Aspects of Land Acquisition in Essex County, Ontario, 1790-1900

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This paper focuses upon the theme of land acquisition which is viewed as part of the larger process of settlement. It seeks to answer the following questions. When was land legally acquired or patented in Essex County? By whom was it patented and what influenced the timing of patenting for particular categories of land? In what townships was land acquisition most rapid and why? What was the role of accessibility and the physical environment in the decision of individuals to acquire particular pieces of property?

An earlier paper in this vein sought to describe the development of the Western District, of which Essex formed a part, as a series of static cross-sections.[1] This paper examines the question of land acquisition in a more restricted area (that of a single county) but from a different methodological perspective — that of change through time. While Johnson's paper is limited to analysis at the township level at particular points in time, this paper seeks in addition to describe rates of acquisition at the level of the lot, thus adding to our knowledge of the settlement of this area.

The structure of the paper is as follows. The physical environment is described first of all, a second section dealing with the source materials used in the study follows, and the statistical methods used to analyse the data are then presented in a third section. Sections four, five and six discuss the results of the analysis at the level of the county, the township and the individual lot respectively. A seventh section summarises the conclusions drawn.

1. PHYSICAL BACKGROUND

Essex County, extending some thirty-five miles from east to west and at its widest twenty-five miles from north to south, contains within its boundaries the most westerly of the four earliest cores of settlement in the

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[1] L.A. JOHNSON, "The Settlement of Western District 1749-1850," in F.H. Armstrong, H.A. Stevenson, and J.D. Wilson, eds., *Aspects of Nineteenth Century Ontario* (Toronto, 1974) : 19-35.

Province of Upper Canada.[2] Physiographically, it forms a glacio-lacustrine plain of little relief lying between 550 and 750 feet above sea level[3] and in its virgin condition carried stands of what Fox and Soper have identified as the Carolinian Zone of Southern Ontario.[4] Tables 1 and 2 report the ingredients of the forest as recorded in the field notes for the townships of Anderdon and Rochester[5] (Figure 1). Though the tables show some slight differences in the relative importance of the various tree types, variations which may be due to real but slight soil differences or the particular perception of the respective surveyors, the forest ingredients are generally representative of the Carolinian forest association, in which the admixture of hardwoods and softwoods is radically different from those areas at these latitudes, denied the ameliorative effects of the Great Lakes.

Table 1: FREQUENCY OF REPORTING OF SPECIFIED TREE TYPES, TOWNSHIP OF ANDERSON, ESSEX COUNTY

Tree Type	*Number of Times Recorded*	*Percentage of Total*
White Ash	31	7.5
Black Ash	49	11.8
Bass	62	14.9
Beech	24	5.8
Elm	76	18.3
Hazel	4	0.9
Hickory	35	8.4
Ironwood	5	1.2
Maple	15	3.6
Marsh	11	2.6
White Oak	68	16.3
Red Oak	17	4.1
Poplar	4	0.9
Plane	0	0.0
Sycamore	3	0.7
Swamp	4	0.9
Walnut	7	1.6

Source: P. CARROLL, Survey Records, Field Notes for 1835, Vol. XI, pp. 178-207 and Original Note Book No. 21, Department of Lands and Forests, Toronto.

[2] C.F.J. WHEBELL, "The Geographical Basis of Local Government in Southern Ontario," (unpublished Ph. D. dissertation, University of London, 1961); "Core Areas in Intrastate Political Organisation," *The Canadian Geographer*, XII, No. 2 (1968): 100-12. See also E. LAJEUNESSE, *The Windsor Border Region* (Toronto: The Champlain Society, 1960).

[3] L.J. CHAPMAN and D.F. PUTNAM, *The Physiography of Southern Ontario* (Toronto, 1966), pp. 240-246.

[4] W.S. FOX and J.H. SOPER, "Distribution of Some Trees and Shrubs of the Carolinian Zone of Southern Ontario," *Transactions of the Royal Canadian Institute*, 29 (1959): 65-84, and 30 (1953): 3-32, and 99-128. See also A.W. KUCHLER, *Potential Natural Vegetation of the Coterminus United States*, American Geographical Society, Special Publication No. 36 (1964).

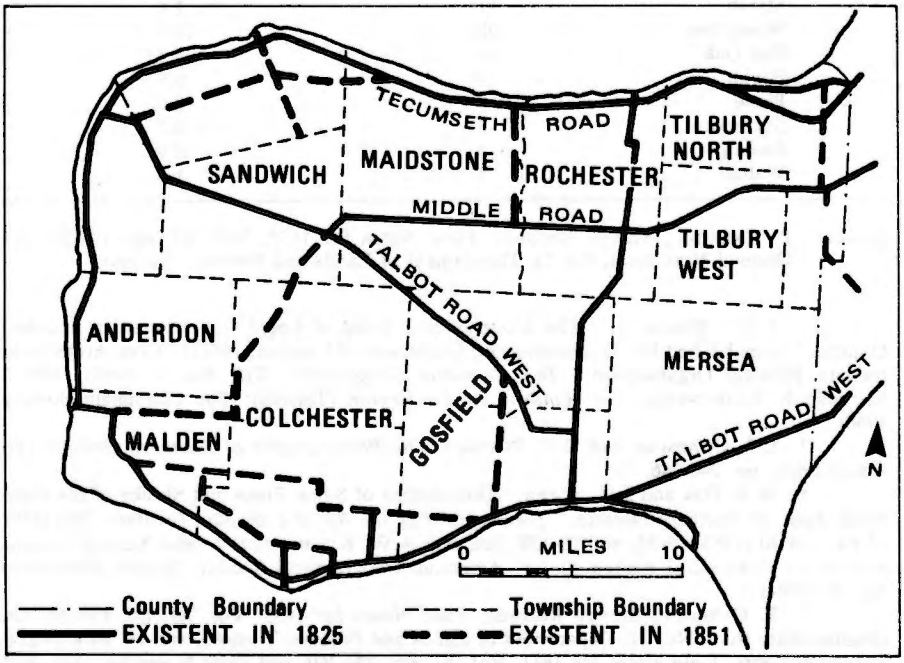
[5] P. CARROLL, Survey Records, Field Notes for 1835, Vol. XI, pp. 178-207 and Original Note Book No. 21, Department of Lands and Forests, Toronto, and M. BURNWELL, Survey Records, Field Notes for 1821, Vol. XI, pp. 220-260, and Field Notes for 1824, Vol. XI, pp. 266-319, Department of Lands and Forests, Toronto.

Table 2: Frequency of Reporting of Specified Tree Types, Township of Rochester, Essex County

Tree Type	*Number of Times Recorded*	*Percentage of Total*
White Ash	13	1.5
Black Ash	168	19.4
Bass	64	7.4
Beech	129	14.9
Elm	171	19.7
Hazel	0	0.0
Hickory	48	5.5
Ironwood	0	0.0
Maple	72	8.3
Marsh	4	0.5
White Oak	124	14.3
Red Oak	4	0.5
Poplar	0	0.0
Plane	9	1.0
Sycamore	0	0.0
Swamp	158	18.2
Walnut	0	0.0

Source: M. Burwell, Survey Records, Field Notes for 1821, Vol. XI, pp. 220-260, and Field Notes for 1824, Vol. XI, pp. 266-319, Department of Lands and Forests, Toronto.

Fig. 1: The Township and Road Network of Essex in the Nineteenth Century



Source: See reference 12.

Within the county there was a marked association between vegetation and soil drainage conditions[6]. An analysis of part of the county showed that the well drained, light-textured loams supported a dominantly white oak, beech and maple association, and the poorly drained heavily-textured clays a black ash and elm swamp association. Statistical analysis of this relationship supported the notion that vegetation could have been used as an index of suitable land for settlement.[7]

Figure 2 summarises drainage conditions since this is known to have been of paramount importance in the settlement of this southwesterly area.[8] The importance of soil drainage in this area was recognised by Charles Rankin, the Deputy Surveyor, as early as 1826[9] and is particularly marked in the historical record of the second half of the nineteenth century when under different technological conditions and by the joint action of the local people and of government, the landscape of this most westerly part of Upper Canada was transformed.[10] In the first half of the nineteeeenth century the wet lands of this area were regarded as formidable barriers to settlement. These wet lands were extensive, and well drained soils were limited to particular areas along the Lake St. Clair and Lake Erie shores, although small tracts running across the country were associated with a series of old beach lines. If, in addition, imperfectly drained soils were considered, then the area most suited for settlement was Lake Erie shore. Certainly the physical geography affected the patterns of communication. The earliest

[6] N.R. RICHARDS, A.G. CALDWELL, and F.F. MORWICK, *Soil Survey of Essex County*, Report No. 11, Ontario Soil Survey (Guelph, 1949).

