BUSINESS LOCATION AND CONSUMER BEHAVIOUR

1882-1910

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EASTERN GREY COUNTY, ONTARIO

By

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ABSTRACT

The major objective of this thesis is to comprehend a changing pattern of nineteenth century places and markets in terms of the business location decision and consumer behaviour. A deterministic model of consumer behaviour is developed, which assumes partial multi-purpose tripping, a spatially uniform consumption mix, and a distance decay effect on purchase frequency. This model provides a measure of the attraction of places to consumers, and market division is deduced from the relative attraction and accessibility of places. The business location decision is inferred; it is shown that perfect order of entry of businesses in places and non-uniform spacing of places are corollaries of the assumed nature of consumer behaviour.

Businessmen in fifty post office settlements serving four Ontario townships between 1882 and 1910 are identified using directory sources. Consumers' location and choice of post office, is reconstructed for 1887 and 1898. Applied to real world conditions, results obtained from the consumer choice model suggest that choice inertia and restricted opportunities for multi-purpose tripping modify market division. Conditions approach the theoretical norm between 1887 and 1898.

Consumer choice and business location are associated with population turnover. Choice inertia is positively associated with population persistence. Imitative choice behaviour at the farm level is detected, and consumer choice of post office reflects rural community as well as market structure.

Business duration is brief; business relocation within the study area is, however, rare. The quality of business location choice is shown to be related to the changing vacancy rate in the business pattern. Business duration varies with the suitability of locations and the size of available markets.

It is concluded that the static and dynamic interdependence of market division and business locations accords with expected conditions; change is effected and modified by endemic population transience. The decline of small places between 1895 and 1910 is implemented through market contraction and business avoidance in a retail environment of continuous change.

FOR: Samuel Thomas Norris

1906-1976

and: James Burney Chubbuck

1915-1974

To whom this meant most.

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INTRODUCTION

PEOPLE, PLACES, AND CHANGE

Pause for an hour in a rural Ontario hamlet. Some buildings are occupied, others derelict. The half dozen structures are at a crossroad. One building is a farmhouse. A chapel, still in use, stands at one corner of the intersection. The community hall, once a schoolhouse, is set apart from the settlement. There are the remains of a dam on the stream which crosses the road 200 yards west of the hamlet. One of the four corners of the intersection is vacant, but the half acre at the corner is not cultivated. A substantial frame house offers a choice of two front doors; between these, the front window has been bricked in across half its original width. There is a large shed attached to the house next door. One Victorian house is now a summer cottage. None of the residents have lived in the hamlet for more than two decades. In the cemetery behind the chapel, only one interment pre-dates 1860 and very few post-date 1914.

Not all nineteenth century hamlets convey their past with such eloquence. Most are not recognisably former places of business. Some have disappeared without trace. Confronted by the visible past, however, the observer is given to speculation. He labels the fragments. He imagines the saw mill, recreates the fire and the buildings it consumed, recognises the store and post office, identifies the blacksmith's shop. These

speculations are well-founded. To this particular place he brings stereotypes founded on many places. When the observer populates his image of this place, he draws on further stereotypes. As he proceeds from the visible to the invisible past, his conception is increasingly at odds with the reality of this and other places. Such an instantaneous glimpse of a past human landscape obscures the continuous changes which underlie its spatial patterns. In his treatment of the general and the particular, and in grappling with stasis and change in the past, our observer is echoing the most revisited methodological issues in historical geography (Darby, 1953; Newcomb, 1969; Prince, 1971).

This thesis examines business location and consumer behaviour in a late nineteenth century rural environment, one of intense geographic and occupational mobility. In this thesis, location and spatial behaviour are viewed within a theoretical framework. The structure of places and markets is inferred from postulates concerning individual behaviour: these postulates are evaluated with reference to individuals across space and through time. The general characteristics of nineteenth century places and markets, if such characteristics exist, are an amalgam of individual decisions. An understanding of these decisions is sought in this thesis.

The pattern of nineteenth century rural service centres and their markets in Southern Ontario conspicuously lacks three characteristics: discrete size classes of places; uniform spacing of places, and proximate markets, that is consumer indifference between equidistant alternatives. So deviant is this pattern from central place principles that it has been depicted as lacking the conditions required to effect spatial order through

unconstrained competition (Marshall, 1964; Dahms, 1975). Nineteenth century rural North American society, no less than its urban counterpart, was neither closed nor stable. It is implausible that a world so evidently in search of opportunity, so ready to adjust to altered circumstances (Knights, 1971; Thernstrom and Knights, 1971; Doucet, 1972; Sutter, 1973; Katz, 1975), adopted a pattern of retail location and consumer spatial behaviour which disregarded the tyranny of distance. More probably, deterministic factors which underlie this pattern have not been identified. Such determinants are sought in this research.

Crude determinism, however, provides at best a partial understanding of human behaviour in the past. Customers were tied immutably neither to the businessmen they patronised, nor to the places they visited, nor even to the farms in which they lived. Businessmen rarely spent their entire career in one place. Places in Ontario were mostly small: their size wavered with the constant turnover in their business population. A theoretical and deterministic framework must confront reality. The identification of reality, the search for and application of sources which reflect the dynamic nature of Ontario society, is a major objective of this thesis. A resolution of this problem is sought by record linkage (Newcombe, 1967): individual context in space and behaviour through time are reconstructed from published directory sources. To the extent possible from such sources, business location and market preference are viewed as intrinsically reversible decisions subject to two sets of factors: attributes of the environment in which a choice is made; and attributes of the individual decision maker.

Record linkage, moreover, reveals a pattern of transience which is not predictable from a qualitative assessment of business locations (Bowden, 1971). Socio-economic and demographic factors affect mobility, which is therefore not necessarily a response to a location pattern. A further objective of this thesis is to evaluate consumer behaviour and business location within what may be regarded as a normal background of intense population turnover of businessmen and consumers.

In examining part of Southern Ontario between 1882 and 1910, this thesis spans the decline, but not the disappearance, of small places serving four townships and their margins. The study area, Eastern Grey County, is selected to exemplify the demise of the hamlet under conditions typical of much of rural Southern Ontario at the end of the nineteenth century. These conditions include: a stagnant or declining, and ageing, rural population; limited opportunities to extend cultivated acreage; increased emphasis on fodder crops within a mixed commercial agriculture; and scant rural employment in small-scale manufacturing or primary resource extraction.

As in other parts of Southern Ontario, the post office was the most common functional attribute of places in Eastern Grey County. The presence of the post office in places was universal in this area owing to the fact that its places were established after 1850, that is after a period in which mill locations in a wheat and lumber staple economy were characteristic settlement nuclei. Post office patronage, prior to the inception of rural mail delivery in the twentieth century, is reliable evidence that a particular consumer chose and visited a place. Thus the postal addresses of rural

ratepayers reflect preference for places in the late nineteenth century. A single postal address precludes consumer indifference and divided loyalty. Post office usage by rural residents is demonstrable from records of post office income. Although consumers were bound to particular businesses in other ways, for example by credit ties, it is not feasible to reconstruct and consistently interpret such bonds for a sufficiently large and representative sample of customers and businesses. Moreover, credit ties, if they influenced consumer tripping for basic and frequent needs, did so through the medium of general store merchants. Since the latter were usually also postmasters, it is likely that the postal address reflects such credit ties. While it is clear that credit ties promote consumer choice inertia, it is less obvious that credit constrains the initial choice of one place or another, particularly if the majority of small shopkeepers were prepared to extend credit to their customers. This thesis therefore employs the post office market as an exact and relevant indicator of place preference, under conditions which are paralleled beyond the confines of the area studied. The latter embraces centres already shown to depart from central place principles in 1896 (Marshall, 1964). A particular and deliberate feature of the area chosen is the fact that it is bounded by towns offering a full range of goods and services to the rural consumer. This feature minimizes the degree to which location and behaviour are subject to unknown influences, and maximizes information concerning towns, accepting that micro-scale analysis imposes a practical limitation on the size of the study area. The demise of the hamlet before 1900 is a trend which draws together several lines of inquiry in this thesis,

one objective of which is to determine whether the decline of small places can be traced to endogenous trends within an area, specifically to changing consumer behaviour and business location strategies.

The central purpose of this research is, then, to comprehend a changing structure of places and markets through theoretical principles and empirical observation of individual behaviour in the past. Chapter One reviews the study area and describes the temporal span, content and reliability of sources which reveal business location and consumer choice. The second chapter reviews three bodies of literature concerned with the behaviour of firms and consumers: the agglomeration of the former and trip behaviour of the latter are shown to be key theoretical questions. In Chapter Three these questions are resolved in a formal model of consumer choice which yields inferences concerning the location of businesses. Thus the interdependence of places and markets is demonstrated as a theoretical point of departure.

The fourth chapter establishes the relevance of this theoretical norm to Eastern Grey County in 1887 and 1898. The relative completeness of activity arrays and the inertia of consumers are cited as significant additional market determinants. A multivariate model of market division is shown to fit both the static and transitional characteristics of markets and places. In the fifth chapter consumer choice inertia and transfer are shown to be associated with rural population persistence and transience. The turnover of business locations is examined in the sixth chapter as an underlying component of business array completeness. A broader examination of individual business duration is made in Chapter Seven, which demonstrates

that business mobility, although prone to modify the interdependence of places and markets, is nonetheless related to the relative quality of business locations.

The character of places and markets in late nineteenth and early twentieth century Ontario is, clearly, more than an amalgam of principles of location and choice as these modify, and are modified by, population turnover. A broader view of the meaning of place is sought in Chapter Five, in which it is argued that post office patronage reflects the continued importance of rural communities in an otherwise declining commercial landscape. This question is revisited in Chapter Eight, a summary and conclusion which focuses on the decline of the small place as a comprehensible transformation of one part of rural Ontario. This transformation, it is argued, is rooted in the individual, local and fundamentally modern behaviour of consumers and businessmen between 1882 and 1910.

The central problem, that of understanding places and markets in change, is not new to historical geography. The methodology and weight of evidence applied to this problem in the chapters which follow do, however, illuminate a past in which theory and observation of individual behaviour share centre stage. This research is a substantive contribution to the problem of maintaining a perspective which embraces people, places and change as these are revealed in records of the past.

CHAPTER ONE

THE STUDY AREA AND DIRECTORY SOURCES

"Wie alles war, weiss ich."

Wagner 'Das Rheingold'

Introduction

The period between 1880 and 1910 in Southern Ontario furnishes an opportunity to study consumer behaviour and business location. A large and comparable body of published source material is available for this period in the form of business directories. The period is followed by three distinct transformations: the First World War; widespread adoption of the automobile; and the introduction of rural mail delivery beginning in 1908 (Spelt, 1972, page 182). Rural mail delivery effected a radical change in consumer behaviour; before its introduction, residents collected their mail at a post office. Few places lacked a post office; it generated trips, and formed a nucleus for nearly all retail businesses located in rural Ontario. These businesses were recorded in county, provincial and Dominion directories. County directory publishers extended this coverage by including the name, farm location and post office address of all township taxpayers. Post offices addresses were chosen by residents rather than assigned to them. A static pattern of post office market areas and business locations is easily reconstructed: record linkage of successive

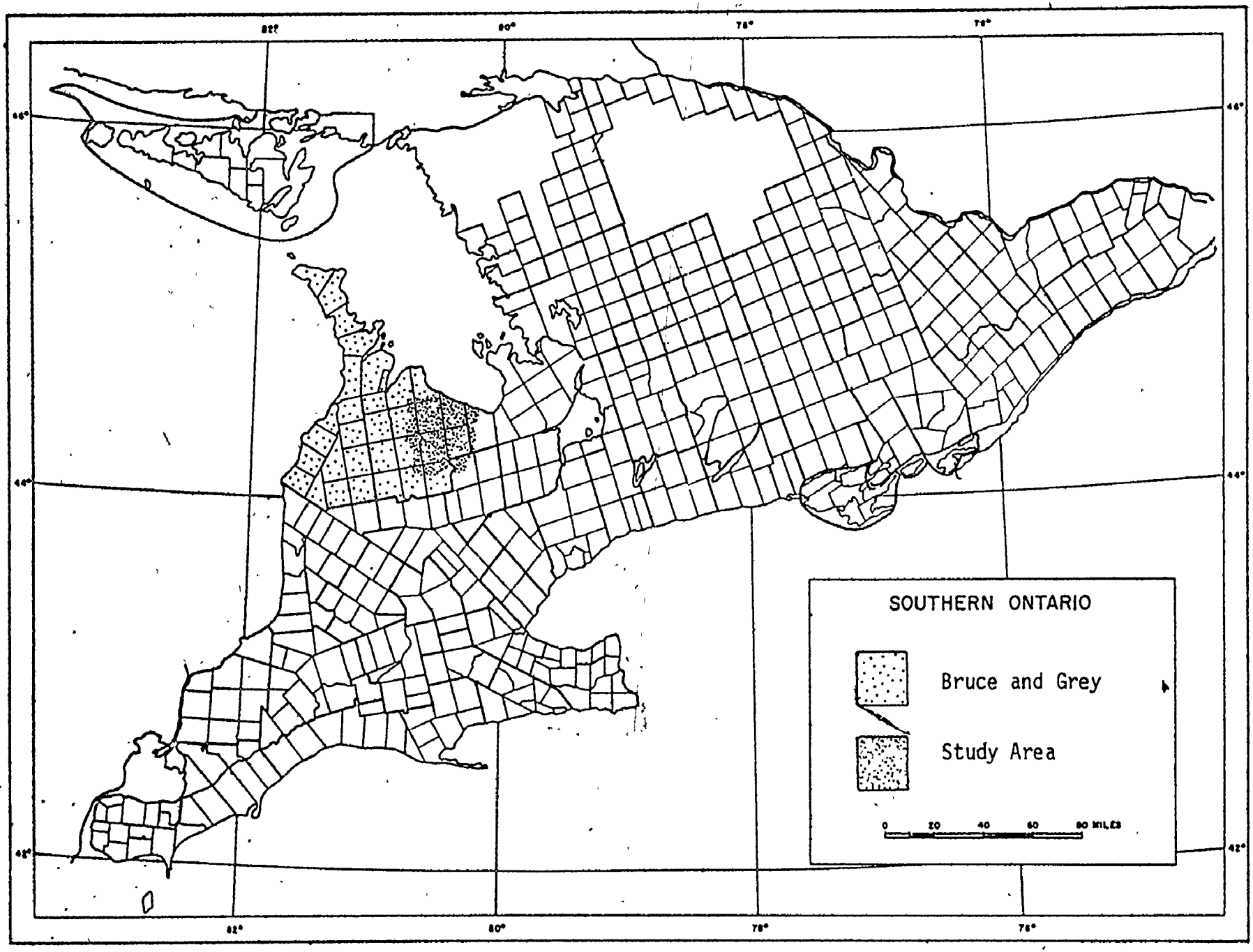
directory sources is also feasible, and such a linked record identifies persistence or transience in choice and location. Only through linkage is it possible to establish the *evolution* of places and markets through the medium of human behaviour in the late nineteenth century.

The Study Area

The study area comprises four townships in Grey County, Ontario: Euphrasia, Artemesia, Osprey and Collingwood (Figure 1.1). Parts of adjacent townships are included to standardise information concerning market areas. The pattern of places serving Eastern Grey County renders the area unusually suitable for an analysis of consumer behaviour and business location. Within the four townships, between 1882 and 1910, hamlets and villages were numerous (Figure 1.4). The towns developed at and just beyond the margins of the four townships. Thus rural consumers were able to satisfy nearly all their purchase requirements without recourse to places outside the area included in the analysis. Also, aside from the town of Collingwood in Simcoe County, every urban place studied is approximately duplicated in size by at least one other centre. In an area as small as 500 square miles this condition is not usually satisfied. The area studied is small because a focus on individual consumers and businessmen during three decades is otherwise impractical.

The study area is part of the Queen's Bush region characterised in 1896 by the absence of uniform spacing or a distinct size hierarchy of places (Marshall, 1964). Almost the entire pattern of places post-dates

FIGURE 1.1: THE STUDY AREA



1850, for by Southern Ontario standards the study area was settled late. Collingwood and Euphrasia townships were surveyed in 1833 and 1836 respectively; Artemesia and Osprey were surveyed during 1848 and 1849 (North Grey Conservation Report, 1959). Settlement inland from Georgian Bay proceeded slowly, accelerating with the penetration of two colonisation roads by 1849 (Lynch, 1853, page 377). In 1850 the populations of Euphrasia, Collingwood, Artemesia and Osprey were respectively 474, 365, 60 and 5 (Lynch, 1853, page 377). The townships possessed no mills in 1848 (Lynch, 1853, page 375).

Village development was slow at first, and settlers were obliged to travel long distances to sell produce and obtain necessities (Marsh, 1931, pages 73-74). Even as late as 1865, the Grey County Directory drew attention to the absence of villages within Euphrasia Township, the lack of grist mills, and the presence of only three saw mills. Postal service was within reach in all four townships by 1865 (Campbell, 1958); by 1910 there were 49 post offices serving the study area. If the presence of a post office did not actually precede a business location, it was not long in following.

Nineteenth Century Origins

The same cannot be said of those parts of Ontario settled prior to 1840. Contemporary observers were almost unanimous in citing the grist or saw mill, with or without a merchant's store, as the nucleus of village development (Jameson, 1837, page 78; Rolph, 1836, page 242; Shirreff, 1835; Pickering, 1832). Scholars have not found cause to

revise this interpretation (Kirk, 1949; Jury, 1946; Watson, 1945; Garden, 1971; Gentilcore, 1972) of the emergence of the smallest places. Although one observer spoke of boosterism as a primary factor in the growth of places (Hogan, 1855, page 39), most new centres established after 1850 began as cross-roads post offices (Schott, 1936, page 218) accompanied by a few local businesses.

Sources

The study of business location circa 1850 is limited severely by the available sources. A contemporary map (Rottenburg, 1850) depicted approximately 1000 nodal points in Southern Ontario. A large number of these, however, fell just short of the designation "place". Early gazetteers and directories (Smith, 1846; Smith, 1851; Mackay, 1851) provide an incomplete and inconsistent description of the developing urban pattern. Of 449 centres recorded, only 369 were mentioned by both W. H. Smith and R. W. S. Mackay (Figure 1.2). Of 293 places whose population was estimated, only 157 received an estimate from both authors.

By 1881 (Figure 1.3) contemporary sources were more unanimous in identifying places. All post offices extant in 1879 (Campbell, 1958) were identified as such in the Ontario Atlas (1879). The atlas indicated built-up areas, almost all of which were post office locations. The 700 centres whose populations were estimated in the 1882 Ontario Directory corresponded to the largest built-up areas in the 1879 Atlas; size estimates of under 200 persons were rare in the 1882 Directory.

FIGURE 1.2

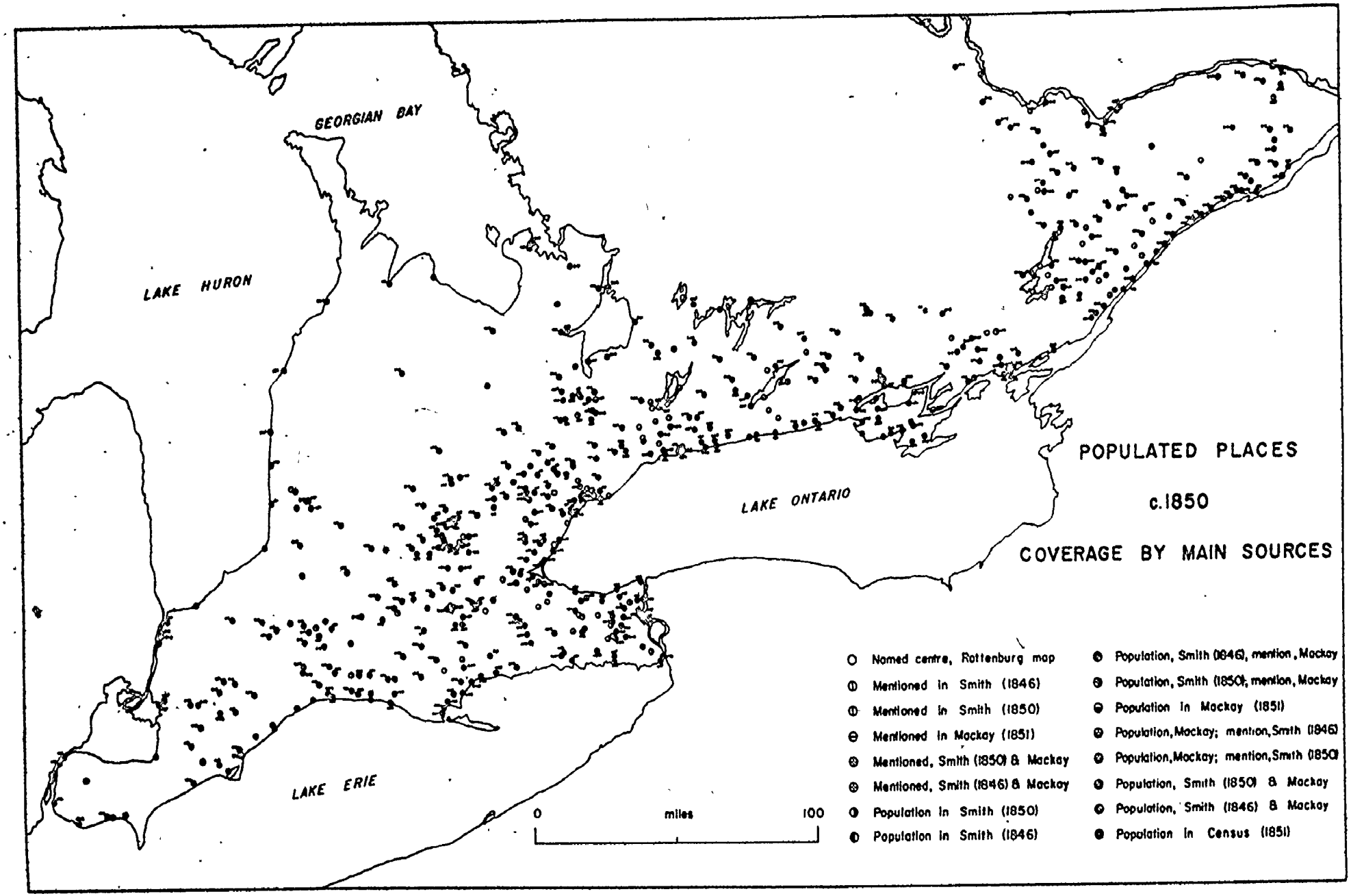
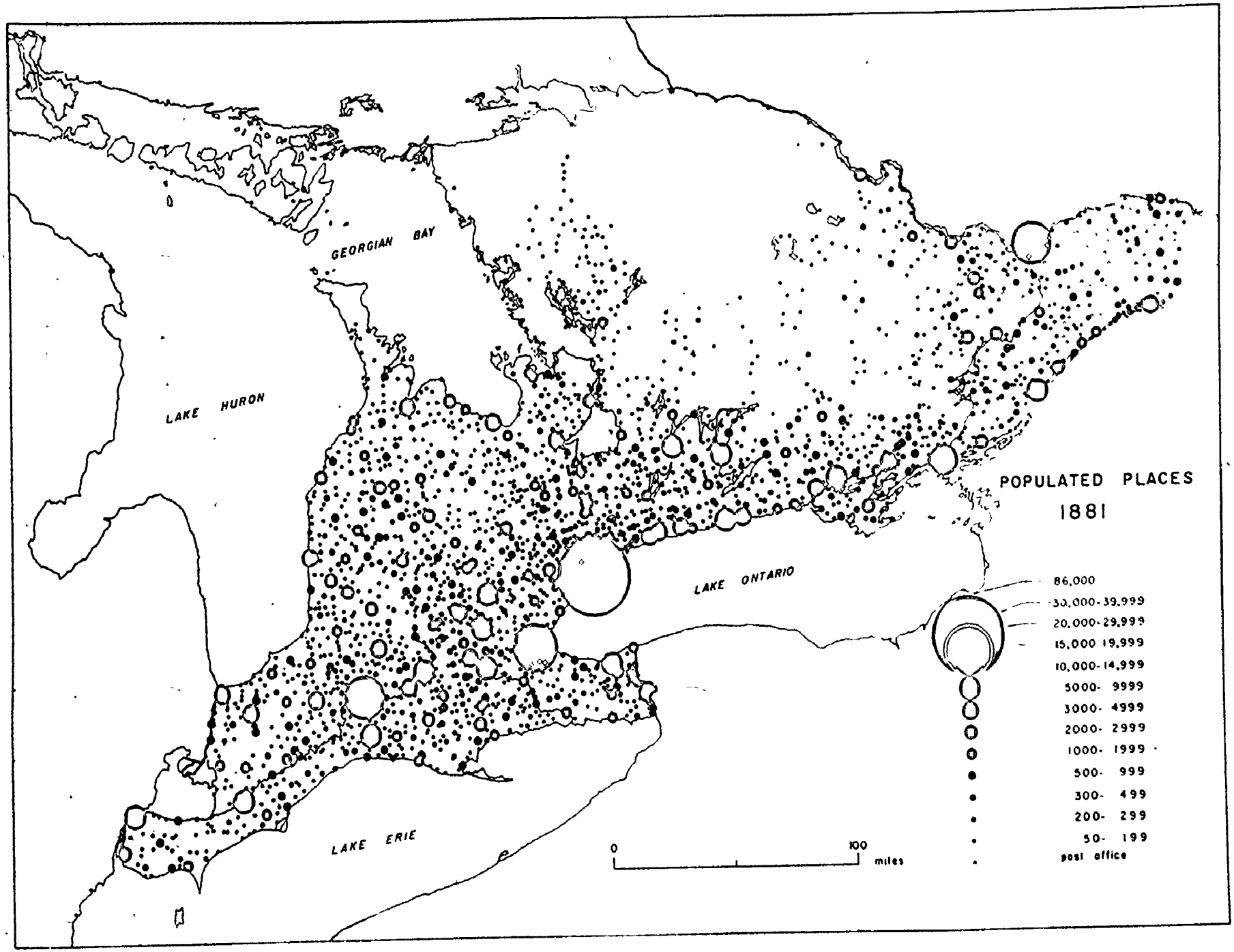

GEORGIAN BAY
LAKE HURON
LAKE ONTARIO
LAKE ERIE
POPULATED PLACES
c.1850
COVERAGE BY MAIN SOURCES
0
miles
100
Named centre, Rottenburg map
Mentioned in Smith (1846)
Mentioned in Smith (1850)
Mentioned in Mackay (1851)
Mentioned, Smith (1850) & Mackay
Mentioned, Smith (1846) & Mackay
Population in Smith (1850)
Population in Smith (1846)
Population, Smith (1846), mention, Mackay
Population, Smith (1850), mention, Mackay
Population in Mackay (1851)
Population, Mackay; mention, Smith (1846)
Population, Mackay; mention, Smith (1850)
Population, Smith (1850) & Mackay
Population, Smith (1846) & Mackay
Population in Census (1851)

FIGURE 1.3


GEORGIAN BAY
LAKE HURON
LAKE ONTARIO
LAKE ERIE
POPULATED PLACES
1881
86,000
30,000-39,999
20,000-29,999
15,000-19,999
10,000-14,999
5000- 9999
3000- 4999
2000- 2999
1000- 1999
500- 999
300- 499
200- 299
50- 199
post office
0
100
miles

In 1882 there were 2571 post offices in Ontario (Urquhart and Buckley, 1965, page 555): this total included nearly all hamlets and villages with fewer than 200 persons; examination of the Bruce (1880), Grey (1880) and other contemporary county atlases reveals that although isolated mills and some other businesses existed, these were rarely more than one half mile from a postal settlement. By 1880 a named and populated place was usually also a post office. Population estimates were no more reliable in 1880 than they had been three decades beforehand; comparison of 138 census populations in 1881 with 1882 directory estimates reveals that the latter exceeded the former by an average of 20 per cent. After 1882, provincial directory publishers based their content on extant post office locations (Table 1.1), supplemented by a few station locations which lacked a post office.

