# Social Regions in Mid-Nineteenth-Century Ontario

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*Renewed interest in "the region" has appeared within the disciplines of both history and geography. In this article, the authors use place of birth, religion, and age structure to identify regions created by Ontarians in the middle of the nineteenth century. Principal components analysis and cluster analysis are employed to this end. The resulting regions are examined for their specific characteristics with respect to the defining variables and to other variables such as nuptiality and marital fertility. The results of this effort to gain insight into the settlement process should be of interest to researchers working in a large number of fields.*

*L'histoire et la géographie connaissent un regain d'intérêt pour le phénomène de « la région ». À partir du lieu de naissance, de la religion et de la structure par âge, les auteurs du présent article reconstruisent les régions qu'avaient définies les Ontariens au milieu du XIX^e siècle. Ils utilisent pour ce faire l'analyse des composantes principales et l'analyse typologique. Les caractéristiques propres des régions ainsi obtenues sont examinées en fonction des variables définitionnelles et d'autres variables telles que la nuptialité et la fécondité des mariages. Les résultats de cet effort de compréhension du processus de colonisation devraient intéresser les chercheurs de nombreux domaines.*

## The Intellectual Context

THIS ATTEMPT to delimit social regions for Southern Ontario at the middle of the nineteenth century should prove useful not only to historians and historical geographers, but also to a host of others, for example, the students of dialect, of furniture, of agricultural technology, and of social

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institutions. Indeed, historians and historical geographers too may be able to identify particular areas where, by changing scale to the micro level, they can identify and describe processes otherwise unobservable. This task of describing what is, or in this case was, is a legitimate stage in scientific analysis; the descriptive and regional tradition is an old one within both history and geography, stretching back into antiquity but strengthened during the Great Age of Exploration and Discovery. Most recently, its validity has been reaffirmed by a leading British authority, Robin Butlin.[1] Of course, the view of the region, as Butlin acknowledges, has been in constant change. This continues to the present.

Until the 1950s, while the areal differentiation tradition dominated the subject, all human geography was regional geography.[2] In both history and geography, regions were conceived in terms of their physical attributes and linked to environmental influences.[3] Indeed, within the English-speaking world the concept of the "natural region" as a "definite characteristic portion of the earth's surface" was conceived by its author as serving the needs of historians by providing a suitable geographical foundation.[4]

In Canada such terms as the "Arctic", the "Prairies", and the "Atlantic Provinces" convey the suggestion although, as William Westfall has pointed out, recognition of the regional character of the country was slow among Canadian nationalist historians.[5] In the nomothetic headiness of the Theoretical and Quantitative Revolution,[6] with its associated emphasis upon the spatial tradition, regional geography acquired a status subordinate to the increasing number of systematic branches into which it was divided. A similar fate overcame the regional perspective within Canadian history in the 1960s and 1970s. Yet in 1991 Chad Gaffield could write:

> Earlier considered a poor cousin within the family of historical activities, the study of regions has become a mainstream focus of scholarly attention. ... The result has been a redefinition of regional history in terms of the frontier of current scientific debate.[7]

1 R. Butlin, *Historical Geography: Through the Gates of Space and Time* (London: Arnold, 1993), p. 72.

2 R. Hartshorne, *The Nature of Geography: A Survey of Current Thought in the Light of the Past* (Lancaster: Association of American Geographers, 1939); A. Paasi, "The Institutionalisation of Regions: A Theoretical Framework for Understanding the Emergence of Regions and the Constitution of Regional Identity", *Fennia*, vol. 164, no. 1 (1986), p. 115.

3 P. Cloke, C. Philo, and D. Sadler, *Approaching Human Geography* (New York: Guilford, 1990), p. 6.

4 A. J. Herbertson, "The Major Natural Regions: An Essay in Systematic Geography", *The Geographical Journal*, vol. 25 (1905), pp. 300–312.

5 W. Westfall, "On the Concept of Region in Canadian History and Literature", *Journal of Canadian Studies*, vol. 15, no. 2 (1980), pp. 3–14.

6 I. Burton, "The Quantitative and Theoretical Revolution", *Canadian Geographer*, vol. 7, no. 4 (1963), pp. 151–162.

7 C. Gaffield , "The New Regional History: Rethinking the History of the Outaouais", *Revue d'études canadiennes*, vol. 26, no. 1 (1991), p. 64. Interestingly, Gaffield sees at least part of the "new" regional emphasis as being upon processal work, paralleling changes in geography.

Within geography, the regional perspective survived not as a central focus but as a framework for analysis.[8] In reaction to this a more humanistic, post-positivist geography, concerned with human nature in its entirety rather than single, measurable attributes, has given rise to a "new regional geography". Because of its emphasis upon the dynamic rather than the static and upon the "social reproduction of space", this promises to banish its "reactionary" character and re-establish its normative significance.[9] Regional geography, say its advocates, will again be "the crown of the discipline". Regions will no longer be mere containers, as the spatial theoreticians are held to have been guilty of assuming, but rather the creations of individuals and of society. In this view an infusion of "social theory" is essential.

In spite of this addition to our conceptualization, current thought on the nature of the region is not monolithic; there are many formulas, some of which in the normal way will undoubtedly pass. A useful summary of the "state of the art" is provided by Anne Gilbert. In her synthesis, the region can be viewed as a local response to capitalist processes, a medium of social interaction, or a focus of identification. The first considers notions of the regionalization of the social division of labour, processes of capital accumulation, reproduction of the labour force, and the political and ideological processes of domination used to maintain the social relations of production. The approach is political-economic and grounded in Marxist theory.[10] The second view places the region as the scene and effect of interaction in social relations; it has been perceived both as locale and territory. A perspective on the region as locale is offered by many whose ideas are rooted in the structuralist school of the social sciences[11] and, in particular, in the ideas of Anthony Giddens.[12] His central notions are that all social relations are structured in space and time and that structures affect and are generated by society. The work of Nigel Thrift and Allan Pred is different in form and emphasis. They share similar perspectives: a de-emphasis upon cultural attribute, artifact, and landscape. Their work stresses the process by which

8 However, some historical geographers continued to value the concept. See L. Guelke, "On Rethinking Historical Geography", *Area*, vol. 7 (1972), pp. 135–139.

9 A. Gilbert, "The New Regional Geography in English- and French-Speaking Countries", *Progress in Human Geography*, vol. 12, no. 2 (1988), p. 215.

10 Work in this vein includes M. Webber, "Agglomeration and the Regional Question", *Antipode*, vol. 14 (1982), pp. 1–11; D. B. Massey, *Spatial Divisions of Labour: Social Structure and the Geography of Production* (London: Macmillan, 1984); D. Harvey, *Consciousness and the Urban Experience: Studies in the History and Theory of Capitalist Urbanisation* (Baltimore: Johns Hopkins, 1985).

11 N. Thrift, "On the Determination of Social Action in Space and Time", *Environment and Planning D: Society and Space*, vol. 1 (1983), pp. 23–57; A. Pred, "Place as a Historically Contingent Process: Structuration and Time-Geography", *Annals of the Association of American Geographers*, vol. 74, no. 2 (1984), pp. 279–297, and *Place, Practice and Structure: Social and Spatial Transformation in Southern Sweden 1750–1850* (Cambridge: Polity, 1986); R. J. Johnston, "Place Matters", *Irish Geography*, vol. 18 (1985), pp. 59–63; Paasi, "The Institutionalization of Regions".

12 A. Giddens, *The Constitution of Society, Outline of the Theory of Structuration* (Berkeley: University of California, 1984); Cloke *et al.*, *Approaching Human Geography*, pp. 94–131.

the region, manifesting the link between person and institution, is continually reproduced and changed through these practices. The third view, with which this article is most closely associated, albeit in terms of emphasis, is that culture is the main object of regional geography.[13]

The region is a set of relationships between a group of people and particular places. The inhabitants are conscious of their similarities and differences. The emphasis here is not on the artifacts and the impact of culture directly on the landscape, upon which an earlier generation of cultural geographers placed their faith. Rather, the ways in which people think about their environment and themselves define the region, the expression of the actors' culture, which also helps form that culture and the players' sense of attachment to it.[14] To students of Canadian history this will not be a new concept; Westfall addressed this theme some 13 years ago, acknowledging the role of the writer in transforming material into mythology which the people identify as their own.[15]

Irrespective of the philosophical viewpoints that inform the members of the subsets, there are common elements. One is that regions are no longer viewed as fixed; rather they are dynamic. In the words of Edward W. Soja, "There are no permanent determinations, no unmodifiable contingencies in the spatiality of social life."[16] Secondly, in this new view "historical explanations" are central. Lastly, regions are not produced by geographers alone but by people who are affected in their political, economic, and cultural decisions by interactive processes operating on local, national, and international scales.[17] Regions are lived through, not in, and geographical regions are defined by boundaries that delimit fields of process and interaction.[18] The present article, with its emphasis upon cultural and social attributes, is to be viewed from this philosophical perspective. The regions delimited here for Ontario at mid-century are the most marked manifestations of processes underway since and before the formal establishment of the province. Already in 1851 they were being transformed.