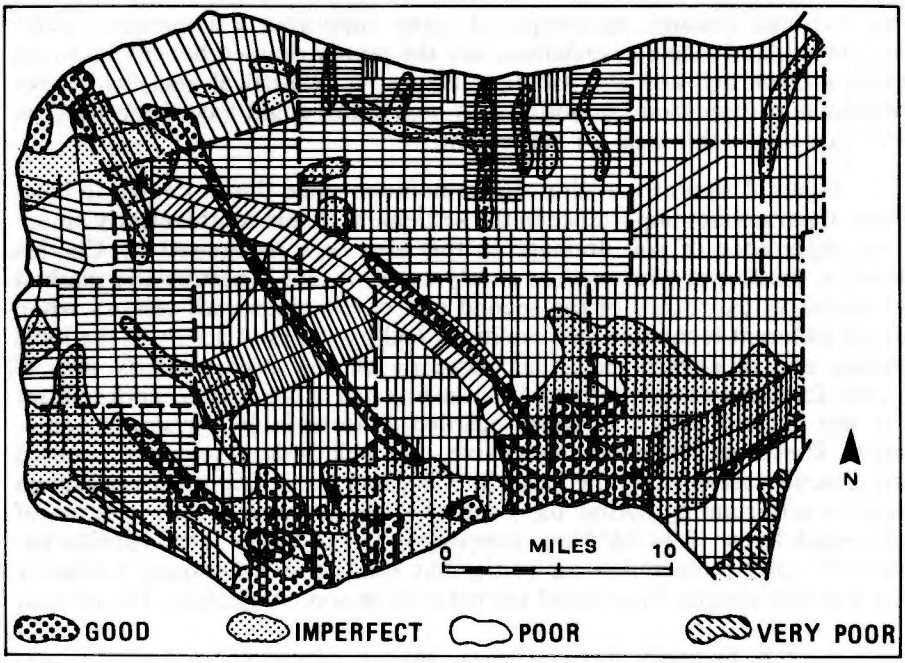
[7] Part of the problem in determining the spatial pattern of particular plant associations is the richness of the data. The surveyors' reports record up to 50 species on any one lot. There is therefore a need for a rigorous and objective method to eliminate regressive elements in the plant association. Heidenreich suggests one such method for Simcoe County. See Heidenreich's appendix in R.L. GENTILCORE and K. DONKIN, *Land Surveys of Southern Ontario 1784-1859*, Cartographica, No. 8 (Toronto: 1973). The statistical method used here was chi-square analysis. See H.M. BLALOCK, *Social Statistics* (New York, 1960), pp. 212-41. The vegetation classification used was based upon an empirical examination of the survey notes of A. Iredell, T. Smith and M. Burwell. See J. CLARKE, "A Geographical Analysis of Colonial Settlement in the Western District of Upper Canada 1788-1850" (unpublished Ph. D. dissertation, University of Western Ontario, 1970), Appendix 4.1 pp. 247-49. Three townships were selected for study. These were the townships of Rochester, Gosfield and Mersea. In the North these townships are covered with a heavy, poorly drained Brookston clay of lacustro-morainic origin, to the south and covering about half the area of Gosfield and Mersea Townships in an area of extensive outwash sands and gravels represented by the Parkhill, Burford and Horrow loams, the Berrien sandy loams, the Harrow sandy loams and the Caistor clay loams. In the essential contrasts of well drained and poorly drained soils these townships mirror the basic division in the county. This division was reflected in the contingency table where poorly drained and well drained (including imperfectly drained soils) were cross-classified with the two dominant vegetation groups. The chi-square value required for rejection of the null hypothesis that there was no relationship between soils and vegetation is 10.827. The value of X^2 obtained was 79.7. See CLARKE, *op. cit.*, pp. 78-9.

[8] D. MCDONALD, ed., *Illustrated Atlas of Canada, Local Maps and Historical Sketch of the County of Essex* (Toronto, 1881), p. 1.

[9] P.A.C., MICROFILM, C.O. 47/115, C. Rankin in 1826.

[10] CLARKE, *op. cit.*, pp. 80-1 and 136-37; C. HERNIMAN, "The Development of Artificial Drainage Systems in Kent and Essex Counties, Ontario," *Ontario Geography*, No. 2 (1968): 13-24 and K. KELLY, "The Artificial Drainage of Land in Nineteenth Century Southern Ontario," *The Canadian Geographer*, XIX, no. 4 (1975): 279-98.

Fig. 2: DRAINAGE CONDITIONS



Source: *Soil Survey of Essex County* (see reference 6).

and most important roads in this area during the nineteenth century were peripheral; the earliest, the Tecumseth Road, was opened in 1804 paralleling the coast of Lake St. Clair.[11] When, in 1811, Mahlon Burwell began surveying the Talbot Road, he directed its path along the well drained Lake Erie shore to Mersea Township which he reached in 1816. Between 1821 and 1825 Burwell completed the Talbot Road through Gosfield and Colchester Townships, following the high land along the old Indian Trail and an older beach line to Sandwich (modern Windsor) as well as the Middle Road from Orford Township in Kent County to Maidstone in Essex County (Figure 1)[12] traversing the heavier poorly drained clays of the region (Figure 2).

2. SOURCE MATERIALS

The prime source materials used were the land patent data available in the Patent Index, the Abstract Index to Deeds or the Domesday Books. These sources provide information on the date of patent or legal acquisition

[11] C. Hamil, *The Valley of the Lower Thames 1640-1850* (Toronto, 1951), p. 158 and p. 300.

[12] Detailed documentation of the tasks performed by these men and the documentary and cartographic sources used to construct Figure 1 are to be found in CLARKE, *op. cit.*, 1970, pp. 123-27, 143-48, and 247-57.

and the geographical location of the property acquired. They can be used to determine the timing of land acquisition in the county as a whole, and for particular categories of land such as Indian, Crown and Clergy Reserves[13] and speculative holdings, if their location is known.[14] The identification of the first three categories can, of course, be established by reference to various documentary and cartographic sources[15] but the identification of land speculators requires an act of judgment. The particular decision taken in this instance is discussed in the next section.

In general, a patent was issued after a settler had been located on his lot, and settlement duties (which included the erection of a dwelling and clearance of a specified acreage) performed. Sometimes, however, settlement duties were not required, and they could vary from place to place through time. In short, the patent data cannot be used without qualification, but neither can alternative sources such as the tickets of location. It is presumably because of this and because of the greater availability of the former than the latter that these data have been widely used by such researchers as C. Wood,[16] L. Wood,[17] Kelly,[18] Clarke,[19] Brunger,[20] and Johnson.[21] This problem of patent reliability is critical in Ontario historiography. There is a great need to establish exactly how reliable they (and for that matter the tickets of location) are as a comment upon actual settlement. Ultimately, what is required is to cross-check such sources with the time of first occupation in such documents as the Assessment Rolls. However, annual runs of Assessment Rolls are difficult to obtain for all parts of Ontario. Yet for the Western District, of which Essex forms a part, and for a sample of 399 property parcels, this writer suggests that the lag between purchase or location and date of patent may have been of the order of six to eight years. At this stage, therefore, it would seem that there was a genuine relationship between patenting and actual settlement. Yet, even if

[13] On the Crown and Clergy Reserves in general see G.C. PATTERSON, *Land Settlement in Upper Canada, 1783-1840*, Sixteenth Report of the Provincial Archives of Ontario (Toronto, 1921); L.F. GATES, *Land Policies of Upper Canada* (Toronto, 1968); A. WILSON, *The Clergy Reserves of Upper Canada* (Toronto, 1968).

[14] J. CLARKE, "The Role of Political Position and Family and Economic Linkage in Land Speculation in the Western District of Upper Canada 1788-1815," *The Canadian Geographer*, XIX, No. 1 (1975): 18-34.

