmers to destroy the bug as soon as possible, using any means at a farmer's disposal. Weld issued a call to arms for agriculturalists in Canada: "Farmers, we have now in our country an invading army of destroyers, a thousand times worse than the Fenians, worse even than a war between Canada and any other country, it may be more expensive and more destructive."¹²¹ He added, "We are waging a deadly conflict with them, and thus far we are the conqueror. Watch, kill, and destroy them by every means is our advice to you...Commence a war of extermination against the insect and its eggs on their very first

¹¹⁹ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 104-5.

¹²⁰ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 104-5.

¹²¹ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 104-5.

appearance.¹²² Previous efforts at destroying this pest had proved fruitless. Weld dismissed lime, plaster, brine, and coal tar as completely ineffective, and noted that no farm fowl had any interest in eating either the beetle or its larvae. Mechanical removal was appropriate on a small scale. Weld related the advice of a St. Thomas farmer who paid children to remove the bugs at a rate of one penny per bug or infected leaf. Alternately, he suggested paying children one dollar for the first beetle, and twenty cents for the next fifty. He concluded, however, that if a farmer was paying children per thousand, then "it's time to use Paris Green."¹²³ A fear of poisoning by Paris Green was, according to Weld, a myth put forward by indolent farmers.

The apparent speed with which farmers adopted this new cure-all emphasized the unwillingness of on-the-ground-farmers to accept either the notion of God's balancing hand or warnings about the potential dangers of using arsenic. Standing by and watching a bug destroy a season's work while hoping for God to step in and set things right was not an option easily accepted. Despite calls for moderation and further study of this new pesticide, many seemed eager to unleash it against the offending beetle. Numerous farmers embraced this first effective control mechanism with the same eagerness that they adopted traditional, but less effective, pest control practices.

The overall effect of the potato beetle in Canada, as judged by the discussions in the Canadian farm journals, was mixed. The insect certainly made inroads in Ontario and

¹²² Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 99. Weld predicted that one-fifth of the Canadian food supply would be destroyed by the bug, resulting in social and economic catastrophe: "The poor farmer, with his large family of children, who depends on the potato as a main support staple will be very much injured. The poor widow and orphan will be oppressed, many young couples will postpone matrimony, and thousands of poor inhabitants will be deprived of the necessities and comforts of home."

¹²³ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 99.

Michigan, but Weld's prognostication of complete and utter destruction of the potato crop remained unfulfilled. A number of natural predators arose to combat the bug, mitigating the most dire predictions. Inconsistently, Weld predicted that the only truly effective check on the incredible rate of expansion attained by the beetle would be found "in its natural cannibal and parasitic insect enemies."¹²⁴ Weld, in a later about-face, downplayed the impact of the beetle only three months after his call to arms and reasserted the notion that God had set in motion a system of checks and balances that would work in the farmer's favour:

After all the hue and cry made about this pest it does not seem that its ravages have amounted to much. Considerable public money has been spent in sending out sundry parties as commissioners to investigate its doings and expensive reports have been sent out from the Government printing press as to what it is and what ought to be done to counteract its doings. Considerable Paris Green and other nostrums have been sold and used by confiding farmers with the idea that they could stop the speed of the pest. Like all other insect pests it must and will have its day, and then disappear as suddenly and mysteriously as it came.¹²⁵

The following years did see increased incursions of the beetle in southern Ontario, which emphasized the importance of continued use of Paris Green.¹²⁶ A farmer, writing to the *Prairie Farmer* and reprinted in the *Farmer's Advocate* in August 1871, emphasized the complexity of pest management in the nineteenth century in a short little ditty. He believed that Paris Green was effective, but that a natural predator, a species of the pumpkin bug, was a more effective killer.

¹²⁴ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 99.

¹²⁵ Farmer's Advocate, Vol. VI, No. 7 (October 1871), p. 147.

¹²⁶ Farmer's Advocate, Vol. VII, No. 6 (June 1872), p. 84.

What will I do with my Early Rose [a species of potato plant]. To keep them clean and free from foes? I've tried to "bug" with kerosene, But that I find won't keep them clean, For if too much on the plant is put, It kills the potato down to the root. The next I tried was tobacco tea. Some said t'was good. I thought I'd see. I'm satisfied that that won't do. For I really think the bugs can chew. I read in "The Farmer" of Paris Green, The best remedy vet tried had been: The mixture one-third to two of flour, Shook over the plant at an early hour. When the bugs want to break their fast, They'd keel right over and breathe their last. Paris Green is good I'm satisfied, The best of all the things I've tried. But one thing more I wish to say. Of what I saw the other day: The bug that infests the pumpkin vine I begin to think is a friend of mine, I caught him killing a potato bug. Of two evils, the least is what I'll hug.¹²⁷

However, despite the fact that the worst did not occur, many farmers, including those in southern Ontario, salvaged their potato crop by using Paris Green. This ability of farmers to protect their crop on a large scale probably diminished the ravages of the potato beetle.

Fruit gardeners also found Paris Green an effective weapon in the early 1870s. Plum and peach tree growers soon brought this new weapon to bear against the curculio. G. N. Smith of Wisconsin, in an article printed in the *Advocate*, noted the insecticide effectiveness: "If they find it effectual in destroying the 'Little Turk'... they will not be obliged to eat it if they think there is danger of being poisoned, but they will have the satisfaction of having used up the enemy, and no seed sown for a crop of them another

¹²⁷ Farmer's Advocate, Vol. VI, No. 8 (August 1871), 8, p. 116.

year."¹²⁸ Again, according to anecdotal accounts in the farm journals, Paris Green proved an effective tool against an insect that had thwarted traditional pest management devices.

Quantifying the Efficacy of Improved Husbandry

The timing of the 1871 Census provides a unique opportunity to quantify the effectiveness of improved husbandry in southern Ontario. Generating a list of who might be labeled a practitioner of improved husbandry is difficult. To accomplish this goal, I have attempted two distinct methods. Both assumed much. The first required scouring the Canadian farm journals for Saltfleet farmers who contributed to the ongoing discussion regarding methods to improve farming in Ontario prior to 1875. I extended the time period past 1871 on the assumption that those who participated in improved husbandry in 1875 probably had knowledge of improving techniques at the turn of the decade. All of the journals I examined (Canada Farmer, Farmer's Advocate, Canadian Agriculturalist, Fruit Growers Association, and the British American Cultivator) had a wide circulation in Ontario and all appeared in Saltfleet. I assumed that the brothers, sisters, sons, and daughters of individuals who appeared in the journals would also have some knowledge of improved husbandry. They may have received advice or guidance from parents or siblings who had attempted to salvage a crop from one particular pest or another. This process generated a list of 108 names of persons I counted as having practised some form of improved husbandry versus 169 names of individuals who did not.

¹²⁸ Farmer's Advocate, Vol. VI, No. 7 (July 1871), p. 105.

Alternatively, one could assume that fruit growing, grape growing in particular, required a level of knowledge above and beyond that of traditional mixed agriculture. Grape farmers probably practiced some features of improved husbandry above and beyond that of other agriculturalists in the townships. Care must be taken, however, because a commitment to grapes required a relatively significant investment that would not see returns for at least three years, and probably more. It is possible, therefore, that variations in yields between grape growers and non-grape growers could be attributed to economic differences which might allow purchases of more fertilizer or the hiring of additional farm labour, rather than variations in agricultural practices. Additionally, as grape growers appeared primarily below the escarpment, climatic variations also could play a role in yield estimations. Controlling for this environmental variable is possible in a regression analysis. There were fifty-two grape growers in Saltfleet versus 225 non-grape producers in 1871.

Both methods of distinguishing improved practitioners produced remarkably similar results. Assuming that differences between improved practitioners and other farmers resulted from differences in farming knowledge, the lack of variation in yields of wheat and hay between the two groups indicates the failure of improved husbandry to give a significant advantage to improving farmers (see Table 6-1).¹²⁹ Both groups produced approximately 14.5 bushels of wheat per acre and 1.2 tons of hay per acre. The contradictory and often dubious scientific articles presented in the farm journals that circulated throughout southern Ontario prior to the early 1870s gave no real advantage to

¹²⁹ Unlike the 1851 and 1861 censuses which allowed for a yield analysis of a variety of crops, the 1871 census listed specific acreages for only three crops: wheat, hay, and potatoes.

improving farmers. Conrad Smith, for example, was certainly not Buckland's ideal farmer. Smith had only read one book by the 1850s, a biography of Lord Nelson. His wife, however, noted that his hard work and dedication to first principles were sufficient to obtain a good crop from land. Damaris recalled,

There was one field, the one that had been first cleared and had been constantly worked for upwards of fifty years, but had been lying idle for three or four years on which the neighbors predicted he would not raise enough to pay for the ploughing. Conrad had a mental reservation that he would disappoint them and he did. Year after year he took off good crops of wheat or clover from that field. He told me that it had only been *scratched over* before he got it - which meant that it had been ploughed both shallow and poorly, and nothing had been returned to it.¹³⁰

In contrast to similar yields in wheat and hay, there were dramatic differences in potato production per acre. Improved practitioners, as determined by their participation in farm journals, obtained an average 107.8 bushels of potatoes from each acre, as compared to 96.8 bushels for non-improved practitioners (see Table 6-1). Alternatively, grape growers, viewed as improved practitioners for this section of the study, obtained a remarkable 28.3 more bushels per acre than their non-improving brethren (see Table 6-2). This latter comparison proved statistically significant at the $\alpha = 0.05$ level in a regression of bushels of potatoes on improved husbandry (n = 183, df = 181, p = 0.0229). When "location relative to the escarpment" is held constant (which compensates for the location of most grape growers), the strength of the relationship is reduced but still remained significant at the $\alpha = 0.1$ level (n = 181, df = 177, p = 0.0825).

¹³⁰ Damaris Smith, "Pioneer Wife," p. 3.

Crop Yields	Improved Husba – From J	Improved Husbandry Practitioners - From Journals -	
	No	Yes	
Wheat per Acre (bushels)	14.5	14.6	14.6
Hay per Acre (tons)	1.1	1.2	1.2
Potatoes per Acre (bushels)	96.8	107.8	101.6
Count	169	108	277

Table 6-1: Crop Yields by Improved Husbandry Practitioners determined by Journal Participation, Saltfleet Township, 1871.131

Table 6-2: Crop	Yields by Improved Husbandry Practitioners determined by	1
	Grape Growing, Saltfleet Township, 1871.	

Crop Yields	Improved Husbandry Practitioners – Grape Growers –		Total
	No	Yes	
Wheat per Acre (bushels)	14.6	14.5	14.6
Hay per Acre (tons)	1.2	1.2	1.2
Potatoes per Acre (bushels)	94.6	122.9	101.6
Count	225	52	277

The increased potato yields obtained by improving practitioners, as indicated in the above tables, intimate an intriguing conclusion. As the 1871 census and the first appearances of Paris Green conveniently coincide, it is reasonable to assume that the improving practitioners noted in the census would have been the initial users of the insecticide. Their increased potato yields, readily apparent in the above tables, suggest more than simply the efficacy of Paris Green as a deterrent to the Colorado potato beetle. They also reflect the legitimacy of the model to distinguish improving farmers from their peers. Improving farmers **should** have higher potato yields because of the recent availability of Paris Green, of which non-improving farmers were probably not as aware

¹³¹ 183 families grew potatoes, 232 grew wheat, and 237 grew hay.

or as eager to use. The success which improvers obtained with potatoes highlights their failure to obtain significant, if any, increased yields of wheat and hay.

Conclusions

By the late 1860s and early 1870s, many advocates of improved husbandry acknowledged the failure of science to provide an effective course of action for farmers. At the same time, however, Paris Green was providing farmers with their first effective chemical insecticide. *The Canada Farmer*, for example, noted that there were too many possible local and climatic variables to take into account and that "unforeseen circumstances and casualties in the ordinary management of the farm often arise to baffle our experience."¹³² A case in point, according to Nesmith, is the bountiful wheat crop of 1871. Almost everyone seemed to grow a bumper crop. The same journal noted, somewhat dejectedly, "Good farming has not produced a correspondingly better crop, while bad farming has produced far more than it deserved."¹³³ In 1866, James S. Gould, the president of the New York State Agricultural Society, essentially predicted this outcome.