## The Substantive Context

Studies in the historical geography of early Ontario have given predomi-

13 M. P. Conzen, "Culture, Region, Homeland and Ethnic Archipelago in the United States: Methodological Considerations", *Journal of Cultural Geography*, vol. 13, no. 2 (1993), pp. 13–29.

14 D. B. Knight, "Identity and Territory: Geographical Perspectives on Nationalism and Regionalism", *Annals of the Association of American Geographers*, vol. 72 (1982), pp. 512–531; A. B. Murphy, "Regions as Social Constructs: The Gap between Theory and Practice", *Progress in Human Geography*, vol. 15, no. 1 (1991), pp. 22–35.

15 Westfall, "On the Concept of Region", p. 11.

16 E. W. Soja, "Regions in Context: Spatiality, Periodicity and the Historical Geography of the Regional Question", *Society and Space*, vol. 3 (1985), p. 177.

17 A. Markusen, *Regions: The Economics and Politics of Territory* (New York: Bowman and Littlefield, 1987).

18 M. Dear, "The Postmodern Challenge: Reconstructing Human Geography", *Transactions of the Institute of British Geographers*, NS 18 (1988), pp. 262–274.

nance to the role of the physical environment in the settlement process,[19] government land policy,[20] land speculation, and the operation of the economic factor.[21] Little attention has been given to the social dimension with the marked exceptions of Alan G. Brunger and John Clarke, who have variously divided their attention between the levels of the individual and aggregations of individuals expressed at the township and county levels. At the individual level the concern has been with measures of origin and birthplace, religious affiliation, kinship, occupation, and agricultural productivity;[22] at the aggregate level it has primarily involved origin, although James Gilmour, the economic geographer, has looked at the occupational

19 R. L. Gentilcore, "Settlement" in R. L. Gentilcore, ed., *Ontario. Canadian Studies in Geography* (Toronto: University of Toronto Press, 1972), pp. 23–45, and "Changes in Settlement in Ontario (Canada) 1800–50: A Correlation Analysis of Historical Source Materials", *International Geography*, vol. 1 (1972), pp. 418–419; A. G. Brunger, "Analysis of Site Factors in Nineteenth Century Ontario Settlement", *International Geography*, vol. 1 (1972), pp. 400–402; J. Clarke, "Spatial Variations in Population Density, South Western Ontario in 1851", *International Geography*, vol. 1 (1972), pp. 408–411; J. Clarke and 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.

20 A. Wilson, *The Clergy Reserves of Upper Canada: A Canadian Mortmain*, Booklet 23 (Ottawa: Canadian Historical Association, 1969); L. F. Gates, *Land Policies of Upper Canada*, (Toronto: University of Toronto, 1968); J.Clarke, "Documentary and Map Sources for Reconstructing the History of the Reserved Lands in the Western District of Upper Canada", *The Canadian Cartographer*, vol. 8, no. 2 (December 1971), pp. 75–83.

21 J. Clarke, "The Role of Political Position and Family and Economic Linkage in Land Speculation in the Western District of Upper Canada", *Canadian Geographer*, vol. 19, no. 1 (1975), pp. 18–24, and "Geographical Aspects of Land Speculation in Essex County to 1825: The Strategy of Particular Individuals" in K. G. Pryke and L. L. Kulisek, eds., *The Western District* (Windsor: Essex County Historical Society and Western District Council, 1983), pp. 69–112; D. Gagan, "Property and Interest — Some Preliminary Evidence of Land Speculation by the Family Compact in Upper Canada 1820–40", *Ontario History*, vol. 70 (1978), pp. 63–69; R. W. Widdis, "Speculation and the Surveyor: An Analysis of the Role Played by Surveyors in the Settlement of Upper Canada", *Histoire sociale/Social History*, vol. 15, no. 30 (1982), pp. 443–458; W. Norton, "Rural Land Value and Land Use Patterns in Mid-Nineteenth Century Southern Ontario" (M.A. thesis, Queen's University, 1969); J. Clarke and D. L. Brown, "Land Prices in Essex County 1798–1852", *Canadian Geographer*, vol. 26, no. 4 (1982), pp. 300–317, and "Pricing Decisions for Ontario Land: The Farm Community and the Speculator in Essex County During the First Half of the Nineteenth Century", *Canadian Geographer*, vol. 31, no. 2 (1987), pp. 169–177.

22 A. G. Brunger, "Settler Location in the Talbot Settlement, Upper Canada", paper presented to the annual meeting of the Canadian Association of Geographers, Thunder Bay, 1973; Brunger, "Geographical Propinquity among Pre-Famine Catholic Irish Settlers in Upper Canada", *Journal of Historical Geography*, vol. 8, no. 3 (1982), pp. 265–282; Brunger, "Geographical Patterns of Early Settlement: Social Institutions on the Frontier of Upper Canada", *Bamberger Geographische Schriften*, Bd. 4 (1982), pp. 267–284; Brunger, "Geographical Aspects of English Emigration to Canada in the 1830's: Settlement and Community Transfer" (CUKANZUS: Oxford, 1983); J. Clarke and K. Skof, "Social Dimensions of an Ontario County: 1851–52" in D. B. Knight, ed., *Our Geographic Mosaic: Research Essay in Honour of G. C. Merrill* (Ottawa: Carleton University Press, 1985), pp. 107–113; Grenville Parkinson, "Birth Place, Religion and Agricultural Productivity in Peterborough County 1851–1861" (M.A. thesis, McMaster University, 1988); J. Clarke, "Social Integration on the Upper Canadian Frontier: Elements of Community in Essex County 1790–1850", *Journal of Historical Geography*, vol. 17, no. 4 (1991), pp. 390–412.

and industrial structure of Ontario in 1851.[23] Thus, in 1973, Clarke, working within the then fashionable tradition of factorial ecology, reduced some 43 variables on origin and religion to six principal components and mapped the resultant scores at the township level.[24] This effort, distinct in its methodological approach and its concern for more than a single origin, was not emulated by other work which, like the earlier studies of James M. Cameron,[25] continued to be primarily concerned with the activities of a single group. Peter K. MacLeod, in his master's thesis presented in 1972, and Clarke and Macleod in their 1974 study used location quotients to describe the patterns of Scots and Irish observable at the county level;[26] William J. Smyth (1977) and Cecil J. Houston and Smyth (1990) sought to estimate, using aggregate census data and simple percentages, the numbers of Catholic and Protestant Irish and to map the Irish at the township level.[27] Like Houston and Smyth, Brunger has employed techniques to disaggregate census data into Catholic and Protestant components of the Irish population and, using a combination of absolute number and the location quotient, to map the distributions of Irish, Scottish, and English people in the province for the census years 1851, 1861, and 1871.[28] As yet there has been no attempt to bring these diverse groups together, to summarize the variety of human experience lived out in regions.

To overcome this shortcoming we seek to establish social regions for Ontario in 1851 within which various social phenomena might be investigated. These might include differences in rates of marriage, in age of marriage between the sexes, in age/sex ratios, in fertility and mortality, commensurate with urban/rural conditions or within the rural realm, with differences between the "frontier" and the "core".[29] Qualities of the regions can then

23 J. M. Gilmour, *Spatial Evolution of Manufacturing, Southern Ontario, 1851–1891* (Toronto: University of Toronto Press, 1972).

24 J. Clarke, "Ethnic Core Areas in Ontario, 1851", Ontario Historical Geographers Conference, Peterborough, Trent University, 1973.

25 J. M. Cameron, "An Introduction to the Study of Scottish Settlement of Southern Ontario", *Ontario History*, vol. 61 (1969), pp. 167–172, and "Scottish Emigration to Upper Canada 1815–55: A Study of Process", *International Geography*, vol. 1 (1972), pp. 404–406.

26 P. K. MacLeod, "*Gualainn Ri Gualainn*: A Study of Concentrations of Scottish Settlement in Nineteenth Century Ontario" (M.A. thesis, Carleton University, 1972); J. Clarke and P. K. Macleod, "Concentrations of Scots in Rural Ontario", *The Canadian Cartographer*, vol. 11, no. 2 (1975), pp. 186–190.