[15] J. CLARKE, "Documentary and Map Sources for Reconstructing the History of the Reserved Lands in the Western District of Upper Canada," *The Canadian Cartographer*, 8, No. 2 (1971): 75-83.

[16] C.J.B. WOOD, "Human Settlement in the Long Point Region 1790-1825," (unpublished M.A. thesis, McMaster University, 1966).

[17] L.J. WOOD, "Settlement of the Mt. Elgin Ridges, Ontario," (unpublished M.A. thesis, University of Western Ontario, 1966).

[18] K. KELLY, "The Agricultural Geography of Simcoe County, Ontario," (unpublished Ph.D. dissertation, University of Toronto, 1968).

[19] CLARKE, *op. cit.*, 1970.

[20] A.G. BRUNGER, "A Spatial Analysis of Individual Settlement in Southern London District, Upper Canada, 1800-1836," (unpublished Ph.D. dissertation, University of Western Ontario, 1973), and "Settler Location in the Talbot Settlement of Upper Canada," paper presented to the Canadian Association of Geographers, Thunder Bay, 1973.

[21] JOHNSON, *op. cit.*, and "Land Policy, Population Growth and Social Structure in the Home District, 1793-1851," *Ontario History*, LXIII, No. 1 (1971): 41-60.

it were shown that the relationship between occupation and patenting was far from perfect, this would in no way lessen the value of patents as a comment upon land acquisition. After all else is said, the patent data remain the final comment upon the date of legal land acquisition[22] which in itself is a recognised phase of the land settlement process. It is as a comment upon land acquisition that these data are used in this paper.

3. METHOD

Details of 3,156 patents were gathered and the frequency of occurrence was recorded for all of them and for the particular classes mentioned above. The results are presented graphically in the next section. It was decided that anyone holding over 400 acres should be considered a land speculator. While this figure might not be as useful in the latter part of the century as the settlers acquired the financial resources and technology to handle large tracts of land, it provides a "rule" for the whole period and allows for the possibility of an individual and his son of the same name acquiring land.

The patents taken out in any one year were accumulated for each township and expressed as a percentage of the number in the final year of patenting. The rate of land acquisition in each township was then analysed using the logistic growth curve defined as

$$P = K/1 + e^{-(a+bt)}$$

where P is the accumulated percentage of land acquired, K is the ceiling of land acquisition, 't' is the variable time, 'b' is the rate of growth coefficient and 'a' is the constant of integration, positioning the curve on the time scale. The parameters were estimated using the method chosen by Griliches, that is, the transformation of the logistic into an equation linear in 'a' and 'b'.[23] The 't' statistic permitted comparison between the slopes for the various townships.[24] The results of this analysis of varying rates of township acquisition are presented in Section 5.

Section 6 deals with the spatial pattern of acquisition at the level of the individual lot. Trend Surface Analysis is used for two samples of 516 and 327 land patents. By separating the regional trend from the anomalies

[22] Detailed commentary on the usefulness of patents as source materials in Ontario can be found in CLARKE, *op. cit.*, 1970, pp. 149-60. See also C.B. MCINTOSH, "Use and Abuse of the Timber Culture Act," *Annals of the Association of American Geographers*, 65, No. 3 (1975): 347-62; "Patterns from Land Alienation Maps," *Annals of the Association of American Georgraphers*, 66, No. 4 (1976): 570-82.

[23] The parameters of the logistic growth curve can be estimated by dividing both sides of the logistic by K — P and taking the logarithm. This yields its linear transform log P/(K-P) = a + bt and allows the parameters to be estimated by least squares. Z. GRILICHES, "Hybrid Corn: An Exploration in the Economics of Technological Change," *Econometrica*, 25, No. 4 (1957): 501-22. In this instance the value of K was set at 99.9 per cent.

[24] M.R. SPIEGEL, *Theory and Problems of Statistics* (New York, 1961), p. 247 gives the following for the comparison of two beta coefficients b_i and b_j

$$t = \frac{b_i - b_j}{Sy.x/Sx} \cdot \sqrt{N-2}$$

or residuals to the computed surfaces it was possible to comment on both the regional and local pattern of land acquisition. This was accomplished by means of the least square linear model technique expressed after Krumbein as

$$Z = A_{00} + \sum_{I=1}^{M} \sum_{J=1}^{N} A_{IJ} X^I Y^J + e$$

where Z is an observed mapped variable, X^I and Y^J represent successive powers of the co-ordinates X and Y, the A's are unknown parameters and 'e' is an observable random variable with mean zero and variance σ^2.[25] In this instance the solution of the model permits the data of land acquisition to be predicted from a knowledge of spatial location. The resultant trends and residuals are accorded equal importance in this study of the spread of land acquisition over time.

4. The Timing of Land Acquisition in Essex County

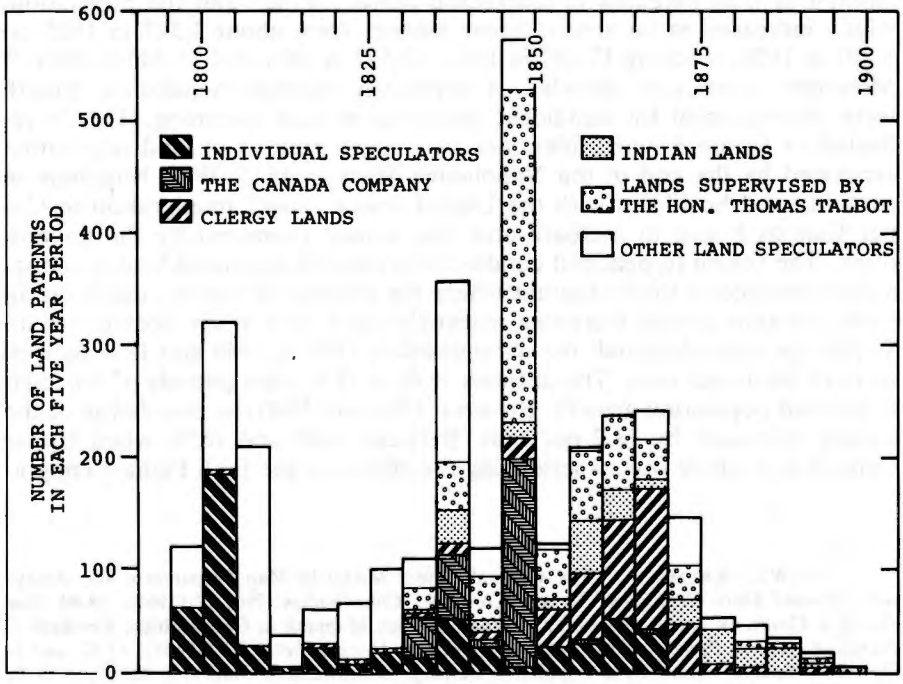
As might be expected, there was a direct relationship between the amount of land patented in nineteenth-century Essex and the population, which increased in an almost linear manner from about 2,347 in 1805, to 5,297 in 1820, reaching 17,817 in 1851, 32,697 in 1871 and 55,545 in 1891.[26] Moreover, particular decades of especially marked population growth were accompanied by significant increases in land patenting. This is reflected in Figure 3 which identifies two major periods of land acquisition separated by the end of the Napoleonic Wars in 1815. With Napoleon in captivity and hostilities with the United States ended, immigration to Upper Canada began to increase and was indeed promoted by the government. The return to peaceful conditions prompted increased land granting, a fact reflected in the histogram where the number of patents taken out in each five-year period increases markedly until 1870 when decline set in. Within the second period, the quinquennials 1836 to 1840 and 1846 to 1850 were of particular note. The decades 1830 to 1850 were periods of especially marked population growth. Between 1830 and 1840 the population of the county increased by 73.2 per cent. Between 1840 and 1850, when Upper Canada as a whole was experiencing the effects of the Irish Famine emigra-

[25] W.C. Krumbein, "The General Linear Model in Map Preparation and Analysis", *Kansas State Geological Survey, Computer Contribution*, No. 12 (1967): 38-44. See also R.J. Chorley and P. Haggett, "Trend Surface Mapping in Geographical Research," *Transactions and Papers of the Institue of British Geographers*, 37 (1965): 47-67, and J. Clarke, "Spatial Variations in Population Density: Southwestern Ontario in 1851", in W.P. Adams and F.M. Helleiner, eds., *International Geography*, (Montreal, 1972): 408-11. 411.