The peak period of directory publishing in Ontario was between 1882 and 1910; during this period almost all places possessed post offices and almost all post offices were listed in directories.

Directory Content and Reliability

In 1851, R. W. S. Mackay compiled a directory for the publisher John Lovell of Montreal. For each place in Canada those persons engaged in a trade or profession were arranged alphabetically by surname. In a second section of the directory names and places were re-arranged by occupational category. This attempt to provide a national business profile clearly stemmed from the similar coverage provided for New England and New York by 1850 (Conzen, 1972, page 1),

TABLE 1.1

PLACES AND POST OFFICES IN BRUCE AND GREY COUNTIES

1882-1892

YEAR	NUMBER OF POST OFFICES (Source: Campbell)	NUMBER OF PLACES (Source: Directories)
1882	210	126
1884	221	212
1886	232	230
1888	239	242
1892	247	249

and from a background of city directory publication in Toronto (Walton, 1833-1834) and Montreal (Doige, 1819). The business directory differs from the gazetteer (Smith, 1846), in that the latter describes places but does not list individuals and their means of livelihood. The organisation and cost required to publish and periodically up-date national or provincial directories limited the business to a few large firms, particularly Lovell of Montreal, the Might Company in Toronto, and the Polk Company. The latter was a Toronto subsidiary of the most conspicuous United States firm in the directory business. At least seventeen directories covering Ontario were published between 1851 and 1910 (Archives of Ontario, Microfilms B70, Series A). A notable lapse in coverage occurs between 1871 and 1882, however.

The distinguishing feature of the county directory, aside from its areal coverage, was the inclusion of lists of township residents arranged alphabetically by surname. County directories also listed tradesmen and persons in the professions under their place of business. Although a Home District directory was published as early as 1837, widespread coverage of Ontario counties post-dates 1860. Publication of such directories by local newspaper printers was a common practice, and few publishers had the incentive or resources to undertake frequent revisions. The Archives of Ontario collection of county directories includes 19 examples of this genre between 1865 and 1867. Following a lapse between 1870 and 1880, numerous county directories were published between 1884 and 1901. In this latter period the Union Publishing Company of Ingersoll extended its directory coverage to much of

Southern Ontario (Archives of Ontario, Microfilms B70, Series C). Grey and Bruce were among the counties revisited most often by directory publishers.

Conzen (1972) found that fewer than half of Minnesota settlements were common to two State business directories in 1865. He assessed the consistency of business coverage by computing the number of business listings per thousand state inhabitants; for individual states the values obtained were surprisingly stable between 1865 and 1880. Other geographers and historians have concentrated mainly on the uses and limitations of city directories (Knights, 1969; Hutchinson, Hutchinson and Newcomer, 1938 ; Cross and Dudley, 1972; Cross, 1974). The issue of reliability was frequently raised by directory publishers, always with the purpose of casting their competitors in a poor light. Introducing the sixth edition of their Ontario directory (1895) the J. S. Might firm claimed "... we do not, like most of the so-called directory publishers, copy from old and unreliable publications..." From their prefatory remarks, however, it is clear that provincial and county directory publishers relied less on plagiarism or direct canvass than on correpondence with informed sources. W. H. Irwin of Hamilton introduced their Simcoe County Directory (1879) by acknowledging a debt to the "postmasters, township clerks and others" and added their gratitude to "editors of the county papers" two editions later (1888). At two dollars or more in 1880, a directory cost almost one third of a labourer's weekly wage, and was twice as expensive as an annual subscription to a weekly newspaper. Subscribers and advertisers were

individuals competent to discern directory inaccuracies. Identified by a bold type face in the directory listings, subscribers included most postmasters and a disproportionately large number of professional men, dry goods merchants and insurance or other agents. As Table 1.1 indicated, Ontario publishers took care at least to include all places.

Directory reliability can be assessed via record linkage. If a businessman is listed in several successive directories, some confidence may be placed in their authenticity. If, however, the businessman is listed intermittently it is likely that his presence has been disregarded by some directory publishers, or that indiscriminate copying of earlier sources has recreated a discontinued business. Record linkage of eleven directories was effected for the following years: 1882, 1884, 1886, 1887, 1888, 1892, 1895, 1898, 1903, 1907, and 1910. All business listings of 50 places serving the Grey County study area were transcribed on to file cards. Each card specified the name, occupation and location of an individual, noting each year in which he was listed. Individuals who were inconsistently covered by these directories included justices of the peace, school-teachers, clerks, clergymen and municipal office-holders. Dressmakers, milliners, music teachers and various agents (insurance, loans, sewing machines, musical instruments, fruit trees) occurred more frequently in 1892 and 1895 than in other directories. An agent listed in 1882 and 1892, however, would be listed in all four intervening directory years. The clearly transient character of the agents and other individuals in the second group above led to the decision to include them in subsequent analysis. The first

group, however, was deleted from the file.

Individuals in consumer-oriented occupations were consistently reported by all but the 1887 and 1882 directories. A blacksmith would be listed, for example, in all directories between 1884 and 1895 except the 1887 volume. Whenever an individual was listed both in 1886 and 1888, it was assumed he had also been present in 1887. The 1882 directory entirely omitted listings for four small villages within the study area; their business community was reconstructed by consulting the Grey County Atlas (1880).

Inconsistencies in name-spelling or attributed occupation were extremely rare; if a person appeared to switch his line of business, later directories confirmed this change. The same was true of persons who appeared to change their place of business. Occasionally businessmen were listed in two places simultaneously: both cases were retained if at least one other directory confirmed the existence of two outlets; otherwise only the newer listing was retained. In developing the card record it became obvious that a high turnover was a characteristic of nineteenth century businessmen. When individual cases were reaggregated by place of business it was also clear that business premises evinced much greater continuity. This was most apparent in the case of saw mills, for the linked record would suggest that a single mill had seen a succession of operators over three decades. The chronological consistency of these eleven directories suggests that such records may be confidently employed to reconstruct business locations, obtain measures of business duration, and to at least assess the

occurrence of local business migration.

Of the eleven directories selected as a means of monitoring the changing pattern of business locations only two are county directories. If they contain reliable information, the 1887 and 1898 directories provide a means of identifying market area, market size and consumer choice transfer. The period which separates these directories was one of great change in the pattern of business. The degree and direction of change in the pattern of markets is therefore of considerable interest.

There is substantial evidence that the persons listed in a county directory were the ratepayers of each township covered by the volume. If so, one could hardly ask for a more representative measure of the number of rural consumers engaged in trip-making. Township ratepayers included non-resident property owners; these are conspicuous in a county directory by virtue of their being listed as having distant post office addresses such as Toronto (Table 1.2). The correspondence between the number of ratepayers in 1894 and the number of persons listed in the 1898 directory is striking (Table 1.2). This relationship is also apparent when the 1898 directory is linked to a 1900 assessment roll (Table 1.3). The six lots containing the village of Kimberley and its environs are described identically by the two sources: those persons exclusive to the 1900 roll clearly replaced those who had left since 1898. In 1887 as well, township clerks or postmasters seem to have been consistent in providing the directory publishers with this type of information: for 10 villages with an attributed population

TABLE 1.2

REPRESENTATIVE MEASURES OF THE CONSUMING POPULATION OF FOUR GREY COUNTY TOWNSHIPS 1887-1898

TOWNSHIP	NUMBER ON DIRECTORY LIST		POPULATION	RATEPAYERS	DISTANT ADDRESSES (Directory)
YEAR	1887	1898	1887[1]	1894[2]	1887
Artemesia	721	1063	4442[a]	1123[c]	13
Osprey	696	980	3132	969	21
Euphrasia	791	1078	3100	1053	16
Collingwood	809	1037	4611[b]	1103[d]	--
TOTAL	3017	4158	15,285	4248	50

[1]Annual Report of the Bureau of Industries for the Province of Ontario, 1892 (Toronto, 1894).

[2]Annual Report of the Bureau of Industries for the Province of Ontario, 1894.

[a]Includes Markdale, population 700 by directory estimate.

[b]Includes Thornbury, population 833 by municipal census.

[c]Does not include Markdale, 194 ratepayers.

[d]Does not include Thornbury, 268 ratepayers.

TABLE 1.3

RECORD LINKAGE OF 1898 DIRECTORY AND 1900 ASSESSMENT ROLL FOR EUPHRASIA TOWNSHIP: LOTS 4 THROUGH 6, CONCESSIONS 4 AND 5

GROUP	NUMBER OF PERSONS		
	COMMON TO DIRECTORY AND ASSESSMENT ROLL	EXCLUSIVE TO DIRECTORY	EXCLUSIVE TO ASSESSMENT ROLL
Farmers	18	4	4
Businessmen	9	5	4
Others	9	6[1]	5[1]
TOTAL	36	15	13

[1]Those persons listed as residents of lot 5, concession 4 or lot 5 concession 5. In the 1900 roll none held more than 1 acre and all were labourers.

of between 60 and 150 persons, the number of directory listings per capita ranged from 3.1 to 6.7. Both the 1887 and 1898 directory ignored town ratepayers who were not businessmen, presumably because small municipalities such as Markdale and Thornbury (Table 1.2) maintained separate assessment rolls. The increase in the number of directory listings between 1887 and 1898 is manifest between villages as well as near them. Although there is not a constant ratio between 1887 municipal populations and their county directory listings, this is accountable to the inclusion of town populations in the former totals. Flesherton in Artemesia Township and Clarksburg in Collingwood Township were small towns whose populations, like those of Markdale and Thornbury, were excluded from the county directory listings. The individuals attributed to a post office by a county directory therefore indicate not only the *area* the office services, but also the *number* of rural consumers who must visit the place to collect their mail.

Post Office Records

The accounts of the Postal Department of the Dominion of Canada were published as parliamentary papers. The department operated 7084 post offices in 1885 and 8832 post offices a decade later.[1] It reported its contracts with mail couriers, the revenue of its outlets, the salaries of its postmasters and other items of expenditure and revenue. Although a large proportion of the 107.6 million letters[2]

[1] Canada. Sessional Papers 29 (1896) Vol. 9, No. 12, page xxi

[2] *ibid.* In 1885 68.4 million letters were sent in Canada.

sent in 1895 undoubtedly originated in cities, a dendritic pattern of mail routes reflected rural hinterland ties. In the Eastern Grey County study area, for example, the towns which published weekly newspapers were the main centres of the mail distribution network. Mail courier contracts in 1887 reveal thrice daily trips between the railway station and the town post office, daily routes from each town to surrounding large villages, and once to thrice weekly shipments from town or village to hamlets and isolated post offices.[3] Although traffic volumes are not published, the contract agreements seem to reflect differences in the quantity of mail handled. The lowest bids submitted for the main routes usually exceeded 8 cents per trip mile, while tenders for tributary routes were characteristically between 4 and 8 cents per trip mile. Postmasters' salaries were based on the volume of mail they handled.[4] Within the study area in 1886-1887 salaries ranged between $10.00 paid to the Harkaway postmaster and $1420.00 received by the postmaster at Collingwood. Only five of the forty study area postmasters commanded a weekly income that exceeded the $7.18 general labourers received in 1887.[5] It appears that the indirect benefits of running a post office outweighed the cash income received;

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[3]Canada. Sessional Papers 21 (1888) Vol. 12, No. 13. Mail transportation contracts during twelve months ending June 30, 1887.

[4]Canada. Sessional Papers 21 (1888) Vol. 12, No. 13. Report 3A. Details of revenue, salaries and allowances in Ontario for year ending June 30, 1887.

[5]Ontario. Sessional Papers 20 (1888) Vol. 20, Part 6, pages 60-61. Annual Report of the Bureau of Industries.

postmasters were usually general store keepers as well.

Post office revenue was on average two to six times the postmaster's salary in 1886-1887. At one cent per ounce,[6] this represented a large quantity of mail. Thornbury's urban and rural ratepaying patrons made per capita purchases of $2.99 during the year 1898-1899. Kimberley's village and rural patrons spent $1.50 per capita in 1898-1899 and $1.73 during 1886-1887. Per capita figures for hamlets and isolated post offices were usually between 50¢ and $1.00.[7] Expenditures were concentrated in the larger centres, a phenomenon which Richtik observes in Manitoba between 1872 and 1886 (Richtik, 1967). Nonetheless, even rural post offices selling stamps almost exclusively to immediate residents took in on average more than a penny per week per household. It is probable that rural residents received more mail than they sent. A patron of one rural post office, F. Whenell of Lady Bank in Collingwood Township, complained to the Post Office Department that a subscription to the "Star and Weekly Herald" of Montreal had been lost or stolen in transit.[8] Newspaper subscriptions alone guaranteed a weekly trip to the local post office and, as noted above, mail courier routes appear to accomodate the circulation of small town newspapers. By reaching and identifying the rural market, newspapers and directories stimulated advertising and mail order sales.

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[6]Canada. Sessional Papers 29 (1896) Vol. 9, No. 12, page xxi.

[7]Canada. Sessional Papers 34 (1900) Vol. 10, No. 12, Appendix C. Canada. Sessional Papers 21 (1888) Vol. 12, No. 13, Report 3A. Number of patrons estimated from 1887 and 1898 County Directories.

[8]Canada. Sessional Papers 33 (1899) Vol. 23, No. 10, Appendix G. Report of Missing Letters. Class B, unregistered letters.

Whereas they could buy stamps or send letters from any post office, consumers were obliged to select a single post office as their address. Post office records suggest that mail was received often enough to make the post office trip the most important, and least flexible, element in the trip behaviour of a late nineteenth century rural consumer.

The Pattern of Business Locations

The pattern of places and the distribution of business activities in places changed constantly between 1857 and 1910. Figures 1.5 to 1.12 provide a glimpse of these changes; the maps are based on business directory evidence. Directories are referenced by year in the bibliography. "Number of activities per place" refers to the number of distinguishable consumer-oriented activities rather than to the total number of business establishments. Interchangeable titles were assumed to be one rather than two activities; thus grocers were merged with general store keepers because businessmen did not consistently describe themselves as being one or the other. Business activities present between 1882 and 1910 are listed in Appendix Six. Places serving the study area are identified in Figure 1.4.

The activities present in 1857 (Figure 1.5) had almost all been established in the preceding five years. In the north-west corner of the study area, for example, the village of Walter's Falls had developed around a saw mill established in 1853 (Marsh, 1931, page 131). In the north-east, in Simcoe County, Collingwood possessed only a grist mill

and tavern in 1852, but grew rapidly as the terminus of the Northern Railway, completed in 1854 (Marsh, 1931, page 47). Thornbury, also on Georgian Bay, was no more than a single saw mill in 1849 and a vacant government town plot in 1852 (Marsh, 1931, pages 46-47). Priceville, Flesherton, Markdale and Dundalk, in the south-west, all post-dated the completion of the Durham Road and Toronto and Sydenham Road in 1849 (Lynch, 1853). The places established by 1857 were, like rural settlement itself, on the periphery of the study area.

New post offices were established as the settled area and rural population density increased . Alwin (1974) also draws attention to the association between settlement expansion and new post office locations. In Canada as in the United States a rural post office was requested by local residents. It was established if the Postal Department considered that it was far enough removed from existing outlets, would serve an adequate clientele and could be linked to the existing pattern of courier routes at a reasonable cost. In 1864 (Figure 1.6) new places within the study area fit all three criteria; they were typically four miles from prior establishments, in the settled margins of the study area, on or near one of the four main colonisation and mail roads. By 1871 (Figure 1.7) a new crop of post offices had appeared, most of the available land in the four townships had been occupied, and township rural populations were approaching levels which they were to maintain until 1900 (Table 1.4). As before, new post offices were characteristically four miles or more from earlier establishments. The latter had acquired new business activities

TABLE 1.4

POPULATION CHANGE IN EUPHRASIA, ARTEMESIA, COLLINGWOOD AND OSPREY TOWNSHIPS 1850-1910

	POPULATION			
YEAR	EUPHRASIA	ARTEMESIA	COLLINGWOOD	OSPREY
1850[1]	474	60	365	5
1861[2]	1472	2575	1492	2201
1871[2]	2899	3484	3576	3033
1881[3]	3031	3817	4366	3494
1891[3]	3228	3640[4]	3463[5]	3181
1901[3]	3149	3553[4]	3728[5]	3119
1910[3]	2789	2903[4]	3363[5]	2931

[1]Lynch (1853, page 377).

[2]Census of Canada.

[3]Annual Report of the Bureau of Industries for the Province of Ontario, (1892, 1901, 1910).

[4]Excluding Markdale (population circa 900 in 1881).

[5]Excluding Thornbury (population circa 250 in 1864, 900 in 1881).

1864; evidently new business activities favoured existing agglomerations, providing the earliest post office villages with a distinct initial advantage. By 1882 (Figure 1.8) the Northern Railway linked Collingwood to Thornbury and Meaford and the Toronto, Grey and Bruce Railway crossed the south-western section of the study area, serving Dundalk, Flesherton and Markdale. Both lines received large municipal subsidies (Trout, 1871, pages 137 and 152). New post offices occupied interstitial locations between two and four miles from existing places, most of which retained or added to their complement of businesses. This pattern of development persisted to 1892 (Figure 1.9). By 1895 the pace of new post office establishment has visibly slackened (Figure 1.10). Rapid decline in the occurrence of business activities is apparent between 1895 and 1898 (Figure 1.11). When Marshall (1964) defended 1896 as a representative temporal cross section of the pattern of places in Bruce and Grey Counties, he could not have more aptly illustrated the peril of cross-sectional analysis. Evidently a structural analysis of late nineteenth century places must consider change as well as spatial pattern.

The decline in rural business which is observable in Eastern Grey between 1895 and 1898 is a culmination of many factors. Commercial wheat agriculture persisted in Grey County (Retallack, 1966) but did not survive Western Canadian competition which intensified after 1896 (Bertram, 1963). Small scale saw milling south of the Canadian Shield was also squeezed by diminishing supplies and competition from enterprises based on virgin stands (Head, 1976). Agricultural depression

undermined the demand base, jeopardising retail establishments. Small-scale industries and crafts serving local markets faced increasing competition from manufacturing enterprises in the cities of Ontario (Gilmour, 1972; Spelt, 1972, page 173). Although net out-migration did not result in absolute rural population decline until after 1900, persons of prime working and consuming age constituted a diminishing proportion of Eastern Grey's population. This decline was particularly rapid between 1891 and 1901. For example, Hudson (1976) has noted a migration stream from Grey and Bruce counties to North Dakota during the last decade of the nineteenth century.

After 1898 no recovery ensued (Figure 1.12). The pattern of activities in 1910 appears to differ in only minor respects from the pattern prevailing twelve years earlier. By 1962, however (Figure 1.13) the residue of the pre-automobile pattern largely comprised places served by paved roads (Marshall, 1964). These were also usually the earliest established and largest centres: thus the 1962 pattern bore a striking resemblance to its 1871 counterpart (Figure 1.7). Postal revenue figures for 1929 suggest that late nineteenth century places disappeared most rapidly during the two decades after 1910.[9] Between 1882 and 1910, however, two factors influencing the pattern of consumer trips were constant; these were the mode of consumer travel and mail collection at post offices. Underlying the growing pattern of businesses between 1882 and 1895, and the decline which ensued to 1910, are all the individual business concerns which were established

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[9]Dominion of Canada. Annual Departmental Reports (1929-1930) Vol. IV, Report of the Postmaster General, pages 71-116, and 26-37.

or terminated in the course of almost three decades. By exploring the context in which businesses emerged and ceased, a deeper understanding of the changing pattern of places may be achieved. The sources reviewed in this chapter provide the necessary evidence to reconstruct this context, which comprises elements of consumer choice and the business structure of places.