27 W. J. Smyth, "The Irish in Mid Nineteenth-Century Ontario", *Ulster Folklife*, vol. 23 (1977), pp. 97–105; C. J. Houston and W. J. Smyth, "The Irish Abroad: Better Questions Through a Better Source, the Canadian Census", *Irish Geography*, vol. 13 (1990), pp. 1–19; C. J. Houston and W. J. Smyth, *Irish Emigration and Canadian Settlement: Patterns, Links and Letters* (Toronto: University of Toronto Press, 1990).

28 A. G. Brunger, "The Distribution of the English in Upper Canada 1851–1871", *Canadian Geographer*, vol. 30, no. 4 (1986), pp. 337–343, and "The Distribution of Scots and Irish in Upper Canada 1851-1871", *Canadian Geographer*, vol. 34, no. 3 (1990), pp. 250–258.

29 J. Clarke, H. W. Taylor, and W. R. Wightman, "Areal Patterns of Population Change in Southern Ontario 1831–1891: Core, Frontier and Intervening Space", *Ontario Geography*, vol. 12 (1978), pp. 27–28.

be identified in terms of a series of aggregate measures and tests made for differences between the regions. Finally, as in all such exercises, the aim is to provide names or labels for the areas studied.[30]

**Sources and Methods**

While the authors believe regions to be the product of human processes, it could be argued that they cannot hope to produce the required sensitivity because of their emphasis upon readily available spatial data. However, qualitative data on kin-migration or the role of fraternal organizations in organizing space, for example, are simply not available for the entire province. Given that our purpose is to provide a general context for more micro-level analysis, these qualitative data may prove more useful after the event than before.

The main source materials used were the returns on origin, religion, and age from the Census of Canada for 1851–1852,[31] supplemented by the Ontario Agricultural Commission Report of 1871 (from which data of first settlement for each township were obtained) and by data on township size and history generously made available by a colleague, Dr. Robert Wightman.[32] From the Census, 88 variables relating to origin, religion, and demography were extracted for 344 townships and the 34 urban areas for which data were available. The inclusion of more "idiosyncratic" variables in the principal components analysis (PCA) *per se* might have only served to limit the usefulness of the resultant regions. For this reason some of the most relevant variables, nuptiality and marital fertility, were not included in the computations. Additionally, these are derived variables, and the manner of their derivation might have engendered debate. The number of variables was subsequently reduced to 43, to assist in interpretation or because the absolute numbers were very small. For example, a Maritime variable was produced by amalgamating three others,[33] and North, South, Western, and Central Europeans were recognized, reducing eight variables to four.[34] Age groups were combined in 10-year intervals; the Census reporting of single

30 D. B. Grigg, "The Logic of Regional Systems", *Annals of the Association of American Geographers*, vol. 55 (1965), pp. 465–491; R. J. Johnston, "Grouping and Regionalizing: Some Methodological and Technical Observations", *Economic Geography*, vol. 46, no. 2 (1970), pp. 293–305.

31 National Archives of Canada, Census of Canada, 1851/52. The census definition of "origin" is "place of birth".

32 Ontario Agricultural Commission Report, vol. 3, 1871. It is a matter of historical accuracy to record that the dates of first settlement were obtained from this source since this was in fact the order of events. However, in cases of dispute, preference was accorded the Wightman data, compiled after exhaustive research in a variety of sources and freed of the natural proclivity for exaggeration which the initial settlers reporting to the Agricultural Commission might have exhibited.

33 The members of this class were those born in New Brunswick, Nova Scotia, and Prince Edward Island and Newfoundland.

34 France was the only member of the class "West European". "Northern European" consisted of those born in Germany and Holland, Sweden and Norway; "Central Europe" was defined as Switzerland, Russia and Poland, Austria and Hungary; and "Southern Europe" as Italy and Greece, Spain and Portugal.

years seemed to add little to the understanding to be obtained in a work aimed at regionalization, although it might in a study addressing demography *per se*. The religious variables were also grouped within constraints of size, national origin, and churchmanship. Distinctions which historians of the Canadian Church held to be socially if not theologically meaningful were maintained, however: for example, between the Presbyterian Church and the Church of Scotland or between the Episcopal and the Wesleyan Methodist groups.[35] The New Connexion Methodists, a British Methodist group, were included with the Wesleyan Methodists; the Baptists, Quakers, Bible Christians, Christians, Congregationalists, Mormons, Second Adventists, Universalists, Unitarians, Protestants, and Disciples were included in a larger group designated "others". This category also included those whose religion was unknown, not given, or not classed.[36] Similarly, the number of townships was reduced to 338 because of their combination in part of the data set or their exclusion from other parts.[37] The data in their original form were then checked for internal consistency.[38]

Forty-three variables on origin, religion, and age were entered into principal components analysis. Principal components analysis (PCA) and its close relation, factor analysis, were developed to analyze the results of tests in the behaviourial sciences. Employed for a wide variety of problems, including some in historical geography, it is a statistical technique used to identify a smaller number of components that can then show relationships among sets of many interrelated variables. Identification of such underlying dimensions or components simplifies the description and comprehension of complex phenomena, such as "socio-economic" status or in the present context "ethnic admixture". The results, termed "components", account for incremental amounts of the variability in the data.[39] They are identified by com-

35 S. D. Clark, *Church and Sect in Canada* (Toronto: University of Toronto Press, 1948).

36 In this way 26 variables were reduced to 12. In Upper Canada at this time Anglicans constituted the largest single proportion of the population at 23.4%; Methodists of all forms made up 21.8% of the population, and Roman Catholics, with 17.6% of the population, came third. Census of Canada, 1851.

37 Howard and Orford Townships reported separately with respect to origin but were combined for purposes of reporting religious denomination; four other townships were not reported under the heading of "Age", and Bexley Township was removed from the analysis because the population total of six was so low.

38 This was achieved by cross-tabulation. The "error" in terms of cultural origin was found to be 0.11%. Sixty-three townships exhibited differences in the religion schedule but the difference between the summary and published totals was minuscule at 0.008%. Similarly, the "percentage error" in the compilation of age within specific cohorts and sexes was 0.08% for males and 0.03% for females. Readers seeking specific details should contact the authors. On numeration procedures, see D. Gagan, "Enumerators Instruction for the Census Of Canada for 1852 and 1861", *Histoire sociale/Social History*, vol. 7, no. 14 (1974), pp. 255–265.

39 H. H. Herman, *Modern Factor Analysis* (Chicago: University of Chicago Press, 1967); L. J. King, *Statistical Analysis in Geography* (Toronto: Prentice Hall, 1969), p. 174. In fact, as a matter of procedure, the data were divided into rural and urban subsets. An eigenvalue cutoff of 1.0 was used and the data were rotated to "simple structure". Analysis of the rural data produced 14 components

ponent loadings that represent the degree of association of particular variables with the more general components (Table 1). In turn these "loadings" are used to generate "scores" or measures of association of each sub-area with the particular component.[40] Plots of the components produced by Atlas Graphics were used to assist in their identification and proved especially useful in the case of bipolar components, which load both negatively and positively.[41] For example, such is the case with Component 3 (Table 1).

A shortcoming of PCA is that the structure of the interrelated variables is identified using individual components. There is an obvious need for these to be grouped, in the present context, into regions characterized by particular combinations. For example, one might ask if a particular area is dominantly Irish Anglican; or is it a French-Canadian Roman Catholic area with a younger population? Various methods of cluster analysis are available, all involving measures of similarity or "distance". The technique used here is known as Ward's method, which uses Euclidean distance and produces the least increase in the total sum of squared deviations between individuals in groups and group means.[42] Ward's method tends to produce discrete, well-defined regions, a characteristic that presumably commends it to geographers rather than to other users of the many techniques of "taxonomic distance".[43]

which collectively explained 68.9% of the variation; analysis of the urban data set produced 12 components which explained 86.4% of the variation. Obviously, the urban data possessed less variation than the rural. Moreover, the structure of the urban data set was *in essence* little different to that of the rural although the order of the components shifted. Because of this and the fact that the structure of the rural and combined rural and urban data sets virtually mirrored one another, the latter offering the complete population, the rural and urban data set was used in the final analysis.

40 J. P. Cole and C. A. M. King, *Quantitative Geography: Techniques and Theories in Geography* (London: Wiley, 1968), pp. 153–159; Harman, *Modern Factor Analysis*; P. J. Taylor, *Quantitative Methods in Geography: An Introduction to Spatial Analysis* (Boston: Houghton Mifflin, 1977), pp. 231–284; R. J. Johnston, *Multivariate Statistical Analysis in Geography* (London: Longman, 1980), pp. 127–182.