We have had theories of agriculture without end, propounded for our consideration; innumerable guesses have been hazarded upon every conceivable topic; inconclusive experiments which no man can number have been made, and yet to our shame be it spoken, there is scarcely a single question which has been mooted in American agriculture that can be said to be settled on the sure basis of reliable experiments.¹³⁴

¹³² The Canada Farmer, September 15, 1871, p. 342, as seen in Nesmith, "The Philosophy," p. 89.

¹³³ Nesmith, "The Philosophy," p. 89.

¹³⁴ Clarence Danhof, *Change in Agriculture: The Northern United States, 1820-1870*, (Cambridge, Mass., 1969), p. 70.

The increasingly untenable demands that improved practitioners placed on farmers to monitor every aspect of their farm proved overwhelming. The following decades saw a clear distinction emerge between the science of agriculture and the practice of agriculture, highlighted with the founding of the Agricultural College in Guelph in 1874.¹³⁵

Factors which distinguished one farmer from another in Saltfleet prior to 1871 had little to do with the science of improved husbandry. Without minimizing its importance, the discovery and production of superphosphates could be reproduced with traditional fertilizers, which one pundit amusingly called the "sheet anchor" of Canada's farm economy.¹³⁶ The advent of Paris Green in the early 1870s, however, proved the first truly effective tool for farmers beyond traditional first principles and could not be effectively reproduced through other means. Apart from this development, which appeared very late in the period under review, the success of rural entrepreneurs stemmed from hard work and a deep understanding of their soil which they likely acquired from having worked it for many years. This appreciation of the particular characteristics of their land allowed farmers to tailor their land to specific crops. Damaris Smith noted the importance of intimately understanding the soil:

Often during the winter I noticed Conrad in an abstracted mood, head bent, gazing into some unknown depth. When I would ask him what he was thinking so hard about, he would say, "I was thinking where I would plant the second field of oats or barley." It was from this, and having heard him say during our rambles over the farm – "this is a great field for barley" - or "what a crop of wheat I can get off

¹³⁵ Nesmith, "The Philosophy," p. 94.

¹³⁶ Canadian Agriculturalist, Vol. XII, No. 4 (February 16, 1860), p. 61. I am not sure if the pun was intentional.

that field" that I felt sure he understood his business and to a great extent the nature of the soil.¹³⁷

Some, such as Damaris and Conrad's son E.D. Smith, who will be discussed in the next

chapter, readily perceived the economic advantages of specializing exclusively in fruit.

¹³⁷ Damaris Smith, "Pioneer Wife," p. 3.

-- Chapter 7 --

A Currant Affair: E.D. Smith, Fruit-farming, and the Niagara Escarpment to 1890.

We traded old ways for the new.

"Fisherman's Wharf" Song by Stan Rogers

Success came most often to those who purchased the best land early, stayed put, and passed this advantage on to their heirs. This is not to say that newcomers could not succeed or that poorer farmers could not find effective means of advancing up the economic ladder. The importance of environmental variables in influencing settlement and success in Saltfleet was not a set of predetermined factors that fated a farmer for success or failure. While technological developments (such as fertilizers, effective pesticides, and hardy seed varieties) and hard work (such as underdraining, weed-control, and effective ploughing) could help overcome a number of natural disadvantages, a perceptive farmer could also buy or lease lands more suitable to specific crops.¹ The ability of some farmers to appreciate economic opportunities and tailor crops to such

¹ As mentioned in the introduction, this thesis assumes that the market for lands in Saltfleet was active. A preliminary examination of the land registry index indicates numerous "bargain and sales" for lands in the township throughout the nineteenth century. Many studies have shown this to be the case in other parts of Ontario. John Clarke's work in Essex County, for example, showed an active land market that fluctuated in activity depending on certain political, immigrations, and economic pressures (Clarke, "The Upper Canadian Land Market: Insights from Essex County, p. 234.) Additionally, Gordon Darroch noted, in his examination of the *Newmarket Era and Express*, a weekly newspaper with a large farmer readership, that the land market was quite active. Numerous advertisements appeared each week (Darroch, "Scanty Fortunes," p. 649. See also McCalla, *Planting the Province*, p. 68, and Akenson, *The Irish*, p. 147-9.

potentialities more effectively than others proved a formidable combination that could overcome the initial disadvantage of not getting there first.

Abram Lee, John Tweedle, Ransom Smith, Murray Pettit, Frank Orr, and many others saw a future in fruit. Some, such as Lee whose farm was on top of the escarpment, were ill-positioned to take full advantage of the economic opportunity. Others, such as Pettit who owned a substantial farm below the escarpment, would profit handsomely, establishing a significant reputation in Ontario's Fruit Growers Association. This chapter traces the influences and decisions of E.D. Smith, a Saltfleet farmer who began life on top of the escarpment, but moved below it when he perceived the economic potential of fruit. His calculations demonstrated the importance of the environmental variables discussed in previous chapters.

Ernest D'Israeli Smith

The most important influence in E.D. Smith's early life must have been his mother, Damaris. As mentioned in Chapter 4, Damaris and her husband Conrad settled 170 acres atop the escarpment in 1853 (see Figure 7-1). While her husband struggled to establish a traditional mixed-wheat farm, Damaris worked to diversify the farm's crops by raising fruits and vegetables wherever she could find a vacant plot and time to spare. Her first effort involved planting currant cuttings in the garden, one row each of white, black, and red. "They did not make much of an appearance," she noted, "for a casual observer to walk down those lands and see a little stick about an inch or so above the ground looked like a great waste of ground," but she had to move the vegetable garden after two years as the currants proved prolific. In the fourth year, she sold nine dollars worth of the little berries. She noted that

Those baskets of delicious currants marked a new era in my fruit fancy. I would have everything in my garden in rows and attend to it. Clean culture will generally bring success. On one side of my garden one year I raised thirty dollars worth of hubbard squash with no great amount of labour laid out either.

"When I look back on the years of imperfect attempts at gardening," she noted, "and the many hard knocks I gave those lumps of sodden earth, it seems to me that it took a great deal too many to knock the chains off ... and bring the old-time wheat farmer to see the necessity of fruit and vegetables for a family."² Later, the fertile mind of E. D. Smith would capitalize on the economic potential of peaches and plums.



Figure 7-1: Location of Smith's First (1853-1889) and Second Farm (1889 – present), Saltfleet Township.

² Damaris Smith, *Pioneer Wife*, p. 3.

Smith, who would become one of Canada's most famous farmers, began his schooling with hopes of becoming a civil engineer. He proved an excellent student, achieving first-class honours in Latin, geometry, algebra, reading and derivation, literature, English grammar, composition, logic, writing, bookkeeping, and geography with second-class honours in Greek and French. The same newspaper that outlined his academic successes also mentioned that Smith bowled or caught out four at the Victoria Cricket Club in two innings and that he batted 22 and 3 in a 111 to 89 victory over a competing school.³ Unfortunately, a sudden debilitating visual impairment shortly before his final examinations stymied Smith's academic hopes, leaving him little choice but to lay down the pen and take up the plough. The transition from scholar to farmer occurred so quickly that the blank pages in Smith's Latin notebooks were recycled as a farm journal. After a translation of works that discussed ancient heroes and kings, such as Mithradates, Lucullus, and Sulla, Smith provided a detailed description of the proper growing techniques for musk and watermelons. As Smith viewed the farmer as the hero of his time, it is, perhaps, not a completely inappropriate transition. Smith felt that all farmers in Canada West could use a classical education to hone their intellectual skills. After tallying up his tuition and books for the past few years, shortly after his affliction, Smith noted that many of his farming friends "consider that to become a farmer this was

³ E.D. Smith Miscellaneous Newspaper Clippings, no date, E.D. Smith Company Family Archives.

useless outlay of money and time; but they grossly err; for I would not begrudge the amount of money paid for the training of my mind were that amount quintupled."⁴

Shortly after returning from school in 1874, Smith took principal management of the farm, as his father had never truly recovered from a serious bout of malaria. Smith had already implemented a number of other plans and projects to generate capital in addition to his agricultural pursuits, probably like many of his peers: he hauled wood into town to sell at market, he pulled over one-thousand bushels sand from the lake, he hired a man to quarry stone out of the escarpment for resale, and he teamed timber and sand for a new school house. It was, however, in dedicating more acres to fruit that he hoped to achieve even greater returns.

I began seriously to think of some better that is more remunerative way of farming. An apple orchard, a vineyard and more livestock, making more manure and raising less grain were the best roads to success that I could find in theory and I commenced at once by setting out 100 grape vines east of the house about 80 yards.⁵

Presumably, he remembered his mother's lessons.

By the late 1870s, Smith began raising a wider array of fruits and vegetables,

including tomatoes, cabbage plants, cucumbers, oats, millet, watermelons, muskmelons,

potatoes, corn, cloverseed, onions, barley, apples and plums. By figuratively putting his

⁴ E.D. Smith, *Diaries*, 1873, E.D. Smith Company Family Archives. Smith's classical education provides some interesting challenges to a researcher. On more than one occasion, I required an encyclopaedia of Greek and Roman Literature to understand some of his farming analogies. My personal favourite is the reference to a prodigious wheat crop rising as Arcturus when Agamemnon stood before the walls of Troy. E.D. Smith, *Diaries*, 1873.

⁵ E.D. Smith, *Diaries*, 1874. A number of other factors contributed to Smith's decision to go into fruit: fluctuations in wheat prices, the depredations of insects on grasses and grains during the 1850s and 60s, and ideological changes among the farming class.

eggs in a number of baskets, he hoped to overcome the climatic uncertainties associated

with farm life.

Here is [the] beauty of fruit and grass, cows and sheep, and in fact, a dependence upon the other sources of income than spring grain. The more I farm the more I am convinced of the necessity of as great a diversity of crops as possible consistent with the economy, then if one fails another may succeed: if I have peach, apples, and grape orchards, if peaches were a good crop money is sure to be made, if peaches were a failure grapes would bring a good price and so on. If the season is late like the present, we could have plenty of time to put millet and corn for feed...wheat does well if spring crops do not and so on to the end of the chapter.⁶

In a particularly good growing season for hay and grass, the benefits of maintaining stock

as part of that diversity, in addition to fruit and vegetables, were clear.

This has been a model growing season since we got the crops in, raining about once in 6 or 8 days a good soaking rain. If crops do not grow, farmers can only blame themselves. In such a season particularly will stock pay. Pasture and all kinds of coarse stuff such as carrots, corn, oats, millet, hay, and being heavy and sure, just in proportion to the richness of the land, whereas wheat may fall flat and shrink or rust may strike it. And the poor farmer gets no more for his labour than in a poor growing year, barley may colour and be good only for feed, so that every year I see the need more and more of keeping more stock and raising more butter beef and wool and less grain devoting more time to the grapes ... Another year I ought to have another hand and if need be put in an acre of berries or something to pay him.⁷

This diversity can be readily seen in the acres Smith devoted to a number of crops in

1877 through 1879 (see Figure 7-2). Oats took up the most acres, but Smith found room

for clover, barley, millet, corn, peas, wheat, and grape vines.

⁶ E.D. Smith, *Diaries*, May 5, 1878.

⁷ E.D. Smith, *Diaries*, June 23, 1878.



Figure 7-2: Number of Acres Dedicated to Certain Crops on E.D. Smith's Farm, Saltfleet Township, 1874-1887.⁸

By the early 1880s, Smith decided to dedicate his farming efforts almost

exclusively to fruit, still raising some grains and grasses for the remainder of his stock.