FIGURE 1.4: PLACES STUDIED 1882-1910

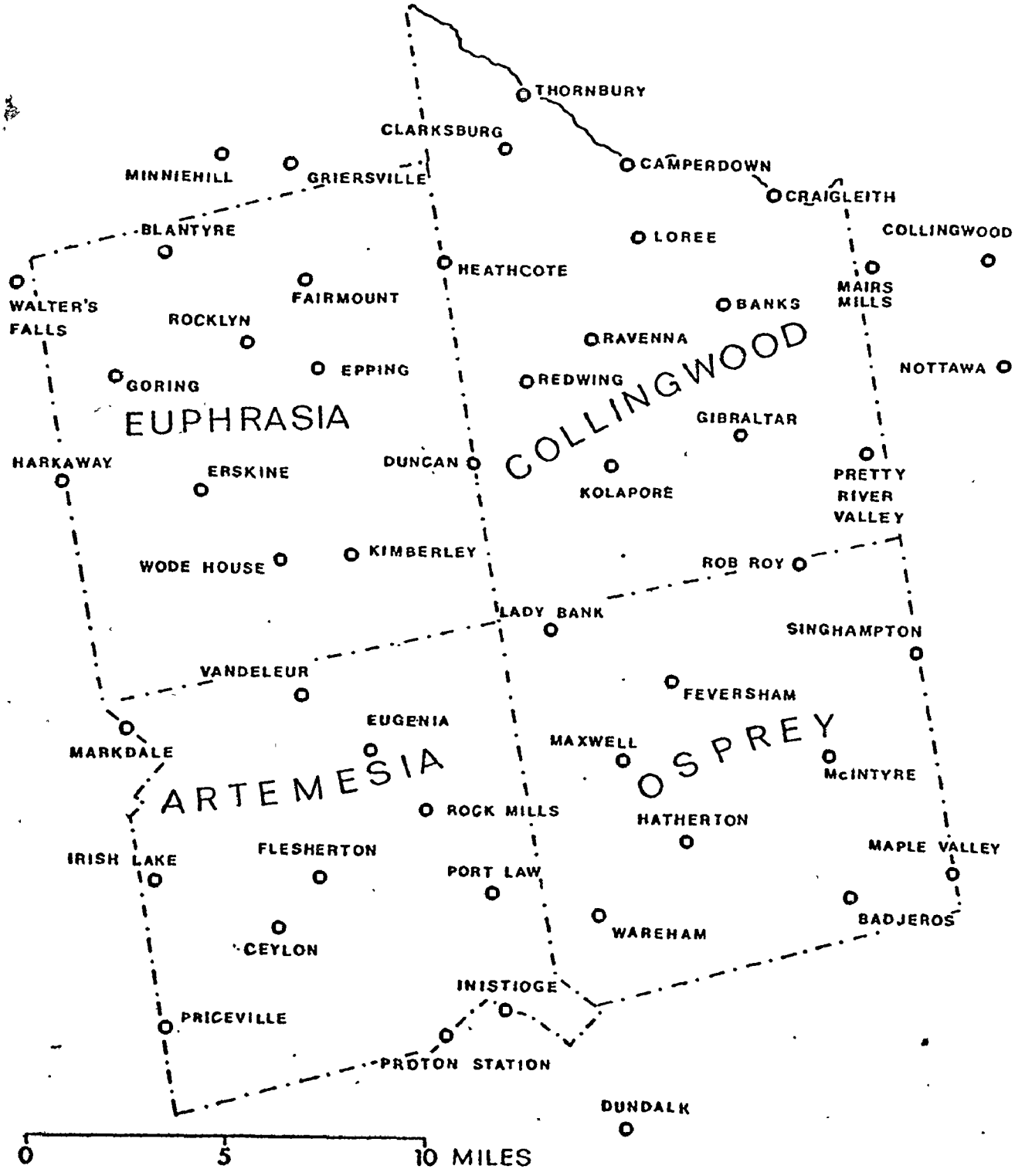


FIGURE 1.5: BUSINESS ACTIVITIES: 1857

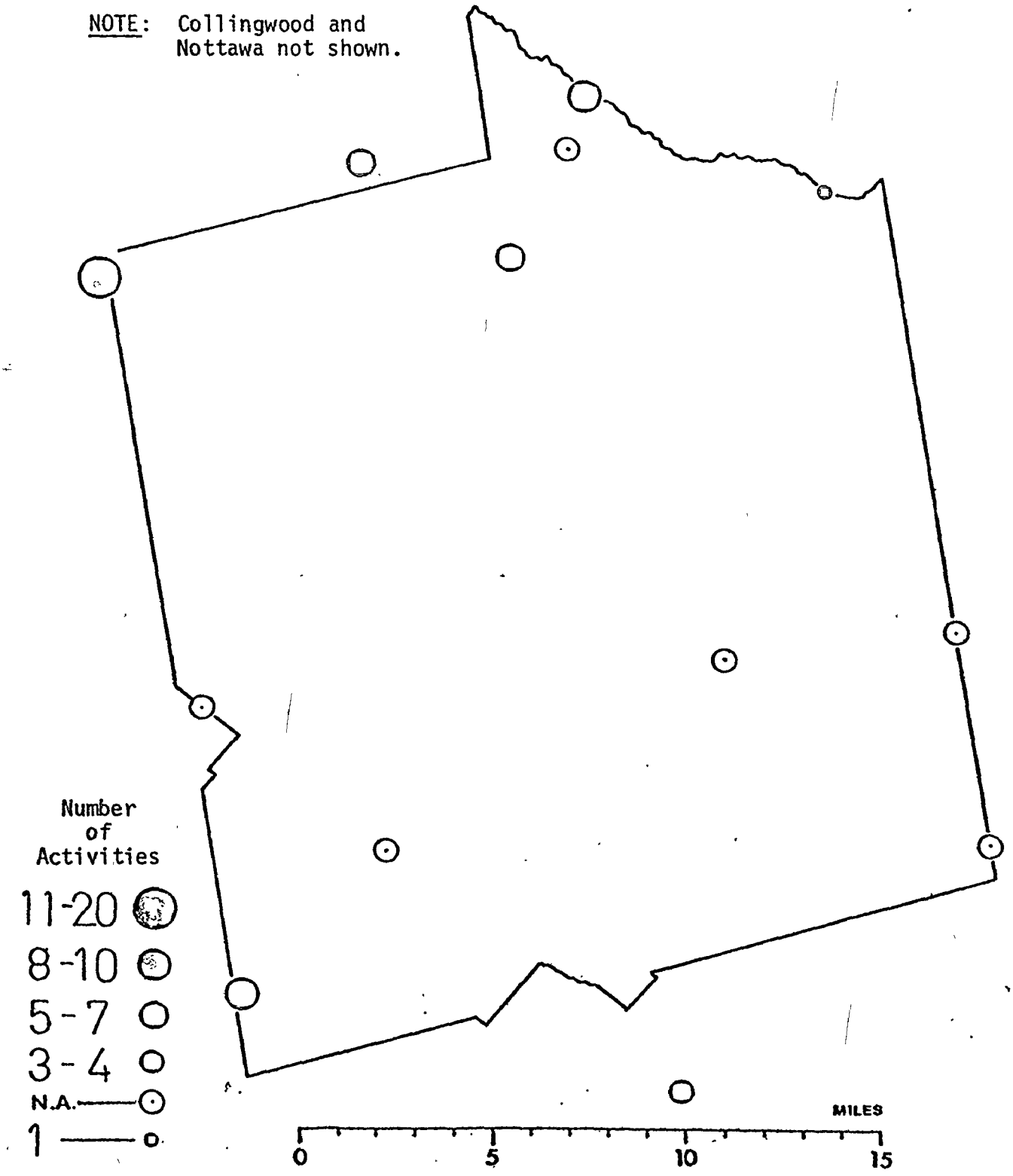


FIGURE 1.6: BUSINESS ACTIVITIES: 1864

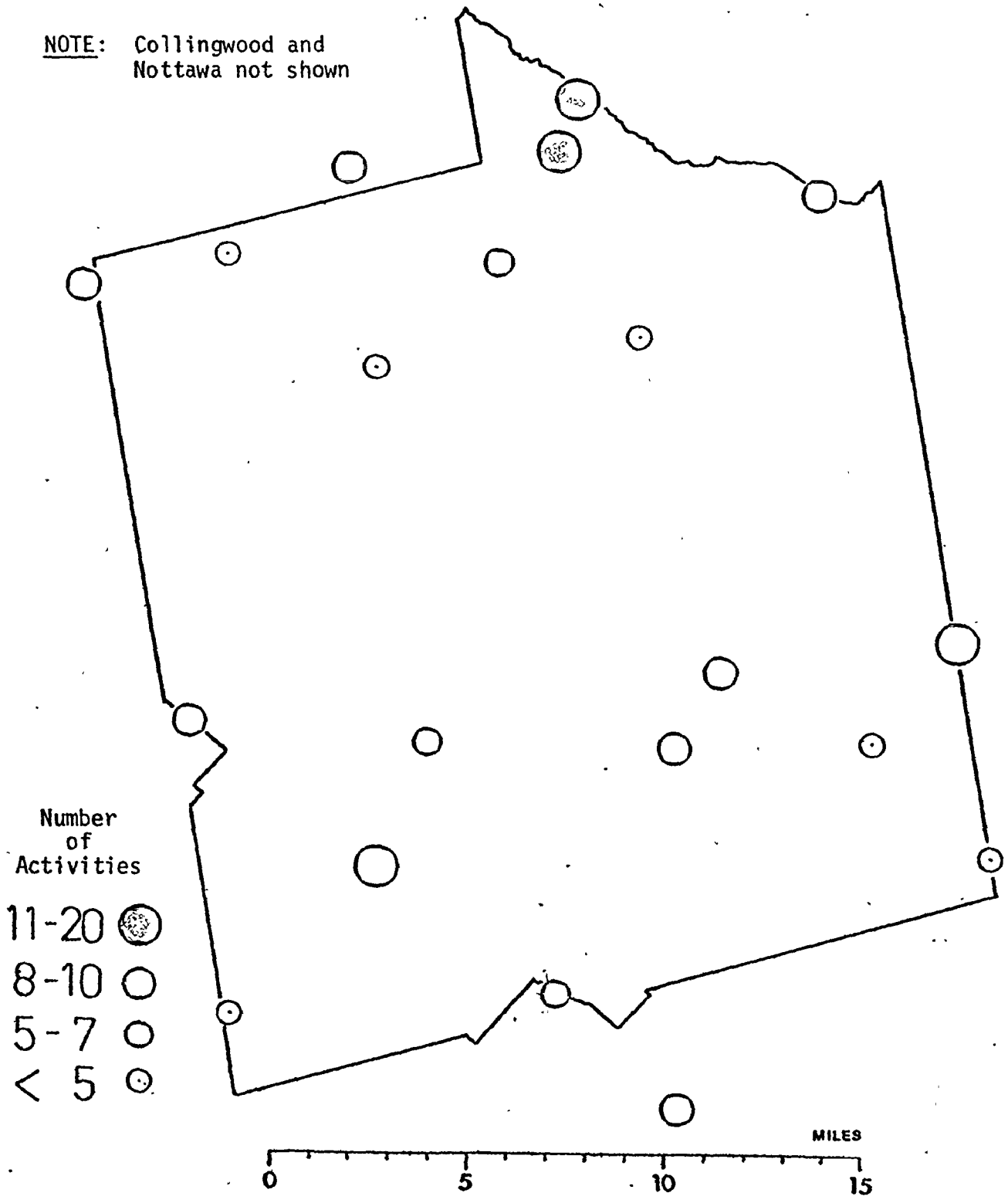


FIGURE 1.7: BUSINESS ACTIVITIES: 1871

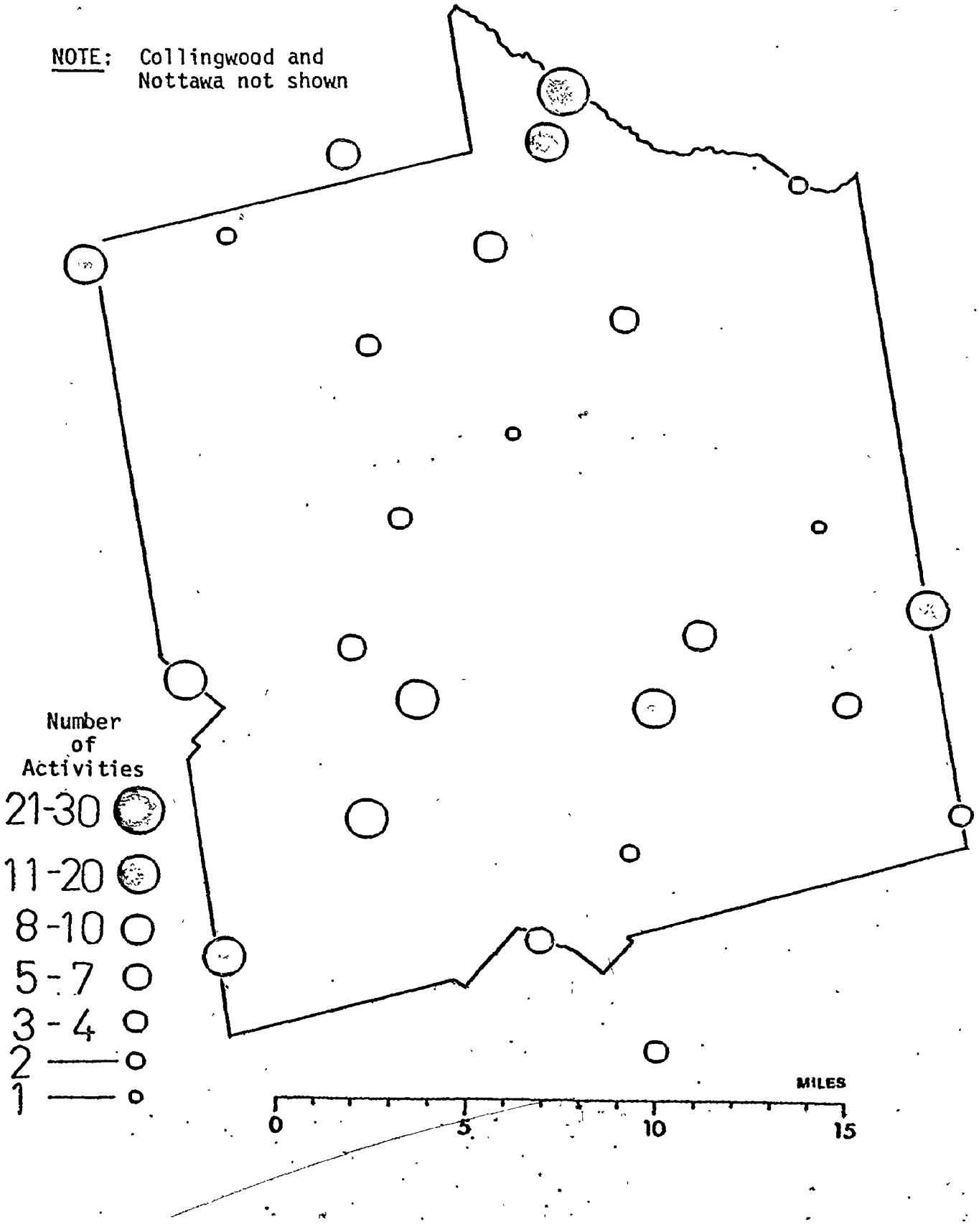


FIGURE 1.8: BUSINESS ACTIVITIES: 1882

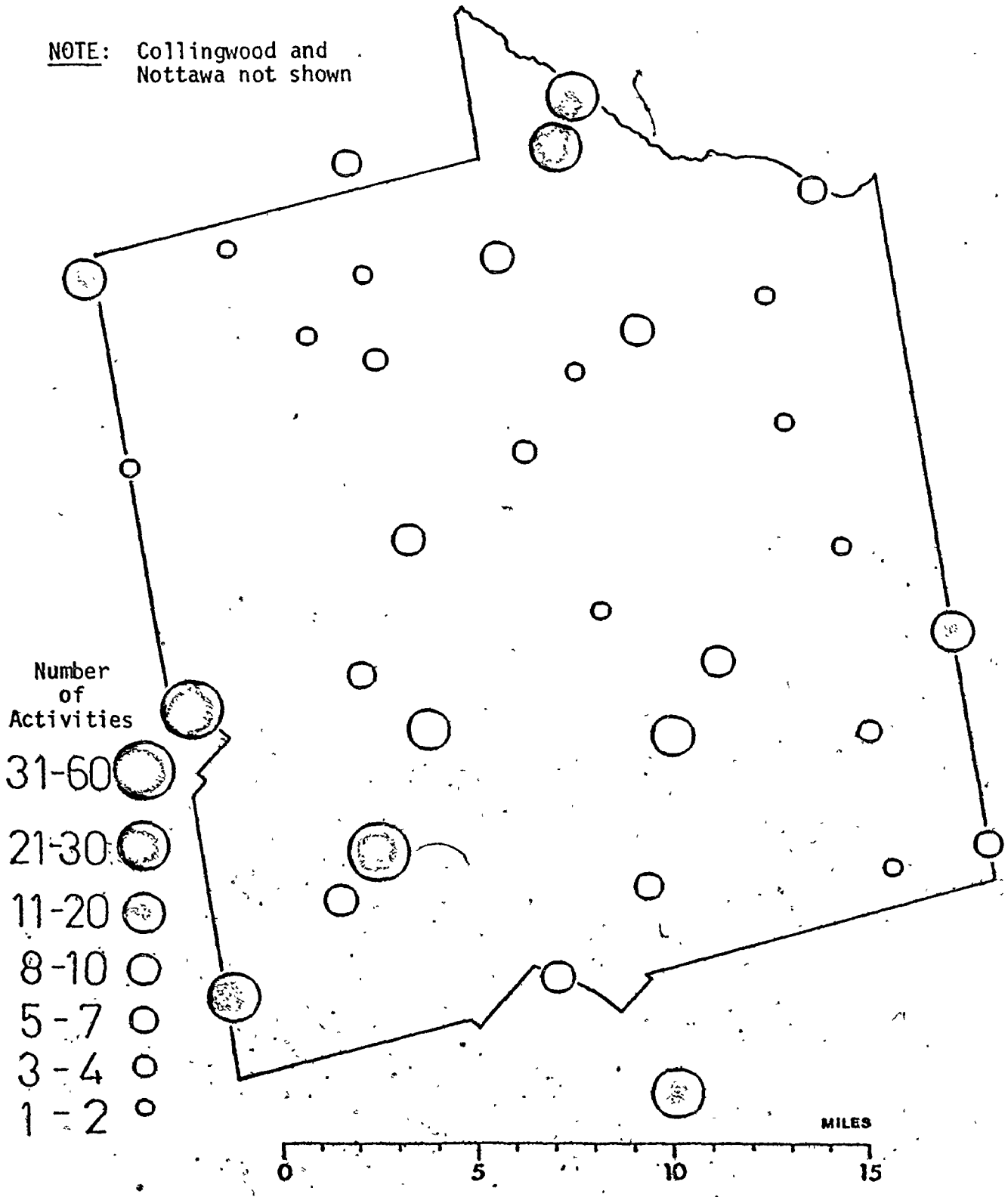


FIGURE 1.9: BUSINESS ACTIVITIES: 1892

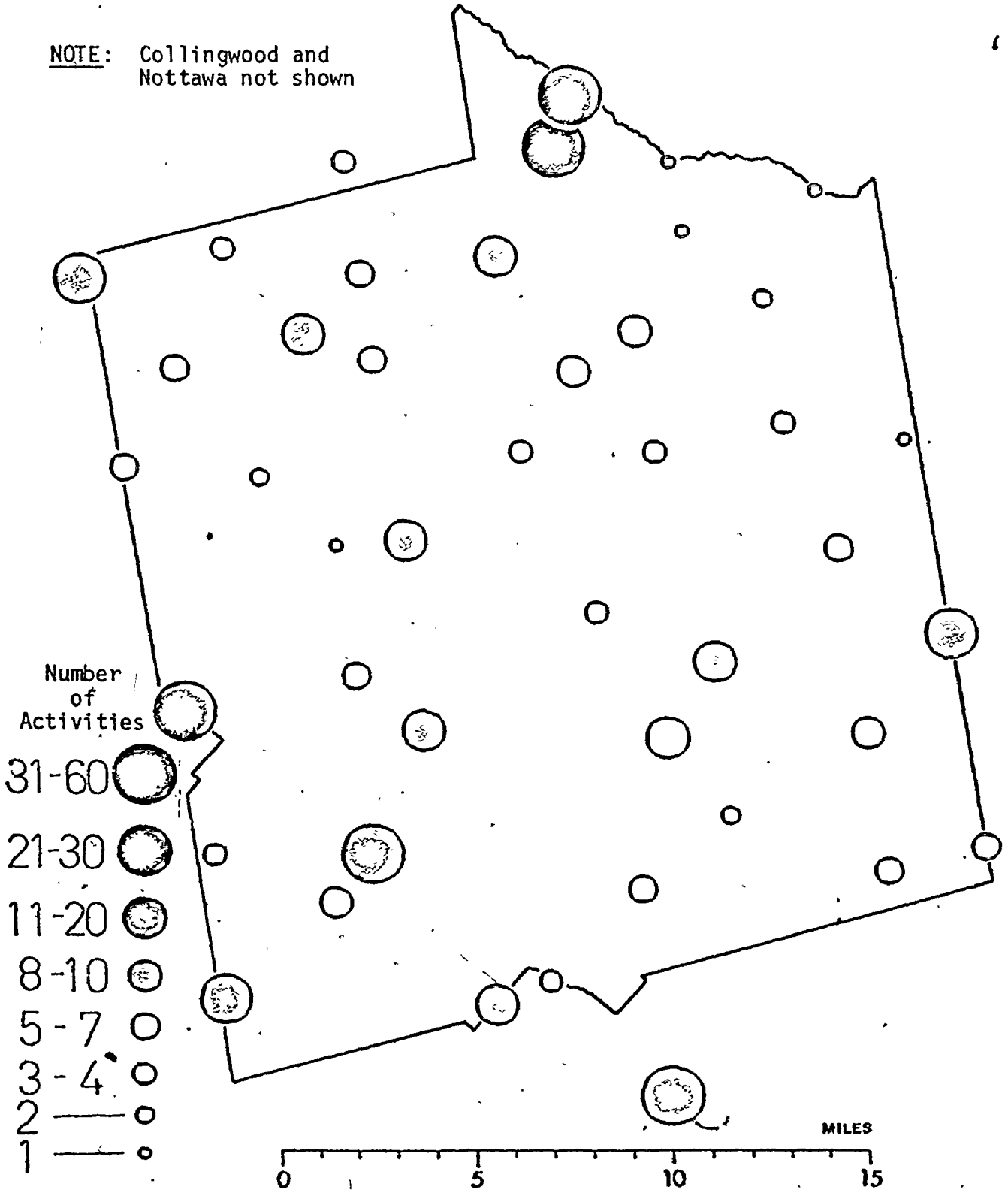


FIGURE 1.10: BUSINESS ACTIVITIES: 1895

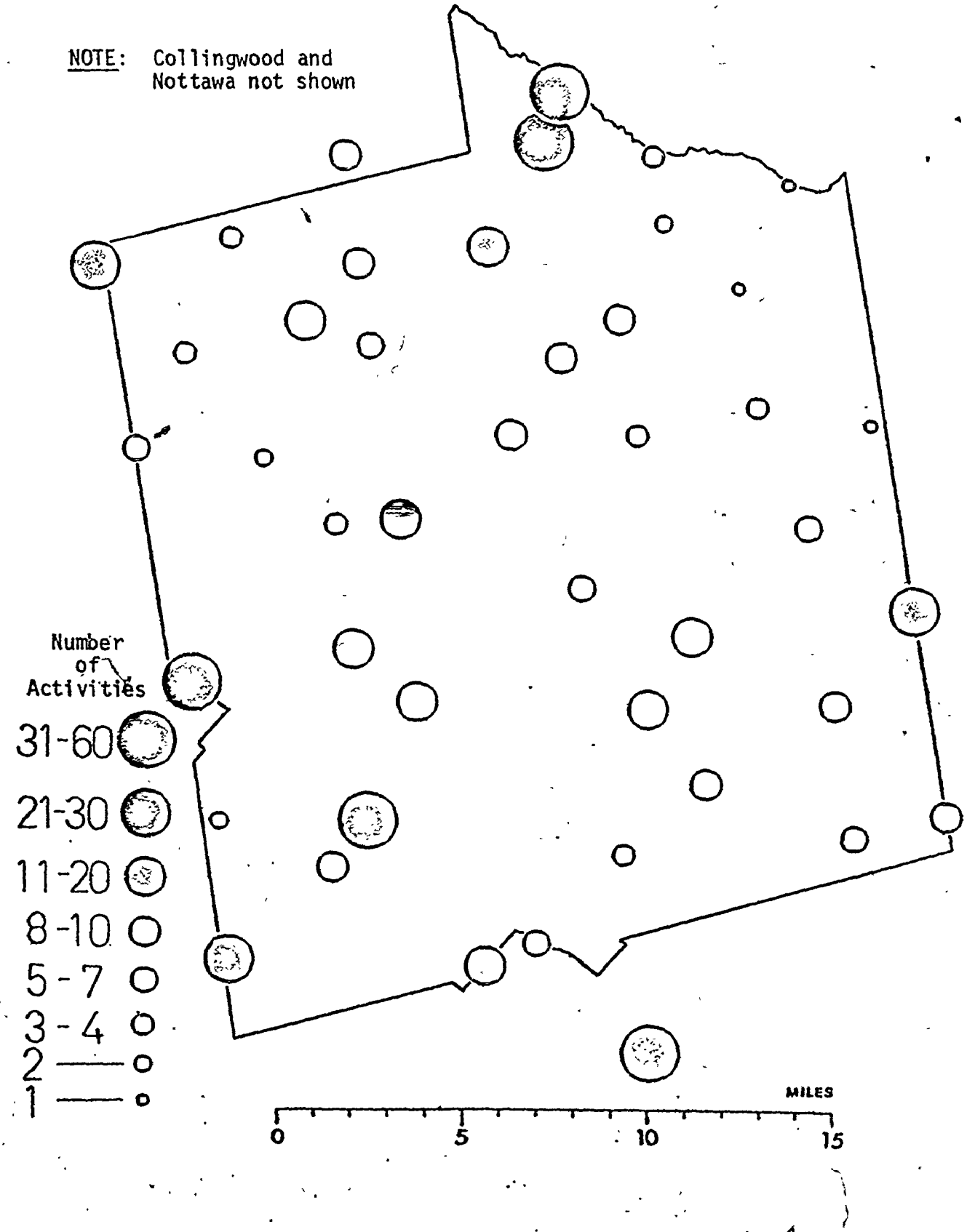


FIGURE 1.11: BUSINESS ACTIVITIES: 1898

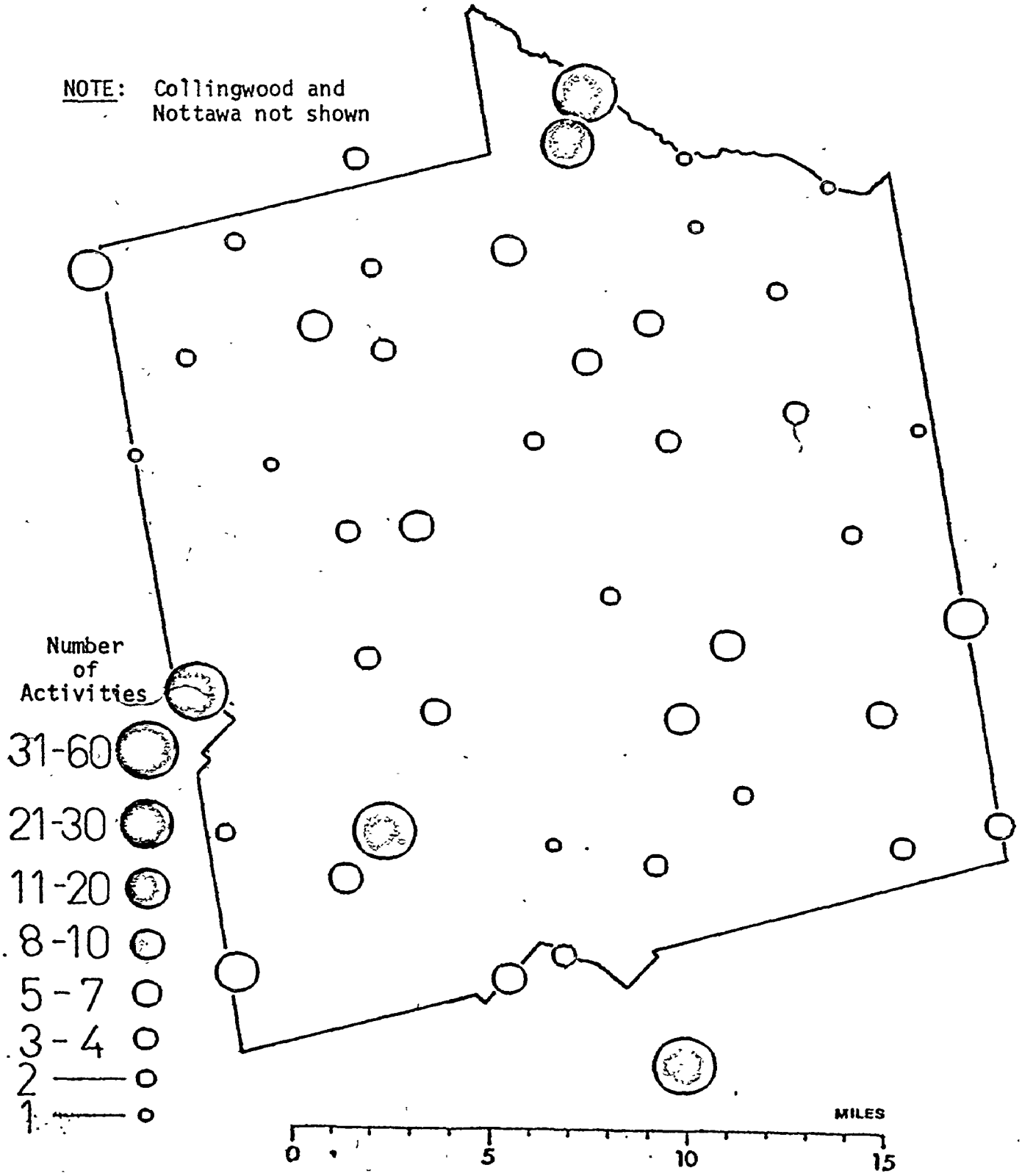


FIGURE 1.12: BUSINESS ACTIVITIES: 1910

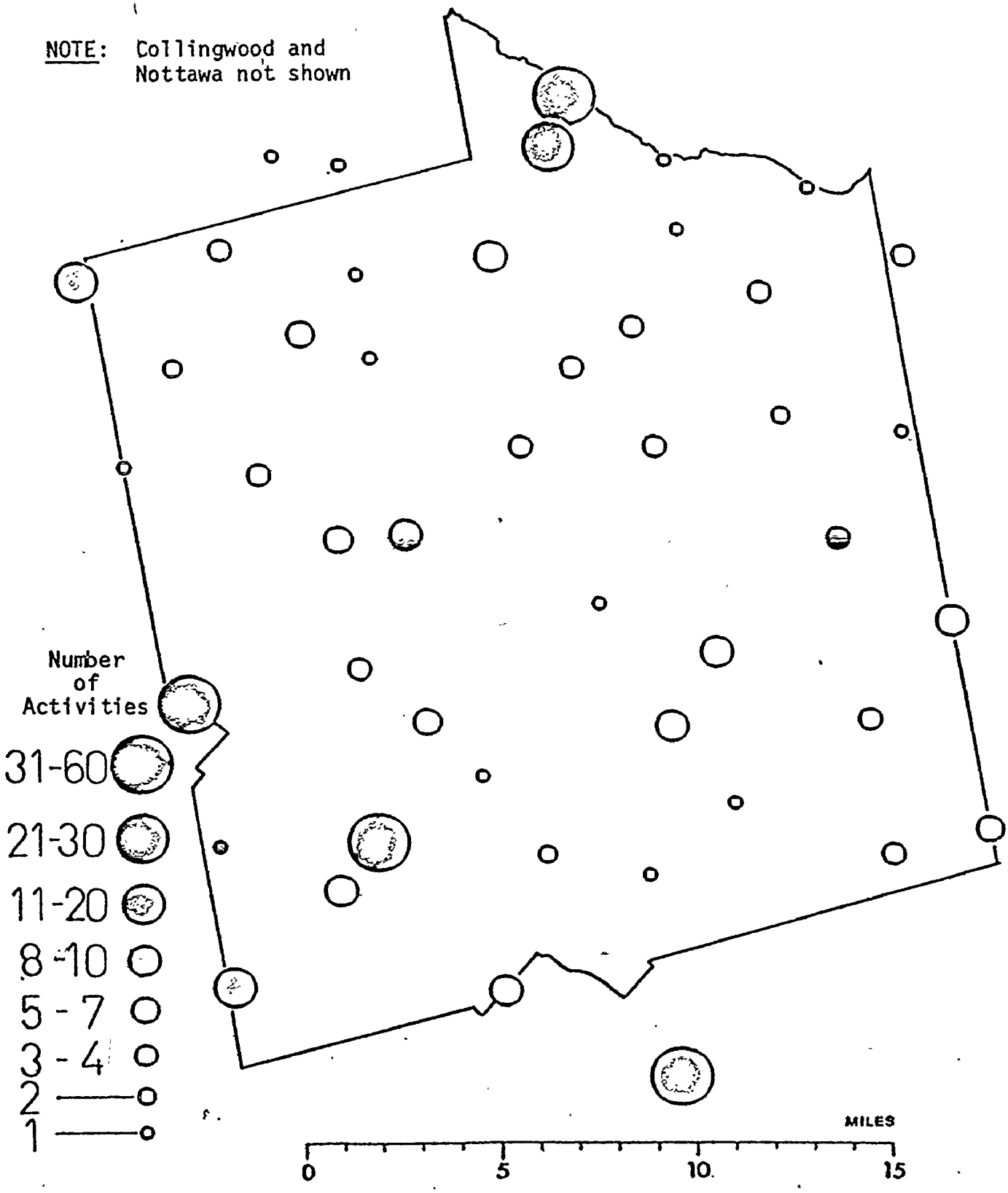
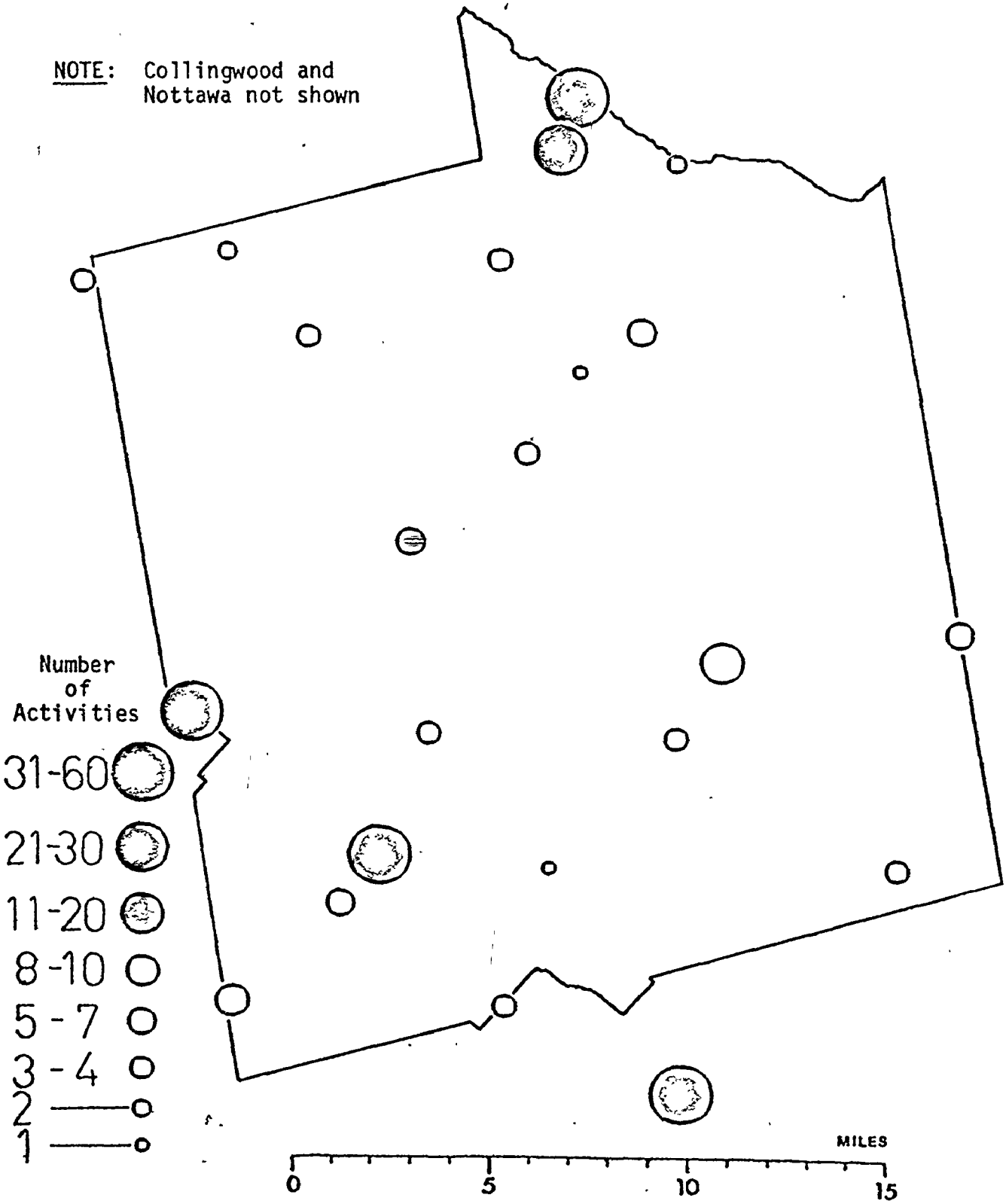


FIGURE 1.13: BUSINESS ACTIVITIES: 1962
after Marshall (1964)



CHAPTER TWO

BUSINESS LOCATION AND CONSUMER BEHAVIOUR: A REVIEW

I don't know whether you know Mariposa. If not, it is of no consequence, for if you know Canada at all, you are probably well acquainted with a dozen towns just like it.

Stephen Leacock (1931)
"Sunshine Sketches of a Little Town"

Introduction

A changing pattern of places may be understood when the human behaviour which underlies the changing pattern is itself identified and understood. To be useful in historical geography, behavioural postulates must be testable. One cannot interview the dead; their preferences are revealed by the record of their activity. A behavioural environment (Kirk, 1952) or image (Boulding, 1956; Lynch, 1960) may filter real world behavioural criteria; such concepts provide at best an intractable conceptual framework within historical geography (Guelke, 1974). A working approach must be gauged by its yield (Prince, 1971).

This chapter considers postulates which can be scrutinized in the light of direct or indirect traces of choice behaviour by businessmen and consumers. A mediating psychological framework is undoubtedly a realistic concept, but it has also to be testable in the world of the past. Business location and consumer choice in late nineteenth century

Southern Ontario were the two primary factors which yielded a pattern of retail businesses. Villages and towns comprised little more than households dependent on such businesses. Small-scale production was consumer-oriented and employed few if any wage labourers (Gilmour, 1972). As Chapter One shows, business location and consumer choice may be reconstructed from published sources. Thus postulates concerning location and market affiliation as the mainspring of places are both testable and applicable.

Three bodies of literature are examined which provide insights concerning location and choice: central place theory, firm location in a competitive context, and consumer behaviour. A critical assessment of this literature provides a basis for developing postulates testable under historical circumstances; these are developed in Chapter Three.

Despite their concern with changing patterns of places, historical geographers have been concerned less with the regularity of human behaviour than with the geometry of central place networks in the past; this has been criticised on empirical and logical grounds (Vance, 1970). The merit of central place theory rests on its assumptions, not on its derived patterns.

Central Place Theory

Central place theory proceeds from assumptions concerning the behaviour of firms and consumers in a fixed environment. Walter Christaller in 1933 and August Lösch in 1939 derived general properties of the spacing and size of central places, the exclusive function of

which is to sell to proximate markets. The English translation of Lösch's German text (Lösch, 1967) provides a formal theoretical statement, whereas Christaller is acknowledged by his translator, Baskin, to have sacrificed rigour and clarity to "... fit the places of Southern Germany into the theoretical scheme ..." (Christaller, 1966, preface). The rural sociologist Galpin (1915) recognised empirical regularities in village patterns, and both Lösch (1967, page xv) and Christaller (1966, page 15) ascribed their theoretical insights to an upbringing in an orderly landscape of places. The roots of central place theory are inductive.

Lösch's assumptions, however, do not concern places. His assumptions are: a uniform income distribution; that transport cost is a linear function of distance; and is borne by consumers; that firms sell to consumers, and seek a maximum profit location; that consumers seek a minimum cost point of purchase; that sellers of a good are distinguishable only by location and mill price; and that firms enter the market until none can make abnormal profits. Lösch implicitly assumes that all trips are made for a single purpose to a single place. Demand is explicitly assumed to vary inversely with price, and therefore to decline with distance. Thus the frequency with which a good is purchased is implicitly invariant with distance, while the quantity obtained diminishes.

From these assumptions Lösch develops the pattern of markets associated with a single good. He deduces a locational equilibrium comprising a lattice of hexagonal markets, each of which contains one

firm at its central point and which yields sales commensurate with normal profits. The conditions for equilibrium are that all consumers are served, that no abnormal profits are made and market boundary indifference exists, that areas of supply, production and sales are as small as possible, and that no firm can increase its profits by changing its price or location. Lösch asserts that such an equilibrium exists for all goods, but that hexagonal markets differ in size. In the spirit of von Thünen (Hall, 1966), Lösch further assumes a central city selling all goods. Overlapping market lattices radiate from this city. Assuming but not specifying agglomeration economies for firms, Lösch rotates these lattices to minimise the number of firm locations; a network of central places results. Without agglomeration economies Lösch's economic landscape does not require places.

Christaller's treatment of the problem is given formal expression by Dacey (1965). Christaller and Lösch concur in respect of the hexagonal market lattice associated with a single good (Berry, 1967, page 59), but differ in their conception of places. Christaller's assumption concerning agglomeration implies that some types of firm command a sales radius larger than the required minimum; some places sell all goods; other places are equidistant from three larger places and sell only those goods that their proximate market will support. The familiar k = 3 hierarchy of places emerges. A place which sells a particular good also sells all goods which require the same or smaller market areas. The order of a place is equated with the largest market area it serves. Berry and Garrison (1958) argue that such a size

hierarchy emerges regardless of demand distribution; places are then not uniformly spaced (Curry, 1967). Christaller's treatment permits excess profits and unserved demand (Webber, 1972). The system is not necessarily in equilibrium; firms benefit by relocating unless they are fixed by agglomeration economies. Neither Christaller nor Lösch considers the evolution of places; central place networks require that all firms coordinate their location decisions.

Do real world patterns mirror the uniformity of central place networks? In the Lösch network distinct size levels of places do not occur; a real world size distribution is also characteristically continuous (Zipf, 1941; Vining, 1955). Random variation from discrete size levels may yield a rank-size distribution (Beckmann, 1958). No completely objective method can identify such levels, however, since the *number* of levels or orders is not known (Marshall, 1969). Empirical identification of orders of central places is therefore arbitrary (Brush, 1953; Bracey, 1953) at least in the pre-selected number of orders (Berry and Garrison, 1958). The measure of size employed varies; "grades" of places have been identified by their possession of "key" functions (Smailes, 1944; Spelt, 1972, pages 52-53). As places evolve, the relative importance of functions may change; the selection of different key functions for different periods removes a basis for comparison (Spelt, 1972). Tracing the same functions through time is equally unreliable (Carter, 1956). In any case, the possession of a supposedly key function does not in reality guarantee the presence of all lower order functions (Marshall, 1964). Some historical studies have measured

the relative importance of functional arrays by assigning point values to functions and obtaining summed scores for places (LaRose, 1967; Bowden, LaRose and Mishara, 1970; Martin, 1973). Subsequent identification of orders based on ranges of such scores compounds the inherent subjectivity of this practice. Other attempts to obtain objective and temporally comparable measures of centrality have been based largely on the use of business directory sources (Carter, in Baker, Hamshere and Langton, 1970, pages 285-287; Caroe, 1968; Davies, 1967; Davies, Giggs and Herbert, 1968). Davy (1970) equates size with the labour force in retail business and identifies declining centrality of small places toward the end of the nineteenth century; he uses the population of a place as a surrogate of its tributary market. In general, the study of size characteristics reveals manipulative agility by scholars; the results neither confirm nor reject an association between real and expected patterns.

Studies of the spacing of real world places are equally inconclusive. In North America, the spacing of towns is not characteristically regular (Dacey, 1960; King, 1962). Income, however, is not uniformly distributed; spacing and size are related in Iowa, but not in less homogeneous areas (Thomas, 1960; King, 1961). In a simple marketing environment, resemblance to a Christaller network may be detectable (Skinner, 1964; Lemon, 1972; Vance, 1970). Transformation of Euclidean space may reveal a spacing based on demand density (Isard, 1956; Getis, 1963), but properties of a central place system based on physical distance are sacrificed (Tobler, 1963). Over time, the attrition of

businesses at unsatisfactory locations may yield more uniform spacing of firms (Berry, 1967, page 9; Marshall, 1964). Systems of places do not always approach uniform spacing (Semple and Golledge, 1970; Haynes and Enders, 1975). Non-uniform spacing may result from simultaneous adherence to agglomerative and market principles (Bell, Lieber and Rushton, 1974). Regularity of spacing is in any case characteristic of location patterns which are not systems of central places (Johnson, 1970). The same can be said of hierarchical structure. Even if the distribution of places is more regular than random (Dacey, 1964), the division of the market may not reflect central place theory.

Like the distribution of demand, the cost of distance may not be a spatial constant. Only a uniform route lattice approaches theoretical conditions (Berry, 1967, page 79). Under conditions of space-time convergence, the cost and impact of distance diminish (Janelle, 1968; Abler, 1971). Distinct market boundaries are replaced by zones of consumer indifference, both in theory (Devletoglou, 1965) and practice (Brush and Gauthier, 1968; Berry, 1967, pages 17-21). Even if distance is costly, market boundaries do not necessarily reflect minimum distance travel (Rodgers, 1956; Berry, 1967, page 10; Murdie, 1965). Historical geography offers no detailed studies of retail market areas. It is apparent, however, that markets for low order goods in newly settled areas of nineteenth century North America exhibited no effective limit to the distance consumers were willing to travel to obtain necessities (Berry, 1967, page 6; Vance, 1970). The proximate and exclusive markets of central place theory are not paralleled by real world conditions.

The above departures suggest that the assumptions of central place theory merit close examination. There are alternative concepts which concern the behaviour of firms and consumers.

The Location Decision of the Firm

Strategies have been suggested by which profit-seeking firms in competition attain equilibrium locations within a market. Hotelling (1929) considered two such firms within a linear bounded market under a condition of inelastic consumer demand. Hotelling assumed that the two firms would seek maximum profits by adjusting their location and price, regarding the rival's location and price as fixed. If transport costs are a function of distance and are borne by consumers, the location pattern of the firms which yields a social optimum is for one firm to establish itself at each quartile point in the market; this is the pattern which conforms to Lösch's argument. Hotelling obtained instead an equilibrium location of both firms at the market mid-point. Lösch (1967, page 73) questioned the validity of Hotelling's assumptions, and noted that a central location was a limiting case of all possible, and equally profitable, symmetrical location patterns. Lösch's argument holds only if the two firms co-operate (Webber, 1972, page 153). Hotelling's assumption concerning consumer demand was questioned (Palander, 1935, pages 232-235; Lerner and Singer, 1937). Chamberlin (1936, pages 194-196) argued that in the linear market case Hotelling's proof is not valid for more than two firms. Smithies (1941) restated the Hotelling problem assuming demand elasticity. Smithies argues that

if each firm assumes that its price and location policy will elicit a competitive response, the firms will favour quartile locations. The argument holds if each firm is aware of the other firm's decision (Greenhut, 1956).