41 This was done in the Social Science Geographic Information Processing facility at Carleton University.

42 The error sum of square can be defined as:

$$ESS = \sum_{i=1}^{n} x_i^2 - \frac{1}{n}\left(\sum_{i=1}^{n} x_i\right)^2$$

where $x_i$ is the value of place i on variable x, n is the number of members of the group and summation is over all variables. See J. H. Ward Jr., "Hierarchical Grouping to Optimize an Objective Function", *Journal of the American Statistical Association*, vol. 58 (1963), pp. 236–244; R. J. Johnston, "Classification in Geography", *Catmog*, vol. 6 (1976), pp. 3–43. This analysis was executed using SPSS/PC. See M. J. Norusis, *SPSS/PC* (Chicago, 1990), pp. B155–196.

43 R. R. Sokal and P. H. A. Sneath, *Principles of Numeral Taxonomy* (San Francisco: Freeman, 1963); P. A. Burroughs, "Classification Methods", *Principles of Geographical Information Systems for Land Resources Assessment, Monographs on Soil and Resources Survey*, no. 12 (Oxford: Clarendon, 1986), chap. 2, pp. 136–146; G. Shaw and D. Wheeler, *Statistical Techniques in Geographical Analysis* (Chichester: Wiley, 1985), pp. 263–265. Griffith and Amrhein point out the shortcoming that, with this method as others, the groupings are not necessarily optimal beyond the first iterative step, and that it tends to join clusters with small and roughly equal numbers of members and to be acutely sensitive to outliers. See D. A. Griffith and C. G. Amrhein, *Statistical Analysis for Geographers* (New Jersey: Prentice Hall, 1991), p. 434.

**Table 1 Rotated Component Matrix: Social Dimensions of Southern Ontario in 1851, Loadings Greater than 0.5**

| | Components | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| %Var. | 12.3 | 8.6 | 7.4 | 5.9 | 5.1 | 4.8 | 4.1 | 3.9 | 3.4 | 3.0 | 2.9 | 2.8 | 2.6 |
| Engw | | | | | | | | | | | | | |
| Scot | | | | | .73 | | | | | -.54 | | | |
| Irel | | | -.80 | | | | | | | | | | |
| Cann | | | | .53 | | | | | | | | | |
| Canf | | | | -.87 | | | | | | | | | |
| US | | | .62 | | | | | | | | | | |
| Mari | | | | | .54 | | | | | | | | |
| WEur | | .78 | | | | | | | | | | | |
| SEur | | | | | | | | | | | | | .67 |
| CEur | | .74 | | | | | | | | | | | |
| NEur | | .83 | | | | | | | | | | | |
| Other | | | | | | | | | | | | | |
| Angl | | | -.70 | | | | | | | | | | |
| CofS | | | | | | | | | | -.85 | | | |
| Pres | | | | | .88 | | | | | | | | |
| CofR | | | | -.85 | | | | | | | | | |
| AMet | | | | | | | | | | | | | |
| UKmet | | | | | | | | | | | -.65 | | |
| Othmet | | | | | | | | | | | .82 | | |
| Luth | | .83 | | | | | | | | | | | |
| Jews | | | | | | | | | | | | | |
| Menn | | .80 | | | | | | | | | | | |
| Othrel | | | .70 | | | | | | | | | | |
| MO-10 | | | | | | -.87 | | | | | | | |
| FO-10 | -.54 | | | | | -.56 | | | | | | | |
| M10-20 | | | | | | | -.61 | | | | | | |
| F10-20 | | | | | | | -.71 | | | | | | |

**Table 1** (*concluded*).

| | Components | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| M20-30 | | | | | | .62 | | | | | | | |
| F20-30 | | | | | | .44 | -.71 | | | | | | |
| M30-40 | | | | | | | .56 | | | | | | |
| F30-40 | | | | | | | | | | | | .75 | |
| M40-50 | | | | | | | | .53 | | | | | |
| F40-50 | | | | | | | | .76 | | | | | |
| M50-60 | .67 | | | | | | | | | | | | |
| F50-60 | .75 | | | | | | | | | | | | |
| M60-70 | .76 | | | | | | | | | | | | |
| F60-70 | .66 | | | | | | | | | | | | |
| M70-80 | .70 | | | | | | | | | | | | |
| F70-80 | .50 | | | | | | | | | | | | |
| M80-90 | | | | | | | | | .59 | | | | |
| F80-90 | | | | | | | | | .68 | | | | |
| M90+ | | | | | | | | | | | | | |
| F90+ | | | | | | | | | | | | | -.59 |

*Note:* The following abbreviations are used: England and Wales (Engw); Scotland (Scot); Ireland (Irel); Canadian non-French (Cann); French Canadian (Canf); American (US); Maritimes (Mari); Western Europe (WEur); Southern Europe (SEur); Central Europe (CEur); Northern Europe (NEur); Other Origin (Other); Anglican (Angl); Church of Scotland (CofS); Presbyterian (Pres); Church of Rome (CofR); American Methodist (AMet); British Methodist (UKMet); Other Methodist (Othmet); Lutheran (Luth); Jewish (Jew); Mennonite (Menn); Other Religion (Othrel); Male (M); Female (F).

*Sources:* The main source materials for the data used in the analysis were Census of Canada, 1851–1852; Ontario Agricultural Commission Report, 1871; and data on township size and history supplied by Dr. Robert Wightman.

**Results**

Table 1 reports the loadings associated with each component in excess of 0.5, together with the variation explained by each component. Cumulatively, the total variation explained by all 13 components was 66.9 per cent. Component 1 loaded positively upon people aged 50 to 80 and probably represents settlement in the "developed" or more established areas of the province. The map of the scores suggested a virtually dichotomized Ontario with the young occurring in the more northern areas (where theory might suggest they should be located), although there were areas in Norfolk, Haldimand, and parts of Brant Counties (Figure 1) where this pattern was distorted and large concentrations of younger people found. The history of each specific area in the period subsequent to initial settlement is not fully known. Presumably, this component represents the culmination of a variety of demographic, economic, and political processes including migration in and out of the regions. These cannot be evaluated in a quantitative manner because of data limitations; the only variable that can, namely date of first township settlement, yielded a significant if low order correlation coefficient of –0.14.[44]

Component 2 with all loadings in excess of 0.7 was obviously the European component, characteristically concentrated in the Waterloo area but with outliers in Welland County and to a lesser extent in Ontario County (Vaughan, Whitchurch, and Markham Townships) (Figure 1) and in the east in Lanark, Stormont, and Dundas Counties. In Stormont and Dundas, these European settlers were largely Dutch and Palatine German and frequently United Empire Loyalist, all reproducing their lives in secure territory. In Lanark County (Bathurst, Beckwith, Drummond, and North Burgess Townships) most of the European element was German, Russian and Polish, Swiss, and French. Many of these individuals were members of the disbanded De Meuron regiment associated with the "Perth settlement".[45] Having served the British, they were rewarded with land and relocated among their confrères. In York County, the European concentration was in large part a result of the efforts of the speculator/colonizer William Berczy, who after initial attempts near the Grand River had removed his European colonists to the Township of Markham.[46] The largest concentration of European-born was in Waterloo County and ad-

44 Significant at 0.01 with 336 degrees of freedom (hereafter df).

45 V. Lindsay, "The Perth Military Settlement, Characteristics of its Permanent and Transitory Settlers, 1815–1822" (M.A. thesis, Carleton University, 1972).

46 R. J. Stagg, "William Berczy", in *Dictionary of Canadian Biography* (Toronto: University of Toronto Press, 1983), vol. 5, pp. 70–72. E. P. Weaver, *The Story of the Counties of Ontario* (Edinburgh: Bell, 1913), reports that in 1794, 60 German families settled in Markham Township. G. Heintz, "German Immigration into Upper Canada and Ontario from 1783 to the Present" (M.A. thesis, Queen's University, 1938), records that, between 1796 and 1802, 5,000 Germans and Dutch people settled in Markham, Vaughan, and Whitchurch Townships (p. 31). Markham Township also saw settlement by French Royalists. See also S. C. Johnson, *A History of Emigration from the United Kingdom to North America 1763–1912* Monograph 34, (London: London School of Economics, 1913); J. W. Fretz, *The Mennonites in Ontario* (Waterloo: Mennonite Historical Society of Ontario, 1967).