[26] Data were taken from the Census of Canada for 1851, 1861, 1871, 1881 and 1891, and from. Johnson, "The Settlement...," pp. 28 and 31. The correlation coefficient betwen the amount of land patented, and the population of Essex, using Johnson's data for the period up to 1851 was 0.96. Strictly comparable data is not at present available for the whole of the nineteenth century but using the population of Essex and the amount of patenting activity rather than the acreage patented, the correlation coefficient obtained was 0.94.

tion and Essex County's isolation relative to the rest of the country was breaking down, it increased by 94.1 per cent. Population increase must therefore explain much of the rapid acquisition of land in these years, but the increase in patenting was also affected by changes in land policy. First it was decided to replace the free grant scheme with one of outright purchase.[27] In 1836 the government sought to buy votes by issuing patents, the basic requirement of enfranchisement, and in 1837 it decided to allow the United Empire Loyalists to acquire land free of settlement duties.[28] These and similar changes of land policy in the 1840s directly affected the rate of acquisition in Essex County. In 1839 lands located prior to 1832 and still unpatented by 1840 were threatened with forfeiture; similarly in 1846 a decision that those located after 1832 and unpatented in 1847 would be confiscated, produced a land patenting rush in Essex.[29] In 1846 alone 245 patents were taken out in Essex County. This can be contrasted with 139 taken out in 1836 and the eighteen taken out in 1809 when the future of this area appeared most secure because of its proximity to the proposed capital for Upper Canada at London, Ontario.[30]

Fig. 3: LAND ACQUISITION 1790-1900



Source: Patent Index, Essex County, Public Archives, Toronto. See also references 14, 15 and 34.

[27] GATES, *op. cit.*, p. 170.
[28] *Ibid.*, p. 140.
[29] *Ibid.*, pp. 137-40, 170, 186-89 and 265-66.
[30] G. CRAIG, *Upper Canada, The Formative Years 1784-1841* (Toronto, 1963), p. 25.

Table 3: PERCENTAGE OF PATENTS IN PARTICULAR QUINQUENNIAL PERIODS ESSEX COUNTY — BY CATEGORY

Period	*Indian Reserve*	*Canada Company*	*Clergy Lands*	*Thomas Talbot*	*Individual Speculators*	*Other Patentees*
1791-1795	—	—	—	—	—	—
1796-1800	—	—	—	—	52.9	47.1
1801-1805	—	—	0.9	—	57.3	41.8
1806-1810	0.5	—	—	—	13.0	86.5
1811-1815	—	—	—	—	16.6	83.4
1816-1820	—	—	4.0	—	41.6	54.4
1821-1825	—	—	—	6.3	15.9	77.8
1826-1830	—	—	—	19.0	21.9	59.1
1831-1835	0.9	35.8	1.9	18.0	15.2	28.2
1836-1840	8.4	15.6	2.8	11.7	13.9	47.6
1841-1845	8.7	12.0	2.6	33.7	12.2	31.6
1846-1850	2.3	33.1	3.5	52.3	0.5	8.3
1851-1855	6.0	—	29.0	47.0	11.9	6.1
1856-1860	24.9	0.5	29.2	32.0	12.9	0.5
1861-1865	11.5	—	38.0	29.8	21.7	0.0
1866-1870	3.4	0.4	52.7	16.0	15.2	12.3
1871-1875	18.4	—	30.5	21.5	—	29.6
1876-1880	65.4	—	7.7	13.5	—	13.4
1881-1885	42.2	—	6.7	4.4	—	46.7
1886-1890	74.2	—	—	6.4	—	19.4
1891-1895	33.3	—	11.1	22.2	—	33.4
1896-1900	25.0	—	—	—	—	75.0

Source: Calculated by the author from Patent Index, Essex County, Public Archives, Toronto.

The years down to 1815 were those in which the future of this area seemed particularly promising. Consequently these were years when speculation by individuals was most rampant.[31] In the period 1796 to 1800 57.3 per cent of all the land patented was acquired by speculators, more than by any other category (Figure 3, Table 3). Thereafter the number of active land purchasers patenting declined, but the number of patents held for speculative purposes remained high because of the activities of the Canada Company which had acquired the large amounts of land held formerly as Crown Reserves.[32] Charged with withholding land from patent to avoid the tax on wild land, the company was castigated by a select committee of the House of Assembly in 1835. It responded rapidly: within three years almost half of its holdings in Upper Canada had passed to patent.[33] In the years 1831 to 1835 and 1846 to 1850 the Company patented 35.8 and 33.1 per cent of all lands patented in the county (Table 3). By 1838 the Company had patented 30.4 per cent of its property parcels in

[31] CLARKE, *op. cit.*, 1975, pp. 18-34.

[32] The Canada Company was incorporated in 1826 and acquired 48,441 acres of former Crown Reserve in Essex County. P.A.O., Register of Lands for the Bathurst, Home and Western District, Canada Company Papers, No. 2, 1824-26, *passim*; P.A.C., National Map Collection f 400, Canada Company Maps (1826-1827).

[33] GATES, *op. cit.*, p. 225.

Essex, and by 1846, when it felt similarly threatened by the latest government land policy, 98.7 per cent of its land had been patented. The Statement of 1846 also threw some urgency into those locating on the lands whose settlement had been entrusted to Colonel Thomas Talbot.[34] Having satisfied that eccentric Anglo-Irish aristocrat of their suitability as settlers, these individuals normally postponed the required visit to York to pay their patent fee, but in the period 1847 to 1848 alone, 247 patents were taken out.[35]

The decades 1830 to 1850 also saw the patenting of the former Indian Reserve (Anderdon Township) and the sale of Clergy Reserves reach some pitch. The Clergy Reserves, which like the Crown Reserves constituted one seventh of the land granted in each township, were a constant source of political embarrassment. Their removal as sources of discontent began with the introduction of a sales policy in 1827 and was continued by Acts of 1840, by the introduction of a ten year credit system in 1846, and culminated in the Clergy Reserve Secularisation Act of 1854.[36] In Upper Canada, the decade 1845 to 1855 was the most important time for the disposal of these lands. In Essex it would seem to have been somewhat later. The most important period was the period 1866 to 1870 when Clergy Reserve sales made up about 53 per cent of all sales and sales of clergy lands in the county continued strongly at least until 1875 (Table 3).

A cursory glance at Figure 3 might suggest that there was little activity by small holders after about 1841. This was not so because while there is evidence to suggest that some of the former clergy lands were acquired by speculators, most were not. The Indian lands were purchased by smallholders, and the lands supervised by Colonel Talbot were without question acquired by genuine settlers. What happened on the former Crown Reserves is at present unclear, but there would seem grounds at this stage to suspect that some at least passed into the hands of individuals rather than corporate speculators. Thus, those acquiring holdings equal to or under 400 acres were proportionately as numerous in the latter period as in the earlier.

5. Rates of Land Acquisition in the Townships of Essex

Patenting began in all but three of the fourteen townships before 1810; that is, before the 1812 war and its aftermath which slowed the process because of the uncertainty of the times and the post-war restrictions on American immigration. These were Tilbury North, first patented in 1825, Sandwich South patented first in 1826, and Colchester North patented first in 1834. Started later, land acquisition was more rapid in these townships, the process taking an average of fifty-seven years. Though there is little difference in date of first patent within the other eleven

[34] J. Clarke, "Mapping the Lands Supervised by Colonel the Honourable Thomas Talbot in the Western District of Upper Canada 1811-1849," *The Canadian Cartographer*, VIII, No. 1 (1971): 8-18.

[35] Calculated by the author from Patent Index, P.A.O., Toronto.

[36] Gates, *op. cit.*, p. 251.

townships there is considerable difference in their achievement rates. Thus Malden (in 1803), Sandwich North and East (in 1806), Colchester South (in 1808), Sandwich West (in 1817) and Gosfield South (in 1818) all passed the fifty per cent mark before 1820. In contrast Rochester (in 1847), Maidstone (1847), Tilbury West (in 1848), Mersea (in 1847), Gosfield North (in 1846), Colchester North (in 1845), Sandwich South (in 1847) took almost thirty years to reach these levels, and Anderdon (in 1862) and Tilbury North (in 1861) took another forty years. Those in the pre-1820 achievement category possessed locational advantages in both the French and British periods with respect to the settlements at Detroit. The early patenting in Sandwich in fact resulted from British recognition of the validity of French grants in this area dating from 1749. In addition these areas enjoyed an initial advantage in that the political decision was made to settle the officers of the Indian Department in Malden Township and to establish British ex-regulars in this politically sensitive area (Gosfield and Colchester Township). These townships possessed initial advantages. By 1842 they had surpassed the seventy-five per cent mark; this was not achieved by the other "early" townships until the 1860s, and in the case of Anderdon (an Indian Reserve for a long time) not until 1880. In most of the townships seventy-five per cent of the land had been taken up by 1865. In the county as a whole the process took 103 years, and on average it took about eighty years.