If, however, firms are uncertain concerning the location strategy of rivals, agglomeration occurs (Webber, 1972, pages 161-162). Webber also finds that the appropriate location strategy depends on the proportion of the linear market one firm can serve; a relatively large sales radius promotes agglomeration (Webber, 1972, page 153). Whereas initial agglomeration of firms is due to uncertainty, agglomeration economies are found to be of increasing importance in the establishment of later towns (Webber, 1972, page 163). Webber argues that the agglomeration of different types of firms rests on emergent local peaks in demand density. Greenhut (1956) attributes agglomeration to external economies available to firms offering a single good, while Neutze (1960) considers the agglomeration of firms offering different goods. Webber's discussion embraces both phenomena. Empirical evidence supports the inference that the first sellers of a single good tend to agglomerate; Berry (1967, page 7) illustrates this in nineteenth century Iowa. There is evidence that the agglomeration of retail establishments does not furnish notable external economies (George, 1966).

Analyses of firm location in a competitive framework demonstrate that regular spacing of individual firms occurs only under certain conditions. The weakest element in Webber's treatment of the problem is that a local peak in demand density, comprising a few firms, is

intuitively an insufficient incentive for different types of business to agglomerate. Whereas initial agglomeration may well depend on the uncertainty of competing firms, there appears to be some market advantage derived from agglomeration which is disregarded in the literature discussed above.

Consumer Behaviour

Faced with a set of retail locations, how does a consumer organize his shopping behaviour? Empirical evidence, theory and direct experience suggest that the following are *not* reasonable assumptions:

1. the single purpose trip;

2. the minimum distance trip;

3. invariant purchase frequency with distance;

4. diminishing unit purchases with distance;

5. diminishing demand with distance.

For example, Long (1971, page 60) deduces that under certain circumstances demand for a good increases with distance. The basic observation from which the literature stems, however, is that a consumer does not necessarily travel to the closest town to obtain a good. The

pattern is, moreover, not one of simple indifference between alternatives (Devletoglou, 1965). A consumer is willing to travel further than necessary to obtain a good in a large town (Berry, 1967, page 10). Travel cost minimization is only one of a number of criteria relevant to consumer spatial behaviour (Huff, 1960). Cultural differences distinguish consumers (Murdie, 1965). Consumer behaviour may be viewed as a learning process (Rushton, Golledge and Clark, 1967), and convergence on an optimal pattern of behaviour may be apparent (Burnett, 1976). Consumer choice appears to depend on perceived rather than actual distance, and on awareness of available alternatives (Cadwallader, 1975). Town size is evidently a stimulus which draws consumers: more information is emitted from large centres; the range of choice within a single good may be greater; price competition between several firms may occur; there is greater certainty that a good is available; there is opportunity to purchase several goods (Brush and Gauthier, 1968, page 165). Indifference surfaces relating joint stimuli of town size and accessibility reflect patterns of trip behaviour (Rushton, 1969a). The trade-off between attraction and accessibility varies across space and through time (Rushton, 1969b; 1971); it also varies within populations differentiated by income and mobility levels (Lentnek, Lieber and Sheskin, 1975). Evidence of market penetration suggests that attraction imparted by size is equally relevant in sixteenth century England and nineteenth century Ontario (Rodgers, 1956; Bulthuis, 1973). The minimum distance trip cannot be regarded as a complete description of consumer spatial behaviour.

Although the attraction imparted by town size is clearly an important factor in consumer choice, it is little understood. Retail gravitation studies, for example, offer no rationale for the impact of size. The Newtonian simplicity of William Reilly's (1931) laws approximating market division has been amended to fit prevailing circumstances (Converse, 1949; Carrothers, 1956). The distance exponents associated with different types of good (Huff, 1963), city sizes (Carroll, 1955), or travel modes (Yuill, 1967) have some predictive power in the sense that they signify systematic departures from random behaviour. Wilson (1968) demonstrates that an entropy maximising approach to trip behaviour yields a most probable distribution which is identical to that postulated by the gravity model. Wilson has also (1971, 1972, 1974) stressed the need to develop aggregative models which are based on micro-economic theories of consumer behaviour. The lack of theory concerning the nature of attraction as incentive and effort as disincentive is typified by a recent article which applies a linear regression model to negative exponential patterns of trip frequency (Young, 1975). Huff (1963) has expressed the impact of place attraction in probabilistic terms; Huff argues that the probability that a consumer will select a location depends on his evaluation of all locations, a concept which is intuitively unreasonable in an inter-urban context. Size alone is not a complete definition of attraction.

As the variety of goods offered by a place increased, the range of multi-purpose trips the place can accomodate also grows. Such trips

offer transport economies, and are an element of place attraction (Rushton, 1971). The multi-purpose trip has received little theoretical attention, notwithstanding the fact that it provides an obvious incentive for the agglomeration of firms (Webber, 1972, page 38). The extent to which consumers can combine purchases of goods depends on more than merely the range of goods offered in a place; purchase frequency and flexibility of purchase frequency are important additional factors (Curry, 1962; 1967). Papageorgiou and Brummell (1975) simplify the problem by assuming homogeneous orders of goods sharing the same purchase frequency. They adopt a surrogate of purchase frequency, however, in the form of an hierarchical classification of Toronto service centres (Simmons, 1964). Papageorgiou and Brummell assume that if a trip is made to obtain a good of a given order, all lower order goods are simultaneously purchased; thus consumer allegiance to low order outlets is divided between all places of that order or greater which are visited. Empirical evidence of divided loyalty exists (Golledge, Rushton and Clark, 1966), but complete multi-purpose tripping is an unnecessarily restrictive assumption. Lowest order goods are usually bought at only a few centres (Berry, 1967, page 10). A more flexible treatment of purchase frequency is clearly required.

Empirical evidence suggests that purchase frequency diminishes with distance (Young, 1975). In a rural context, however, trip frequency is relatively insensitive to distance (Garrison, 1956). For a mobile rural population, the relative importance of time and effort has faded in comparison with the allure of price and variety (Hodge, 1965). In

a pre-automobile environment, accumulation of demand may be combined with infrequent trips by consumers who lack easy access to towns (Vance, 1970, page 59). Under conditions of low demand density during western settlement, regional entrepôts depended on infrequent commercial ties with extensive areas (Burghardt, 1971; Ward, 1971; LaRose, 1973; Muller, 1973; Kerr, 1975). Berry (1943) and Jones (1937, page 12) cite high transport costs as a factor which maintained the hegemony of nineteenth century entrepôt cities and restricted the development of secondary towns. The literature concerning nineteenth century itinerant peddlers and general store merchants bears witness to the extent to which contact frequency was more dispensable than quantity and variety consumed (Tryon, 1917; Atherton, 1939, 1949; Jones, 1937). The geographical literature establishes no link between the distance and periodicity of exchange characteristic of pioneer or export staple economies (LaRose, 1973), and patterns of trips within an integrated network of central places. The distinction which Vance (1970) draws between exogenous and endogenous trade is at best relative; if demand accumulation and variable purchase frequency characterise the former, they are logically also typical of the latter, merely at a reduced scale. In nineteenth century Wisconsin, for example, it is not possible to identify a sharp break between the two systems of trading linkages (Conzen, 1975).

Summary

For goods and services obtainable at fairly short distances, demand is invariant across space (Applebaum, 1940). Consumption levels may be maintained by absorbing the cost of inaccessibility through reducing trip frequency. It may not even be necessary to do this for some goods and services obtainable by multi-purpose trips. The latter clearly increase the distance a consumer is willing to travel. If multi-purpose tripping affects market division, it also influences the firm location decision. The existing literature concerning consumer behaviour and business location demonstrates the degree to which central place theory rests on dubious assumptions. To date, however, the location decision of the firm has not been examined in the context of consumer behaviour which is responsive to agglomeration. If such a link can be effected, it may provide a key to understanding places and markets in the past.

CHAPTER THREE

ANTICIPATION OF PATTERN

"So now everything became little islands, without communication, without further islands to which this that one was on was a stepping stone, a point with point, a necessary stage. Little islands set in their own limitless sea, one crossed them in a minute, in five at most, then it was a different island but the same ... the same voices, the same masks ..."

John Fowles (1974) "The Ebony Tower" page 229

With the richness of sources concerning business location and consumer choice established, a hypothetical pattern of trip behaviour is applied to a set of shopping opportunities. Market division and subsequent business location decisions are inferred. These inferences are testable in view of the available late nineteenth century record. The theoretical literature reviewed in the second chapter is notably at odds with the empiricism, synthesis, and temporal emphasis which are the hallmarks of historical geography. This gulf is, however, more apparent than real. An abstraction must be judged not only by its internal consistency, but also by its relevance to experience and observation. That is the strength of an abstract argument which includes some form of multi-purpose tripping. The merits of such an argument are that multi-purpose tripping actually occurs, that on grounds of experience it is preferred over more expensive modes of trip behaviour, and that is provides some incentive for businesses to

agglomerate. Chapter Two demonstrated that no existing conception of the business location decision provides a rationale for cumulative agglomeration, and that even the initial agglomeration of firms has been treated as a corollary of uncertainty in decision making rather than of multi-purpose tripping. Just as Fowles reveals real thought through the medium of an abstract landscape, the historical geographer may comprehend the reality of a changing landscape by seeking an ordered abstraction of its underlying components, by anticipating pattern.

Initial Assumptions

Four assumptions are made, termed A1 through A4. These assumptions concern the environment and nature of consumer behaviour.

A1. Uniformity. Consumers are uniformly distributed along a bounded linear market. Income is identical for all consumers and, following Strotz (Wilson, 1971, page 6), the proportions of income spent on consumer goods and services and on travel are invariant. Goods and services are consumed at the same rate by all consumers. The price of each good or service is identical at all locations at which it is sold.

A2. Transport Costs. All consumer purchases require trips. All trips incur transport costs, which are borne by consumers. Transport cost is a positive linear function of distance travelled between any pair of points in the market.

A3. Multi-Purpose Trips. If more than one good or service is sold at a single location, any available combination may be bought by a consumer in the course of a single trip. Only one location is visited on each trip.

A4. Purchase Frequency. With each good and service there is associated a purchase frequency when transport cost is a finite minimum. The greater the number of locations at which a good or service is offered, the more often it is purchased. The relative incidence of a business activity is assumed to be a linear function of its associated purchase frequency.

Assumption A1 departs from the usual uniformity constraint in that demand for goods and services is assumed to be invariant with distance. Hotelling (1929) employs this assumption only in respect of quantity consumed. Since A1 includes a budgetary constraint, transportation expenditure must, like all expenditures, be identical for all consumers regardless of their location. Therefore, from A2, consumer trip frequency must vary if consumers are not equally accessible to points of purchase. Distant consumers make trips less often, maintaining the uniform budgetary allocation to transportation. Whereas Lösch assumes that the accepted penalty of isolation is a reduction in consumption, A1 and A2 regard the consumer as an individual who bears this penalty exclusively by reducing the number of trips he makes.

Assumption A3 is less restrictive and more realistic than the single purpose trip which undermines the usefulness of classical central place theory. It is also more flexible than Brummell and Papageorgiou's (1975) assumption that the consumer purchases *all* n lowest order goods when an n^{th} order centre is visited. Multiple destination tripping is excluded by A3; this is reasonable if complete order of entry of activities exists, for then multiple destination tripping effects no savings in transportation expenditure.