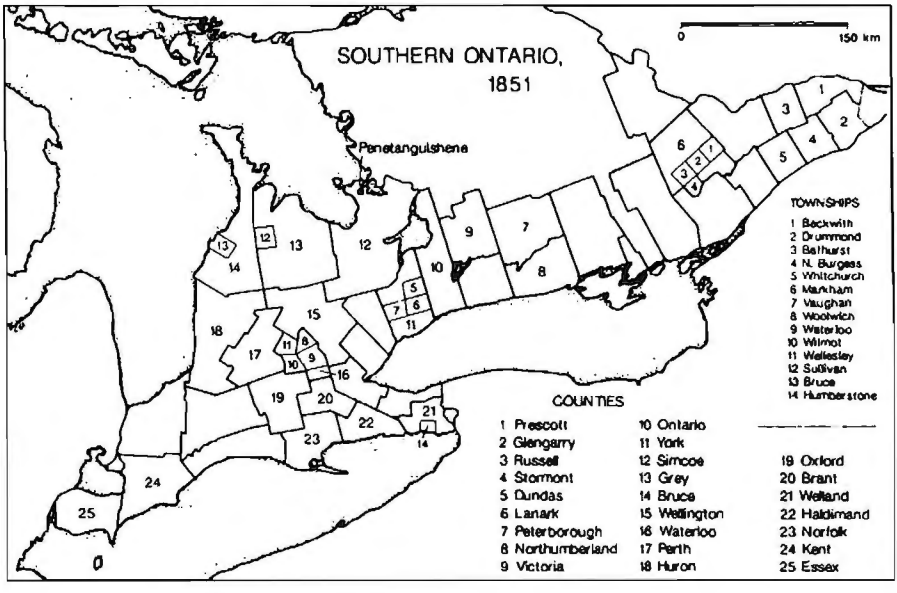


**Figure 1** Places mentioned in the text (Social Sciences Geographic Information Processing, Carleton University)

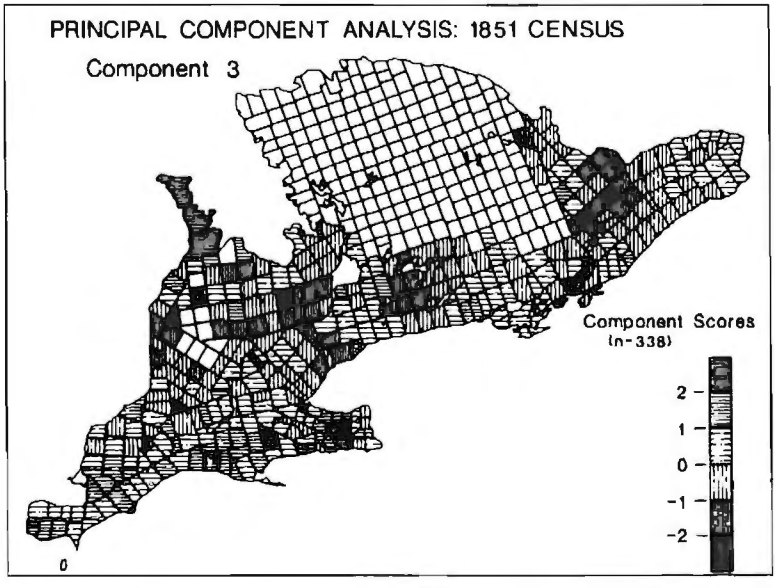


**Figure 2** American/Irish differentiator component (Social Sciences Geographic Information Processing, Carleton University)

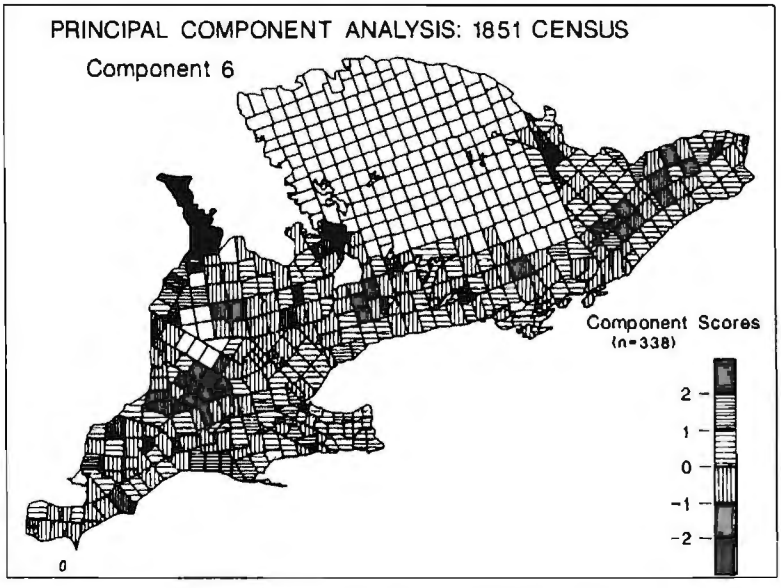


**Figure 3** Young families (Social Sciences Geographic Information Processing, Carleton University)

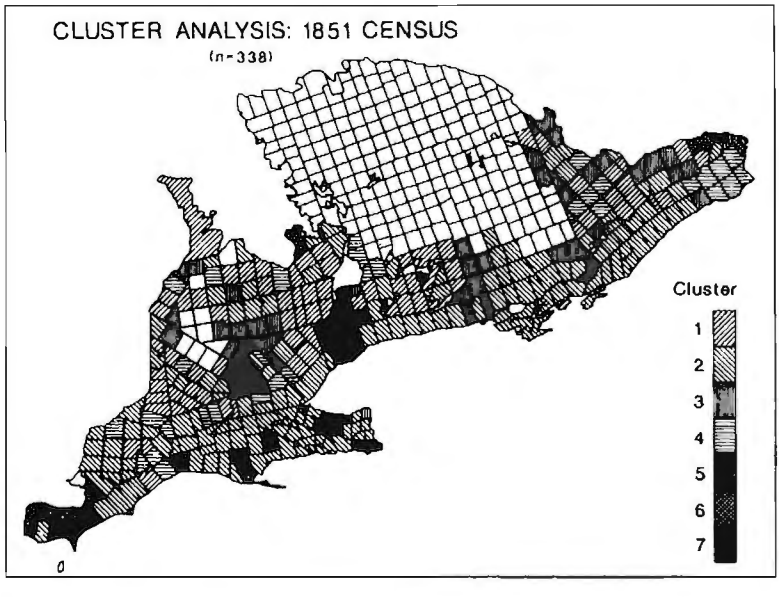


**Figure 4** The regions (Social Sciences Geographic Information Processing, Carleton University)

joining parts of Perth and Oxford Counties (Figure 1). In the four townships of Waterloo, Wellesley, Wilmot, and Woolwich, between 18 and 30 per cent of the population were of German or Dutch origin (primarily Mennonite and Lutheran) and between one and eight per cent had been born in France. These townships were also the core settlements for the numerically much smaller groups of Swiss, Russians and Poles, and Austrians and Hungarians.

Component 3 (Figure 2) was bipolar. It differentiated areas of American settlement (associated with high positive loadings) from those occupied by the Irish (with high negative loadings). By 1851, with the exception of the native-born, the Irish were numerically the dominant element in the population.[47] In fact this might also be thought of as a component that distinguishes the wave or settlement phase, one of the earliest and most spatially extensive phases being American (Loyalist and other) and the later, post-Napoleonic phase being Irish and Scottish.[48]

The Americans' scores were concentrated in close proximity to the United States and within the areas that Charles F. J. Whebell has designated core areas of settlement.[49] The Irish settled further north than the Americans and their settlements were spatially more extensive, stretching through parts of Grey and Bruce Counties eastward through the Shield townships of Victoria, Northumberland, and Peterborough Counties towards the Ottawa Valley (Figures 1 and 2).[50] Generally, where the Americans were the Irish were not; a correlation analysis of this relationship yielded a Pearson correlation coefficient of –0.46.[51]

Component 4, the French-Canadian, Roman Catholic component, showed the expected concentrations in the southwest of the province. In Essex and Kent Counties the earliest settlement was French, dating to 1749.[52] Other groupings were found in the more recently settled areas of Prescott and

47 The Census of 1851 shows that the largest single group was the Canadian non-French, containing the offspring of all immigrants. This group constituted 55.46% of the population, followed by the Irish (18.18%), the Scots (9.23%), those born in England and Wales (7.16%), and those from United States (4.05%). Within the townships of Southern Ontario at this time the Irish constituted on average 18.18% of the population with a standard deviation of 11.32. The median value was 16.69% and the mode 1.1%.

48 H. I. Cowan, *British Emigration to British North America: The First Hundred Years* (Toronto: University of Toronto Press, 1961).

49 C. F. J. Whebell, "Core Areas in Intrastate Political Organisation", *Canadian Geographer*, vol. 12, no. 2 (1968), pp. 99–112; R. L. Gentilcore and D. Wood, "A Military Colony in a Wilderness: The Upper Canada Frontier" in J. D. Wood, ed., *Perspectives on Landscape and Settlement in Nineteenth Century Ontario* (Toronto: University of Toronto Press, 1975), pp. 32–49. Within the townships of Southern Ontario the mean for Americans was 4.18%, the standard deviation 3.71, the median 3.17, and the mode 2.2.