All townships experienced a period of lag when little patenting activity was taking place (Table 4). This varied in its duration but generally had passed by the 1840s. It endured least in the townships closest to Detroit and Michigan, and is well illustrated in the cases of Rochester and Gosfield North townships (Figure 4). It reflects in part the action of speculators in discouraging people from settling in the area, but it also reflects the locational disadvantages of the area with respect to the economic and social foci of the colony which was increasingly centred in the Toronto-Hamilton area. Forty years before this region had been one of considerable promise. The Lieutenant-Governor, John Graves Simcoe, had planned to establish the capital of Upper Canada nearby at London, and a naval dockyard at the site of Chatham. Neither of these plans came to fruition. Moreover, the situation was exacerbated by the British abandonment of Detroit, by the decline of the Indian trade and the realisation that the quality of land was better elsewhere in Upper Canada. The area stagnated and the focus shifted from the Detroit area eastwards towards the new capital at York. The Western District and Essex County were off-centre with respect to this development.[37] However, with the opening of the Erie and Welland Canals, the further development of the road network and the fact that "saturation" of the central areas forced newcomers westward and northward, this area experienced renewed patenting activity on a larger scale than ever before. The results are reflected in the graphs which swing markedly upward after 1840 (Figure 4).

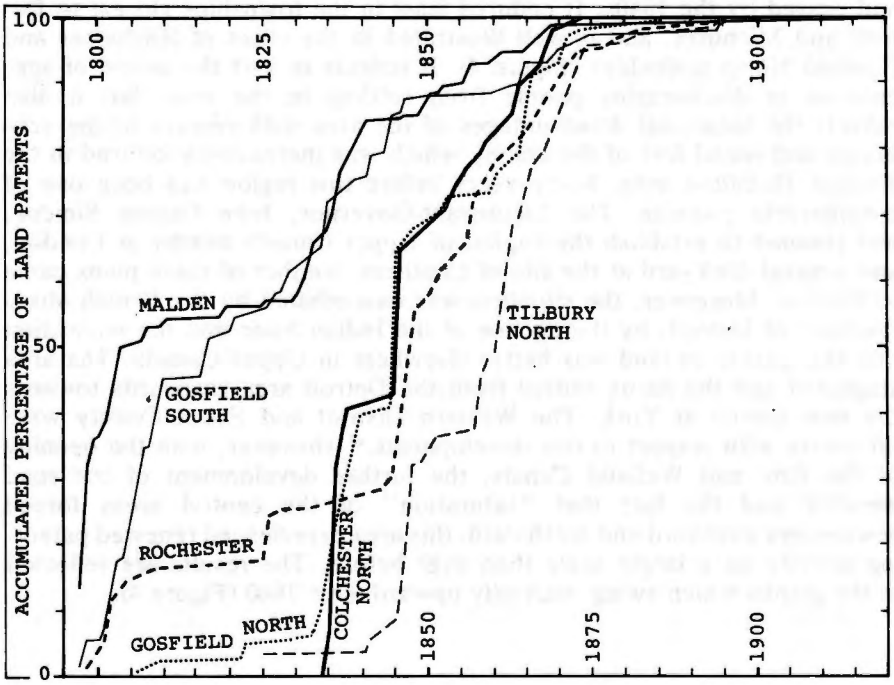
[37] CLARKE, *op. cit.*, 1970, pp. 32-68; JOHNSON, *op. cit.*, 1974, pp. 30-33.

Table 4: Land Acquisition Data, Towsnhips of Essex County
(Sorted by Duration of Lag Period)

Township	*Date of First Patent*	*Year in Which 50% Was Patented*	*Year in Which 75% Was Patented*	*Years to Completion*	*Number of Lag Years*	*Date of Lag Years*
Rochester	1798	1847	1859	96	41	1804-45
Maidstone	1797	1847	1857	85	32	1806-37
Tilbury West	1801	1848	1864	83	27	1811-24 & 1828-40
Malden	1797	1803	1831	65	28	1803-30
Mersea	1801	1847	1864	94	26	1806-31
Anderdon	1836	1862	1880	64	24	1809-32
Sandwich West	1797	1817	1834	72	17	1804-20
Tilbury North	1825	1861	1865	71	16	1825-40
Gosfield North	1806	1846	1862	80	14	1810-23
Colchester North	1834	1845	1855	55	9	1838-46
Colchester South	1796	1808	1838	77	9	1812-16 & 1825-29
Sandwich South	1826	1847	1857	58	8	1826-33
Sandwich North & South	1800	1806	1833	99	6	1810-15
Essex County	1796	1846	1859	103	29	1808-36

Source: Calculated by the author from Patent Index, Public Archives of Ontario, Toronto.

Fig. 4: Representative Profiles of Land Acquisition



Source: Calculated by the author from Patent Index, Essex County, Public Archives, Toronto.

Table 5: A TABLE OF CORRELATION COEFFICIENTS AND OF TOWNSHIP LINKAGE BY SIMILARITY OF BETA COEFFICIENTS

Township	*Correlation Coefficient*	*Coefficient**	*Group Number*
Sandwich North & East	0.97	0.058	8
Malden	0.91	0.061	
Gosfield South	0.96	0.064	
Colchester South	0.87	0.067	7
Sandwich West	0.95	0.074	6
Rochester	0.96	0.082	5
Mersea	0.96	0.092	
Tilbury West	0.93	0.083	4
Maidstone	0.94	0.094	
Anderdon	0.98	0.126	3
Gosfield North	0.97	0.130	
Tilbury North	0.98	0.138	2
Colchester North	0.95	0.144	
Sandwich South	0.98	0.155	1
Essex County	0.95	0.086	—

Source: Calculated by the author.
* Significant at the 0.001 level.

The S-shaped or logistic curve was adopted at the outset to describe the land acquisition profiles (Figure 4) because, of course, it has a basis in theory.[38] It allows for an incipient slow stage, a second period of rapid acquisition and a saturation stage during which all of the land is finally acquired. The dependent variable was the accumulated percentage of land patents; the independent variable the length of time in which land holding had been going on. The usefulness of this approach is indicated by Table 5 where the correlation coefficients are seen to be high. Both the correlation coefficients and the beta coefficients proved significant at the 99.9 per cent confidence level. The beta coefficients were ranked and tested for differences between them. Eight groups were recognized. Of these, five included more than one township (Table 5). Throughout the nineteenth century the slowest overall rates of development were found in the townships of Malden, Gosfield South, Sandwich North and East (all of which had sufficiently similar coefficients to be classed as one group) and in Colchester South and Sandwich West townships. These were townships which had enjoyed an initial advantage in terms of accessibility and in terms of proximity to the embryonic urban centres of Amherstburg and Detroit. They were also townships which contained a large portion of well drained land in an area that was on the whole poorly endowed. As a result, they experienced a fair amount of land acquisition activity by land speculators and the friends of the government in the early years. This in turn rendered the profiles of townships in groups six through eight more

[38] E.P. ODUM, *Ecology* (New York, 1975), pp. 123-28.