Assumption A4 is based on several related concepts. The first is that expenditure by all consumers on a given good will support a particular number of firms. These firms may agglomerate or disperse. The second concept is that each good is sold in some minimum unit quantity. If this unit quantity is small, and net annual expenditure on the good is large, purchase frequency will of course be high and transport costs will constitute a large proportion of the price of the good. Firms then disperse to guarantee a proximate market, and firms will also be numerous owing to the large amount expended by consumers. If the unit quantity is large, and net annual expenditure small, purchase frequency will be low and transport costs will not constitute a large proportion of price. Firms are few in number, and tend to agglomerate to guarantee a market share. The argument is reinforced if A3 holds, for transport costs as a proportion of price are reduced by purchase combinations, possibilities of which are greatest for those goods bought least often. Thus purchase frequency is plausibly related to the number of locations at which a good is offered, expressed as a

proportion of the total number of locations. A linear relationship is assumed on grounds of simplicity.

Given fixed expenditures and prices, purchase frequency and unit purchase quantity are inversely related. The former declines and the latter rises with trip distance. From A3, however, it is clear that whenever a good is sold at a location offering other goods required more frequently, its *potential* purchase frequency is limited only by the frequency with which the location itself is visited. Thus the less often a good actually *is* purchased, the more often it *may be* purchased. This finding is important, for it applies particularly to those goods and services which are associated with a fixed unit quantity (for example, a haircut), with non-deferable need (for instance, medical attention), with fixed periodicity (such as a weekly newspaper) or with a limited inventory (as with perishable goods). The four initial assumptions do not determine entirely unrealistic patterns of consumption.

A Model of Consumer Choice

A set of business activities sells goods and services to consumers. This set is defined as A, where

$$(3.1) \quad A = \{A_1, A_2, A_3, \ldots, A_n\}$$

when A_1 and A_n have respectively the largest and smallest number of locations. A set of activity locations, or places, is defined as P, where

$$(3.2) \quad P = \{P^1, P^2, P^3, \ldots, P^m\}$$

P^1 and P^m possess respectively the largest and smallest number of business activities. The incidence of activities in places is defined by the matrix I.

$$(3.3) \quad I = \begin{pmatrix} I_{11} & I_{12} & I_{13} & \cdots & I_{1n} \\ I_{21} & & & & \cdot \\ I_{31} & & & & \cdot \\ \cdot & & & & \cdot \\ \cdot & & & & \cdot \\ \cdot & & & & \cdot \\ I_{m1} & \cdot & \cdot & \cdot & I_{mn} \end{pmatrix}$$

The matrix cell I_{ij} is equal to 1 if place P^i contains activity A_j and is otherwise equal to zero. Then the number of activities present in P^i is

$$(3.4) \quad I_{i\cdot} = \sum_{j=1}^{n} I_{ij}$$

and the number of places in which A_j occurs is

$$(3.5) \quad I_{\cdot j} = \sum_{i=1}^{m} I_{ij}$$

From assumption A4, the relative purchase frequency associated with A_j is defined as

$$(3.6) \quad F_j = \frac{I_{\cdot j}}{I_{\cdot 1}}$$

Each activity in each place commands a tributary market. Markets are defined by the matrix M:

$$(3.7) \quad M = \begin{pmatrix} M_{11} & M_{12} & M_{13} & \cdots & M_{1n} \\ M_{21} & & & & \cdot \\ M_{31} & & & & \cdot \\ \cdot & & & & \cdot \\ \cdot & & & & \cdot \\ \cdot & & & & \cdot \\ M_{m1} & \cdot & \cdot & \cdot & M_{mn} \end{pmatrix}$$

Thus M_{ij} is the market of A_j at P^i. From assumption A1, M must constitute total demand and M_{ij} is a segment of the linear market.

The distance D_{ix} is a finite length of the linear market separating a consumer located at x from a place P^i. The transport cost to obtain only A_j at P^i is a constant

$$(3.8) \quad \frac{F_j}{D_{ix}} \quad D_{ix}$$

since purchase frequency decreases as transport cost increases with distance. (3.8) is consistent with the budgetary constraint in A1. The consumer seeks the greatest attainable purchase frequency F_j/D_{ix} at a cost which is itself commensurate with F_j. Therefore if only A_j is obtained the consumer patronises the nearest location at which it is offered. This inference is based, however, on a fifth assumption:

A5. Consumers Maximize Satisfaction. Given A1, A5 then must mean that satisfaction is maximised when F_j is attained, for consumers differ only in their location and in the attainable frequency F_j/D_{ix}.

Given a multi-purpose tripping assumption, it is clear that an agglomeration of activities provides the consumer with measurable satisfaction, for the cost of obtaining several goods is no greater than that of obtaining the good required most often. The attraction of a place when distance is disregarded depends on the good a consumer seeks and on whatever combination of other goods is available. The attraction of P^i as a location at which to patronise a good A_l is

$$(3.9) \quad W^{il} = \sum_{j=l}^{n} I_{ij} F_j$$

The consumer at x, faced with a set of alternative locations offering A_l, will regard the attraction of each alternative as being

$$(3.10) \quad W_x^{il} = \sum_{j=l}^{n} \frac{I_{ij} F_j}{D_{ix}} = \frac{W^{il}}{D_{ix}}$$

The consumer will choose the location at which attraction, given the distance that must be travelled, is maximised. The consumer is indifferent between two locations, P^1 and P^2, when

$$(3.11) \quad \frac{W^{1z}}{D_{1x}} = \frac{W^{2z}}{D_{2x}}$$

and therefore when

$$(3.12) \quad \frac{D_{2x}}{D_{1x}} = \frac{W^{2z}}{W^{1z}}$$

Thus the market boundary between two locations offering A_z is the locus of points at which their attraction is equal.

Multi-purpose tripping effects transport cost savings. How are these savings expended? An example demonstrates that the benefit of multi-purpose tripping comprises the ability to afford more trips. Consider a linear market served by two places, P^1 and P^2, the former offering A_1 and A_2, the latter comprising A_1 only. No other activities or places exist. From (3.6) $F_1 = 1.0$ and $F_2 = 0.5$. By (3.9) $W^{11} = 1.5$ and $W^{21} = 1.0$. At a point, q, between P^1 and P^2, the equality (3.12) is satisfied

$$(3.13) \quad \frac{D_{2q}}{D_{1q}} = \frac{W^{21}}{W^{11}} = \frac{1.0}{1.5}$$

Thus the boundary between M_{11} and M_{21} is at q, which gives three fifths of the A_1 market between P^1 and P^2 to P^1 and the remaining two fifths to P^2. Consumers within M_{21} must visit the larger place specifically to patronise A_2, whereas consumers within M_{11} patronise A_2 during A_1 trips. This appears to violate assumption A1, since transport costs for one group of consumers are F_1, from (3.8), while the other group expends $F_1 + F_2$. Transport cost savings by multi-purpose tripping are commensurate with $W^{ij} - F_j$, which is demonstrable from (3.9). Therefore uniformity of transportation expenditure is maintained only if a consumer at x visits P^i with a frequency equivalent to

$$(3.14) \quad \frac{W^{ij}}{D_{ix}}$$

This model of consumer choice is restrictive in the sense that consumers prefer to travel less often rather than consume smaller quantities, and choose to travel more often rather than increase their consumption. In an environment in which almost all goods are necessities for which demand is relatively inelastic, and in which all persons are to some degree isolated from outside contact, the model may approximate actual choice behaviour. Nineteenth century rural North Americans walked this tightrope between deprivation and isolation (Lesy, 1973).

Business Location

If a businessman assumes that consumers will prefer to engage in multi-purpose tripping, his least risk locational strategy is clear. A

location for A_{j+1} must be selected from existing A_j locations, for otherwise sales are imperilled. Thus the matrix I (3.3) will contain row vectors which are unbroken activity arrays in places and column vectors which are unbroken locational arrays of activities. Properties of I are

$$(3.15) \quad I_{11} = I_{21} = I_{31} = \ldots I_{m1} = 1$$

$$(3.16) \quad I_{11} = I_{12} = I_{13} = \ldots I_{1n} = 1$$

$$(3.17) \quad \text{if } I_{ij} = 0, \; I_{i+1,j} = 0 \text{ and } I_{i,j+1} = 0$$

$$(3.18) \quad \text{if } I_{ij} = 1, \; I_{i-1,j} = 1 \text{ and } I_{i,j-1} = 1$$

The central places in a Christaller system define an incidence matrix which possesses properties (3.15) through (3.18). A Löschian system does not possess these properties. Sets of *identical* rows and column vectors, orders of central places and goods, are an additional characteristic of a Christaller incidence matrix which cannot be deduced from (3.15) through (3.18).

The location of places is determined exclusively by the decisions of businessmen engaged in A_1, for whom A_{j-1} is not a locational constraint. Other businessmen must choose between two kinds of A_{j-1} locations:

1. those that do not yet possess a firm engaged in A_j

2. those that possess at least one firm engaged in A_j.

The first choice affects the pattern of market boundaries, the second influences market shares. The first choice increments $I_{.j}$ in (3.5), which increases F_j in (3.6). The attraction of the place chosen therefore also increases, and the market boundaries of *all* activities A_1, A_2 ... A_j undergo adjustment according to (3.12). Thus a business not only requires a location comprising all activities which occur more often, but also benefits from the presence of any activities which occur more often, since its market is thereby enlarged. The second choice divides M_{ij} in (3.7) into two or more equal parts. A firm's share of M_{ij} may be greater than an exclusive market elsewhere, since M_{ij} increases if A_{j+1}, A_{j+2} ... A_n occupy P^i more rapidly than they occupy adjacent A_j locations. If businessmen select the maximum sales alternative from among a set of least risk possible locations, firms engaged in a single activity may be distributed unevenly among places. This result accords with reality. It does not require an assumption that the agglomeration of firms arises from higher income density in towns (Webber, 1972, page 161).

Furthermore, because M_{ij} expands or contracts as a result of other firms' location decisions -- including those of firms engaged in other activities -- an initially viable market may contract to the point of inadequacy. Although this chapter does not formally define a threshold

market, such a threshold is implicitly a precondition for successful business location. The inferences that transferred consumer allegiance can bring about excess profits or business extinction clearly reflects a real world phenomenon; the changing pattern of business does not arise only from locational rivalry among firms.

The Location of Places

The spacing of places depends on the locational behaviour of businessmen engaged in A_1. The problem is simplified by considering a segment of a linear market. It is assumed that this segment is bounded by two places P^1 and P^2, and that a firm seeks to establish a location P^3 which will provide it with a market, M_{31}. In Figure 3.1

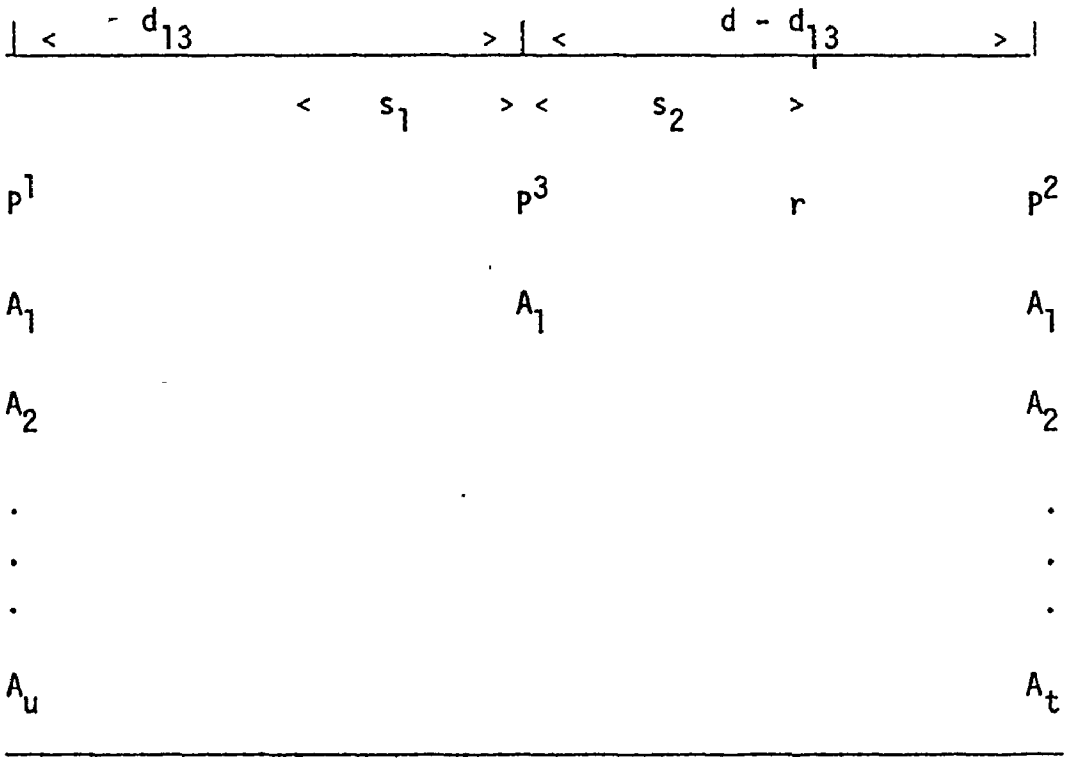
$$(3.19) \quad M_{31} = s_1 + s_2$$

The distance between P^1 and P^2 is equal to d, and P^3 is located at a distance d_{13} from P^1. Suppose that P^3 is chosen with the objective of maximising M_{31}, assuming that no subsequent location, P^4, will be established between P^1 and P^2.

The values s_1 and s_2 can be expressed in terms of F_j, d and d_{13}. From (3.11), given u activities at P^1, and t activities at P^2

FIGURE 3.1

THE LOCATION DECISION IN A LINEAR MARKET CASE



$$(3.20)\quad \frac{\sum_{j=1}^{u} F_j}{d_{13} - s_1} = \frac{F_1}{s_1}, \text{ and } \frac{\sum_{j=1}^{t} F_j}{d - d_{13} - s_2} = \frac{F_1}{s_2}$$

$$(3.21)\quad s_1 \sum_{j=1}^{u} F_j = (d_{13} - s_1) F_1, \text{ and}$$

$$s_2 \sum_{j=1}^{t} F_j = (d - d_{13}) F_1 - s_2 F_1$$

$$(3.22)\quad s_1 = \frac{d_{13} F_1}{F_1 + \sum_{j=1}^{u} F_j}, \text{ and } s_2 = \frac{(d - d_{13}) F_1}{F_1 + \sum_{j=1}^{t} F_j}$$

from (3.19)

$$(3.23)\quad M_{31} = \left(\frac{d_{13}}{F_1 + \sum_{j=1}^{u} F_j} + \frac{d - d_{13}}{F_1 + \sum_{j=1}^{t} F_j} \right) F_1$$

The rate of change in M_{31} with respect to d_{13} is therefore

$$(3.24)\quad \frac{d M_{31}}{d d_{13}} = \left(\frac{1}{F_1 + \sum_{j=1}^{u} F_j} - \frac{1}{F_1 + \sum_{j=1}^{t} F_j} \right) F_1$$

Since the right hand side of (3.24) is negative when u exceeds t, that is when P^1 has a greater attraction than P^2, M_{31} increases with successively lower values of d_{13}. P^3 obtains a maximum market at a location closer to the larger place. When u is equal to t, however,

$$(3.25) \quad \frac{d\, M_{31}}{d\, d_{13}} = 0$$

From (3.25) it is evident that when P^1 and P^2 exert equal attraction, P^3 obtains the same market regardless of its location between them. P^3 locates *at* P^1 or P^2 rather than between them when

$$(3.26) \quad \sum_{j=1}^{u} F_j = \sum_{j=1}^{t} F_j > 3$$

This is because a new A_1 location obtains market equal to

$$(3.27) \quad \frac{\frac{1}{2}\, d}{2} = \frac{d}{4}$$

when it is established at P^1 or P^2; and it obtains the same market at any point between the two places when $W^{11} = W^{21} = 3$. At the mid-point location, for example, when

$$(3.28)\quad \frac{F_1}{s_1} = \frac{3}{\frac{1}{2}d - s_1} \quad \text{and} \quad \frac{F_1}{s_2} = \frac{3}{\frac{1}{2}d - s_1}$$

then

$$(3.29)\quad \frac{1}{2}d = 4s_1 = 4s_2$$

Since $s_1 + s_2$ defines M_{31} (from 3.19)

$$(3.30)\quad M_{31} = \frac{d}{8} + \frac{d}{8} = \frac{d}{4}$$

by substitution from (3.29). Since (3.27) and (3.20) yield the same market, the businessman engaged in A_1 is indifferent between occupying an existing location and establishing a new one. As firms agglomerate, however, the option given by (3.27) is in general

$$(3.31)\quad \frac{M_{ij}}{n} \qquad n = 1, 2, \ldots, k$$

for the k^{th} firm entering business.

If P^3 is able to make any sales, there is a point r (Figure 3.1) such that the consumer is indifferent between P^1 P^2 and P^3 when P^3 locates such that

$$(3.32)\quad \frac{\sum_{j=1}^{u} F_j}{d_{13} + s_2} = \frac{\sum_{j=1}^{t} F_j}{d - d_{13} - s_2} = \frac{F_1}{s_2}$$

In fact P^3 cannot establish a common market boundary with P^2 between r and P^1. If it gravitates toward P^1, as (3.24) suggests it should, P^3 will cease incrementing its market beyond a location which satisfies the equality (3.32), for thereafter it suffers market loss to P^1 immediately to the left of r. Therefore if an A_1 businessman assumes that no competitors will succeed him, he will maximise his market by occupying the closest possible location to a more attractive place that still gives him a market boundary with a less attractive place.

If, however, a new A_1 location is established on the premise that it is *not* the last new location between P^1 and P^2, an appropriate strategy is to maximise the market that P^3 will retain after the location of P^4 has been chosen. Such an objective can be achieved by leaving P^4 with the choice of two alternative locations both of which provide it with a best available market which inflicts minimum market loss on P^3. Clearly, a P^3 location based on (3.32) and (3.24) will not satisfy these criteria, for the more P^3 maximises s_2 in Figure 3.1, the more it stands to lose when P^4 chooses the larger market available within $d - d_{13}$ in preference to a location within d_{13}.

When the attraction of P^1 and P^2 is equal, P^3 must occupy the mid-point between them, for this minimises the best market available to P^4 and also minimises the worst market loss P^3 can suffer, which

approaches s_1 or s_2, or is equal to 1/2 (s_1 + s_2) if the next location is coterminous with P^3. A mid-point location is also socially optimal, for it maximises the number of consumer trips that can be made.

When the attraction of P^1 is greater than that of P^2, P^4 always chooses a position within d - d_{13} if P^3 opts for the mid-point. This is because its share of d_{13} will be greater than its share of d - d_{13}, for any location strategy applied to these alternatives. The greater the disparity in attraction between P^1 and P^2, the nearer to P^2 is the best location for P^3 if the objective is to equalise the market P^4 can obtain and minimise the damage it can inflict.

Thus uniform spacing of places is unlikely to occur if adjacent pairs of places differ in their attraction when new locations are established between them. Early arrivals which expect subsequent locations gravitate away from larger centres, while late arrivals which exhaust the market locate near to larger centres. Centres which are at least three times as attractive as new places repel nearby locations but draw additional firms in activities they already possess.

Summary

From assumptions concerning demand, transport cost, trip behaviour and purchase frequency, it is expected that the market division associated with a consumer-oriented business activity will be based on the relative attraction of places in which the activity is located. This proposition is assessed in the following two chapters. It is also anticipated that multi-purpose tripping promotes perfect order of

entry of activities; the degree to which business arrays exhibited this characteristic in the study area between 1882 and 1910 is evaluated in the sixth chapter. Finally, it is proposed that the selection and rejection of a business location depends on the available market share it offers; this issue is revisited in the latter part of the seventh chapter.

The empirical treatment of business location and consumer behaviour raises further questions concerning the role of choice behaviour and mobility in so far as these factors influenced the location and consumption of retail goods and services. The anticipated pattern outlined in this chapter may therefore be regarded as a framework within which greater understanding of the historical record, and the additional factors noted above, may be attained.

CHAPTER FOUR

MARKET PATTERNS: 1887 AND 1898

"Time is nature's way of preventing everything from happening at once."

Anon. Washroom Graffiti

Introduction

If the previous chapter has any relationship to real world behaviour, the relationship should be manifest in a temporal cross-section describing a pattern of places and their markets. Two such cross-sections are examined and compared in this chapter. The first depicts the pattern of activities and markets in 1887, during a period of growth which continued to 1895. The second describes the pattern as it stood in 1898, just after a dramatic decline and preceding a period of stagnation which persisted to 1910.

The relative attraction of places in 1887 is calculated, and a pattern of expected market boundaries is derived. Actual and expected market areas are compared. Systematic deviations from the number of consumers expected to patronise each post office are identified, and suggest other factors which influence business location and consumer behaviour. Changes between 1887 and 1898 are consistent with the expected evolution of markets and places. The postulated association of place attraction with market division is modified historically by

initial advantage, choice inertia, and business uncertainty.

Expected Market Division in 1887

The attraction of each place as a post office choice is calculated for each directory year studied between 1882 and 1910. Values are listed in Appendix One. The measure of attraction employed is, from (3.9) in the previous chapter

$$(4.1) \quad W^{il} = \sum_{j=1}^{n} I_{ij} F_j$$

Expected market areas in 1887 are defined for post office markets. As the most commonly occurring activity, the post office is defined as A_1 from (3.1). All places in 1887 possessed a post office; therefore from (3.5) and (3.6)

$$(4.2) \quad I_{.1} = \sum_{i=1}^{m} I_{i1} = m$$

Computed W^{il} values are associated with a one mile radius around each place in the study area. The unit distance selected does not affect resultant market boundaries, but does influence the measure of intensity of attraction. Note from (3.10), given that

$$(4.3) \quad W_x^{il} = \sum_{j=1}^{n} \frac{I_{ij} F_j}{D_{ix}}$$

as D approaches zero W_x^{il} approaches infinity, and W^{il} is equal to W_x^{il} when D is equal to one. Using (4.3), concentric circles around each place are drawn corresponding to diminishing values of W_x^{il}. The study area in 1880 was served by a grid of survey roads of equally poor quality, with intersections at intervals of less than two miles (Grey County Atlas, 1880). A straight line distance metric is therefore a reasonable approximation of actual travel conditions, except in the vicinity of the Niagara Escarpment, where unimproved survey road allowances were more common.

Figure 4.1 illustrates the expected pattern of post office market boundaries in 1887. Boundaries are defined by the locus of points at which the maximum value of W_x^{il} is shared by more than one place. At these points consumers are expected to be indifferent in their choice of two or more equally attractive post office locations. Figure 4.1 is reduced from a scale of 1:50,000.

The point pattern in Figure 4.1 maps the resident and non-resident persons listed in the 1887 county directory whose actual post office choice differs from that expected. Above the Niagara Escarpment in Osprey Township, the southeastern quarter of Figure 4.1, the expected pattern of markets generally accords with actual market configuration. The northwestern township, Euphrasia, contains the Beaver Valley re-entrant of the escarpment. Mis-allocation of consumers is evident throughout this township, however, even in its northwestern section, where travel conditions were uniform in 1887.