50 D. H. Akenson, *The Irish in Ontario: A Study in Rural History* (Montreal: McGill-Queen's University Press, 1984); B. S. Elliott, *Irish Migrants in the Canadas* (Montreal: McGill-Queen's University Press, 1988); R. C. Harris, P. Roulston, and C. de Freitas, "The Settlement of Mono Township", *Canadian Geographer*, vol. 19, no. 1 (1975), pp. 1–15.

51 The F-statistic was equal to 90.02 and with 336 df proved significant at more than 0.0001.

52 F. J. Lajeunnesse, *The Windsor Border Region* (Toronto: Champlain Society, 1960).

Russell Counties,[53] where in the 1850s the Church was beginning to assist colonization. A third concentration was at Penetanguishene in modern Simcoe County.[54]

Two components (Components 5 and 10) in Table 1 represent elements of the Scottish tradition in Southern Ontario. The first loaded positively on birth in Scotland or the Maritimes and Presbyterianism. It added 5.1 per cent to the overall explanation. The second, loading on birth in Scotland and membership in the socially more elite Church of Scotland, added an additional three per cent and represents a more restricted element of "Scottishness". Component 10 was spatially more confined, occurring in only 123 of the 338 areas compared to Component 5, which was represented in 138 areas. Significantly, Eastern Ontario was better represented on Component 10 than it was on Component 5. Of the 138 townships with scores on Component 5, only 38 lay in the area east of Toronto;[55] on Component 10 fully half of the townships lay to the east of Toronto. This qualitative difference may, in part, accord with a Highland/Lowland segregation.[56] Generally, the Scots were concentrated in the relatively later settled areas of southwestern Ontario.[57]

Components 6 to 9 represent those subsets of the dimension "Age", which were not specifically associated with the first component. Representing successively more senior subsets, they have been labelled "Young Families", "Young Families II", "the Mature", and "the Oldest". Cartographically, they are represented by Component 6 (Figure 3), which exhibited the greatest visual order and one most in keeping with the expectation that younger people would be more northern in distribution. The areas of 20- to 30-year-olds (probably the years of initial family formation) correspond with positive scores on this component; away from these areas families were even younger (on average), but the patterns are not continuous. In part, this is because the dichotomized pattern is artificial in that this was a very young population in which the average ages were 21.36 years for men and 19.65 for women; on the other hand this young population, motivated by the desire for land, must also have been a mobile one.[58]

53 D. G. Cartwright, "Institutions on the Frontier: French-Canadian Settlement in Eastern Ontario in the Nineteenth Century", *Canadian Geographer*, vol. 21, no. 1 (1977), pp. 1–21.

54 A. C. Osborne, "The Migration of Voyageurs from Drummond Island to Penetanguishene in 1828", *Papers and Records of the Ontario Historical Society*, vol. 3 (1901), pp. 123–166; N. H. Barrett, "A Study of Concentrations of French Population in Southern Ontario, 1861 and 1881" (B.A. thesis, Carleton University, 1975).

55 This is not to say that Eastern Ontario begins at Toronto; rather this division provides a convenient descriptive measure.

56 McLeod, "*Gualainn Ri Gualainn*".

57 Brunger, "The Distribution of Scots and Irish".

58 D. Norris, "Household and Transiency in a Loyalist Township: The People of Adolphustown, 1784–1822", *Histoire sociale/Social History*, vol. 13, no. 26 (1980), pp. 399–415; D. Gagan, *Hopeful Travellers: Families, Land and Social Change in Mid-Victorian Peel County, Canada West* (Toronto: University of Toronto Press, 1968), and "Geographical and Social Mobility in Nineteenth

Component 11, the last worthy of comment, is the Methodist factor and is bipolar, loading negatively upon British Methodist elements (Wesleyan and New Connexion) at –0.65 and "Other Methodists" at 0.82. This component is also associated with Episcopal Methodism (the American facet) at a lower level of –0.37. The structure of the component suggested a distinction between the more orthodox versions of Methodism and its sects. "Other" Methodists were located in older, often American areas or in those parts where the traditional forms did not dominate, for example, in York, Ontario, and Simcoe Counties or in recently settled parts of Huron, Perth, and Wellington (Figure 1). If "other" meant more evangelical, then the opportunity for evangelism was greater where competition was least, that is where Episcopal and Wesleyan Methodism were absent or insignificant.[59] It is perhaps worth recording that the Methodist component was the only one not to include any of the cultural epithets, unlike, for example, Catholicism which was primarily identified with French origins, or Presbyterianism which was often associated with birth in Scotland.

All 13 components were cluster analyzed. Examination of the error sums of squares suggested that seven classes provided the best description of the data. Table 2 provides summary measures of the qualities of these areas in terms of the means and standard deviations of the standardized scores. The table shows the association between group membership and particular components; in the interests of brevity only the first and second associations (if a second was possible) with the group are identified. This procedure helped identify the patterns apparent in Figure 4, which represents a regionalization of the selected social data for Ontario at this time.

Examination of Figure 4 reveals a basically dichotomized Ontario, consisting of the census enumeration areas which compose Clusters 1 and 2. The most southerly of these (Cluster 2) is shown in Table 2 to represent areas characterized by an attachment to Wesleyan and New Connexion Methodism (and to a lesser extent the American variant, Episcopal Methodism, with a mean of –0.34).[60] These were also areas populated by non-French Canadians (second highest average positive scores on Component 4 at 0.25), whose presence was indicated by positive scores. Cluster 2 would

Century Ontario: A Microstudy", *Canadian Review of Sociology and Anthropology*, vol. 13, no. 2 (1976), pp. 152–164; A. G. Darroch, "Migrants in the Nineteenth Century: Fugitives or Families in Motion", *Journal of Family History*, vol. 6 (1981), pp. 257–277; D. Norris, "Migration, Pioneer Settlement and the Life Course: The First Families of an Ontario Township" in D. H. Akenson, ed., *Canadian Papers in Rural History*, vol. 4 (Gananoque: Langdale Press, 1985), pp. 130–152.

59 Clark, *Church and Sect In Canada*; G. French, "The People called Methodists" in J. W. Grant, ed., *The Churches in the Canadian Experience* (Toronto: Ryerson Press, 1966).

60 Within the area of Cluster 2 the mean percentages of British Methodists and Episcopal Methodists were 15.4 and 8.0%; the respective standard deviations were 11.7 and 8.4% (n=150). The provincial averages were 10.8 and 4.3% with standard deviations of 11.1 and 6.8% (n=338). A t-test was used to test for differences between the sample area and the population as a whole. With t-values of 28.75 and 11.94 (149 df), significant differences were recorded in excess of the 0.0001 confidence level.

**Table 2 Statistics on Component Scores Associated with Particular Clusters**

| Component | | Cluster 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| | n | 74 | 150 | 37 | 31 | 29 | 12 | 5 |
| 1 | $\bar{x}$ | | | -0.73 | 0.73 | | 0.18 | -0.12 |
| | σ | | | 1.03 | 1.31 | | 0.97 | 0.65 |
| 2 | $\bar{x}$ | | | | -0.16 | | -0.22 | 6.92 |
| | σ | | | | 0.19 | | 0.24 | 2.67 |
| 3 | $\bar{x}$ | -0.82 | | -0.50 | | 0.60 | 0.71 | |
| | σ | 0.86 | | 0.76 | | 1.09 | 0.72 | |
| 4 | $\bar{x}$ | | 0.25 | -0.51 | | 0.52 | -3.87 | |
| | σ | | 0.51 | 0.92 | | 0.35 | 0.81 | |
| 5 | $\bar{x}$ | 0.28 | | | 1.55 | -0.44 | -0.46 | |
| | σ | 0.93 | | | 1.65 | 0.63 | 0.59 | |
| 6 | $\bar{x}$ | -0.36 | | 0.87 | | 0.25 | -0.25 | |
| | σ | 0.96 | | 1.26 | | 0.89 | 0.73 | |
| 7 | $\bar{x}$ | 0.09 | | 0.64 | -0.53 | -0.17 | | |
| | σ | 1.20 | | 1.59 | 0.62 | 0.56 | | |
| 8 | $\bar{x}$ | | 0.11 | -0.44 | | | 0.74 | -0.39 |
| | σ | | 0.71 | 1.46 | | | 0.71 | 0.71 |
| 9 | $\bar{x}$ | | -0.15 | -0.05 | 0.22 | 0.32 | | |
| | σ | | 0.88 | 0.87 | 0.96 | 0.85 | | |
| 10 | $\bar{x}$ | | | -0.79 | -1.11 | 0.29 | 0.58 | |
| | σ | | | 1.19 | 1.63 | 0.74 | 0.62 | |
| 11 | $\bar{x}$ | | -0.34 | -0.13 | | 2.03 | 0.09 | |
| | σ | | 0.81 | 0.86 | | 0.99 | 0.54 | |
| 12 | $\bar{x}$ | -0.76 | 0.36 | | 0.29 | | | -0.37 |
| | σ | 0.81 | 0.81 | | 0.75 | | | 1.09 |
| 13 | $\bar{x}$ | | -0.08 | 0.57 | | -0.36 | | 0.14 |
| | σ | | 0.86 | 1.78 | | 1.04 | | 1.02 |

*Sources:* See Table 1.

appear to represent older areas of settlement (although not the oldest) where sufficient time had elapsed to permit the identification of individuals in the Census as Canadian-born. In contrast, the areas included in Cluster 1 were generally settled later and their origin and religious structure reflect this newer settlement phase.