parabolic than might have been expected. Townships in groups four and five experienced higher overall growth rates even though they occurred in areas that were more poorly drained. Their growth profiles were more characteristically sigmoidal indicating a period of slow growth in the initial period, during which time the more southwesterly townships were being taken up. This continued into the 1830s and 1840s when the county's isolation from the eastern political, economic, and social foci began to end, and the population of this most south-westerly part of the province increased. Thereafter, their growth rates increased markedly as a result of the spreading effect from this eastern core. The highest rates of growth occurred in the townships of Anderdon and Gosfield North which are grouped together on Table 5, in Tilbury North and Colchester North, townships which also had sufficiently high beta coefficients to form one group, and in Sandwich South where the growth rate was the highest of all fourteen townships. These townships, relatively inaccessible and with much poor soil, were among the last to begin the process of patenting. An analysis of the size of the beta coefficients against the date of first patent supports this observation, yielding a positive correlation of 0.86. The period of regional isolation over, these townships experienced rapid land acquisition rates, which not only reflected the movement of population westward from Toronto but also the decision to end the existence of the Indian Reserve in the west and to create the Township of Anderdon, to pressure the Canada Company (Crown Reserves) and to sell the Clergy Reserves. In three of these "back" townships there were unusually high amounts of reserved land. The reserved lands of Sandwich Township had been allocated in what became Sandwich South Township and as a result almost eighty percent of this township consisted of Crown and Clergy Reserves. Similarly, the reserved lands of Colchester North and Gosfield North constituted approximately forty-seven per cent and sixty-eight per cent respectively of the townships. The result of these political decisions and of other similar decisions threatening forfeiture against the non-reserved and unpatented lands and offering those holding Militia and United Empire Loyalist rights, land free of settlement duties, was to produce a land patenting rush and to raise the beta coefficients for the townships. In Sandwich South the percentage of land acquired increased from 5.9 per cent in 1834 to 41.6 per cent in 1840 and from 45.2 per cent in 1845 to 66.2 per cent in 1850. In Gosfield North the respective figures were 6.5 per cent to 38.0 per cent and 41.9 per cent to 69.0 per cent. Between 1845 and 1846 the figure increased from 41.5 per cent to 65.0 per cent alone! In Colchester North the change was from 0.5 per cent to 41.4 per cent between 1835 and 1840, and 42.7 per cent to 69.1 per cent between 1845 and 1850. In this township all of the Canada Company lots were patented in 1846. The Company was, of course, anxious to patent its land because its contract with government was drawing to a close and criticism of its activities was loud. The high rates of acquisition in these townships were not therefore a result of their superior natural endowment but rather testify to the operation of the political process.

6. Acessibility and the Environment in the Choice of Individual Lots

In order to answer the question, "What was the role of accessibility and the physical environment in the decision of individuals to acquire property?" two samples were taken and subjected to trend surface analysis. The first of these was a stratified sample of 516 lots and included representative data points from the Crown, Clergy and Indian Reserve lands as well as those held in speculation. The second was a sample of 327 from which all four categories had been removed since they obscured a more fundamental pattern of land acquisition, that of the small holder, and made the evaluation of the importance of the physical environment more difficult. In both cases, the cubic surface was deemed the most appropriate and proved significant at the 99.9 percent confidence level. The surfaces were remarkably similar and because of this only the surface from the second smaller sample has been presented here (Figure 10). The residuals, plotted to identify factors of local rather than regional importance, were those greater than one standard error. These were of two types, negative residuals where patenting was generally ahead of the general trend of acquisition, and positive residuals where lots were acquired later than the overall trend. Figure 5 shows the extreme residuals from the first sample of 516 lots.

In at least five instances the positive residuals equal to or greater than one standard error pick out the Clergy Reserves of Essex and a sixth

Fig. 5: Extreme Residuals from Cubic Surface, Sample of 516

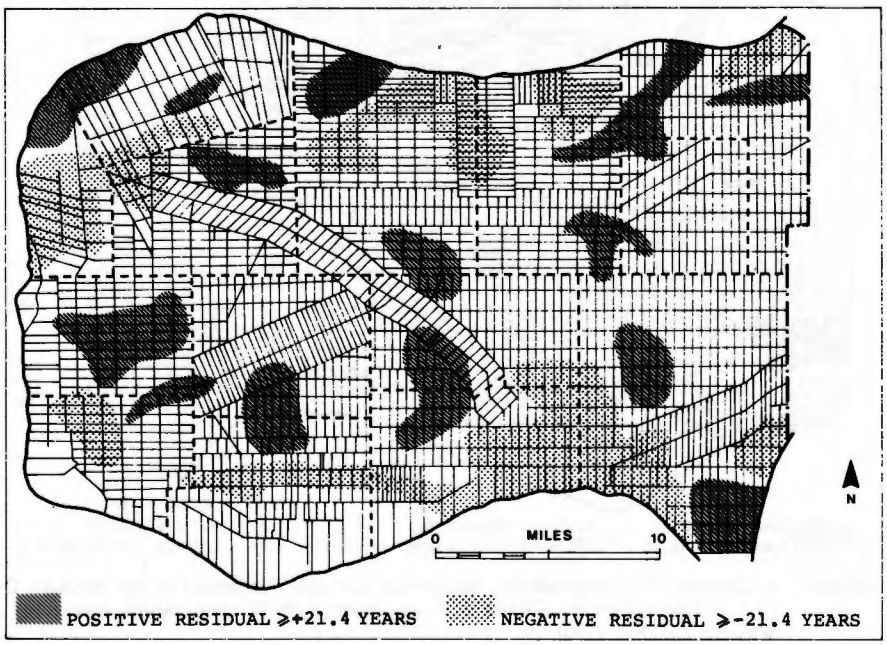
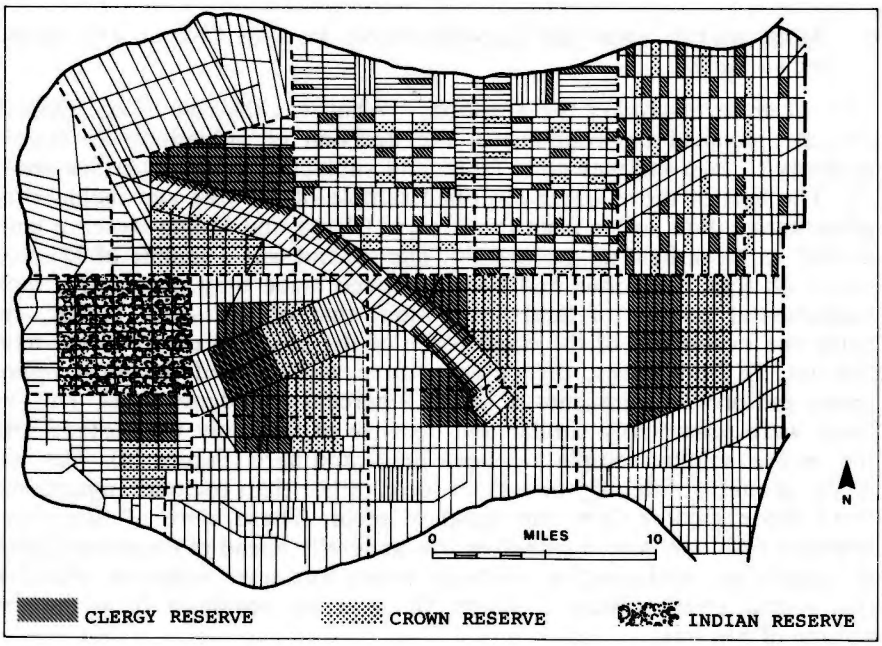
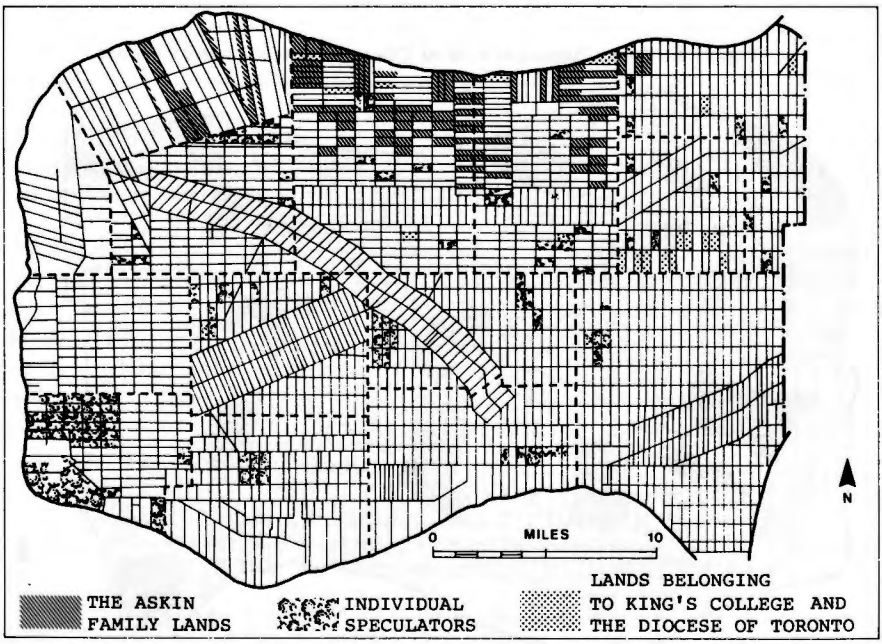


Fig. 6: THE RESERVED LANDS



Source: See reference 15.