As Figure 4.2 illustrates, real world post office selection did

FIGURE 4.1: EXPECTED POST OFFICE MARKET BOUNDARIES: 1887

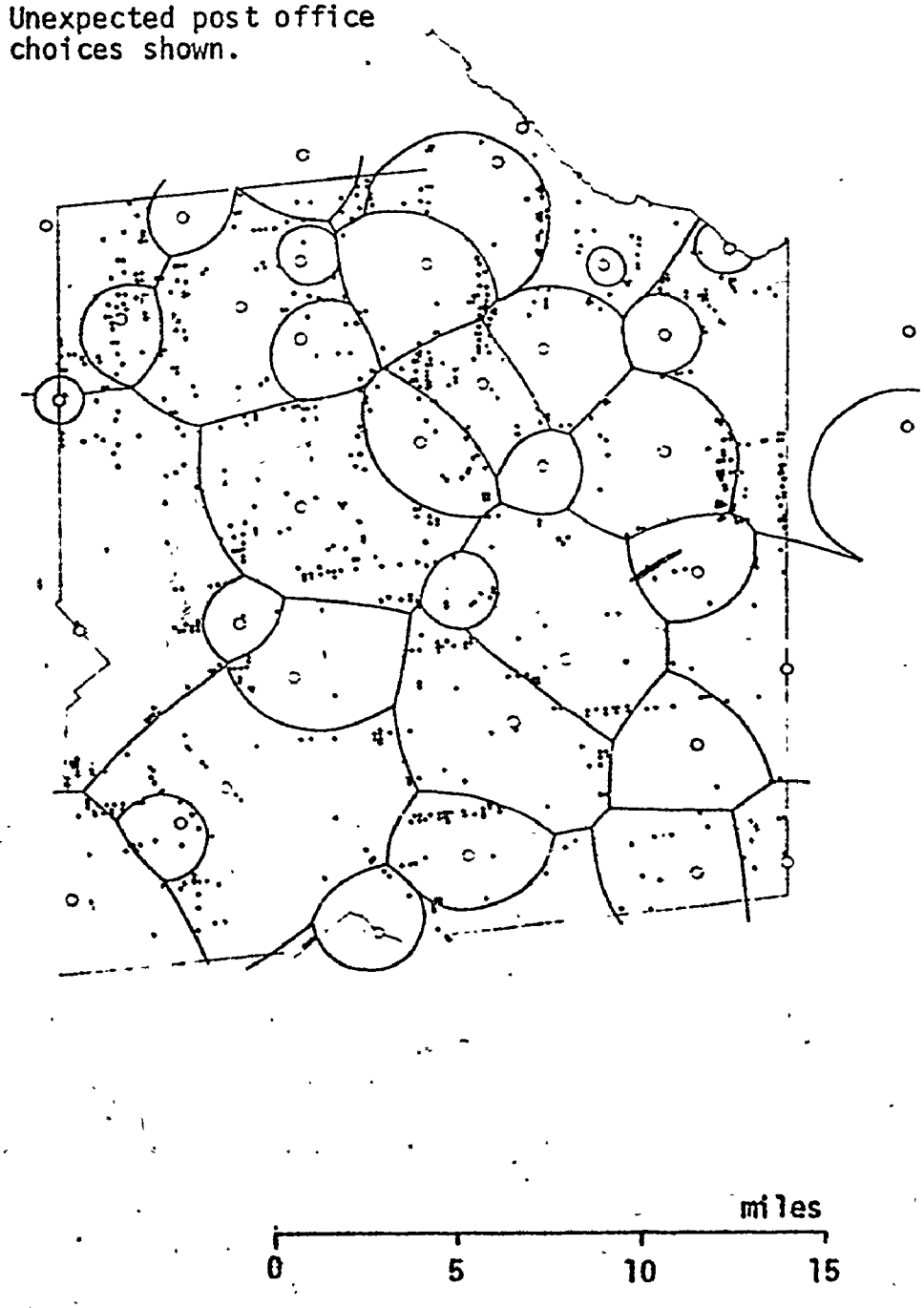
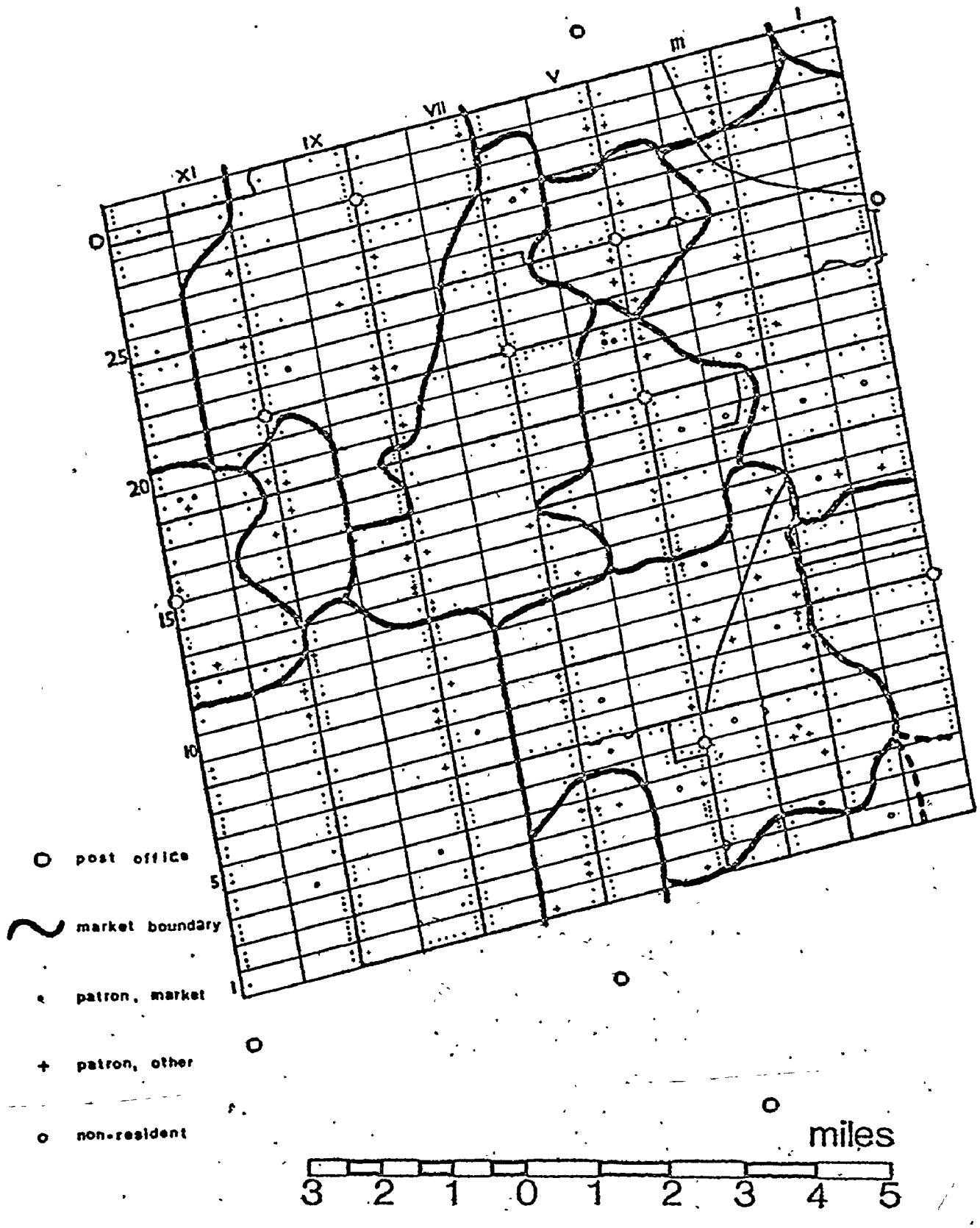


FIGURE 4.2: POST OFFICE MARKETS IN EUPHRASIA TOWNSHIP: 1887



result in distinct market areas. Market boundaries in Figure 4.2 are interpolated from 200 acre survey lots within which no single preference predominates according to county directory evidence. The location of residents and market boundaries within survey lots is approximate.

The configuration of markets within the entire four township area is illustrated by Figure 4.3. It is apparent that places with a greater variety of business activities tend to possess larger post office market areas than places with few activities. This trend is consistent with (4.3).

Actual and expected market areas differ in size as well as shape. As Figure 4.4 shows, the discrepancy between actual and expected conditions is greatest in the northwestern section of Euphrasia. Discrepancies in areas served by post offices located outside the four townships are exaggerated by the fact that only the margins of their market area are considered.

Market dimensions and total consumer demand are regarded as synonymous by assumption A1 in Chapter Three. It is therefore necessary to establish whether this assumption is tenable for Eastern Grey County in 1887. As Figure 4.5 reveals, the percentage of the four township area that lies within each post office's market corresponds closely to its share of the patrons listed in the 1887 County Directory. Rural consumer density may therefore be regarded as relatively invariant within the study area. Only a few places, notably Clarksburg and Heathcote in the intensively cultivated lower reaches of the Beaver Valley, exhibit unusually high or low consumer density. Because it is

FIGURE 4.3: POST OFFICE MARKETS AND PLACES IN 1887

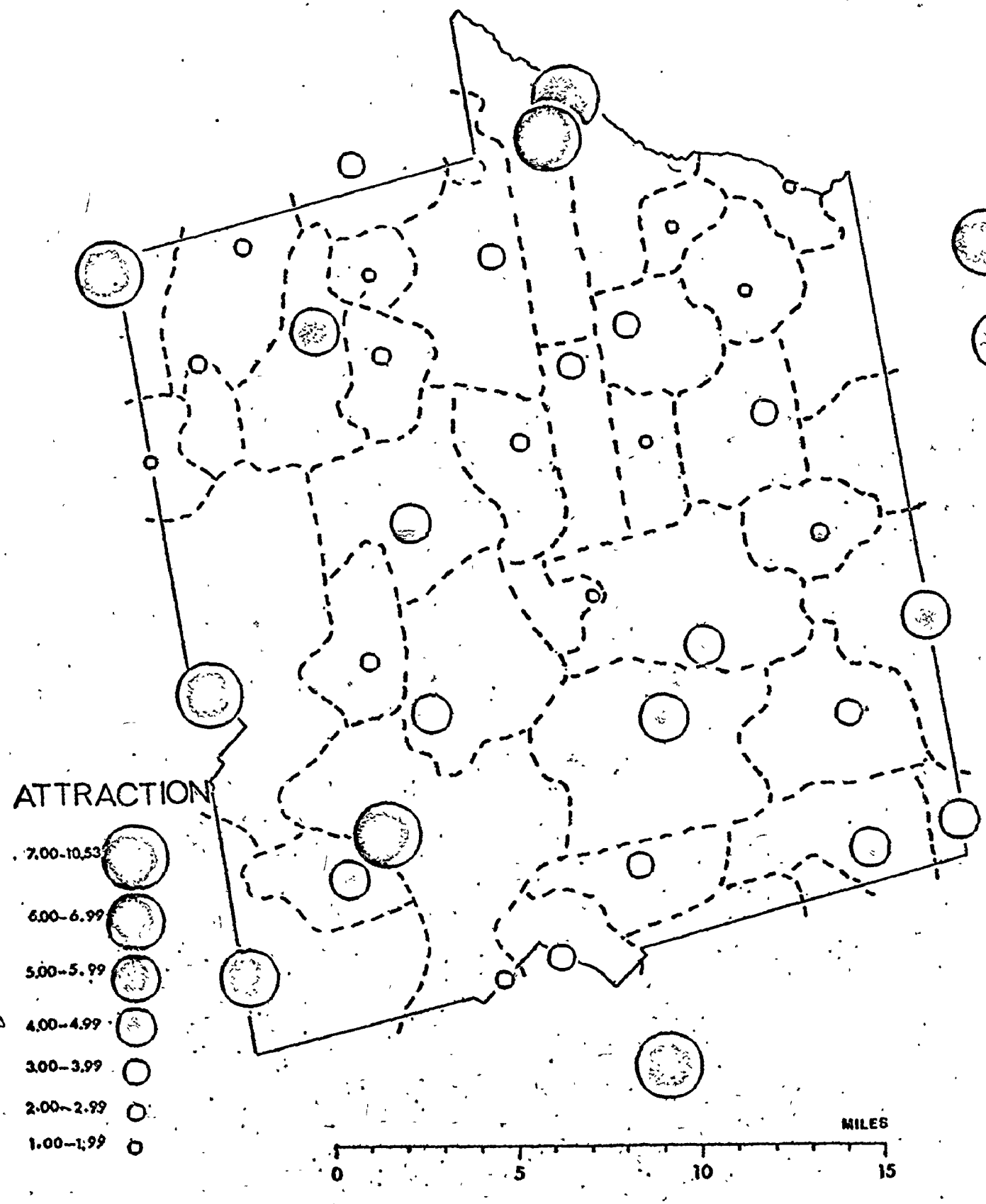


FIGURE 4.4: SIZE DISPARITY OF ACTUAL AND EXPECTED MARKET AREAS: 1887

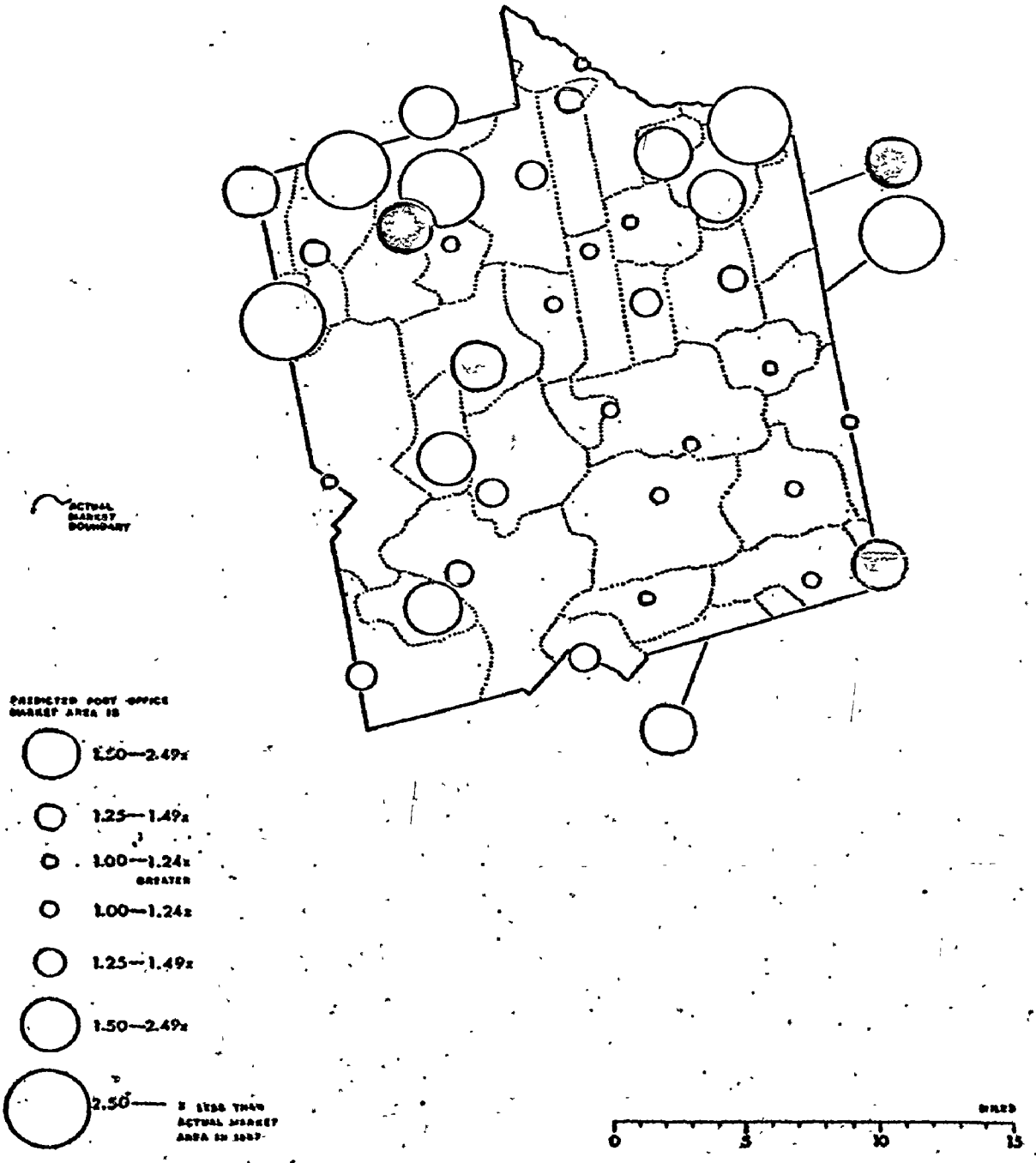
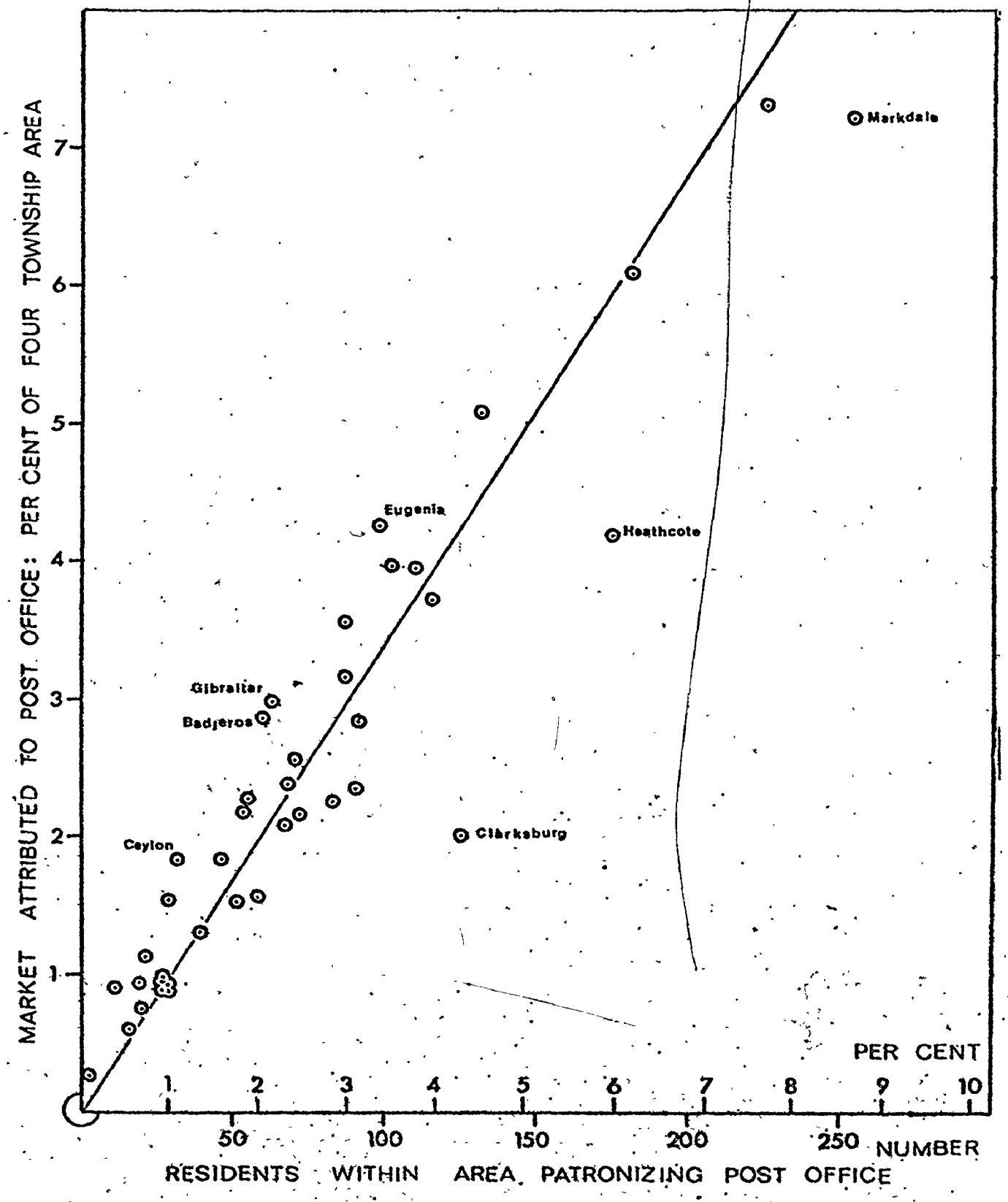


FIGURE 4.5: RELATIVE CONSUMER DENSITY WITHIN POST OFFICE MARKETS: 1887



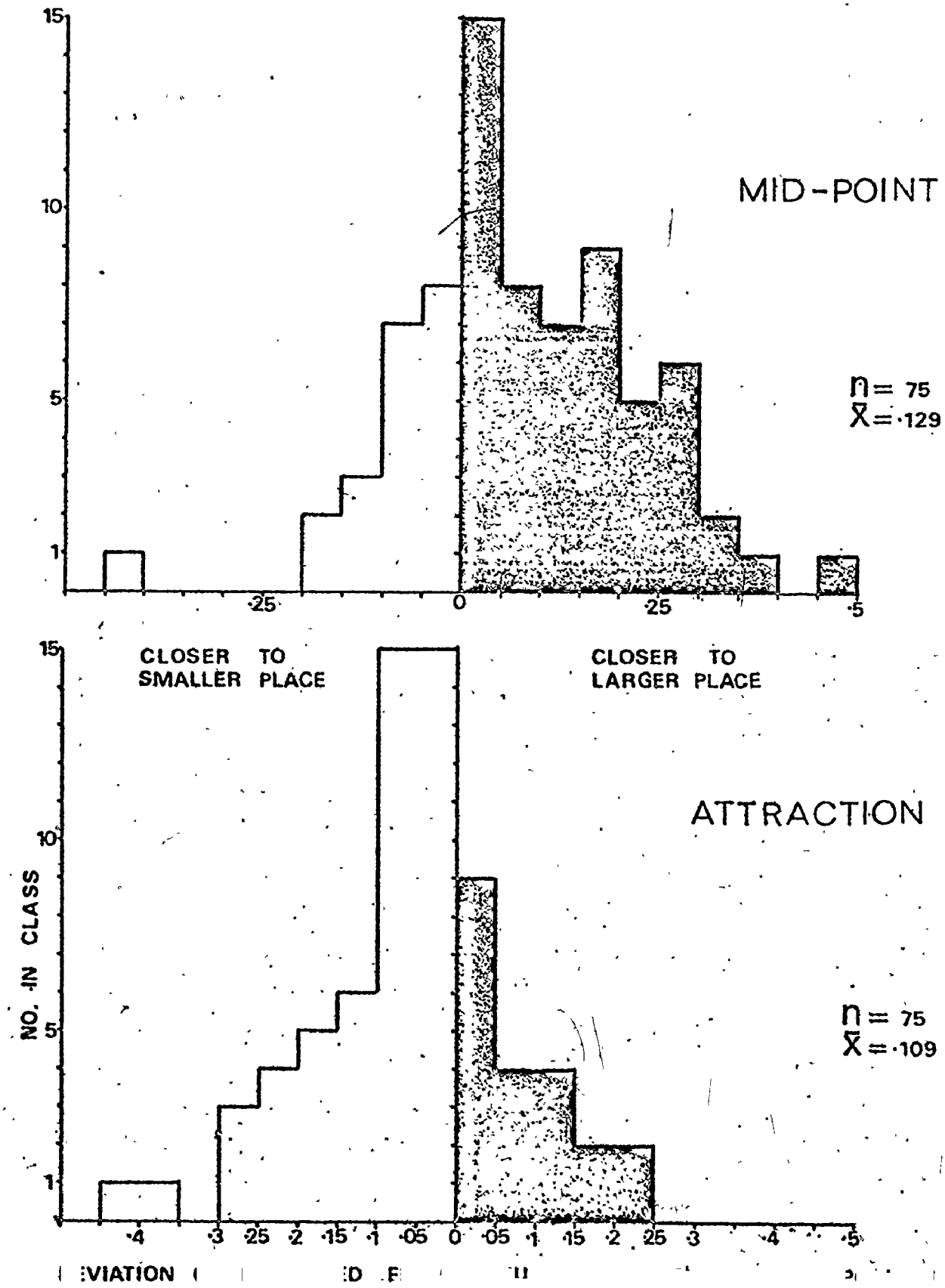
argued in the previous chapter that businesses seek the best available tributary market *demand*, this chapter employs the number of listed post office patrons as a measure of market size.

Before the pattern of expected market areas is set aside in favour of an approach to the problem via linear regression, it is appropriate to ask whether Figure 4.1 furnishes a better estimate of consumer behaviour than an assumption that each consumer patronises the closest available post office. Figure 4.6 indicates that market division based on place attraction tends to place the expected indifference point between the actual point of indifference and the less attractive of two places. Conversely, market division based on expected mid-point indifference tends to place the expected boundary closer than the actual boundary to the more attractive of two alternative choices. The mid-point assumption is the less valid of the two; respective distribution means are given in Figure 4.6. That the impact of place attraction is less than expected suggests either that the friction of distance has been underestimated, or that unspecified factors moderate the pull of attraction. Empirical evidence exists to support the latter alternative.

Market Size and Place Attraction

Systematic deviation from a general relationship between place attraction and market size is observed in the residuals from a linear regression of these two variables. The number of post office patrons is the dependent variable (y) associated with the attraction (x) of

FIGURE 4.6: RELATIVE ACCURACY OF ATTRACTION AND MID-POINT ASSUMPTIONS AS BOUNDARY DETERMINANTS: 1887



36 places serving the study area in 1887 (Figure 4.7). Of 39 places, 3 are excluded from the analysis: these are Dundalk, Maple Valley and Badjeros, all of which serve patrons outside the area covered by the 1887 county directory. In the notation of Chapter Three

$$(4.4) \quad y_i = M_{il}$$

$$(4.5) \quad x_i = W^{il}$$

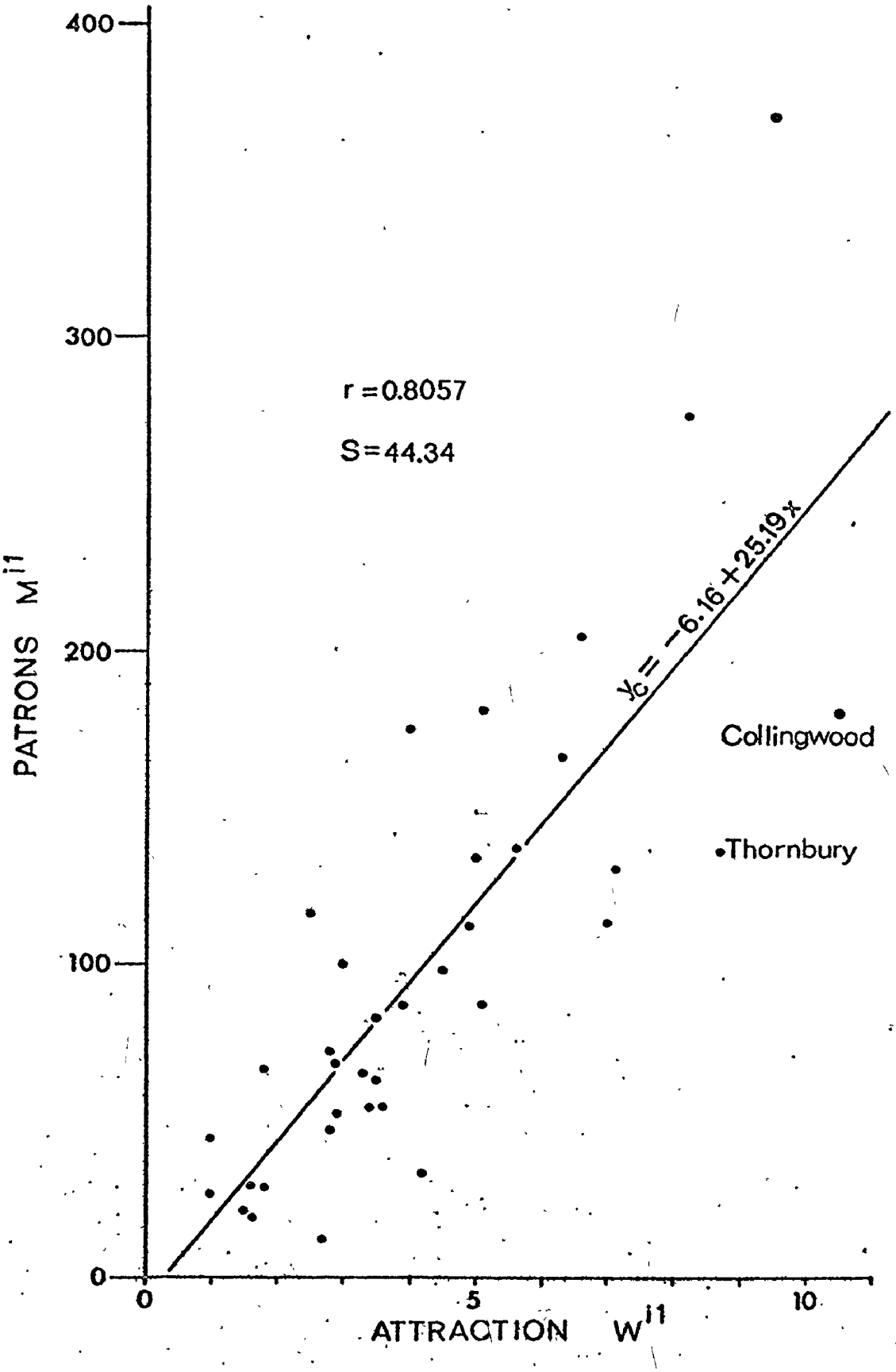
Attraction and patronage values entered in the regression

$$(4.6) \quad y_i = a + bx_i + \varepsilon$$

are listed in Appendices One and Two respectively.

The positive linear relationship ($r = 0.8057$) between attraction and patronage is apparent in Figure 4.7. Two towns, Collingwood and Thornbury, exhibit far fewer than the expected number of listed patrons. This is due to the predominantly urban, and unrecorded, market their post offices serve, and is also related to their location on Georgian Bay, which restricts their rural market to approximately half the size it would otherwise be. A linear relationship between market size and place attraction is an acceptable hypothesis. The r^2 value of 0.6492, however, suggests that the unexplained variance in this relationship merits further examination.