These areas are shown in Table 2 to be associated with the bipolar Component 3, which loaded positively on the variables "born in the United States" and "other religions" and negatively on "born in Ireland" and "Anglican".

In the case of Cluster 1 the characteristic association is with the Irish and Anglicans (mean –0.82) as well as with Component 6, which has been labelled here "Young Families" (–0.36), and Component 12 (Females 30 to 40). In effect, this was the difference between long-settled and recently settled areas, and tests of the differences of means showed this to be so.[61] In fact, in terms of their settlement history, there were three groups, a pre-1810 group (Clusters 2, 5, 6, and 7), an intermediate class with one member (Cluster 4), and a post-1820 group (Clusters 1 and 3). Similarly, there were three groupings of people classed by average age of the population (which for the province was only 20.6 years), the only difference being that, within the oldest group, Clusters 6 and 7 were different, presumably because of the presence of the longer-settled French Canadians.[62]

Within and surrounded by the areas of Cluster 2 were the areas encompassed in Cluster 5. Here there was a greater emphasis on the Canadian non-French whose average score was 0.52 (Table 2), a marked emphasis upon "Other Methodists" rather than the "established" forms present in Cluster 2, and the second average but still high positive scores (0.60) on "born in the United States" and "other religions".[63] Interestingly, within the smaller number of members in Cluster 6 (n=12) the American-born score was highest (0.71). In fact, the mean percentage of American-born in these areas (6.62 per cent) and in the larger Cluster 5 were little different (6.25 per cent).[64] However, the most important characteristic of the areas involved in Cluster 6 was the predominance of French-speaking Roman Catholics (Component 4). This is shown by the very high mean value of –3.88 on Component 4 concentrated in the three areas discussed earlier.

If within the southern part of the province there were enclaves of Americans and "other Methodists", there were areas to the north where particular attributes were locally important. Within the areas of Cluster 3 young families drawn from a variety of backgrounds (Irish Anglican and French-Canadian Catholic) predominated, but the overriding characteristic was

61 The respective means and standard deviations for Clusters 1 to 7 were as follows: 1825 (S.D.=15.47), 1809.64 (S.D.=20.1), 1828 (S.D.=18.1), 1816.65 (S.D.=18.84), 1801.03 (S.D.=16.8), 1807 (S.D.=23.39), and 1809 (S.D.=18.79). A series of t-tests revealed the three phases of settlement noted above.

62 With t-values of 5.3 and 24.0 for 179 and 102 degrees of freedom, Clusters 2 and 1 both proved sufficiently different to 4 at the 0.001 significance level. Since the means are identical, Clusters 1 and 3 are no different. Clusters 2, 5, and 7 proved no different to one another but, with a t-value of –11.4 and 15 df, Clusters 6 and 7 proved significantly different at the 0.001 level.

63 In Cluster 5 the mean for Canadian non-French was 65.7% with an S.D. of 11.4 (n=29). In Cluster 2 the respective statistics were 59.3 and 12.2 (n=150). Other Methodists constituted 24.8% (1 S.D.=13.1) of Cluster 5 and 3.6% (1 S.D.=6.7) of Cluster 2. American-born constituted 6.2% (1 S.D.=2.7) of Cluster 5 and 5.6% (1 S.D.=3.7) of Cluster 2. Other religions formed 25.4% (1 S.D.=16.8) of Cluster 5 and 17.8% (1 S.D.=17.7) of Cluster 2. A series of t-tests, run to establish statistical differences between the two clusters on the above variables, all proved significant at the 0.001 level.

64 The respective standard deviations were 7.82 and 2.7. With a calculated t-value of 0.21 the null hypothesis had to be rejected.

obviously relative youthfulness. These people were associated with the Ottawa Valley, stretched westward along the margins of the Canadian Shield to the developing parts of Dufferin, Wellington, Grey, and Bruce Counties (Figure 1). These were the most recently settled areas. The mean date of survey was 1825 and the mean date of settlement was 1828;[65] in such frontier circumstances relative youthfulness is only to be expected. Cluster 4, according to Table 2, contained high average scores on the Scottish Components 5 and 10 as well as Component 7, identified as "Young Families II", and Component 1, people aged 50 to 80. In fact, while the common characteristic of these areas is their "Scottishness",[66] it is probably best to conceive of them in terms of pre- and post-Napoleonic immigration waves. In this way the Glengarry Highlanders included some of the older settlers; the Scots of Bruce and Sullivan Townships some of the most recent and younger settlers.[67] Finally, Cluster 7 is obviously the European dimension of settlement; concentrated in Waterloo County, it has a marked outlier in Humberstone Township (Figures 1 and 4).

**Discussion**

Presumably, these regions are in fact the manifestations of social processes such as chain migration, responses to political decision, and the desire for association leading to propinquitous settlement. These are continuous processes extending beyond the boundaries of the regions delimited here, but they reach their most marked development in the areas identified. However, if the areas have been adequately identified, they played a role in shaping the views and attitudes of the people. Indeed, they formed part of their respective "territories".[68]

We cannot elaborate on this aspect except in theory; we can, however, examine the qualities of these regions in terms of a number of social attributes. Ideally, these might include measures of affinity, of membership in various cultural, fraternal organizations, of visits and even marriage within groups and between cultural groups, of meetings of literary societies and churches: in short, all the social institutions by which cultures reproduce themselves. Such measures are not available for all of Ontario at this time.

65 The respective standard deviations were 21.1 years and 18.0 years.

66 The mean percentage of Scots in these areas was 26.7 (S.D.=13.6; n=31). In Ontario as a whole the Scottish mean was 9.3% (S.D.=10.0, n=338). The calculated t-value of 9.16 proved significant at the 0.001 level.

67 The average age in Bruce and Sullivan Township was 18.7 and 21.0 years; the respective values for the townships of Glengarry County were 21.3 in Kenyon, 21.8 in Lochiel, 22.8 in Lancaster, and 23.8 in Charlottenburg. The average age in Ontario at this time was 20.6 years. Bruce was first settled in 1851; Sullivan in 1844. The townships of Glengarry, in contrast, were settled between 1783 and 1794. In Bruce and Sullivan townships Scots constituted 30.0 and 13.8% of the township population; they made up 21.7% of Kenyon, 18.2% of Lochiel, 12.1% of Lancaster, and 9.6% of Charlottenburg.

68 Murphy, "Regions as Social Constructs".

**Table 3 Nuptiality and Marital Fertility**

| Cluster | | Nuptiality ratio | Marital fertility ratio |
|---|---|---|---|
| 1 | $\bar{x}$ | 0.632 | 2.712 |
| | $\sigma$ | 0.086 | 0.255 |
| 2 | $\bar{x}$ | 0.618 | 2.509 |
| | $\sigma$ | 0.063 | 0.370 |
| 3 | $\bar{x}$ | 0.625 | 2.642 |
| | $\sigma$ | 0.078 | 0.637 |
| 4 | $\bar{x}$ | 0.545 | 2.958 |
| | $\sigma$ | 0.074 | 0.617 |
| 5 | $\bar{x}$ | 0.607 | 2.501 |
| | $\sigma$ | 0.065 | 0.344 |
| 6 | $\bar{x}$ | 0.607 | 2.643 |
| | $\sigma$ | 0.070 | 0.253 |
| 7 | $\bar{x}$ | 0.682 | 3.048 |
| | $\sigma$ | 0.059 | 1.140 |

*Sources:* See Table 1.

However, a large number of variables are available from the Census of Canada directly or by derivation. Of necessity, one must be selective. Since the purpose here is to be suggestive and to prompt other work, only the simplest indisputable measures can be employed.