I intend to go into fruit now extensively as I believe there will be an almost unlimited market for the next generation. The country is growing so fast the population of Toronto has increased in 18 years from 44 to 80 thousand and many other towns and cities in the nation, at the same rate ... the consumer of fruit will

⁸ From Smith's *Diaries*. I calculated the number of acres dedicated to grapes using Smith and Pettit's estimates. Both suggested planting vines ten to twelve feet apart [*Canadian Stock-Raisers' Journal*, Vol. I, No. 5, (March 1884), p. 85]. Using an average distance of eleven feet apart in all directions, Smith planted approximately 360 vines per acre. As vines survived from year to year, the addition of new vines would increase the total number of acres in vines each year. I deducted five percent from the yearly total for damage. Smith noted that many of these damaged vines were often replaced by the nurseries and were not counted in the number of vines he planted, however, the deduction captures some of the incidental damage to the vineyard. Data for this graph was harvested from Smith's *Diaries*. The yearly total acreage of each crop did not equal the total number of acres under cultivation for the farm, especially between 1874-6 and 1885-6. Smith did not note acreages for other particular crops during the period covered by the graph. He does mention planting strawberries, currants, other berries, onions, a variety of other vegetables, and hay. Additionally, there would have been a large section of land dedicated to orchards (mostly pears, apples, and peaches) and pasture.

double in the next twenty years easily and moreover better facilities for shipping will be found and consequently other markets will be opened up and also hundreds of towns of from 500 to 1000 pop. now who consume none or little of the choice fruit ... will not only become better able to buy said fruits but will also acquire a taste for them and when they do they will be determined to have them, so that taking these and other things into consideration I believe those who go into fruit at once will reap the largest rewards of anyone engaged in farming.⁹

Notice that his first thoughts of where he could sell his goods were of local markets.

With a three-year expansion plan in mind, Smith cultivated more and more fruits and

vegetables so that by 1883, he hoped to generate approximately \$3000 profit per year.

This plan included over eighteen different varieties of apples, 16 000 strawberry plants,

1600 grape vines, quinces, gooseberries, raspberries, plums, peaches, celery, onions, and

potatoes. He dropped his apiary and sheep-raising efforts, noting that everything would

be "subsidiary to the fruit business."¹⁰ Smith was not alone. Murray Pettit, another

Saltfleet farmer, noted the importance of specialization in crops other than wheat,

emphasizing a trend that had been progressing for some time in the township.

The children of this grain-growing people have followed the footsteps of their fathers, their cry being continually, "Wheat! Wheat! By wheat we live or die!" But the wide-awake farmer of today in the older settled portions of the country is fast becoming aware of the fact that the soil is less productive; that wheat growing is attended with a greater amount of labour and less profit than twenty years ago; hence we find him pulling out of the old rut, and turning his attention to stock-raising, dairying, fruit-growing, gardening, etc. The fairest field that presents itself to our view is grape growing, in suitable localities.¹¹

⁹ E.D. Smith, *Diaries*, November 27, 1880.

¹⁰ E.D. Smith, *Diaries*, November 20, 1881.

¹¹ Canadian Stock Raisers' Journal, Vol. I, No. 4, (February 1884), p. 65. The volume numbers for this journal, which changed names three times prior to 1890, are not straightforward. The journal appeared to restart their numbering system after the first series. To make matters more confusing, the first Volume I covered more than one year.

Figure 7-2 makes Smith's increased specialization by 1887 readily apparent. A number of crops that featured prominently ten years earlier had disappeared, including barley, clover, millet, and peas. Corn, which had been grown extensively in the past, appeared intermittently on Smith's farm. Only grape vines consistently increased in acreage over time, rising from less than one acre in 1874 to over twenty acres in 1887.¹² With the exception of grapes and other fruit, Smith only planted corn and oats.

Agricultural Knowledge

It was during this change from oats to orchards that Smith retuned his impressive intellect from a career in engineering to one of farming. He was, in many ways, George Buckland's ideal farmer: classically trained and agriculturally oriented. Contemporary journals noted the rarity of Smith's type of farmer: "While it is true that almost any man may scratch and live at farming, (semi-barbarous nations do this), the number now fitted to farm in the proper sense of the term is comparatively limited."¹³ One author wrote,

The expression, "Oh, he is a book farmer!" is often heard, and when the operations are done by a cranky novice, they may lead to larger outlays and small returns, and the general disgust of surrounding practical men; still, I never knew a practical farmer who could not gain much information by carefully reading farm topics in farming papers.¹⁴

Smith was both.¹⁵

¹² Smith did not keep similar records for strawberries, peaches, and other fruit, which certainly took the place of some more traditional crops.

¹³ Canadian Stock Raisers' Journal, Vol. I, No. 10, (June 1883), p. 6.

¹⁴ Canadian Stock Raisers' Journal, Vol. I, No. 5, (March 1884), p. 6.

¹⁵ In Saltfleet, Smith was not alone. Other members of the Winona and Stoney Creek Grape Growers' Club, for example, in addition to Smith and Pettit, contributed articles and columns to farm journals. W.C. Webster, for example, wrote to the *Canadian Horticulturalist* (June 1885, p. 90).

The establishment of the Ontario Agricultural College in Guelph in 1876 promised, according to some, a new age of agricultural knowledge. The impact of the college on the knowledge base of the average farmer, however, remained questionable. Certainly, many still believed in folk wisdom and pseudo-scientific tenets and some, like William Weld and W.C. Smith (no relation), issued challenges to the college to prove its worth. W.C. Smith, an Ontario farmer, wrote a scathing indictment of the college's efforts.

Mr. Editor, allow me a small place to ask the Professors of our Ontario School of Agriculture what they have done to check the increase of those insect pest which prey on our different grain and root crops? Also, what they have done to prevent and cure the various diseases our live-stock are subject to? Two years ago, at the above institution, 40 lambs were lost by tapeworm. They neither cured nor found out the cause. Tuberculosis decimated their herds. Their cows are aborting wholesale. They have experimented on feeding cattle, finding the result that it costs *ten* cents per pound and is sold at *six* cents per pound.¹⁶

In response, the editor of the *Canadian Live-Stock Journal* defended the college on two fronts. First, he argued that a few years of operation were hardly sufficient time to solve such intractable problems, like tuberculosis, which had gone unresolved in the human family never mind in livestock. And second, and more importantly, the college's true purpose was to educate farmers in the scientific method, allowing them to learn through proper experimentation and observation.¹⁷ This indoctrination should allow farmers to put the myths and pseudo-science of the past behind them. The college, for example, took pains to settle, once and for all, the wheat-chess debate. In response to a Brantford farmer's request for an identification of a sample of chess, Professor J. Hoyes wrote

¹⁶ Canadian Stock Raisers' Journal, Vol. II, No. 7, (July 1885), p. 172. Journal's emphasis.

¹⁷ Canadian Stock Raisers' Journal, Vol. II, No. 7, (July 1885), p. 172.

I know that many maintain that chess is deteriorated wheat. If so, why does it not return to wheat when it is surrounded by good conditions? We always find plants growing under adverse conditions, though very inferior, will at once improve and reach their normal appearance when things are favourable – not so with chess, it invariably produces chess...I hope the inquirer will not change his mind on the origin of chess, viz. that it comes from chess.¹⁸

This emphasis on scientific methodology was an important step forward, although the goal of a scientifically educated class of farmers was still a fair distance away.

The scientific focus of the college paralleled significant changes in the quality of Ontario's farm journals. While editors still published letters from any interested farmers, journals began reserving monthly columns for experienced, educated farmers. The *Stock Raisers' Journal*, for example, published monthly horticultural articles from E.D. Smith, Murray Pettit, and William Saunders; the first two were emerging as practical experts in the fruit growing community, while the last was a noted entomologist. This journal, sponsored by the Thorley Horse and Cattle Food Co. of Hamilton in 1883, included reports of experiments conducted at the college, noting not only the results, but also the scientific method used to isolate the numerous variables, including latitude, height, exposure, drainage, and temperature. News and reports from the Experimental Farm in Ottawa were added in 1888. The publishing of consistent farming information written by experts who emphasized scientific observation was another step in the right direction.¹⁹

¹⁸ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 7 (July 1887), p. 548.

¹⁹ Of course, journals did not always agree with each other. William Weld, the editor of the *Farmer's Advocate*, often disagreed with the practices at the college and the contents of other journals. Between April and August 1887, for example, Weld and the College engaged in a running debate on the proper method of fertilizing the soil, which often degenerated into petty name calling and questionable editing of responses.

think while he works, has no business in the vineyard."²⁰ Unlike previous decades, these journals began publishing advice that was, in some cases, consistently effective. As E.D. Smith noted, "by the aid of hellebore and Paris Green, a good force-pump and careful watching, very much can be accomplished."²¹

In July 1884, Smith began contributing a regular horticultural column to the *Stock Raiser 's Journal*, now called the *Canadian Stock Raisers' Journal*, addressing the cultivation and marketing of most fruits and berries. His articles provided detailed step-by-step instructions for all aspects of fruit growing, including preparing the land, fertilizing, disease and insect management, pruning, and harvesting. His program for success was quite labour intensive, with particular emphasis placed on underdraining the soil.²² He noted in one article on strawberries, for example, that "No doubt some will object that too much expense and labor is involved by the above system, to which I would say I am only describing what I consider the most profitable plan in the long run."²³ Smith was not alone in stressing the importance of underdraining; the same journal published six comprehensive articles on the topic in six successive issues from December 1883 to May 1884.

²⁰ Canadian Stock Raisers' Journal, Vol. I, No. 7, (May 1884), p. 123.

²¹ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 8 (August 1887), p. 526. Hellebore is a variety of poisonous plant of the lily family; the roots and stems produce alkaloids. The species used as an insecticide, and coincidentally in the modern-day treatments of heart disease, is *Veratrum album*. Of course, many contradictions and much questionable folk wisdom remained. Salt, for example, continued as a staple fertilizer for the region's farmers. For example, in the *Canadian Stock Raisers' Journal*, J. Ransford, the secretary of the Canada Salt Association, recommended applying up to eight hundred pounds of salt per acre for barley, oats, and rape seed and up to 1100 pounds per acre for gardens and fallow lands [*Canadian Stock Raisers' Journal*, Vol. I, No. 10, (June 1883), p. 6].

²² For example, *Canadian Stock Raisers' Journal*, Vol. I, No. 8, (June 1884), p. 160; or *Canadian Stock Raisers' Journal*, Vol. I, No. 11, (September 1884), p. 244.

²³ Canadian Stock Raisers' Journal, Vol. I, No. 9, (July 1884), p. 6.

Like most farmers, Smith experienced troubles with insects and his columns provided what he thought were the most effective remedies. In 1884, the curculio, which had already devastated the plum orchards of most farmers in Saltfleet, began to turn its attentions to other fruits. According to Smith, the little Turk, "after marking nearly every cherry tree with its crescent cut, pounced upon the few pears that it was hoped would tickle somebody's palate this autumn and ... as a last resort is working hard and fast at our apple crop."²⁴ In response, Smith suggested that farmers step up their use of Paris Green, which had proved effective elsewhere. Unlike many farmers, Smith had no concern over the toxicity of Paris Green.

One-fourth of a pound of Paris green to forty gallons of water is amply sufficient. Consumers need not be alarmed, as the poison is either washed off or evaporates long before autumn, when the fruit is gathered; and if it were not, the quantity is so small that it would not materially injure a person even if the fruit were eaten at once, skin and all.²⁵

Others disagreed. The editor of the *Canada Farmer* thought it "quite time that a check were put upon the use of Paris green."²⁶ The application on apples was particularly troublesome, according to the editor of this journal, because the poison would rest in the stem cavity, with unhealthy results. Still, it was difficult to deny Paris Green's success. Some farmers in the township who failed to use Paris Green found their crops destroyed. J. Tweedle, who heard Smith's advice for using the pesticide on apples but failed to implement it, noted the following: "We neglected to spray our orchard, and although it set a fair crop was almost totally destroyed, not five barrels of fruit fit to barrel where we

²⁴ Canadian Stock Raisers' Journal, Vol. I, No. 10, (August 1884), p. 217.