Fig. 7: LANDS PATENTED BY SPECULATORS



Source: J. CLARKE, "A Geographical Analysis of Colonial Settlement in the Western District of Upper Canada 1788-1850," (unpublished Ph.D. dissertation, University of Western Ontario, 1970), pp. 92-123.

group of extreme positive residuals corresponds with the former Indian Reserve in Anderdon Township (Figures 5 and 6). The establishment of these reserved lands was among the first tasks faced by the surveyors of this area. The reserves were to have been scattered with respect to one another and to those in adjacent concessions in accordance with the chequered Plan, drawn up by the Surveyor General, D.W. Smyth.[39] In Essex County, however, implementation of this plan would have required the removal of settlers.[40] Since this was not desirable in a strategically sensitive area, it was decided to allocate the Clergy and Crown (later Canada Company) reserves in blocks in Sandwich, Malden, Colchester, Gosfield and Mersea Townships.[41] On Figure 5 all of the Clergy blocks appear as areas of positive residuals. The areas of negative residuals acquired earlier than the general trend, reflect, in part, areas where land speculation by individuals was particularly marked (Figure 7). In Maidstone and Rochester Townships the area of negative residuals corresponds with lands patented by the Askin family which appears to have placed its priority on compact accessible holdings rather than land quality.[42] In Malden Township officers of the Department of Indian Affairs acquired large quantities of land at an early date[43] but in this instance the negative residual areas also correspond with an area of fairly well drained soils. Elsewhere, the extreme negative and positive residuals appear to identify environmental conditions. In Mersea Township the extreme positive residuals in the extreme south correspond to an area of known swamp; along the Lake Erie shore a band of extreme negative residuals picks out the well drained soils of this part of the county. The role of the physical environment became clearer with the removal of the Crown, Clergy, Indian and speculative holdings from the sample.

The generalized linear surface for the smaller sample of 327 points (R=0.17) indicated that the earliest land was acquired in the west of the county in Sandwich and Malden Townships and took approximately forty-five years to reach Tilbury Township in the north-east (Figure 8). The quadratic surface explained an additional eight per cent of the variation and took the form of a west to east rising ridge (Figure 9). The basically concentric pattern of land acquisition represented by the cubic surface (R=0.31) is obviously related to overall access by water and via the Tecumseth, Talbot and later Middle Roads (Figure 1). However, the distance between isochrones would seem to emphasize the particular importance of the well drained soils of the Lake Erie shore along which land was rapidly acquired. In a given five-year period, larger amounts of land

[39] On methods of survey in Upper Canada see W.F. WEAVER, *Crown Surveys in Ontario* (Toronto: Department of Lands and Forests, 1962); R.S. LAMBERT and P. ROSS, *Reviewing Nature's Wealth* (Toronto, 1968); R.L. GENTILCORE, *Land Surveys of Southern Ontario*, Cartographica, Monograph No. 8 (Toronto, 1973); GATES, *op. cit.*, pp. 51-3.

[40] Letter of Patrick McNiff, Detroit, to the Honourable Hugh Finlay, Quebec, 3 May 1791 in *Public Archives of Ontario Report for 1905* (Toronto, 1906), pp. xciii-xclv.

[41] P.A.O., Simcoe Papers, Envelope 44, Surveyor-General's Office, Upper Canada, 9 November 1795 and CLARKE, *op. cit.*, 1971, pp. 75-83.

[42] CLARKE, *op. cit.*, 1975, p. 28.

[43] E. LAJEUNESSE, *The Windsor Border Region* (Toronto, 1960), pp. 161-63.

Fig. 8: CONTOURED LINEAR SURFACE

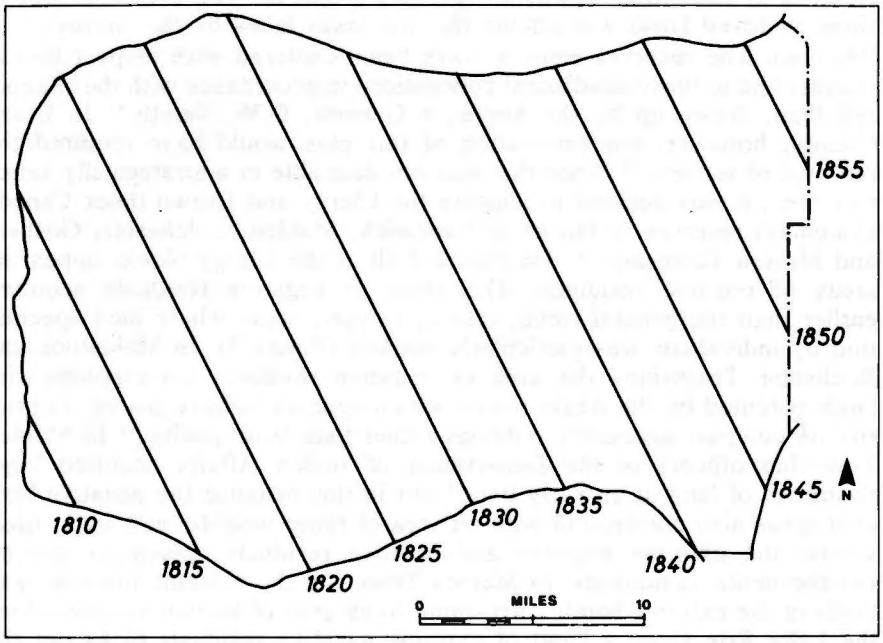


Fig. 9: CONTOURED QUADRATIC SURFACE

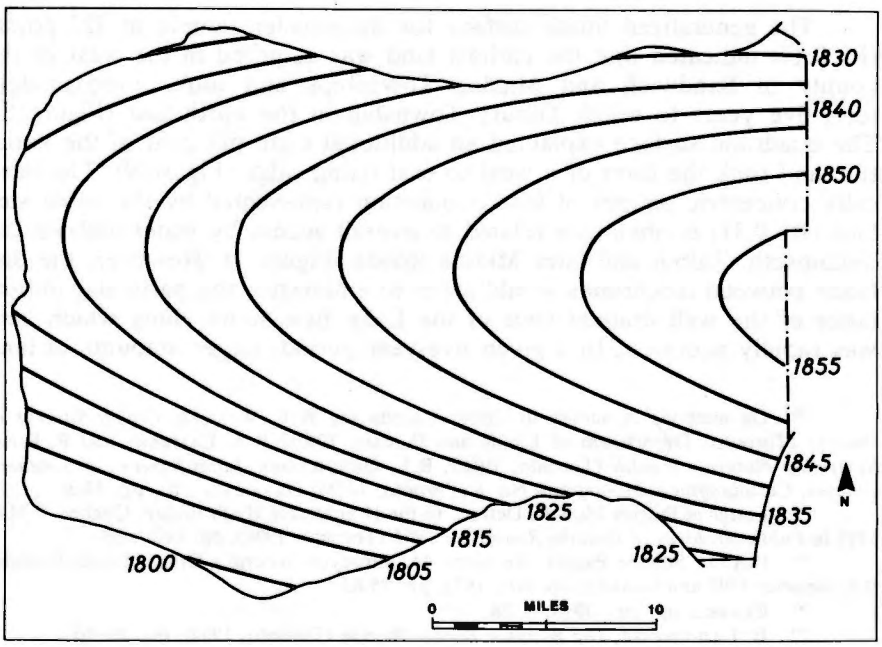
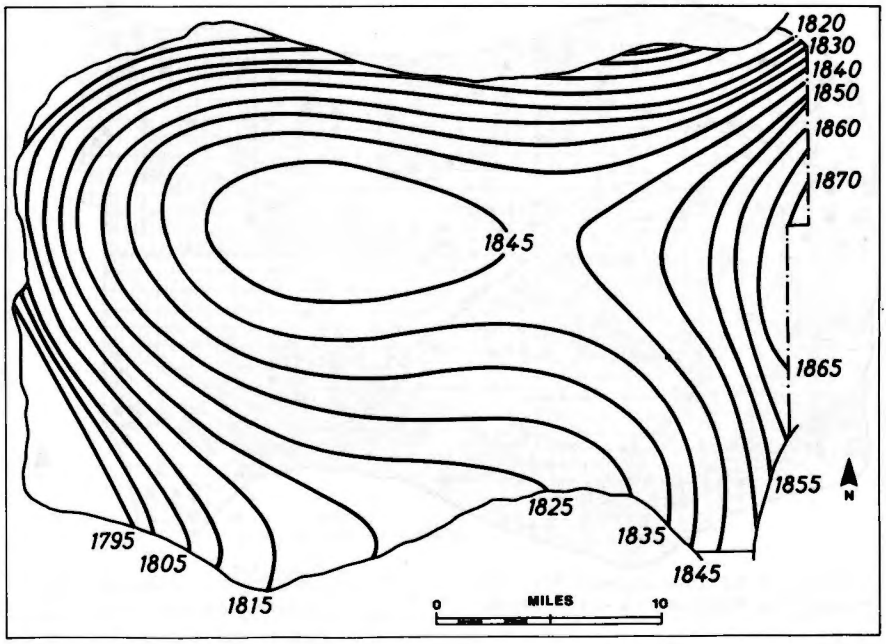