Marriage and marital fertility appear appropriate variables to measure association with our regions, although, in fairness, both variables have also been shown to be related to economic factors. This interrelationship is developed in the Ontario literature in the work of Lorne Teppermann and William L. Marr. There is reason to believe that the Census is not especially reliable in this regard. Teppermann, Ellen Gee, and Marr have shown that, for Canadian data, direct measurement of crude birth rate, for example, is not satisfactory for a variety of reasons. Following their lead, we use adjusted statistics, namely the nuptiality and marital fertility ratios which, for reasons of comparison, follow Marr's definitions.[69] Nuptiality is de-

69 Teppermann, in addition to crude birth rate, feels the need to employ other measures (using a selected life table to correct for mortality) in the year preceding the focus of his study and to employ "stable population models in a manner employed in many presently underdeveloped nations". L. Teppermann, "Ethnic Variations in Marriage and Fertility: Canada 1871", *Canadian Reviews of Sociology and Anthropology*, vol. 11, no. 4 (1974), pp. 324–343. Ellen Gee comments

fined as the ratio of married women aged 15 to 50 to the total number of women in these age cohorts. Marital fertility is the ratio of children under 10 years of age to the number of married women aged 15 to 50. The results appear as Table 3.

Nuptiality is shown to have been highest within the townships that compose Cluster 7, that is the European-born areas composed mostly of German and Dutch Mennonites and Lutherans. It was next highest in the "frontier" areas of Clusters 1 and 3, and reached intermediate levels in the older areas comprising Clusters 2, 5, and 6. Here, within the areas settled prior to 1810, on average there was no distinction in nuptiality rates between the older more "American" areas and the dominantly French-Canadian areas. Nuptiality was lowest in the highly Scottish areas of Cluster 4. In relative terms marriage was more common in the areas of Cluster 1, but this was the frontier and the population dominantly Irish and Anglican. Alternatively, either the stereotype of late Irish marriage is exploded or those escaping the circumstances of famine in Ireland followed their natural proclivities. A series of t-tests showed all clusters other than 5 and 6 to be distinct, suggesting a cultural distinctiveness commensurate with settlement phase.[70]

Comparison of nuptiality and marital fertility shows that there was not complete agreement between the two variables (Table 3). The European areas possessed the highest nuptiality and marital fertility rates; the Scottish areas the lowest nuptiality rates but the second highest fertility rates. If, as Teppermann suggests, the Scots married later, they compensated by producing higher fertility rates.[71] In Clusters 2 and 5, effectively "Old Ontario" in 1851, marital fertility was lowest, perhaps because, as McInnis and Richard A. Easterlin have argued, among other reasons, these areas had passed beyond some critical sustenance threshold.[72] In contradistinction, fertility rates were high in the French-Canadian areas and on the frontier in Clusters 1 and 3, where bush was being converted to farmland. Here, the availability of land provided a different dimension.

on problems of stillbirth, illegitimacy, and underreporting in general. In Gee's opinion these shortcomings are sufficiently great to compel her to abandon the Census estimates altogether. E. Gee, "Fertility and Marriage Patterns in Canada, 1851–1971" (Ph.D. dissertation, University of British Columbia, 1978), pp. 20–21. Marr also expresses reservations on the data. W. L. Marr, "Nuptiality, Total Fertility and Marital Fertility in Upper Canada, 1851: A Study of Land Availability, Urbanization and Birthplace", *Canadian Studies in Population*, vol. 13, no. 1 (1986), pp. 1–18. See also M. McInnis, "Birth Rates and Land Availability in Nineteenth Century Ontario", Annual Meeting of the Population Association of America, Toronto, 1972.

70 Teppermann, "Ethnic Variations", p. 339.

71 *Ibid.*, p. 340.

72 McInnis, "Birth Rates and Land Availability"; R. A. Easterlin, G. Alter, and G. Condran, "Farms and Farm Families in Old and New Areas: The Northern States in 1860" in T. K. Hareven and M. A. Vinovskis, ed., *Family and Population in Nineteenth Century America* (New Jersey: Princeton University Press, 1978), and "Population Change and Farm Settlement in the Northern United States", *Journal of Economic History*, vol. 36, no. 1 (1976), pp. 45–75.

## Conclusion

This work has shown that there were two primary divisions in Ontario in 1851 which accorded to a large extent with date of settlement. These have been designated "Old" and "New", terms that in the historiography of Ontario have come to refer to different areas, as settlement moved ever northward and "new" became "old". Within the former (Cluster 2) the population was largely non-French-Canadian and, while all other denominations were represented, Methodism was omnipresent. Settled on average in 1809, these townships represent the general condition. Northward, in the townships contained within Cluster 1, the average date of settlement was 1825. This group was formed of Components 3 (primarily Irish and Anglican), 6 (Young Families), and 7 (Young Families II). It was the frontier characteristic, coincidentally Irish and Anglican, comprised of relative latecomers but primarily young and land-hungry, that forged this region.

On top of this basic structure were the much more localized areas in which origin and religion were almost exclusively Roman Catholic. On average, they had been settled longer ($\bar{x}$ = 1807) than even the townships of Cluster 2, although they contained some of the most recent settlements in Eastern Ontario and the earliest settlement in the province as a whole, the seigneurial long lots of Essex County. In these areas the population was, on average, older due to this earlier occupation and the fact that Americans, generally an older group, were also present. The Americans were most clearly represented in Cluster 6 where American origin was associated with the category "other religions", the term including Baptists and a host of sects. In terms of their date of settlement, these areas were statistically no different than those included in Cluster 7, although the national composition and religious structure of the latter were entirely so.[73] Cluster 7 areas were overwhelmingly German and Dutch, Mennonite, Tunker, and Lutheran, containing the youngest inhabitants of any group (20.1 years). They were localized in five townships. Another strongly cultural group was Cluster 4. The members of this class were scattered all over the province but this was one of the most homogeneous of all classes, consisting of Scottish and Maritimes-born individuals, adhering to the Church of Scotland or the Presbyterian Church.[74] Given the geographic pattern of these Scottish townships, it is no surprise that in terms of settlement dates they belonged to the "intermediate" category. In a basically young province they were relatively older, as indicated by the loadings of Components 1 and 7 on these areas. In comparison some of

73 t-value = 1.21 with 15 df.

74 Generally, the ubiquity of, for example, the Irish and the Scots has meant that some of the regions are non-contiguous. What is remarkable is the high degree of order apparent in this cross-sectional study which is, in fact, a palimpsest of a variety of processes operating over at least 70 years.

the least homogeneous townships were contained within Cluster 3, of which the average date of settlement was 1828 and where (with Cluster 1) the average age of the inhabitants was 20.2 years, the second youngest in the province. Interestingly, these were some of the most mixed areas in terms of origin, containing French Canadians, Irish, and Scots. In fact, this was the new edge of settlement.[75]

It has been suggested that, if these areas are other than mere containers, it should be possible to identify some of the processes responsible for region-building.[76] In general terms the regions identified reflect in part the moment of history. These include the circumstances which created a French seigneury in remote Essex County or which, 100 years later, moved the Church to sponsor colonization in the eastern part of the province to sustain *la survivance*. They include the political circumstances of revolution in the territory that was to become the United States and the recreation of a Loyalist province to the north, in territory abutting the former American homeland. The North American phase of a European war, by delaying the arrival of British settlers, created a spatial separation between "old" and "new" areas. The administrative decision to open territory at a particular time and to permit particular groups (Europeans in Waterloo, Catholic Highlanders in Glengarry, Irish ex-soldiers in Essex) also affected the pattern of settlement. These circumstances and decisions were augmented by the natural tendencies of human beings to cling to their own place, to identify and defend their region. There is an entire sphere of human practice and experience that has a strong territorial base. Within these spaces at mid-century, the reproduction of humanity was also fashioned by institutions and activities such as school, church, kinship, dances, visits, country fairs, and work "bees", by the simple desire to be close to those of a similar kind.

No doubt a myriad of processes, including the important one of chain migration, operated in the creation of these regions. Two processes investigated here, namely nuptiality and marital fertility, are significant socially and biologically. It has been shown that there was overlap between the regions as delimited and patterns of marriage and reproduction, most notably in the European and Scottish areas. There are a host of other Census variables (to say nothing of other types of information) that might be investigated in this way, for example, mortality, male/female ratios, dependency, size of family, and literacy. The demographic elements are obviously related not only to cultural but also to economic forces. Marvin

75 One indicator of the "frontier" is the ratio of males to females. In this area this was highest at 125.6 men per 100 women. Elsewhere this statistic varied between 110.96 and 112.82.

76 Recent work conducted at the level of the lot suggests that social processes related to "propinquity" played a significant part in the settlement decision.

McInnis and William L. Marr in the Canadian context and Easterlin, in his seminal work in the American, have all employed this in terms of land availability.[77] Focus upon this economic factor may aid in understanding the mechanisms by which regions are created and the cultural regions that might be expected in Ontario at a later date.

77 McInnis, "Birth Rates and Land Availability"; Marr, "Nuptiality, Total Fertility"; Easterlin, "Population Change and Farm Settlement".