²⁵ Canadian Stock Raisers ' Journal, Vol. I, No. 10, (August 1884), p. 217.

²⁶ Canada Farmer, Vol. XII, No. 3 (March 15, 1875), p. 42.

should have had fifty. We don't intend to be found napping this season or any other.²⁷ Smith also advised farmers to use Paris Green against the canker worm, aphids, and tent caterpillars. In conjunction with the poison, Smith recommended a number of more traditional pest management techniques, such as, a strong soap wash for the apple borer and oyster-shell bark louse, and allowing hogs to roam the orchard to help defeat the codling moth.²⁸ Some of these remedies, however, remained controversial and contradictory to earlier advice. The struggle against the robin, which munched on harvest-ready grapes, for example, combined old and new ideas. Smith, as secretary to the Grape Growers Club in Winona, helped pass a motion that sought the complete destruction of the bird. He noted

it is advisable that every grower of cherries, berries and grapes shall kill all robins and destroy all nests and eggs possible, from their first appearance in the spring until the grape crop is gathered, at the same time sincerely regretting the old friend of our youth has become one of our most formidable enemies.²⁹

Ironically, the same journal advised small children not to disturb nests, as birds were "great caterpiller [sic] killers and agricultural assistants."³⁰

Murray Pettit, like Smith, began a monthly serial on the proper manner of fruit growing, which first appeared in the February 1884 edition of the same journal. He also covered a variety of topics, including vineyard location, grape varieties, planting techniques, fertilizer, and insects. He advised planting grapes in soils that almost exactly

²⁷ The Canadian Live-Stock and Farm Journal, Vol. V, No. 4 (April 1888), p. 118.

²⁸ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 5 (May 1887), p. 499.

²⁹ Canadian Live-Stock Journal, Vol. II, No. 5 (May 1885), p. 131.

³⁰ Stock Raisers' Journal, Vol. I, No. 4, (December 1882), p. 1.

matched those found under the escarpment in Saltfleet, that being, a rich, deep land with some sand.³¹

The detailed advice of Smith and Pettit exemplified a larger movement towards fruit farming in the Saltfleet area. Many Saltfleet farmers participated in the Winona and Stoney Creek Grape-Growers Club, which had been operating since at least 1878.³² Many of these men had invested significant capital in fruit. William Lottridge by 1884 had planted over six thousand grape vines, including Diana, Isabella, Delaware, Concords, Salem, and Rogers Four and Nine.³³ Twenty-five farmers met at the March meetings of 1884, and over one hundred in 1885. Here, farmers discussed the merits of one species of grape, apple, pear, blackberry, strawberry, raspberry, gooseberry, and currant over another, emphasizing the advantages of particular soils, methods for eliminating pests, and the importance of good drainage.³⁴ With grapes, for example, many insisted that Concords and Clintons paid best. Unfortunately, pests and diseases were reducing yields. In particular, black rot, Illinois Disease, Steel-blue Beetles, and the dreaded Phyloxera louse (which was devastating French viticulture) concerned Saltfleet's fruit growers, although many believed these problems were either temporary or not sufficiently invasive to cause too much alarm.³⁵ One peach disease, however, which first appeared in Michigan, proved particularly vexatious: the yellows.

³¹ Canadian Stock Raisers' Journal, Vol. I, No. 4, (February 1884), p. 65.

³² Many of these same farming families helped establish Ontario's Fruit Growers Association in Hamilton in 1859.

³³ Canadian Stock Raisers' Journal, Vol. I, No. 6, (April 1884), p. 110.

³⁴ Canadian Stock Raisers' Journal, Vol. I, No. 6, (April 1884), p. 110.

³⁵ Canadian Stock Raisers' Journal, Vol. I, No. 6, (April 1884), p. 110.

Peaches provided an important component of the Saltfleet farmers' income. Each year, market goers in Hamilton and smaller communities looked forward to the bundles, bags, and boxes that arrived from the Niagara region. The late 1870s, however, saw a precipitous decline in peach production resulting from a troubling disease called the yellows. The first sign of infection appeared in the leaves, which would fold up and droop. The fruit would ripen early, but it proved particularly bitter. Finally, the wood of the tree became yellow and spongy, resulting in the tree's death within three years. Experts proffered a variety of causes. A Professor Penhollow believed that soil exhaustion was the culprit, but no satisfactory explanation would be found in the nineteenth century, nor was any cure.³⁶ Mr. B. Gott of Arkona predicted the complete decimation of the peach industry.³⁷ Many simply burned down their orchards in order to prevent further infection, finding solace in pear, grape, and berry production.³⁸

Smith agreed that peaches had suffered almost irreparable damage in the past few years, but he believed that poor yields resulted from three problems. First, inappropriate cultivation diminished yields dramatically, as insufficient drainage, few windbreaks, and improper pruning exhausted orchards, leaving them vulnerable to disease.³⁹ Second, Smith believed that a wasp-like fly, which laid its eggs in the bark of peach trees,

³⁶ In fact, the yellows is caused by a viral infection (*Chlorogenus persicae*), spread through grafting or the plum leafhopper (*Macropsis trimaculata*). Signs of the disease can take from forty days to three years to appear (Texas A&M University – Tech Lab, "Texas Plant Disease Handbook," As seen on the internet at http://cygnus.tamu.edu/Texlab/Fruit/Peach/peachy.html on August 17, 2000.

³⁷ Canadian Stock Raisers' Journal, Vol. I, No. 11, (September 1884), p. 244.

³⁸ Canadian Stock Raisers' Journal, Vol. I, No. 8, (June 1884), p. 160.

³⁹ Canadian Stock Raisers ' Journal, Vol. I, No. 11, (September 1884), p. 244.

produced symptoms in peach trees similar to the yellows.⁴⁰ Finally, Smith acknowledged the devastating effects of the true yellows. The first two problems, according to Smith, could be solved with better husbandry and interventionist strategies, such as lime, ash, soap, carbolic acid, and manual extraction. Even Smith, however, could offer no cure for the last, save burning the infected trees at the earliest sign of infection.⁴¹ In the spring of 1887, he stated that the growing of peaches seemed "to be almost a thing of the past"⁴² in his region owing primarily to the yellows, although Smith continued to tend to his own orchards. To his surprise, the summer of the same year brought an enormous peach crop. Smith, desolate in a previous article, assumed a more haughty tone in his writings given the success of his own orchards.

Had the growers retained their confidence in this fruit, and properly cared for their orchards, a much larger crop would have been the result, but successive failures chilled their hearts, and of late the orchards have gone to destruction fast, so that there are not enough of thrifty trees to furnish a crop like that of seven years ago, when the orchards were in their prime. The best orchards, being the youngest, are around Bartonville and Stoney Creek and in the Niagara district, whilst the once famous orchards of Grimsby look old and feeble.⁴³

The year 1885, which proved particularly good for all fruit except grapes,

prompted Smith to accelerate his experiments, seeing which species proved most suitable to particular locales. He noted that this year provided an excellent opportunity to observe "as most fruit crops were heavy, and we had a chance to compare varieties when at their best. It was a year, too, prolific in fungoid diseases, so we had an opportunity of testing

⁴⁰ Canadian Stock Raisers' Journal, Vol. I, No. 12, (October 1884), p. 276.

⁴¹ Canadian Stock Raisers' Journal, Vol. I, No. 12, (October 1884), p. 276-7.

⁴² The Canadian Live-Stock and Farm Journal, Vol. IV, No. 6 (June 1887), p. 525.

⁴³ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 8 (August 1887), p. 574.

the abilities of various kinds to resist these diseases."44 The poor showing by grapes also prompted Smith to conduct a variety of experiments to find species that tasted as good as the Concord, produced sufficient yields, could tolerate temperatures below thirty degrees Fahrenheit, produced in a variety of soils, had strong insect-resistant leaves, presented fruit in large bunches, and were rot proof.⁴⁵ Many popular species, such as the Champion and the Dracut Amber, failed Smith's seven points. Most grapes, in fact, failed the final test, resistance to rot. Smith settled on the Moore's Early, Worden, and Concord for black grapes. Lady and Niagara for white, and Brighton for red.⁴⁶ Only through constant experimentation with new varieties and by tailoring the species of grapes to "seasons and localities,"⁴⁷ he insisted, could success be had. The efforts so far had seen one hundred and thirty tons of grapes shipped from Winona in 1885. He predicted, "three years from now five hundred tons would be harvested in Saltfleet Township."⁴⁸ As a result of his well-written columns and careful experimentation that followed his motto of "Eternal vigilance is the price of good fruit,"⁴⁹ Smith's reputation grew. His advice was so respected that R.R. Hunter of Dundas, after suggesting a number of quick and easy remedies for the codling moth in a letter to the Canadian Live-Stock Journal, wrote,

⁴⁴ Canadian Stock Raisers ' Journal, Vol. II, No. 1, (January 1886), p. 244.

⁴⁵ Canadian Live-Stock Journal, Vol. II, No. 4, (April 1886), p. 97.

⁴⁶ Canadian Live-Stock Journal, Vol. II, No. 4, (April 1886), p. 104.

⁴⁷ Canadian Live-Stock Journal, Vol. II, No. 4, (April 1886), p. 104.

⁴⁸ Canadian Live-Stock Journal, Vol. II, No. 4, (April 1886), p. 104.

⁴⁹ Canadian Live-Stock Journal, Vol. II, No. 11, (November 1886), p. 324.
"What does your correspondent, Mr. E.D. Smith, of Winona, think of these methods of dealing with this great enemy to the apple?"⁵⁰

Economic Potential and Local Markets

The influence of climate and geography made specializing in fruit possible, but the burgeoning markets for fruit made it desirable. Farmers in the Niagara region often did not receive full market value for their produce as most fruit and vegetables were often sent to the large commission houses. Smith, who believed that "fruit growers do more to bankrupt the gravediggers than doctors," believed his tonics would sell best in the local Hamilton market, which, by 1890, had grown to more than 47 000, but also in a number of smaller towns, including Walkerton, Listowel, Palmerston, Kincardine, Wingham, and Clifford.⁵¹ He found his greatest success in taking orders a week in advance and then making deliveries while attending the local markets the next week. In fact, Smith urged all farmers to sell at their local markets where they received cash immediately for their efforts. Shipping the fruit could result in damage on the road, a decline in prices while in transit, or a large cut taken by the "rascality of commission merchant or others to whom the fruit is shipped."⁵² There were, however, some unexpected difficulties in taking the time to deliver personally fruit to the local market.⁵³ On one trip out of town, Smith

⁵⁰ Canadian Live-Stock Journal, Vol. II, No. 5, (May 1886), p. 135.

⁵¹ E.D. Smith, "Autobiography," E.D. Smith Family Archives, File No. BF 20129. Smith ultimately abandoned this enterprise in the 1920s because they could not compete with merchants who invaded the Niagara District during the harvest with large trucks and then drove all over Ontario and the United States, selling the produce to local merchants.

⁵² Canadian Stock Raisers ' Journal, Vol. I, No. 14, (December 1884), p. 332.

⁵³ This practice raised the interesting question of who was working in the fields when Smith was away (other than his wife and mother). Although this thesis does not directly address the issue of farm labour, a

asked his cousin Ransom, who owned another farm in Saltfleet, to look after his peach orders for his Listowel customers. Ransom kindly obliged and then proceeded to fill the orders with his own fruit, essentially stealing the clientele from his relative. Smith's only comment was that "one has to be sharp in business and not rely on men's honour for anything."⁵⁴

Smith condemned both the exorbitant rates charged by rail companies and the manner in which the fruit was handled. The rail companies, he believed, felt impervious to farmers' complaints, as they had no other significant shipping options within the province. This allowed rail companies to charge rates which prevented farmers from recovering their costs. In addition, Smith believed that this indifference resulted in little care in loading and unloading the produce.