Fig. 10: CONTOURED CUBIC SURFACE

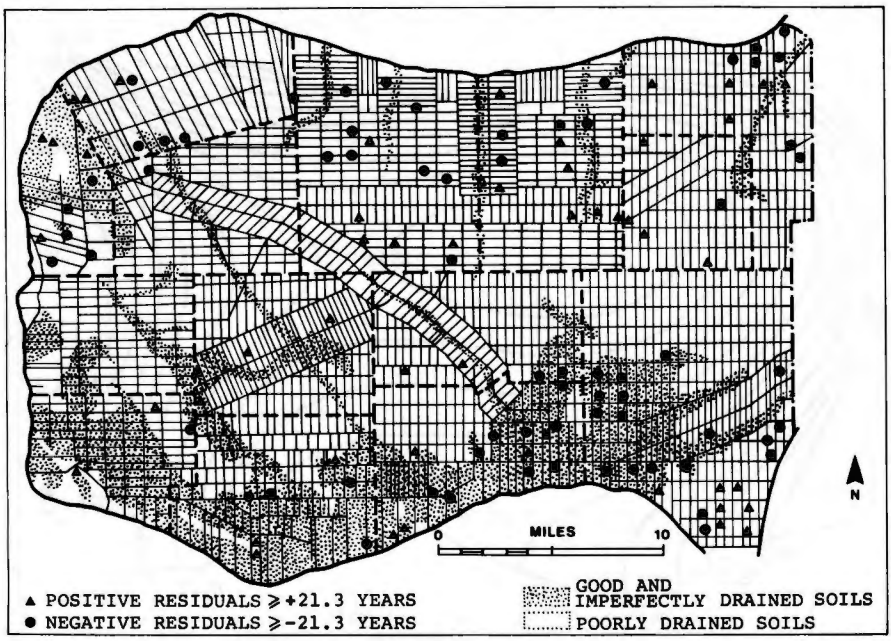


were taken up in this area than in other parts of the county. This was particularly true of the period 1820 to 1825 when larger amounts of land were patented in Colchester and Gosfield Townships than along the Lake Saint Clair shore in Maidstone and Rochester Townships. As Figure 10 shows, the earliest patents occurred in Malden, the latest in Tilbury and Mersea Townships. As was shown earlier, the decade 1835 to 1845 was seen to have been one of considerable importance in this area. This is reflected in the generalized surface of land acquisition.

The map of extreme residuals from this second cubic surface (Fig. 11) clearly suggested the importance of soil drainage conditions as a local factor affecting land acquisition. Drainage characteristics were summarised into poorly drained and well drained categories.[44] A chi square test was run between these two drainage classes and the sign of the residuals greater than one standard error. It was expected that there was a significant association of well drained soils and negative residuals and conversely of positive residuals and poorly drained soils. A X^2 value of 14.9 confirmed the hypothesis at the .01 level. A second chi square analysis was performed to investigate the relationship between timing and the dominant type of vegetation since vegetation has been thought to have

[44] The category "well drained" included well and imperfectly drained; the category "poorly drained" included poor and very poor drainage conditions.

Fig. 11: EXTREME RESIDUALS FROM CUBIC SURFACE, SAMPLE OF 327



been used as a guide to good land.[45] This second analysis was conducted in Gosfield, Rochester and Mersea Townships. The vegetation was classified into an oak-hickory, chestnut group and a black ash, and elm swamp group. The value of X^2 was greater than that required for significance at the 0.001 level and with one degree of freedom.[46] The null hypothesis was therefore rejected. The hypothesis that the early settlers may have used the type of vegetation as an indicator of soil quality is seen to have statistical validity.

7. CONCLUSION

Within Essex County there were two distinct periods of land acquisition separated by the War of 1812 and its aftermath. In the first period, which lasted until about 1815, large tracts of land were acquired by land

[45] K. KELLY, "Practical Knowledge of Physical Geography in Southern Ontario During the Nineteenth Century," in A. FALCONER, B.D. FAHEY and R.D. THOMPSON, eds., *Physical Geography: The Canadian Context* (Toronto: McGraw Hill Ryerson, 1974): 10-18. However, see also A.G. BRUNGER, "Analysis of Site Factors in Nineteenth Century Ontario Settlement," in W.P. ADAMS and F.M. HELLEINER, eds., *International Geography*, 1 (1972): 400-402; R.L. GENTILCORE, "Change in Settlement in Ontario (Canada) 1800-1850; A correlation analysis of historical source materials," in W.P. ADAMS and F. HEILLEINER, eds., *International Geography*, 1 (1972): 418-19.

[46] Both X^2 tests were conducted using the correction for continuity as suggested by S. SIEGEL, *Non-Parametric Statistics for the Behavioural Sciences* (New York, 1956): 107-10.

capitalists who at any one time could acquire more than fifty per cent of all the land taken up by patentees. These speculators controlled a diminishing proportion of land patented in the second period but their place in the hierarchy of patentees was taken by the Canada Company, a corporate speculator. The effects of government land policy were most marked in this later period. Faced by the House of Assembly with the threat of recommending forfeiture to the Imperial Parliament, the Canada Company rushed to patent its lands. Similarly, the Honourable Thomas Talbot endeavoured to have the lands he supervised patented. In the 1850 and 1860 most of the lands being patented were former Indian Reserves and Clergy Reserves, reflecting the government's desire to rid itself, at least in the case of the Clergy Reserves, of a constant political sore.

The analysis at the township level showed that by 1865 most of the lands of Essex County had passed to patent. All of a township had on average been patented within eighty years and several much sooner. The townships that were patented fastest were the back townships of Sandwich South, Colchester North, Gosfield North, Tilbury North. These reflected neither their superior physical endowment nor their accessibility, but rather the fact that they contained large amounts of reserved lands which for political reasons were patented rapidly. Moreover, they had begun to be acquired at a time when the region as a whole was beginning to orient itself towards the more rapidly growing eastern urban centres of Toronto and Hamilton. Those townships that contained well drained soils, that were more accessible by road or from the coast, and were close to the village centre of Amherstburg in Malden Township or the Town of Sandwich (modern Windsor) experienced an initial advantage, but the advantage was lost when development shifted to the Toronto-Hamilton area. A period of lag resulted and lasted down to 1840 during which there was little or no increase in patenting, and while rapid recovery took place thereafter, this resulted in lower overall acquisition rates.

Use of trend surface analysis at the lot level pointed to the importance of overall access and identified the Indian and Clergy Reserves as areas that were anomalous in terms of the date of their acquisition. Whether or not they were also anomalous in terms of their actual development is another issue which, together with the activities of land speculators, is the subject of ongoing research by this author. The analysis of the extreme residuals from the trend surface showed that these were associated with soil drainage conditions, the earliest patentees acquiring well drained, lightly textured loam and sandy loam soils. Differences in soil were in turn reflected in differences in vegetation, which could well have been used as a guide to soil conditions. Certainly there is a statistical association: whether the relationship is causative remains a topic for debate and for future work.