FIGURE 4.7: POST OFFICE PATRONAGE AND PLACE ATTRACTION IN 1887



Analysis of Residuals from the 1887 Regression

Standardised residuals from the 1887 linear regression are computed. Using the form employed by Thomas (1960) the standardised residual is expressed as

$$(4.7) \quad \frac{y_c^i - y^i}{S_{y_c}}$$

in which y_c^i is the value of y computed from the best fit regression of y on x, y^i is the observed value of y and S_{y_c} is the standard error. Positive values of (4.7) therefore indicate that the observed y value is smaller than expected.

Three attributes of places in 1887 are hypothesised as being associated with unexplained variance in the linear regression of market size on place attraction. Association of a regression residual with completeness of the business array, age of post office, and business array stability may be detectable. These three attributes are briefly considered.

Completeness of Array. Whereas Chapter Three argues complete order of entry of activities, this condition is not necessarily satisfied in the real world. An incomplete array of businesses prevents the consumer from engaging fully in multi-purpose tripping; he must go elsewhere to obtain a missing activity. Attraction, W^{ij}, summarises the pull of activities assuming an array to be complete. An index of array completeness measures the degree to which this assumption is

confirmed under real world conditions. The index is

$$(4.8) \quad C^{il} = \frac{\sum_{j=1}^{n} I_{ij} F_j}{\sum_{j=1}^{q} F_j} \quad 100 \qquad 0 < C^{il} \leq 100$$

for a place possessing q activities. Thus C^{il} is equal to 100 if the place possesses all activities between A_1 and A_q. The greater the purchase frequency associated with a missing activity, the greater is the reduction in C^{il}. C^{il} also declines as the number of missing activities increases. The index can be employed as a scalar of attraction, that is

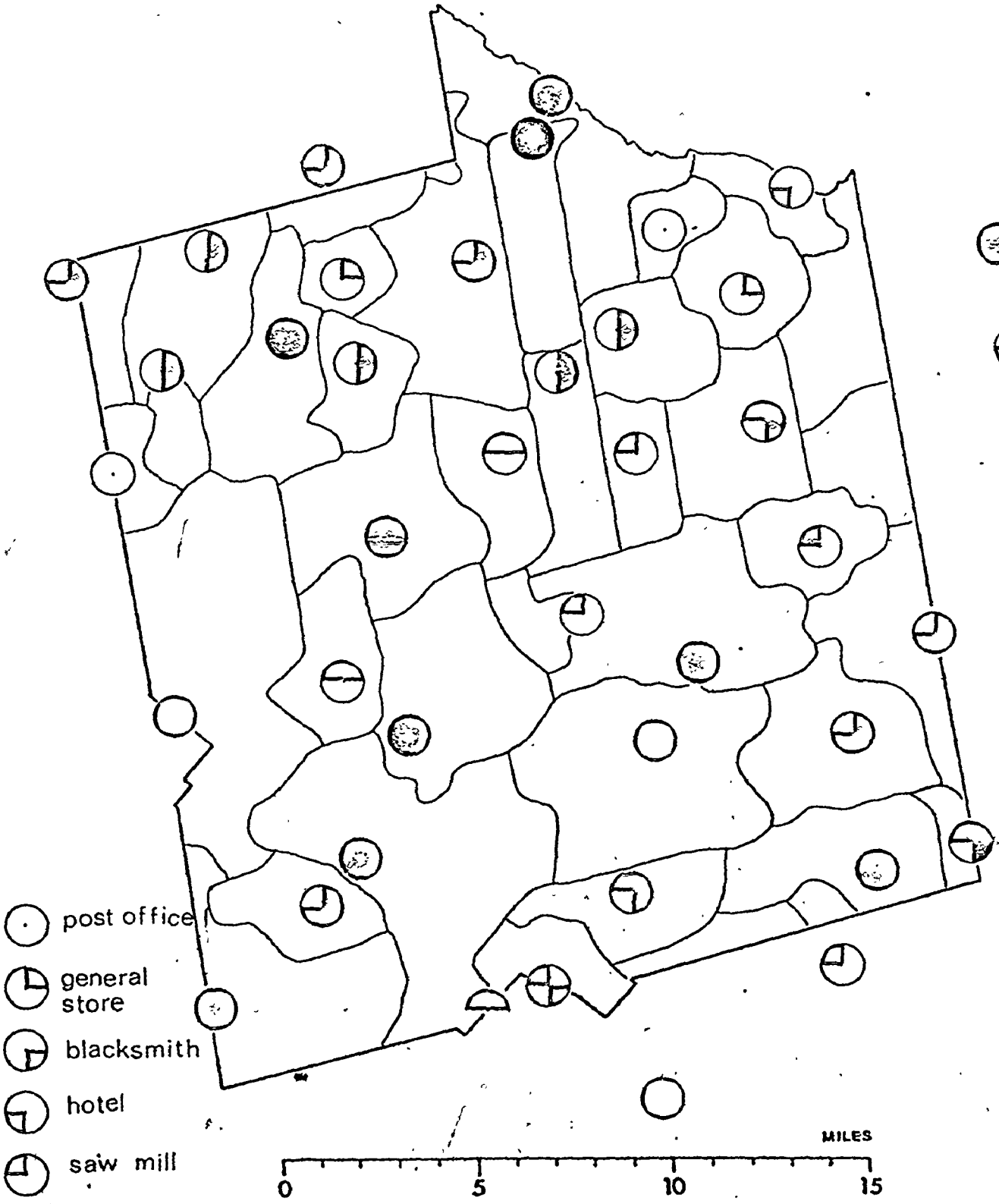
$$(4.9) \quad C^{il} W^{il}$$

In this chapter, however, it is regarded as a separate attribute of places which may tend to reduce their ability to draw customers.

Figure 4.8 illustrates the distribution the five most common business activities in 1887. Several post office settlements possessing a blacksmith, hotel or saw mill lack a general store, despite the fact that only post offices occur more frequently than general stores. Array completeness may well influence consumer choice.

Post Office Age. There is reason to suppose that the date of post office establishment is associated with whether there are more or

FIGURE 4.8: DISTRIBUTION OF FOUR BUSINESS ACTIVITIES IN 1887



fewer patrons given place attraction. Consumer inertia is invoked as the factor which underlies this association; patrons will not necessarily change their postal address immediately when a better alternative is made available. This phenomenon will favour older post offices with an established clientele.

This inertia factor is regarded as being distinct from the additional relationship between post office age and the accumulation of business activities. This degree of accumulation is measured by place attraction, and the surfeit or deficit of consumers *despite* place attraction is a separate effect. In general, older places in the study area did possess more business activities in 1887. The 15 post offices established before 1858 (Campbell, 1958) included 11 of the 15 largest places and 11 of the 15 largest markets. Post office dates of establishment are listed in Appendix Four. Older post offices are expected to possess larger, and newer post offices smaller, markets than are characteristic of a given level of place attraction.

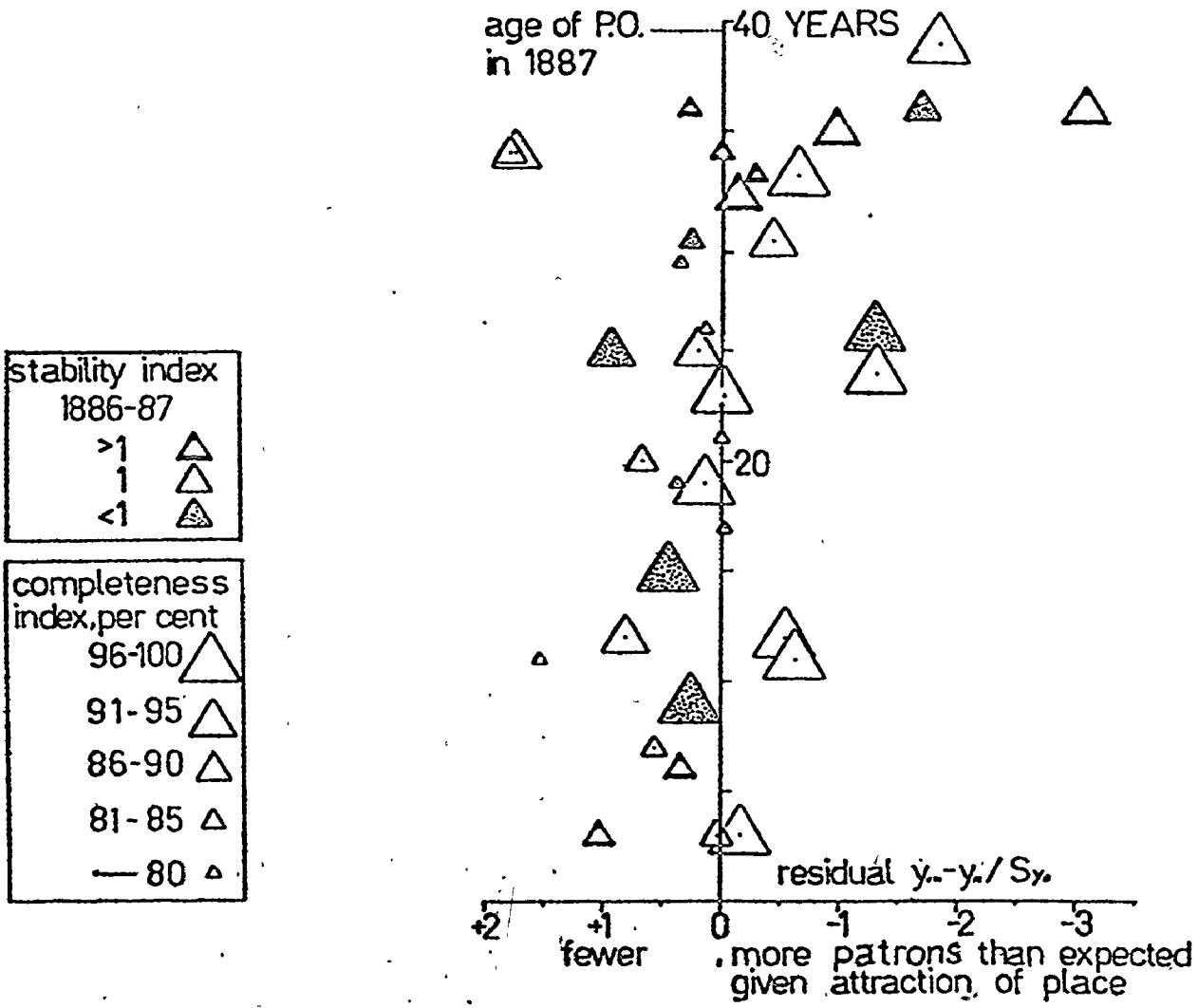
Array Stability. If the association between a place's attraction and its tributary market is weak, this may be due to recent loss or gain in the number of business activities, unaccompanied by as immediate a change in post office patronage. Array stability is defined as

$$(4.10)\quad s^{ij} = \frac{W^{ij}_{t_j}}{W^{ij}_{t_{j-1}}}$$

where t_{j-1} and t_j are successive years in which business directory evidence is available. The years 1886 and 1887 are compared. S^{il} is a measure of short term change in place attraction; it is equal to 1.0 when no change has occurred and exceeds 1.0 when attraction has recently increased. Array stability values are listed in Appendix Three. In 1887 only two places registered a stability value less than 0.9 and only five places exceeded a value of 1.1. The attraction of half the places studied was unchanged between 1886 and 1887. Thus available evidence suggests that short term fluctuation in business arrays plays a minor rôle, if any, in accounting for unexplained variance in consumer choice in 1887.

The Residual Pattern. Figure 4.9 is a scatter diagram of 36 places included in the 1887 linear regression. The horizontal and vertical axes of Figure 4.9 are respectively a scale of standardised residual values and post office age in 1887. Places are also distinguished by their completeness (4.8) and stability (4.10) in 1887. The figure suggests that older post offices have more and newer post offices fewer patrons than expected. Also, 14 of the 17 places with a C^{il} value of 90 or less have fewer than the expected number of patrons, and 8 of the 11 places with the most complete arrays recorded more than the expected number of patrons. The stability index does not, however, appear to amplify the relationship between attraction and market size.

FIGURE 4.9: MARKET RESIDUALS AND THREE ATTRIBUTES OF PLACES: 1887



It is concluded that at least two additional factors are plausibly associated with the pattern of post office markets in 1887. The apparent contribution of post office age is interpreted as an indirect measure of the effect of consumer inertia. The mediating effect of array completeness is interpreted as the degree to which multi-purpose tripping is accomodated by actual conditions. The historical context examined merits a broader conception of the relationship between market and place than that developed in Chapter Three.

A Multivariate Model of Market Division

The number of post office patrons a place commands is hypothesised as being a joint function of its attraction, post office age, array completeness and recent array stability. This hypothesis is tested under conditions prevailing in 1887 and 1898, for 34 and 45 places respectively. The towns Collingwood and Thornbury are deleted for reasons discussed above. A stepwise multiple regression model is employed to test the hypothesis; a programme in the Biomedical package series -- BMD 02R -- is used. This programme enters a sequence of independent variables into the regression; the entry criterion is an F test of significance.

Table 4.1 reproduces the correlations matrices of the five variables noted above for 1887 and 1898. The significance of the departure from zero of an individual correlation coefficient, r, is evaluated by a one-tailed test of Student's t distribution (Spiegel, 1961, page 263). The value of t is equal to

$$(4.11)\quad \frac{r\left(N-2\right)}{\sqrt{1-r^2}}$$

in which N is the number of cases from which the correlation coefficient is derived. Adopting the 95 per cent confidence limit, it is clear from Table 4.1 that a triad of variables -- attraction, age and patronage -- exhibits significant positive correlation both in 1887 and 1898. In addition, array completeness is significantly correlated with age (negative) and stability (positive) in 1898. In 1898 stability value is based on change occurring between 1895 and 1898, a period during which attraction declined rapidly. Table 4.1 suggests that by 1898 greater completeness of array is associated with recently established post offices which have maintained or increased their relative attraction during the preceding three years. The 1887 results do not parallel this observation.

The significance of changes in values of r between 1887 and 1898 is evaluated before the results of the two multiple regressions are discussed. The statistic u is a measure of the significance of a change in the degree of correlation between two variables (Thomas, 1962; King, 1969, page 132). The equation

$$(4.12)\quad u = \frac{(z_1 - z_2)}{\left(\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}\right)^{1/2}}$$

TABLE 4.1

CORRELATION MATRICES OF FIVE VARIABLES INCLUDED IN THE MULTIPLE REGRESSION ANALYSIS OF 1887 AND 1898 PLACES

1887: 34 places

r matrix

VARIABLE		x1	x2	x3	x4	x5
x1 Attributed Patrons	M^{il}	1.000	0.855*	0.683*	0.194	-0.130
x2 Attraction of Place	W^{il}		1.000	0.622*	0.005	-0.078
x3 Age of Post Office, years				1.000	-0.098	-0.276
x4 Completeness of Array	C^{il}				1.000	-0.001
x5 Array Stability	S^{il}					1.000

1898: 45 places

r matrix

VARIABLE						
x1 Attributed Patrons	M^{il}	1.000	0.933*	0.658*	-0.073	-0.060
x2 Attraction of Place	W^{il}		1.000	0.576*	-0.084	0.026
x3 Age of Post Office, years				1.000	-0.291*	-0.173
x4 Completeness of Array	C^{il}				1.000	0.311*
x5 Array Stability	S^{il}					1.000

*Correlation significant at 5 per cent level or less (t test).

yields a statistic of zero mean and unit variance; z_1 and z_2 are the standard scores of the two r values compared, n_1 and n_2 are the populations from which r_1 and r_2 are respectively derived. The null hypothesis is tested that u does not differ significantly from a value u', which is based on the normal distribution function. The result of this hypothesis for four pairs of variables is summarised in Table 4.2.

The increased association between patronage (x1) and attraction (x2) between 1887 and 1898 is evidently a significant trend, for the null hypothesis is rejected within a 95 per cent confidence limit (Table 4.2). The emergent association between array completeness (x4) and stability (x5) is probably significant; there is a .094 chance, however, that the null hypothesis is correct. The diminishing correlations between age (x3) and either patronage (x1) or attraction (x2) are statistically not a significant trend. The evidence therefore suggests that the attrition of businesses that had occurred by 1898 included some adjustment to prevailing market conditions, while a rapid decline in businesses tended to leave a place with an incomplete activity array.

The results of the stepwise multiple regression analyses are reported in Table 4.3. Values of r^2 are respectively 0.8140 and 0.8919 in 1887 and 1898. In both years place attraction is demonstrably the best predictor of post office patronage. The β coefficient values in Table 4.3 reflect the proportion of the variance in the dependent variable accountable to each independent variable (King, 1969, page 140). The variance removed by place attraction leaves some scope

TABLE 4.2

SIGNIFICANCE OF CHANGES IN VALUES OF r BETWEEN 1887 AND 1898

VARIABLES (see Table 4.1)	u	PROBABILITY OF u' (0 < u' < u)
x1, x2	1.724	0.042
x1, x3	0.211	0.416
x2, x3	0.304	0.380
x4, x5	1.314	0.094

TABLE 4.3

RESULTS OF STEPWISE MULTIPLE REGRESSIONS: 1887 AND 1898;
POST OFFICE PATRONAGE AS THE DEPENDENT VARIABLE Y_c^i

Year 1887 Equation $Y_c^i = -211.16 + 24.88x2^i + 1.96x3^i + 1.88x4^i + \epsilon$

n = 34 multiple r = 0.9022 multiple r^2 = 0.8140 S_{y_c} = 34.68

VARIABLE	x1 (y)	x2	x3	x4
Mean	97.82	3.95	21.77	89.29
Standard Deviation	76.66	2.09	11.06	8.86
Computed F		45.06*	7.72*	7.52*
β		0.68	0.28	0.22

Year 1898 Equation $Y_c^i = -37.74 + 38.86x2^i + 1.19x3^i + \epsilon$

n = 45 multiple r = 0.9444 multiple r^2 = 0.8919 S_{y_c} = 30.97

VARIABLE	x1 (y)	x2	x3
Mean	114.49	3.04	28.73
Standard Deviation	92.04	1.96	13.90
Computed F		178.56*	8.40*
β		0.83	0.18

---

*F significant at 99.9 per cent level of confidence. Degrees of freedom are: 3 and 30 (1887 data); 2 and 42 (1898 data).

for the contribution of age and completeness in 1887, but by 1898 any variance accountable to array completeness is subsumed in the first two variables entered in the regression.

Despite the substantial attrition of businesses that occurred between 1895 and 1898, completeness of array and array stability are not significant factors in market division; evidently the selective termination of businesses was generally consistent with prevailing market conditions before 1898 and any variation in the occurrence of business termination was otherwise random in character.

It is noteworthy that when the number of individual businesses had fallen to its 1898 level, arrays were more complete on average (Table 4.4). By 1898 more than eighty per cent of the places examined recorded a C^{11} value of 90 or more. The trend was therefore toward the interdependence of market and attraction anticipated in Chapter Three. By 1898 *relative* differences in post office age had lessened and places were less distinguishable by their level of array completeness.

Clearly, the eleven year interval between 1887 and 1898 provides time for changes in the pattern of consumer preference and business location. The remainder of this chapter is devoted to these changes.

Components of Change 1887-1898

In this period the places lost or gained patronage of their post office, and also exhibited relative loss or gain in their attractiveness as mail collection points. Eight new post offices were opened between

TABLE 4.4

DISTRIBUTION OF COMPLETENESS INDEX VALUES IN 1887, 1895 AND 1898

INDEX VALUE C^{il}	PER CENT OF ALL PLACES		
YEAR	1887	1895	1898
0 - 79	10.00	8.69	2.13
80 - 89	37.50	26.09	17.02
90 - 99	37.50	47.83	55.32
100	15.00	17.39	25.53

See (4.8) for derivation and discussion of completeness index.

1887 and 1898, all of which drew from the market of one or more 1887 establishments. No 1887 outlet ceased operation in the eleven years following.

The market commanded by each post office is expressed as a percentage of the total market commanded by the places studied. This provides a basis for comparing the two years; the absolute number of patrons is not employed for this purpose because the 1898 county directory list is considerably longer than its 1887 predecessor. The difference in percentage market share is therefore employed as a measure of growth or decline.

The residuals from the 1887 multiple regression model provide a measure of the difference between actual and expected patronage. They can be regarded as signifying expected change in market size after 1887, provided that all places retain the same relative attractiveness. A positive linear association is hypothesised between actual and expected change in the market served by each post office. By linear regression of y (actual change in per cent market share) on x (1887 multiple regression residual) the following relationship is obtained for 34 places extant in 1887:

$$(4.13) \quad y_c^{\,i} = -0.2567 - 0.6518x^{i}$$

$$r^2 = 0.5192$$

The standard deviation of y is 0.9530 and the mean is -0.0024. Even

FIGURE 4.10: ACTUAL AND EXPECTED MARKET CHANGE 1887-1898

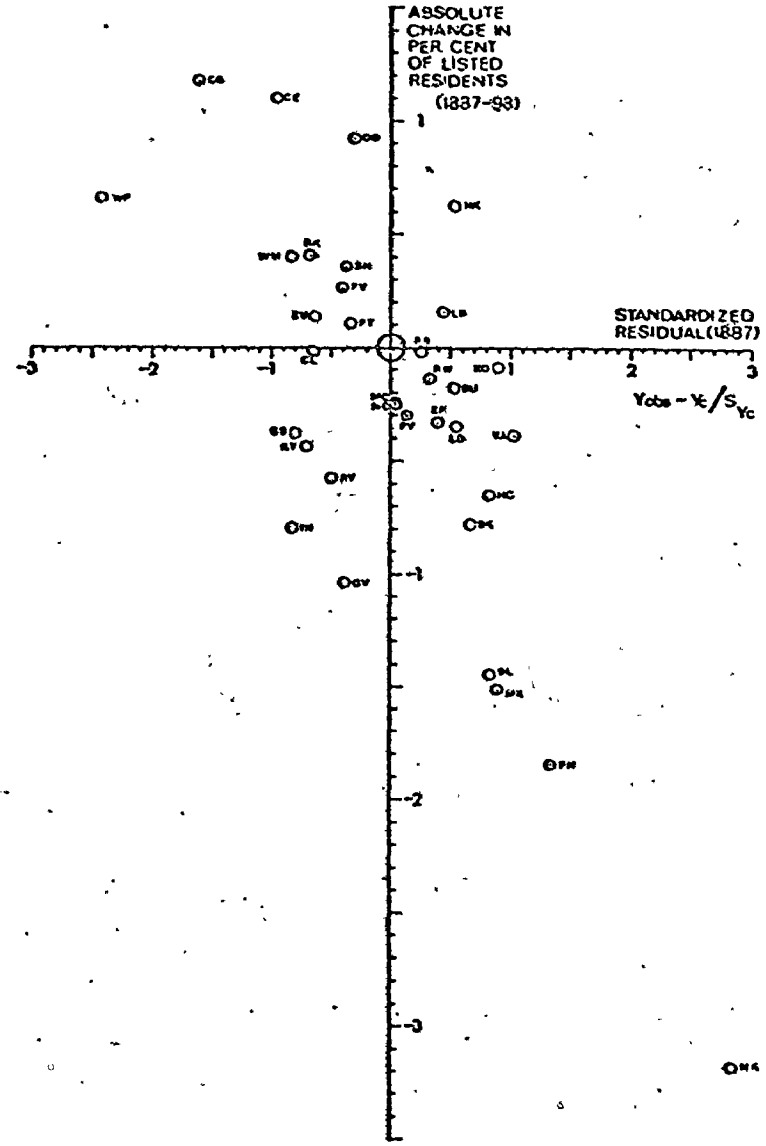
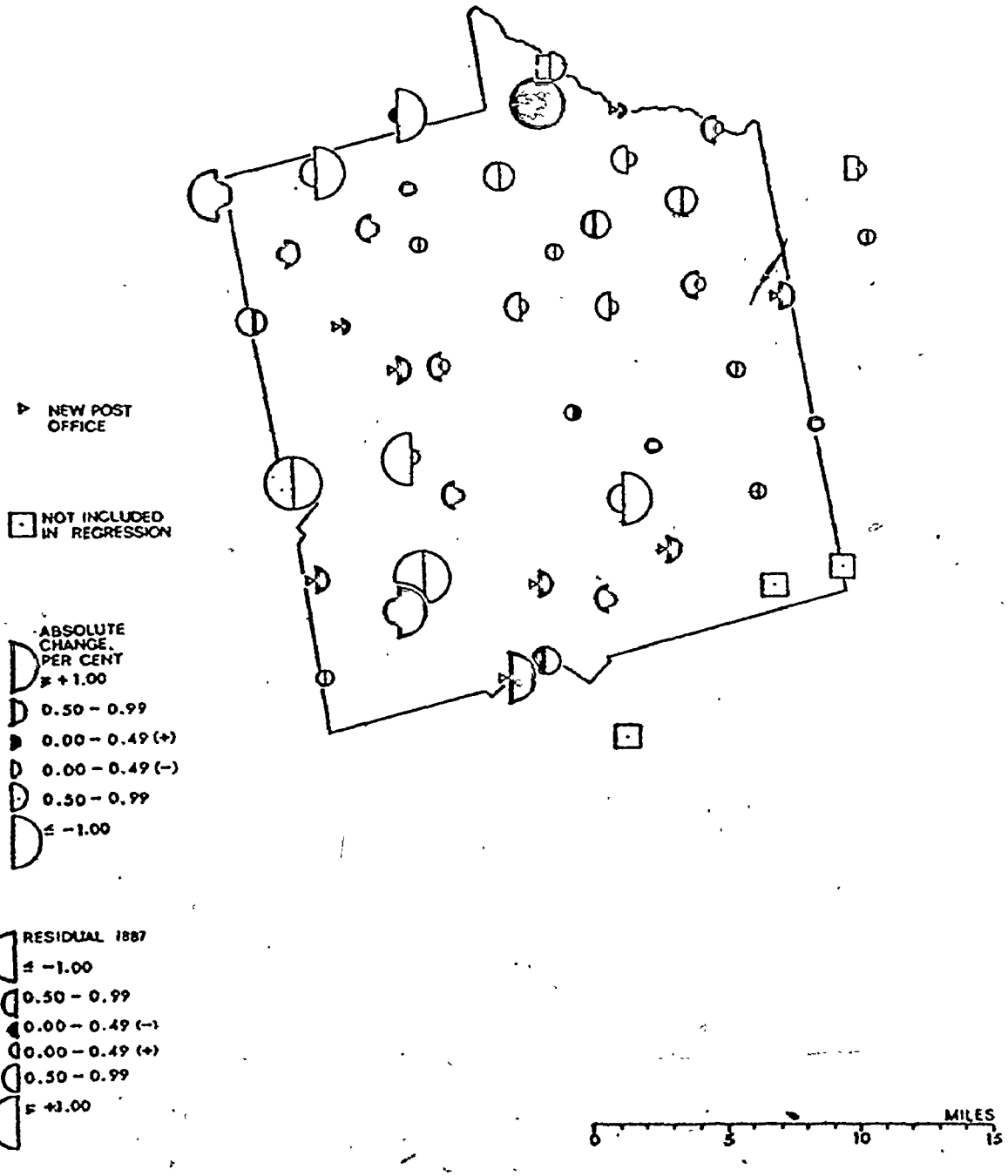


FIGURE 4.11: OBSERVED AND ANTICIPATED MARKET CHANGE 1887-1898



ignoring the impact of new post office establishment and disregarding changes in relative attraction, deviation from the expected norm in 1887 provides a fair estimate of subsequent market evolution. As Figure 4.10 shows, 26 of the 34 places mirrored expected growth or decline in their actual market development.