The baskets are stacked one upon the other as though they contained hardware or dry goods, and not valuable fruit easily damaged. But this is not the worst of it, for if this were all, wooden covers and stinted measure would save most of the fruit. Baskets are never by any mischance set down carefully; they are not even allowed to drop down, falling with their own weight, which would be sufficient to burst ripe Concords...but they are usually shoved down, a little extra force of gravitation, apparently to see if a hole cannot be punched through the bottom of the car.⁵⁵

⁵⁵ Canadian Stock Raisers' Journal, Vol. I, No. 14 (December 1884), p. 333.

comment is warranted. During the 1880s, Smith had hired at least one man, probably a few more, to help in the fields. Although this thesis asserts that fruit growing gave farmers on smaller farms an opportunity to derive a satisfactory income, large farms also participated in fruit growing. The hiring of labor allowed many of these larger farms to dedicate many acres to orchards and generate profits from their actions, as exemplified by Smith's actions in the late 1890s and early nineteenth century after he purchased eighty acres below the escarpment, which will be discussed later.

⁵⁴ E.D. Smith, "Autobiography," June 28, 1937, E.D. Smith Family Archives, File No. BF 20129, p. 3. The adaptation of farming families to changing economic opportunities can also be seen in Andrew H. Baker and Holly V. Izard, "New England Farmers and the Marketplace, 1780-1865: A Case Study," *Agricultural History*, Vol. 65, No. 3 (Summer 1991), pp. 29-52. The difficulties of moving fruit and vegetables to market at this time are addressed in James L. McCorkle, Jr., "Moving Perishables to Market: Southern Railroads and the Nineteenth-Century Origins of Southern Truck Farming," *Agricultural History*, Vol. 66, No. 1, (Winter 1992), pp. 42-62.

This combination of high rates and poor handling resulted in at least a ten percent reduction in receipts, and led Smith to sell his fruit at local markets throughout the region.

It was in selling his own fruits and vegetables across southern Ontario that Smith realized a lucrative opportunity. In by-passing merchants who sold fruit purchased directly from commission houses, Smith could eliminate the middleman.

I realized that this method of selling our fruit meant that the fruit traveled along two sides of a triangle whereas, if shipped direct to the small towns, I would travel along only one side of a triangle and there would be a considerable saving for somebody so I initiated the system of selling fruit direct to the retail merchants in the towns and villages outside of the large cities. This entailed very soon buying fruit, as the demand rapidly increased beyond my ability to supply from my own farm so that the business of buying and selling fruit developed into quite large preparations.⁵⁶

Smith found that by taking a ten percent commission on the fruit of fellow farmers, he could cover his expenses for a trip, leaving the sale of his grapes on the same trip as profit. Smith, for example, sold the grapes and peaches of Murray Pettit. After selling over 1400 pounds of grapes (mostly Concords) and fifteen baskets of peaches for Pettit, Smith had realized a \$4.31 commission in just five days; a small amount in itself, but he sold fruit for many local farmers. On one occasion, he spent six weeks in the London area obtaining and filling orders for his own produce and at the same time buying and selling the crops of many others. By February 1886, Smith began advertising the sale of fruit trees and bushes in the *Canadian Live-Stock Journal* (formerly the *Canadian Stock*

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⁵⁶ E.D. Smith, "Autobiography," p. 2.

Raisers' Journal).⁵⁷ After 1887, he adopted the name Helderleigh Nurseries for this branch of his enterprise.



Figure 7-3: Wagons, full of Smith's Fruit, await Shipment to Market, Winona, Saltfleet Township, circa 1890 (National Archives of Canada).

Additional markets for fruit could be found in the canning trade, which emerged as a significant industry for Hamilton and the Niagara region in the 1880s. Smith, who would one day own one of the largest canneries, believed that canned fruit would play an integral part in preserving the future of the fruit industry because all of Canada could then be provided with the peninsula's bounty. By 1887, four canning firms had begun

⁵⁷ Canadian Live-Stock Journal, Vol. II, No. 3, (March 1886), p. 75.

operations in Hamilton. Ten years previously, there had been none.⁵⁸ Smith predicted that by 1897, revenues from grapes alone would surpass that from all the Dominion's wheat and barley. Murray Pettit believed that Canadian farmers would never out-produce market demand, especially once people tasted the best kinds. He stated that the "thrifty-labouring classes,"⁵⁹ who only have grapes as an occasional treat would readily purchase them more frequently as production increased. His prognostications were dramatic.

When the villagers and the rural cultivators can literally sit under "their own vine and fig tree;" when the tempting clusters of the vine in the fresh are upon the poor man's table for six months of the year; when grape juice in its various preparations is among the family stores in every household; when less pork and more grapes are eaten by the farming community, then will our daily journals contain fewer accounts of suicides, and our asylums fewer inmates.⁶⁰

If the market for fresh grapes ever filled up, there was always a market for raisins,

preserves, unfermented wines, grape jelly, grape relish, and grape catsup.⁶¹ The Fruit

Growers Association, of which Smith was a member, did what it could to increase

consumption by distributing recipes throughout the region that called for grapes. Smith

prompted the same organization to begin distribution of peach, plum, and pear recipes.⁶²

⁵⁸ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 8 (August 1887), p. 574.

⁵⁹ Canadian Stock Raisers' Journal, Vol. I, No. 4, (February 1884), p. 65.

⁶⁰ Canadian Stock Raisers' Journal, Vol. I, No. 4, (February 1884), p. 65.

⁶¹ Canadian Live-Stock Journal, Vol. II, No. 10, (October 1886), p. 296.

⁶² Canadian Live-Stock Journal and Farm Journal, Vol. II, No. 12, (December 1886), p. 355. Smith hoped that British markets would be available to Canadian grape growers, but the only variety cheap enough would not stand the voyage. The Niagara, the grape most likely to stand the voyage, was too expensive in comparison to British varieties [Canadian Live-Stock and Farm Journal, Vol. II, No. 12, (December 1886), p. 355].

Despite a firm belief in the economic potential of fruit, only some fruit proved profitable. Apples, for example, could be grown almost anywhere, making expensive land unnecessary. Smith noted

There is soil and climate as suitable for the production of apples, and practically as convenient to market, that can be bought for from \$40 to \$60 per acre, as that which would cost \$400 per acre, hence I consider it folly for the man with land of high value to attempt competition in apples...I know a gentleman who annually sells more value in apples from some broken mountainside, that is too rugged to cultivate, than he does in grain from any similar number of acres on his farm.⁶³

Smith questioned how anyone on expensive land could compete with the farmer whose property was valued at only twenty dollars per acre. Smith presented similar arguments for planting trees for profit. The long growing time for walnut trees, for example, meant that return on raising such trees would be far less remunerative than renting land for cultivation. To make tree-planting pay, farmers must only plant on lands that were both unsuitable to other crops and valued at far less than good agricultural land. He felt the untillable sections of the escarpment would be perfect for such endeavours.⁶⁴ Abram Lee, for example, owned a productive farm above the escarpment on lands less expensive than those below. He derived most of his fruit income from growing apples.⁶⁵ The *1890 Assessment Roll for Saltfleet Township*, which estimated the return of a forced sale, indicated that the lands below the escarpment could obtain a minimum of \$350 per acre, an impractical price for apple orchards. Grapes, peaches, and berries proved far more

⁶³ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 12 (December 1887), p. 692.

⁶⁴ [*The Canadian Live-Stock and Farm Journal*, Vol. V, No. 4 (April 1888), p. 117]. The almost complete denuding of the escarpment's trees in the nineteenth-century, for housing and the railroad, also meant that there was plenty of room for these trees.

⁶⁵ Abram Lee, "Diary – 1880," Erland Lee Museum House, Stoney Creek, p. inside flap. Lee did grow a variety of fruit, but many of his grapes were frozen out in some years.

cost-effective for farms below the escarpment, adding to the drive to specialize in particular crops.

By the late 1880s, the relative importance of fruit to a farm's overall economy depended largely on its location. Pettit who lived below the escarpment, for example, believed that fruit was the most important element of his economy. In contrast, J. Tweedle, who lived above the escarpment at the back of the township, stated that the "foremost business on the farm is no doubt the maintenance and care of its flocks and herds."⁶⁶ Fruit, for Tweedle, was an added comfort to improve farm life. Smith, on the other hand, began dedicating more and more of his efforts to fruit. Echoing sentiments of Adam Smith's pin factory, E.D. Smith said

It is not advisable to attempt growing fruit for sale on a grain farm. Either the fruit or the grain is likely to be neglected. Each year I become more convinced of the wisdom of specialties in farming. A factory making all the different parts of a machine cannot compete with one that makes only parts of similar constructions, buying other parts from other factories; neither can a farmer find time to properly oversee a too diversified system of farming, nor can he grow diversified crops as cheaply as the specialist, one reason being that more machinery and buildings are required on a given area of land for diversified farming than for special.⁶⁷

Smith's change from diversification to specialization was almost complete.

Climatic Difficulties

Despite having a fine and productive farm with cleared lands and good drainage, Smith appreciated the difficulties associated with growing fruit on top of the Niagara Escarpment, the most visibly striking example of geophysical variation in the township.

The escarpment contained the moderating effects of Lake Ontario, sheltering the lands

⁶⁶ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 3 (March 1887), p. 442.

⁶⁷ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 12 (December 1887), p. 692.

below it from temperature extremes. A cruel, unexpected frost, devastating to fruit farmers, illustrated the dangers of not lying under this protective mantle. The early frosts of 1883, for example, resulted in significant losses to Smith's grape business:

Had three or four heavy frosts but not enough to hurt the grapes, though the leaves were killed on the Delaware and Rog[ers] so the grapes would not ripen! Till last night where we got one that froze all the grapes, Concords and all, so ever are stripping them off as fast as possible and sending them to Toronto and London to sell for what they will ...but bad as this was, it was still better than anything else on the farm.⁶⁸

The following spring brought even more distress. A late frost destroyed six-hundred dollars worth of grapes, despoiled half the black currants, devastated the entire blackberry crop, and damaged the leaves of all the red raspberries: "my whole loss will not fall short of a thousand dollars. All in one night and if there had been no wind I do not doubt every bit of green vegetation would have been frozen solid."⁶⁹ A week of severe winter cold could also inflict damage. Peach trees, for example, generally do not survive sustained temperatures below –23°C. The winter of 1881 brought weeks of this bone-chilling cold to southern Ontario, and Smith suspected that his entire peach orchard had been damaged.⁷⁰

Smith seemed particularly concerned about spring frosts that could so often

destroy fruit crops, peaches in particular, before they even started.

The only preservation from this is a location south or southeast of a large body of water. The north and northwest wind in passing over the water becomes tempered, and these are the directions from which our cold waves of wind come,

⁶⁸ E.D. Smith, *Diaries*, October 5, 1883

⁶⁹ E.D. Smith, *Diaries*, June 1, 1884.

⁷⁰ E.D. Smith, *Diaries*, February 6, 1881.

so that the above location is not only wave-exempt from spring frosts, but is not so cold in winter as other parts of the country.⁷¹

The lake and escarpment provided protection from frosts that could decimate the tender buds in the spring or the market-ready fruit in the fall, as Smith noted in 1882: "First frost last night; pretty heavy; would have been frosts 2 weeks ago on several nights only for lake winds, nights had frost in back places."⁷² During the cold snaps of the early 1880s, Smith acknowledged the temperature variations experienced by communities below the escarpment, compared to those of his farm:

We have had 6 weeks of very cold weather mercury below zero from -5 [-20°C] to -10 [-23°C] degrees at least a dozen times and this morning -22 [-30°C] below here I presume or more as it was -19 [-28°C] at Stoney Creek, -16 [-26°C] at Winona and -12 [-24°C] at St. Catharine's. Plenty of snow on the ground however all these weeks. Let us see how the fruit trees stand it.⁷³

Admittedly, not too many peach trees could have survived these sustained temperatures either above or below the escarpment. However, Smith's assumption that temperatures were slightly warmer in and around Winona and Stoney Creek than around his farm indicated that farmers within the same township faced different levels of risk.⁷⁴

In addition to climate, soil characteristics also held Smith back. His property, which rested mostly on clay loam, was suitable to some crops but not others. He felt that

the two most profitable types of red raspberries, Turner and Brandywine, would not

⁷¹ Canadian Stock Raisers' Journal, Vol. I, No. 11, (September 1884), p. 244.

⁷² E.D. Smith, *Diaries*, October 20, 1882.

⁷³ E.D. Smith, *Diaries*, February 11, 1885.

⁷⁴ The moderating effects of large bodies of water had probably been known for millennia. As early as the 1860s, farm journals in Ontario suggested that farmers take this factor into consideration when they purchased their property (Clericus, *Canadian Agriculturalist*, January 16, Vol. XII, 2, p. 33-4). E.D. Smith, *Diaries*, October 20, 1882. E.D. Smith, *Diaries*, February 11, 1885.

effectively grow on his property, but would do very well on the sandy loam below the escarpment.⁷⁵

The disadvantages of living atop the escarpment, including frosts and poor inappropriate soil, proved costly. The cold winter of 1886 and the following dreary spring produced mediocre results. Also, more farmers were growing fruit, which was driving prices down. Competition came not only from the Niagara Peninsula, but from Pelee Island, Essex County, and the St. Clair Region. Specialists in fruit were also appearing in greater numbers: William Rennie had been selling seeds from Toronto since 1870,⁷⁶ Pearce, Weld & Co. sold garden and field seeds out of London by 1882,⁷⁷ A.M. Smith sold trees and bushes in St. Catharines by 1884.⁷⁸ Smith concluded, "there is not much profit in [fruit farming] at present, except for an expert upon a choice location."⁷⁹ He was fast becoming such an expert, but his farm was ill suited to profit making. Smith realized that to be successful in fruit, he would have to move to a more hospitable location. In 1889, Smith purchased approximately 80 acres nestled snugly at the base of the escarpment (see Figure 7-1). He described these lands, after sufficient underdraining removed the cold springs and wet bottoms, as "the very best soil for many purposes."80 This property would serve as the principal location for all his future fruit growing and nursery endeavours.

⁷⁵ E.D. Smith, *Diaries*, May 24, 1885.

⁷⁶ Canadian Live-Stock Journal, Vol. II, No. 8, (August 1885), p. 201.

⁷⁷ Canadian Stock Raisers' Journal, Vol. I, No. 1, (September 1882), p. 6.

⁷⁸ Canadian Stock Raisers' Journal, Vol. I, No. 5, (March 1884), p. 92.

⁷⁹ Canadian Live-Stock Journal, Vol. II, No. 8, (August 1886), p. 218.

⁸⁰ The Canadian Live-Stock and Farm Journal, Vol. V, No. 3 (March 1888), p. 85.

Does Smith's relocation to lands more suitable to fruit production mean that he does not exemplify a principal theme of this chapter, namely, that good farmers were successful because they understood their land and tailored their crops to its environmental peculiarities? The answer is no. Saltfleet's farmers were not forcibly constrained to live within the limits of the lands they inherited or purchased. Farmers could always move if they believed better economic opportunities existed elsewhere, assuming they had the means to pay and, presumably, the expectation that the new lands would meet their needs. Smith realized that the southern Ontario market for fruit was growing rapidly. He knew his land well-enough to realize that it was not capable of meeting this need. An active land market, which is assumed in this thesis, allowed him to purchase lands elsewhere in the township in order to service better what he perceived to be a growing market. At the same time that Smith exemplified the entrepreneurial farmer at his most dynamic best, he also benefited from established family holdings in the township. He understood variations in climate and soil from long observation; he knew something about fruit tending from his mother. He also had the assets of a working farm which could be liquidated to assist with the purchase of a new operation. It is likely too that his family's established presence made him a good credit risk.

Saltfleet at 1890

By 1890, the regional variations between Saltfleet farms in 1890 appeared quite different from those in the early half of the century. In 1850, for example, the farms below the escarpment were, on average, larger and much more expensive than those above. The assessment roll for 1890, however, indicates that the average farm below the

escarpment was much smaller, only 43 acres compared to 59 acres (see Table 7-1). Although there were a number of very large farms below the escarpment, the majority were now much smaller (see Figure 7-4).⁸¹ This small size disguises an extraordinary difference in real value. The township officer assessed the farms below the escarpment at an average value of \$84 per acre, compared to only \$38 per acre for farms above the escarpment (see Figure 7-5). Even more remarkably, the eighteen individuals who called themselves fruitgrowers in the assessment roll (all of whom were located below the escarpment) possessed a per acre assessed value of \$182, almost five times the value of farmers above the escarpment. The combined effects of superior climate and soil for market-ready produce and close proximity to the city and rail line created a region in Saltfleet that was worth substantially more than elsewhere in the township. This economic pressure, as Smith stated, prevented this expensive land from being used for less cost-effective produce, such as apples. High-value fruits, such as grapes, berries, and peaches, proved the only crops suitable to land that obtained, in a few prime locations, assessed values over \$350 per acre. Although no cultural variables could be derived from the 1890 assessment roll, environmental variables and the age of farmers could be. Only a farm's relative location to the escarpment proved significant at the $\alpha = 0.05$ level in a regression of these factors on assessed value (see Table 7-2). Age also proved insignificant in this regression.

⁸¹ As mentioned in Chapter 1, the *Assessment roll for 1890* is a single-schedule document that tallies the assessed value for each property in the township. Including only farmers, market gardeners, and fruit-growers, there were 513 individuals that possessed real property over five acres in size in Saltfleet. The decline in farm size across the township may not exclusively have been the result of changes in agriculture, although it certainly was a key factor.

Bronorty Characteristic	Relative to	Total	
	Above	Below	i Utai
Average Total Acres	59	43	48
Average Cleared Acres	52	40	44
Total Real Property (\$)	2286	3347	2620
Real Property per Acre (\$)	38	84	60
Count	218	230	448

 Table 7-1: Property Characteristics by Relative Location to Escarpment, Saltfleet

 Township, 1890.



Figure 7-4: A Boxplot of Average Total Acres by Relative Location to Escarpment, Saltfleet Township, 1890.



Figure 7-5: Average Assessed Value of Real Property per Acre (\$) by Farm per Lot, Saltfleet Township, 1890.⁸²

Table 7-2: P-Values for a Regression of Envir	onmental Temporal
Variables on Assessed Value, Saltfieet T	ownship, 1890
$(p < 0.001, n = 493, df = 486, R^2 =$	0.105). ^{#3}

Source	P
Constant	< 0.001
{C} Escarpment	< 0.001
{C} Drainage	0.186
{C} Red Hill	0.372
{C} 250M of Water	0.091
Age	0.281

As the 1890 assessment roll is a fundamentally different historical document than

the various decennial censuses, it could be argued that comparing property size between

⁸² Weighted by lot.

⁸³ When four high leverage and high influence data points were eliminated from the regression, the significance of distance to water disappeared. Additionally, a square root transformation corrected for a slight non-normal distribution, which produced a regression with only the escarpment proving statistically significant (p < 0.001, n = 488, df = 481, R²=0.101).

the types of records would be misleading, a problem that cannot be easily rectified given that the agricultural schedules for the 1881 and 1891 censuses have been destroyed. The *Abstract Index to the Land Registry Records* for Saltfleet, however, provides a consistent record which can be used to compare changes in land size over the entire period of study. As indicated in Figure 7-6, the largest undivided parcel of land for each lot in Saltfleet prior to 1850 for lands above and below the escarpment proved very similar, ranging from approximately ninety-eight acres in 1810 to approximately eighty-nine acres at midcentury.⁸⁴ The second half of the century proved dramatically different. The largest average parcel size for farms below the escarpment between 1851 and 1870 was 73 acres and only 59 acres for the subsequent twenty-year period. The properties above the escarpment were much larger, with the largest average parcel being 83 acres between 1851 and 1870 and 74 in the subsequent period. This change in Saltfleet's agriculture does not mirror the results of other studies which emphasized the demographic and agricultural stability of long-settled rural communities near the turn of the century.⁸⁵

⁸⁴ For example, if a lot contained two farms, one of twenty acres and one of eighty acres, then the largest single parcel for this lot would be eighty acres. I excluded all properties smaller than five acres, all lots surrounding the township's five small towns, and all the lots in the Broken Front Concession, which differed in average size from the rest of the lots in the township.

⁸⁵ Hal S. Barron, Those who Stayed Behind: Rural Society in Nineteenth-Century New England (Cambridge: Cambridge University Press, 1984), p. 134-5.



Figure 7-6: Largest Property Parcel for each Lot, Saltfleet Township to 1890. Inequality

A general theme throughout this thesis is the continued level of inequality that typified settlement in the township. The distribution of farm acreage indicates that inequality in 1890 was increasing after the dramatic decline that appeared between 1819 and 1851 (see Figure 7-7). In the early part of the century, the large properties claimed by some loyalist officers and settlers, such as Augustus Jones, contrasted the small landholdings of many others. This disparity established some initial inequities. By mid century, the size of Saltfleet's farms was more equally distributed amongst its farmers, and this change seems to have been a consequence of properties in loyalists hands being divided either amongst sons and daughters as they came of age, or perhaps sold by speculators or absentee landlords to new settlers. By 1890, the average farm in Saltfleet had become much smaller. Farmers, who accelerated their move towards fruit farming during this period, needed fewer acres to accomplish their goals. An increasing number of small fruit farms stood in juxtaposition to the many large farms that still dotted the township, creating increased inequality in land acreage in Saltfleet. Over the entire period in question, the level of inequality between age groups with respect to the distribution of farm acreage (the only measure of wealth with data points in all five primary document) remained remarkably consistent. The land-rich and the land-poor appeared in equal percentages amongst the young and old. This reiterates the statistical insignificance of age in most of the multiple regressions on farm acres throughout this study.



Figure 7-7: Gini Coefficients for Farm Worth, Assessed Value, and Total Acreage by Age of Farmers, Saltfleet Township, 1819-1890.⁸⁶

⁸⁶ As the 1819 assessment roll did not include the age of individuals, the Gini coefficients for that year are not divided by age. Also, recall that the 1819 total acreage was the average property holdings throughout the township and not the average farm size.

The Gini coefficient for farm worth between 1851 and 1871 indicates a general rise in inequality over mid century. In 1851, it appears that many of Saltfleet's farmers derived a relatively successful income from crops and livestock that lessened disparity in the community. The crisis in land and wheat speculation that followed the high grain prices in the mid 1850s and the beginnings of crop changes in the township over the period in question probably contributed to the rising level of inequality. As Conrad Smith noted, those who based everything on continuing high prices for wheat lost almost everything. Note again that there was almost no difference in the coefficient between younger and older farmers. Finally, there appears to be a large jump in the level of inequality between 1851 and 1861, as derived from assessed value. This change probably resulted from the manner in which assessed values were calculated rather than fundamental changes in the township, although the changes in farm worth suggest that there may be additional forces at work. Between 1871 and 1890, the evidence appears contradictory. On the one hand, the decreasing level of inequality as derived from assessed value supports Di Matteo and George's work that suggests a similar decline in Wentworth County over the same period through their examination of probate records, although their study included both urban and rural individuals.⁸⁷ On the other hand, the level of inequality in Saltfleet based on total acres rose over the two decades in question.

Ultimately, given the different sources of data and the manner in which assessment and censuses rolls changed over time, only two definite conclusions should be

⁸⁷ Livio Di Matteo and Peter George, "Canadian Wealth Inequality in the Late Nineteenth Century: A Study of Wentworth County, Ontario, 1872-1902," *Canadian Historical Review*, Vol. 73, No. 4 (December 1992), pp. 483.

drawn from the variations in Gini coefficients presented in Figure 7-7. First, there was remarkably little difference in the distribution of wealth between the young and the more experienced farmers. There were rich and poor in both groups. Second, there was a general decline in inequality after the township's initial settlement period, but after 1851, the level of inequality in the township again began to rise.

Conclusions

Conrad Smith tended a mixed-wheat farm with his wife and children above the Niagara Escarpment during the middle-half of the nineteenth century. Years of hard work yielded an impressive farm and a respectable income. Yet Conrad's son, Ernest D'Israeli, ultimately rejected the grain-centred-mixed farming of his father when he assumed management of the farm. Seeing the future of farming in the production and distribution of peaches and plums rather than grains and grasses, E.D. Smith began experimenting with a variety of fruit crops as early as the 1870s. Smith stated,

To make farming remunerative, we must use the utmost discretion and judgement; of course, the noble art of agriculture admits of an immense diversity of forms and opinions. We must choose those which are best adapted to our country and locality and herein lies the opportunity of exercising a great amount of judgement and skill as well as practice.⁸⁸

The most important lesson that any farmer should learn was to understand intimately the lands that they were to farm. Smith eventually proved to be one of the most successful of Saltfleet's farmers because of his ability to tailor his crops to his locale and to a burgeoning market. His success was passed on to the next four generations.⁸⁹

⁸⁸ E.D. Smith, *Diaries*, 1874.

⁸⁹ Llewellyn S. Smith and Phyllis Cowan, *The House that Jam Built*, (Markham: Baby Boomer Press, 1995) p. 51-229.

The impact of local environmental variables weighed heavily on the mind of Smith, influencing his decision to grow certain crops and purchase certain properties. Historical studies of common farming activities in Canada have focused on townships and counties as their organizing principle. As E.D. Smith demonstrated, local environmental variables influenced crop choice and property size to such an extent that significant and dramatic variations can be found within a township. Historical analysis should look beyond the constraints imposed by the arbitrary and somewhat artificial structure of primary documents. A more logical organization of an analysis of the Niagara peninsula, for example, contrasts farms below the Niagara Escarpment to those above, rather than comparing the agricultural output of Saltfleet against that of neighbouring townships. Settlement patterns become much more apparent when census data are organized along geophysical lines rather than survey lines.

-- Conclusion --

I've watched the Vs of geese go by Fox foot in the snow. I've climbed the ridge of [Hamilton] Mountain, Looking to the valley below, And watching the apples grow.

> "Watching the Apples Grow" Song by Stan Rogers

In 1860, an article in the Canadian Agriculturalist cautioned farmers to pay strict

attention to the environment of the property they planned to settle. Clericus, the author,

advised purchasers to examine their lands carefully. He noted,

Gardens situated on the Niagara river, in which the trees blossom early, and then receive a severe check from the great coldness of the air, produced by large masses of ice floating down from the upper lakes, must yield fruit very precariously - while those upon the lake shore would not only escape this, but would be free also from late spring and early autumn frosts. Those who would be very successful should weigh these things well, and if they refuse, ought not to complain of subsequent miscarriages.²

The author's advice echoed that of previous guidelines which provided environmental

clues as to what would make good farmland. Such lore can be traced back to the search

for the black walnut, which influenced Upper Canada's first settlers. These settlement

guides reflected how the quality of land influenced a farmer's success or failure.

¹ Of course, any fan of Stan will know that the above lyrics are not quite right. It should read, "I've climbed the ridge of Gaspereaux Mountain" in a song that disparages life in Ontario and the singer's desire to live by the sea in the Maritimes.

² Canadian Agriculturalist, Vol. XII, No. 2 (January 16, 1860), p. 35.

Uncleared land presented new arrivals with a set of potentialities. As cultural activities altered the natural surroundings, different economic and settlement possibilities emerged, which in turn, required their own cultural response. This dynamic of new ecologies, adaptation, and more change continuously evolved. The principal economic activity for settlers in Saltfleet was agriculture, which depended on the particular property that each farmer settled on and how that land was changed over time. A few decades of intensive farming quickly negated the millennia of accumulated nutrients. Deforestation exposed the ground to the eroding effects of rain and wind. These alterations to the natural landscape required further adaptations in the cultural landscape, adaptations which we can broadly characterize as improved husbandry and crop specialization. These refinements were tailored to a farm's particular environmental characteristics. Farmers' responses combined with the unique traits of each farm produced individual parcels of property with distinct economic and agricultural characteristics. Studies that seek to understand settlement and agriculture in southern Ontario cannot treat the land as homogeneous, no matter how many qualifying statements are employed to acknowledge and then exclude these variations.

There are numerous factors that shape and alter the success and failure of farmers in nineteenth-century Ontario that are traditionally excluded from statistical studies of the wealth distribution in the province, including land quality, settlement persistence, the sequence of land acquisitions in a particular region, access to credit, initial capital, distance to markets, access to effective transportation, early knowledge of changes in market demand, fluency in the cultural and linguistic levers of political power, or access to cultural and social organizations that provided aid when needed. This thesis addressed two of these variables by creating a new model that included environmental and settlement persistence variables. Moreover, we can best work with these two variables at the local level over a long period of time.

The most dramatic geophysical feature of the township produced the most dramatic changes and adaptations in the township's agricultural activities. The area below the escarpment, where the moderating effects of Lake Ontario were most pronounced, was the first to be settled, although there was considerable overlap between regions. Below the escarpment, large farms predominated. Later arrivals, finding most of the good lands below the escarpment already taken, moved up the mountain where they tended to concentrate on grains and grasses. Over-farming and extensive clearing, however, compromised the fertility of the soil below the escarpment. Farmers, looking for alternatives, realized their land's suitability to fruit and vegetable production. They began to specialize in these crops, devoting more and more of their time and capital to grapes, plums, and peaches. Needing fewer acres for a successful fruit farm, agriculturalists began dividing their farms into smaller parcels. Ultimately, by 1890, the average farm below the escarpment was considerably smaller than those above. This was a complete reversal from the township's earliest days. These cultural responses to soil and climate created distinct agricultural patterns that would have been lost in a provincewide or even township-wide study. In fact, precisely because a detailed local study has suggested this conclusion, it has been possible to question some general suppositions about how and why some rural folk accumulated greater property than others.

The importance of good agricultural lands was not lost on settlers nor the historians who studied them. McInnis noted that the essential difference between Upper

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and Lower Canadian farmers could essentially be attributed to climate. A longer growing season, he noted, allowed Upper Canadian farmers to plant both winter and spring wheat. Darroch and Soltow, however, excluded environmental variables from their statistical analysis of the 1871 census of Ontario. By focusing on cultural differences, they explained variations in cultural terms. The Weberian model provided a ready paradigm. Baptists and Methodists owned more land because they were Baptist and Methodist. Anglicans and Catholics owned less because they were Anglican and Catholic. The reason for the latter's failure, according to the authors, stemmed from an alleged belief system that failed to instill adequately thrift, self-restraint, and capital acquisitiveness. While there may very well be cultural variations associated with wealth in Ontario, statistical studies must hold land quality and time on the land constant before making these claims. The influence of the Niagara escarpment on crop choice, farm size, and even inheritance patterns emphasizes this importance.

The effect of other local environmental variables on farming decisions in Saltfleet is more subtle, but still evident. Both the Red Hill Creek Valley and distance to water influenced the decisions of farmers to specialize in cattle. A reliable water source was a necessity to good livestock practices, while the valley's particular amalgam of soil and topography proved less suitable for grain and almost perfect for grazing grasses. Each environmental characteristic pushed farmers to specialize in particular agricultural endeavours to take advantage of growing local markets in Hamilton, Toronto, and the surrounding region.

The importance of drainage, on the other hand, is difficult to establish. Despite the significance that nineteenth-century agriculturalists placed on good drainage, this study could not consistently attribute significant variations in settlement or agriculture to a farm's natural drainage patterns. This result could be attributed to a number of factors. First, drainage may not have been as important to successful farming as portrayed by improving practitioners. This conclusion would support assertions in this thesis regarding the failure of journal editors to provide an effective regimen for success on the land. Second, a farm's natural drainage may not have been as significant a contribution to crop success as artificial underdraining. Third, the model used in the thesis does not capture successfully lands that historically possessed poor drainage. And fourth, variations in quality of drainage might be great enough to make a difference. Future work might expand or improve quantitative attempts to examine the importance of drainage and how farmers tailored their crops to this particular aspect of their property.

The specialization of agricultural activities based on the land's characteristics indicates that farmers should be viewed as rural entrepreneurs who reacted to specific environmental and market influences and not out of an alleged religious belief system that spilled over into presumed habits of work and investment. The relative success of a farmer in generating a satisfactory income derived, in part, from a capacity for hard work, initial economic position, and good fortune with respect to sickness, pests, and the weather. Success, however, also derived from a farmer's ability to perceive changes in the land and economy. Such individuals purchased particular parcels, cultivated certain crops, and initiated improvements to their investments based on a deep understanding of their land's capabilities. An analysis of this understanding of local environmental variables provides a useful point of entry into better understanding settlement patterns.

In Saltfleet, a wide variety of factors combined to influence these patterns.

Particular environmental factors important to property accumulation in this locale might not be pertinent elsewhere, which is exactly the point. Cultural variables, religion in particular, which was readily employed to explain variations in settlement in Darroch and Soltow's 1871 study, failed to materialize as significant in Saltfleet. This is not because a single township provided results different from provincial patterns (which it often did), but because when land quality and settlement persistence were held constant, the significance of cultural variables disappeared. Of course, even though this thesis uses a new settlement model to examine variations in the distribution of wealth, it is still based on an analysis of one township. The conclusions drawn from this analysis, therefore, should be viewed as a first step towards a better understanding of the distribution of wealth in the province. Incorporating the lessons here into a broader study would be difficult, but not impossible. Long-term climate studies for the province offer a number of variables that could be incorporated into a broader study, including growing-degree days, rainfall, and minimum temperatures.

The emphasis I place on the importance of land quality and climate may raise issues of environmental determinism, a concern that should be addressed considering that I am skeptical cultural determinism. Both paradigms are flawed. As Lemon stated, "If cultural determinists made people into preprogrammed automatons who followed custom, then environmentalists imagine people like Pavlovian dogs able only to react to external stimuli."³ The importance of environmental variables as they influenced the fertility of the land in its broadest sense does not mean that the actions of individual farmers were

³ Lemon, *Poor Man's Country*, p. xv. Lemon does not look at the environment as the prime factor for change, but stresses the importance of economy and culture, with natural variations serving as a modifier to action.

predetermined. In fact, I argue the opposite. Planting decisions embodied the skills and perceptions of individual settlers. Although sickness, insects, misfortune, and poor initial economic position could ruin even the most clever farmer, an individual's ability to perceive changes in both the land and market, and then tailor crops to these opportunities influenced success and failure.

The significance of environmental variables weighed heavily on the mind of E.D. Smith, influencing decisions to grow certain crops and purchase certain properties. This should not be a surprise. Certain crops are suited to certain soils, drainage, and climates. Farmers, as is apparent in the wonderfully descriptive prose of Smith, consciously oriented their production towards their specific locale. Smith noted,

Some soils and some climates are suitable for grapes, others for apples, and others for corn, oats, and clover, and I would strongly advise anyone thinking of embarking in the fruit business, to study well the conditions of these as to their suitability, before investing money in the enterprise.⁴

Of course, it could be argued that Smith was different, made exceptional by his years of education. However, as important as his academic work had been to him, schooling was not what made Smith an exceptional farmer. He admitted as much, stating that when he first started he did not approach agriculture in a rational manner, resulting in "many a costly lesson."⁵ In fact, Smith started out as many of his peers had, by assuming control of a mixed-agricultural farm from his parents. What ultimately distinguished him from other agriculturalists was his ability to perceive changes in the land and economy, and act upon what he saw.

⁴ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 12 (December 1887), p. 692.

⁵ The Canadian Live-Stock and Farm Journal, Vol. IV, No. 12 (December 1887), p. 692.

-- Appendix A --

The Calculation of Farm Worth

The calculation of farm worth is meant to generate a statistic that represents one aspect of wealth in the township, in addition to acreage and assessed value, which are derived directly from primary sources. Farm worth is not a measure of net agricultural output, yearly productivity, or marketable surplus. This thesis assumes, based on works by Marvin McInnis and Darroch Soltow, that the majority of farmers in Ontario generated at least some agricultural surplus to sell at market.¹ Farm worth should be considered a "settling up" of all production (field crops, farm products, and animal products) and live animals if they were forcibly sold (for example, at a sheriff's sale to settle a judgment debt) in a competitive market (for example, an auction) on one day, after deductions for fodder costs were taken into account. The following tables present the prices used to obtain the value of livestock and produce and the percentage of crops deducted for fodder for the calculation of farm worth for the 1851, 1861, and 1871 census.

1851

The calculation of farm worth follows, in part, the careful (and innovative) process outlined by the Frank Lewis and Marvin McInnis in their study of agricultural

¹ McInnis, "Marketable Surpluses," p. 410-413. Darroch, "Scanty Fortunes," p. 653.

output in Lower Canada for 1851.² Considering the purpose of my farm worth statistic and that Lewis and McInnis's calculations were based on township level data, I made some technical adjustments to their procedure. First, in the calculation of required draft animals, Lewis and McInnis used the ratio of old to young horses found in the 1861 census (33 percent), which produced fractions of animals. When dealing with an individual farm, one-third of a horse cannot be equated with two-thirds of an ox. To accommodate this difficulty, all calculations were rounded to the nearest whole number, making sure that rounded totals equaled figures presented in the census. If the rounded totals did not equal the number reported in the census, then the calculation was altered in favour of older animals rather than younger (a horse instead of a colt).

Second, there was no need to distinguish between livestock sent to slaughter and that held over for future years because I am trying to generate a figure that captures the value of all livestock and produce and not the yearly or net output. The same is true for seed held over for next year's crop. Third, deductions for transportation costs were less problematic in a study of a single township. It is not unreasonable to assume that all farmers within the township faced the same transportation costs, although steep roads probably made the journey to market slightly more treacherous for farmers on top of the escarpment. Considering that Saltfleet farmers sold most of their produce in Hamilton, the trip was not particularly long, although it certainly was not always pleasant considering the state of early nineteenth-century roads. This assumption is based on a number of sources, in particular the diaries of E.D. Smith and Abram Lee, a farmer in

² (Lewis and Mcinnis, "Agricultural Output," pp. 69-85. See also McInnis, "Marketable Surpluses," pp. 400-403; McInnis, *Perspectives*; and Marvin McInnis, "Some Pitfalls in the 1851-1852 Census of Agriculture of Lower Canada," *Histoire sociale – Social History*, Vol. XIV, No. 27 (May 1981).

Saltfleet who kept a daily journal from 1860 to the turn of the century. Lee stated repeatedly that he sold much of his produce in Hamilton. Also, the yearly receipts found in the back of each diary indicate that Lee purchased most of his goods from retailers in Hamilton. These purchases were often done on the same trip made into town to sell produce. I decided not to factor transportation costs into the market price. The exception to this is hay, which is particularly expensive to deliver. For this item, I deducted \$3.92 per long ton for transport, as per Lewis and McInnis.

In order to circumvent some of the deficiencies in the census, Lewis and McInnis used coefficients to better estimate the production of some goods. The estimate of dairy products in the census, for example, is particularly underreported. This thesis used Lewis and McInnis's butter-equivalent estimate of ninety-two pounds per cow per year, which was valued at 10¢ per pound in 1851. I excluded a number of items appearing in the census from the calculation of farm wealth, principally the items normally associated with domestic labour, such as the production of linen, cloth, and flannel. This exclusion is problematic given the fundamental necessity of "women's work" to the success of the farm, but the decision followed from the difficulty of ascertaining a price for such goods.³ Finally, the census did not report a number of agricultural products that undoubtedly contributed to overall farm output, including fruit (other than cider), honey, wax, tallow, soap, straw, eggs, and poultry.

To accommodate the amount of feed required for animals and domestic consumption, Lewis and McInnis applied a coefficient to the eight principal crops. They assumed that all the buckwheat, rye, and corn went to animal feed and that twenty

³ Cohen, Women's Work, in particular Part 1.

percent of the potatoes, fifteen percent of the barley, five percent of both oats and peas, and one hundred percent of the wheat was available for market after internal farm needs were met. In addition, Lewis and McInnis used fixed coefficients to deduct a certain amount of crop production to account for domestic consumption. I chose not to deduct crops for domestic consumption given the nature of the farm worth statistic, which was not a measure of net surplus, but a measure of wealth that tried to capture the value of livestock and produce at a given moment in time. The prices used for the 1851/2 census produce and livestock come from Lewis and McInnis's article (market price not farm gate price) because prices in the local Hamilton paper in 1851 were quite sketchy (see Table A-1 and Table A-2). The deductions for fodder for all three census years can be found in Table A-3.

Price ¢ Price ć item ltem Wheat (bushel) 76.6 Flax and Hemp (pound) 5 20 Oats (bushel) 30.0 Hops (pound) Barley (bushel) 52.5 Cider (gallon) 3.3 55.0 Grass Seed (bushel) Peas (bushel) 200 7.5 Buckwheat (bushel) 36.9 Maple Sugar (pound) Rye (bushel) 52.1 Beef (pound) 2.53 Potatoes (bushel) 38.8 Pork (pound) 4.97 50.0 Corn (bushel) Wool (pound) 20.0 408 Hay (ton) Butter (pound) 10.0 Tobacco (pound) 10

Table A-1: Market Prices for Field Crops, Farm Products, and Livestock and Animal Products (in cents), 1851.

Tal	bl	e A-2:	Val	lue of	F L	ive	Ani	imai	IS ((in	Do	ilars),	1851.
-----	----	--------	-----	--------	-----	-----	-----	------	------	-----	----	-------	----	-------

Animal	Price \$	Animal	Price \$	
Horses	48	Milk Cows	15	
Colts and Fillies	16	Calves and Heifers	6	
Oxen	24	Pigs	4	
Steers	12	Sheep	1.5	

Сгор	Percentage used for fodder
Barley	85%
Buckwheat	100%
Carrots	100%
Com	100%
Hay ⁵	90%
Mangelwurtzel	100%
Oats	95%
Peas	73%
Rye	100%
Turnips	100%

Table A-3: Deductions from Farm Produce for Fodder, 1851-71.⁴

1861

The produce component of farm worth followed the same procedure outlined for the 1851 census, although I obtained prices for most crops from market summaries printed in a local Hamilton newspaper, *The Daily Spectator and Journal of Commerce* (see Table A-4). For most of these, I averaged the prices from listings that appeared from July to December. Farmers may have had other produce available at other times of the year, root crops in particular, but the average price from these months is a suitable indication of prices Saltfleet farmers obtained for their goods. Prices for clover and timothy could not be found in 1861, so I used prices from August 1862. Additionally, I could not find any price for maple sugar, cider, flax, hemp, or hops, so I used McInnis's 1851 figures; not a perfect solution, but better than excluding the products. Finally, figures for turnips, mangelwurzel, carrots, beans, flax, hemp, cloth or flannel could not be found. The absence of the first four could be troublesome given the importance these

⁴ Taken from Lewis and McInnis, "Agricultural Output," p. 69-81. These are based on coefficients used for farm consumption and do not include additional deductions for household consumption.

⁵ I could find no indication in the farming literature as to how much hay a farmer kept for livestock and how much was sold at local markets. I assigned a figure of 90% of hay being used for fodder purposes.

crops could have to the raising of livestock, but the calculation of farm worth assumes that all of these products served as fodder. Finally, the absence of prices for cloth and flannel will underestimate the domestic contribution of the household to the overall farm economy. To this figure, I added the estimated value of all produce of the orchard, which appeared as a separate column in the census.

The live animal component of farm worth comes directly from the census. Enumerators for the 1861 census were required to estimate the value of all livestock on a farm. This figure probably better captures the quality of livestock between farms and so provides a better indication of the distribution of wealth amongst farms, which is the purpose of the farm worth statistic. The deductions for fodder are the same as those presented in Table A-3.

ltem	Price ¢	ltem	Price ¢
Fall Wheat (bushel)	97	Clover (bushel)	373
Spring Wheat (bushel)	78	Timothy (bushel)	175
Barley (bushel)	43	Flax ^b (pound)	5
Rye (bushel)	50	Hemp ^b (pound)	5
Peas (bushel)	46	Wool (pound)	24
Oats (bushel)	24	Maple Sugar (pound)	7
Buckwheat ^a (bushel)	45	Cider (gallons)	13
Corn (bushel)	45	Butter (pound)	14
Potatoes (bushel)	63	Beef (pound)	5
Hops ^b (pound)	20	Pork (pound)	5.25
Hay (ton)	442	Wool (pound)	24

 Table A-4: Market Prices for Field Crops, Farm Products, and

 Livestock and Animal Products (in cents), 1861.

^a The price of buckwheat fluctuated widely between 30¢ and 80¢ per bushel.

^b As 1861 prices could not be found, I used the 1851 values from Lewis and McInnis.

1871

The derivation of prices from the Hamilton newspaper in the 1870s was a more complex process as numerous types of grains and vegetables appeared in the weekly column. This creates difficulties as the 1871 census provides only one column for each type of crop despite the numerous varieties and grades available. The two columns for spring and fall wheat, for example, do not capture the variety of species (such as Treadwell or Early Spring) or grades (such as Extra, First, and Second). To accommodate this difficulty, I averaged all types and grades of grains, fruits, vegetables, and livestock listed in the paper into one figure (see Table A-5).

Generating an average price for a number of items proved troublesome. The complete list of fruits, for example, would have included pears, cherries, plums, melons, peaches, etc. Most of these fruits were only available during a few weeks of the year, and unlike apples, did not keep unless canned. There were significant variations in the price of these goods: pears received \$1.50 per bushel, while plums fetched \$2.10 per bushel. I settled on a conservative \$1.70 per bushel. This figure probably underestimates the value of a number of crops, such as blueberries and raspberries, but as pears appeared a popular choice amongst Saltfleet farmers, the estimated figure does not excessively inflate the worth of this category. No 1871 prices could be found for maple sugar, tobacco, or a hive of bees.

Calculating the value of livestock also presented challenges. Unlike the 1861 census, the 1871 census did not present a convenient estimation of the worth of all livestock. Both the livestock auction and farmers market in Toronto, summaries of which were presented weekly in *The Globe*, offered per pound values for oxen, milch cows, cattle, swine, and sheep. I used these values and an average animal's live weight to calculate the worth of a farmer's livestock (Table A-6). Unfortunately, the livestock auctions in Toronto did not report the sale prices for horses. The 1861 census, which included an estimated value of all livestock, used a figure of \$75 per horse in Saltfleet, which I used for the 1871 census. Colts and fillies (a separate entry in the census) were valued at one-third that of full grown animals.⁶

ltem	Price ¢	ltem	Price ¢	
Fall Wheat (bushel)	118	Carrots (bushel)	33	
Spring Wheat (bushel)	118	Hay (ton)	442	
Barley (bushel)	58	Grass (bushel)	125	
Oats (bushel)	41	Hops (pound)	15	
Rye (bushel)	45	Grapes (pound)	20	
Peas (bushel)	79	Apples (bushel)	88	
Buckwheat (bushel)	55	Pear (bushel)	170	
Corn (bushel)	88	Butter (pound)	15	
Potatoes (bushel)	67	Honey (pound)	16	
Turnip (ton)	20	Wool (pound)	31	
Mangelwurtzel (bushel)	40	n a		

Table A-5: Market Prices for Field Crops, Farm Products, and Livestock and Animal Products (in cents), 1871.

|--|

Animal	Price \$	Animal	Price \$	
Horses	75	Milk Cows	41.25	
Colts and Fillies	25	Calves and Heifers	13.75	
Охеп	49.5	Pigs	10.8	
Steers	46.75	Sheep	3.375	

⁶ McInnis and Lewis use this fraction in their study of agricultural output in 1851; "Agricultural Output," p. 78.

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