Of six instances in which decline ensued when growth was expected, four were places whose markets bordered those of post offices established after 1887. As Figure 4.11 indicates, the disparity between observed and expected change is greatest in the vicinity of the eight new post offices.

Variance in (4.13) is also accountable to the changing pattern of business activities. Intuitively, if expected market growth does not occur some businesses will leave, and if expected market decline does not ensue, businesses will enter to capitalise on the available sales potential. Table 4.5 presents evidence that businesses did respond in this manner. Raw residuals, $y^i - y_c{}^i$, are computed from (4.13) and two classes are identified: markets greater than and those less than the median difference between actual and expected market change. Places are grouped by the median change in attraction between 1887 and 1895 and also between 1887 and 1898. A chi squared test of the contingency table for the former period confirms an association between the direction of unexpected market change and relative change in attraction between 1887 and 1895. The null hypothesis that there is no significant association between these attributes cannot be rejected at the 95 per cent level of confidence for the entire period 1887-1898.

TABLE 4.5

CONTINGENCY TABLE: ACTUAL AND EXPECTED CHANGE IN POST OFFICE PATRONAGE VERSUS RELATIVE CHANGE IN PLACE ATTRACTION 1887-1895 AND 1887-1898

Residual: Actual Minus Expected Change in Patronage 1887-1898 (Median = 0.13% Total Patronage in Study Area)	RELATIVE CHANGE IN ATTRACTION			
	1887 - 1895 (Median = 1.26) Number of Places		1887 - 1898 (Median = 0.84) Number of Places	
	G.T. Median	L.T. Median	G.T. Median	L.T. Median
Number of Places Exceeding Median	12	5	11	6
Number of Places Below Median	5	12	6	11
	$\chi^2 = 5.76$		$\chi^2 = 2.94$	

χ^2 to reject null hypothesis at .05 significance level = 3.84

Thus Table 4.5 provides only partial confirmation of the argument that unexpected shifts in patronage are accountable to the changing pattern of business location.

There is order in markets and the size of the places that serve them. There is order too in the effect of consumers who are slow to change and businessmen who are slow to respond. There is order even in change, in the interplay of places and markets. The results identify structural relationships, but the patterns give no more than a hint of individual behaviour. A complete account of consumer choice and business location requires a more searching examination of the historical record.

CHAPTER FIVE

CONSUMER CHOICE AND RURAL SOCIETY

"In America, everyone is his own best judge of his needs".

Alexis de Tocqueville

We are able to state that between 1887 and 1898 expected change in post office patronage occurred. As yet, we do not know how this patronage was transferred. If there are attributes of places which render them more or less likely to be chosen, it is equally likely that the nineteenth century consumer possessed attributes which qualified his choice behaviour. Two such attributes are examined in this chapter, respectively residential persistence and the propensity to imitate the choice behaviour of neighbours. Both are found to be important elements in the changing pattern of markets.

The assumption that post office patronage if founded only on the desire to achieve the maximum benefit from consumer trips is also open to question. Distinct tributary areas arising from post office selection suggest parallels with those other institutions in rural Ontario which partitioned the nineteenth century landscape. Like the chapel, school, hall and lodge, the post office may have been a key element in the structure of rural communities as well as in the pattern of businesses. If so, allegiance to a post office may transcend shopping

behaviour. This aspect of choice behaviour is indirectly observable in late nineteenth century Eastern Grey County. Small places declined not because they were visited less often, but because less money was spent in them.

Market Area Change and Choice Transfer

Market boundary changes in one of the four townships studied are illustrated in Figure 5.1. Euphrasia Township provides several extreme cases of deviation from the expected market pattern in 1887 (Figure 4.1). Two new post offices, Erskine and Wode House (Figure 5.2) were established in Euphrasia between 1887 and 1898; the markets they served were mostly detached from tributary areas of Markdale and Kimberley. Extensive market area change also took place in the northwestern quarter of Euphrasia. In this area much of the market commanded by Blantyre in 1887 was served by Goring or Rocklyn eleven years later. This transfer is consistent with the limited number of activities present at Blantyre between 1882 and 1903 (Figure 5.2). Other market adjustments also appear to be related to the relative attraction of places; Kimberley's gains from Epping exemplify this. Heathcote and Fairmount's gains from Griersville are also consistent with differences in attraction.

At a local level it is evident that choice transfer between 1887 and 1898 was a complex phenomenon. Figure 5.3 illustrates a 12,000 acre tract of northwestern Euphrasia bounded by four post offices in 1898. The expected indifference point, x, between two post offices is

FIGURE 5.1: POST OFFICE MARKET BOUNDARY CHANGE: EUPHRASIA 1887-1898

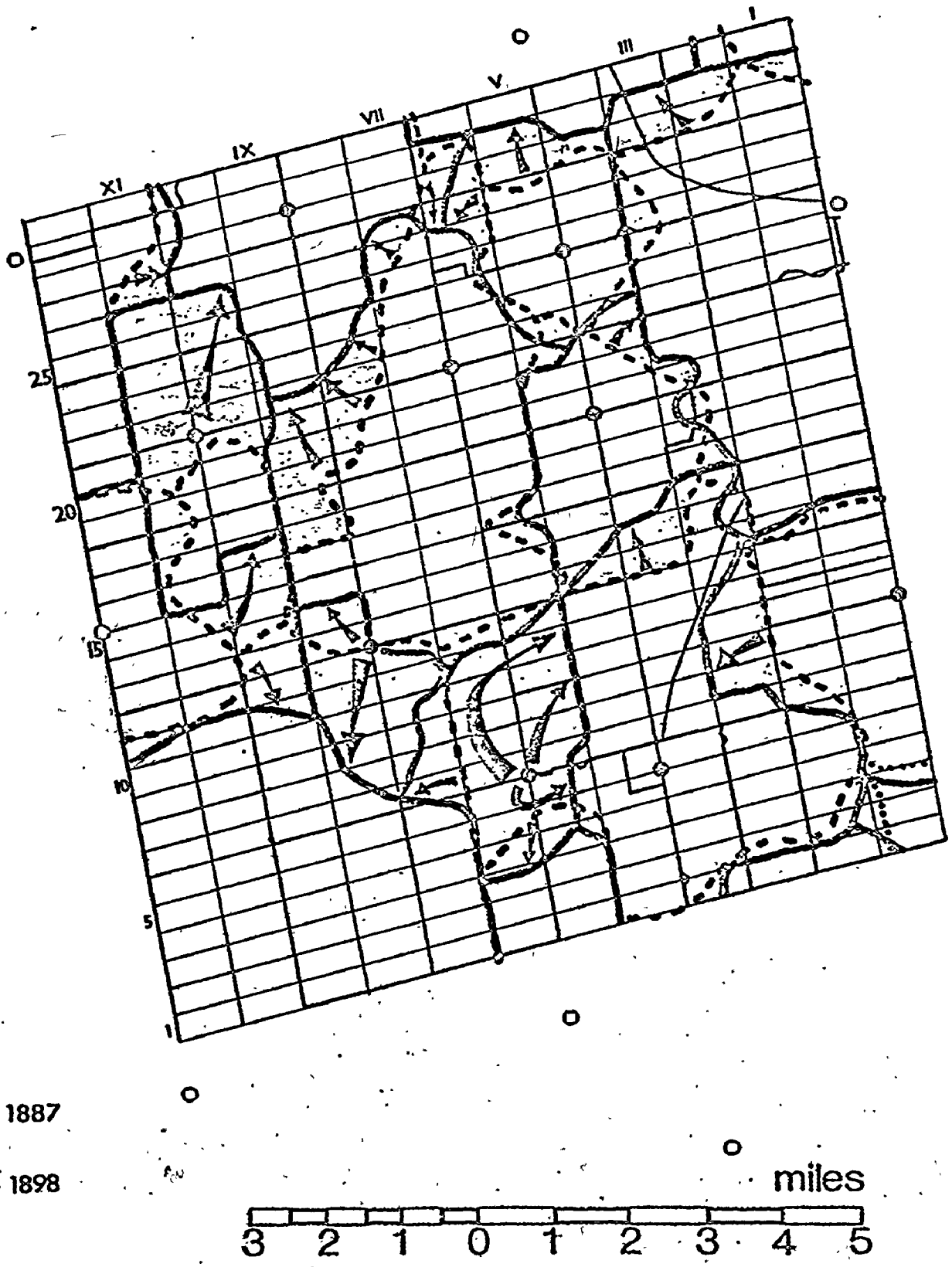


FIGURE 5.2: BUSINESS ACTIVITIES IN PLACES: EUPHRASIA 1882-1903

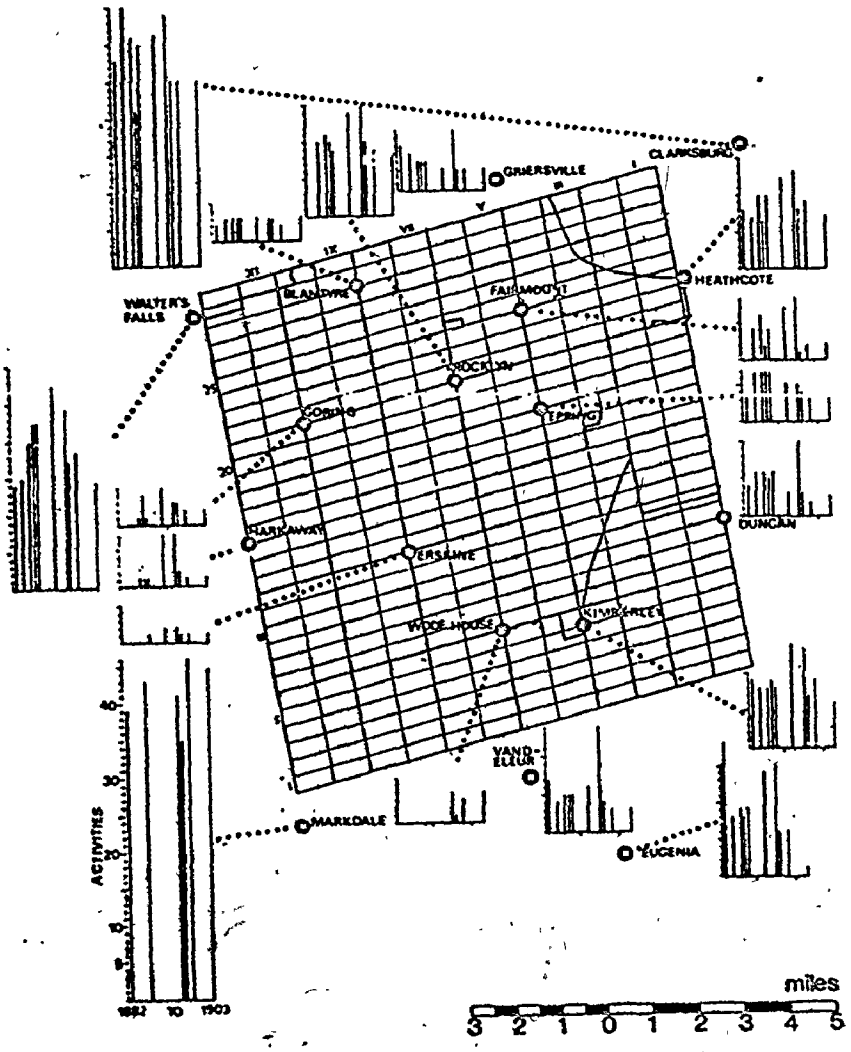
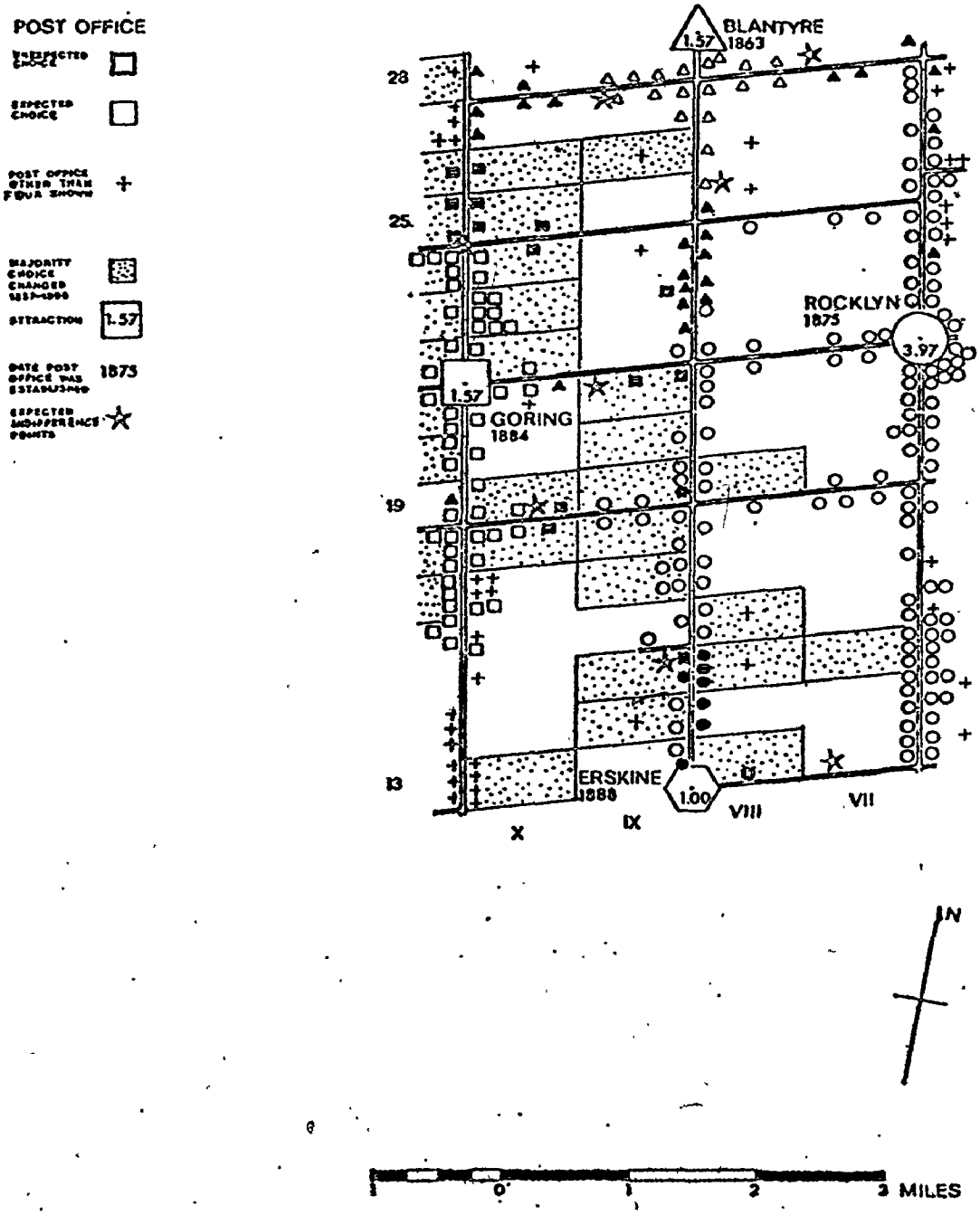


FIGURE 5.3: CONSUMER CHOICE OF FOUR POST OFFICES IN EUPHRASIA: 1898



based on the equality

$$(5.1) \quad \frac{W^{i1}}{D_{x1}} = \frac{W^{21}}{D_{x2}}$$

when D_{xi} is the shortest road distance between x and a place with attraction W^{i1}. Thus post office age and array completeness are not entered as choice criteria. Residents whose choice is unexpected, given (5.1), are identified in Figure 5.3. Ten unexpected Blantyre patrons and seven unexpected Rocklyn patrons occupy distinct segments of the ninth concession road. Evidently consumer inertia, inferred from post office age, was still a choice factor in 1898. Blantyre, the oldest of the four post offices, lost less than expected between 1887 and 1898, while Erskine, established in 1888, had not won over several Rocklyn patrons within a mile's walk of the Erskine post office. The fact that Goring's expected market is smaller than the area it actually serves in 1898 is probably related to the fact that six Goring businesses in 1887 had dwindled to two activities eleven years later. After Blantyre addresses had become Goring addresses the wisdom of such a change had diminished.

Figure 5.3 illustrates several instances in which a resident's choice does not mirror that of his immediate neighbours. The Blantyre patrons on Concession XI, lot 19 and Concession X, lot 21 exemplify this phenomenon. Choice transfer and choice persistence are attributes of individuals, not of space.

Four factors are thought to have delayed the transfer of post office patronage:

1. Inertia. If the relative merits of a current and a prospective choice did not differ markedly, the option of taking no immediate action may have been preferred.

2. Inconvenience. Collecting mail at a less attractive location may be preferable to the inconvenience associated with changing one's address.

3. Uncertainty. Evaluating a prospective new postal address involved weighing a known quantity against incomplete knowledge concerning an alternative. There was also no assurance that an alternative address would retain its advantage.

4. Alienation. Regular trips to the post office entailed contact with local residents. To change an address was to relinquish part of a social network.

The effect of these four factors depends on how long a person has retained a postal address; in particular alienation and inconvenience will be greatest for long-standing patrons. In contrast, the recent arrival has fewer close contacts to sacrifice, has not established a

set pattern of behaviour, has less resistance to change and is *equally* ignorant of the merits and demerits of a set of alternatives. An association between residential persistence and the incidence of choice transfer is therefore expected.

Population Turnover and the Pattern of Transferred Choice

Scholars in the field of social history are accumulating evidence concerning rural population mobility in the nineteenth century (Alcorn and Knights, 1975). High rates of population turnover were clearly as endemic in Ontario as elsewhere (Gagan, 1973). Euphrasia township is no exception in this respect. The persistence of ratepayers may be measured by comparing the Euphrasia entries in the 1887 county directory with those of its 1898 successor. The occurrence of choice transfer can also be identified by examining recorded postal addresses.

The Euphrasia list comprises 791 persons in 1887 and 1078 persons in the 1898 directory. The total population of the township was almost identical in these two years, 3100 and 3171 persons respectively.[1] Thus while there is reason to suspect that a person listed in 1898 but not 1887 was in fact a non-taxable Euphrasia resident in 1887, it is much less likely that a person listed in 1887 but not 1898 was still a Euphrasia resident in 1898. A satisfactory basis therefore exists to identify the persistence and choice behaviour of the 1887 cohort.

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[1] Ontario Department of Agriculture. *Annual Report of the Bureau of Industries for the Province of Ontario, 1892* (Toronto, 1894). The population of Euphrasia in 1898 was reported in the Bureau of Industries for that year.

Record Linkage. Three record linkage criteria were employed: surname, first name, and location. A listing in both the 1887 and 1898 directory was assumed to refer to the same person if:

1. surname, first name, lot and consession were identical;

2. surname, lot and concession were identical, but a minor spelling discrepancy distinguished the first name in the two directories;

3. first name, lot and concession were identical, but a minor spelling discrepancy distinguished the surname in the two directories;

4. surname and first name were identical, but the lots recorded were adjacent; these cases were regarded as *possible* instances of residential relocation; or,

5. surname and first name were identical, but the lots recorded were neither identical nor adjacent; these cases were regarded as *probable* instances of residential relocation.

Based on these linkage criteria, 59.3 per cent of residents on the 1887 list still remained eleven years later (Figure 5.4). The 1887 cohort diminished at a rate of 4.13 per cent per annum. The age-

specific mortality rate of males over 20 within the Grey East Census District in 1881 was 0.90 per cent per annum.[2] The 1887 list comprised almost exclusively males, and constituted one quarter of Euphrasia's population. Males over 20 in Grey East also constituted one quarter of the district's population. For every death that reduced the 1887 cohort there appear to have been approximately three individuals who simply left the township. As Figure 5.3 indicates, those persons who replaced 1887 predecessors were unlikely to share their surname. Replacements with different surnames outnumbered apparent male blood relatives by 5.5 to 1. Married daughters inheriting the family farm cannot be identified in the directory record; if they were as numerous as male relatives distinguished by linkage there was approximately a 2.2 to 1 ratio of purchase of vacated parcels to land inheritance. A value between the two ratios above is consistent with the probable mix of transience and mortality in the 1887 cohort.

Thus a credible pattern of persistence and replacement emerges in the course of county directory linkage. Of the 1887 cohort, 3.9 per cent apparently relocated within Euphrasia and a further 6.4 per cent almost certainly did so. The post office choice behaviour of five groups is detectable:

1. 1887 residents who had not moved by 1898;

2. 1887 residents who had "moved" to an adjacent lot by 1898;

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[2] *Census of Canada*. 1881. Vol. 2, pages 376-377, 100-115.

3. 1887 residents who had moved beyond an adjacent lot to another Euphrasia location by 1898;

4. 1898 residents who had replaced 1887 residents sharing the same surname; or

5. other 1898 residents who had replaced 1887 residents.

Post Office Retention and Choice Transfer

Each of the five groups listed above is distinguished according to those persons who retained an 1887 postal address and those who did not (Figure 5.4). Of the latter those who adopted one of the three most recently established post offices are distinguished from those who chose a post office established before 1884. The choice behaviour of the five groups is summarised in Table 5.1. As expected, persistent residents (Group 1) were those least likely to change a postal address. Even if they did change, they were also least likely to opt for an older post office. The three new establishments, Goring, Wode House and Erskine effected a change in the pattern of accessibility to which even the inertia of persistent residents was not immune. Provided persistent township residents moved further than one lot, they were quite likely to have altered their patronage by 1898 (Group 3); evidently convenience outweighed allegiance. Those who replaced 1887 residents (Groups 4 and 5) were, regardless of kinship, prone to reject their predecessor's choice.

FIGURE 5.4: 1887 COHORT LINKAGE

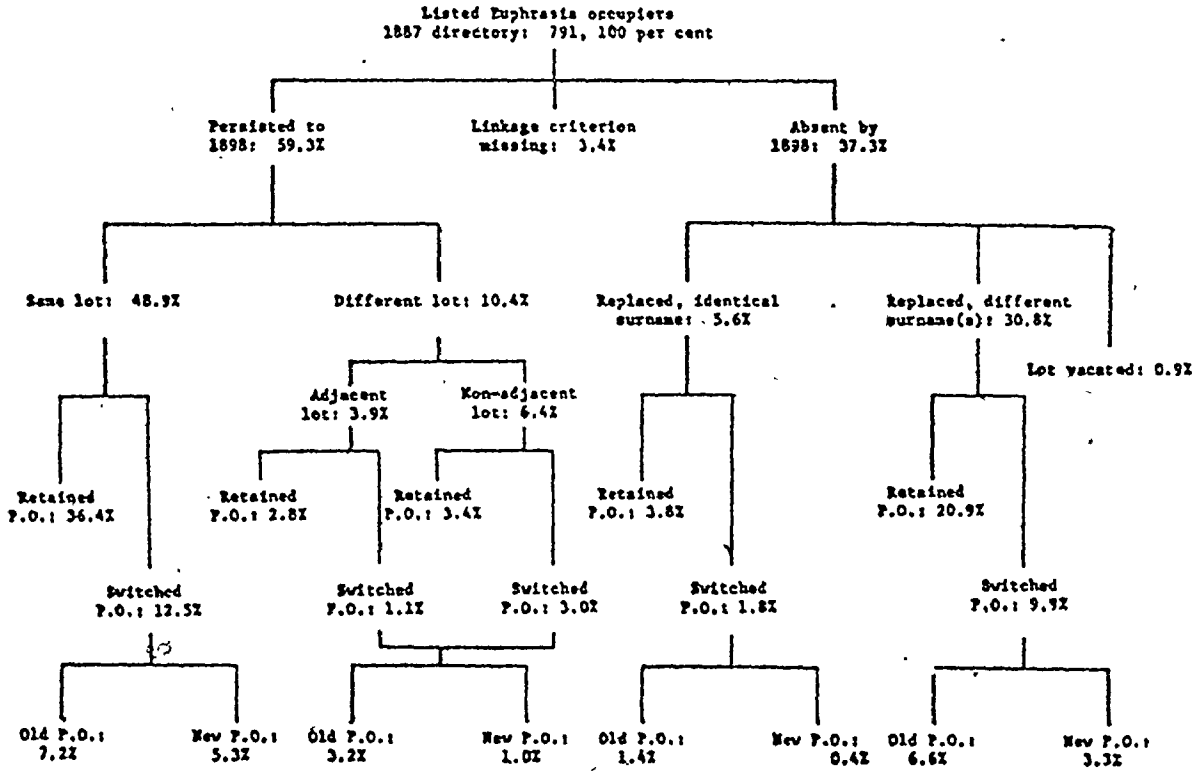


TABLE 5.1

CHANGE OF POST OFFICE 1887-1898, BY SELECTED GROUPS OF EUPHRASIA RESIDENTS IN 1898

	GROUP					
	1	2	3	2 AND 3	4	5
Number in Group	387	31	51	82	44	251
Post Office Choice in 1887 and 1898 Differed, Per Cent	25.6	29.0	47.0	41.2	31.8	31.1
Pre-1884 Post Offices as Per Cent of Choices Which Differed	57.8	n.d.	n.d.	75.6	78.6	66.6

NOTE: See text for specification of groups.

Do the apparent differences noted in Table 5.1 reflect a significant relationship between persistence and choice transfer? The null hypothesis states that the incidence of choice transfer by persistent residents does not differ significantly from that of the replacement population. Group 1 in Table 5.1 is therefore compared with groups 4 and 5 combined. Transfer to post-1884 post offices is not considered, because a choice based on a change in relative accessibility is not relevant to the hypothesis. Groups 2 and 3 are disregarded for the same reason.

The resultant contingency table is reproduced in Table 5.2; expected cell frequencies are based on the assumption that the choice behaviour of each group is that of both groups combined. The null hypothesis is rejected at the .975 confidence level by a chi-square test of significance. The hypothesis that the occurrence of post office choice transfer by persistent residents is less than that of more recent arrivals is accepted.

The apparently greater propensity of persistent residents to choose newer post offices in the course of choice transfer is evaluated. The same groups as above are compared (Table 5.3). The null hypothesis that the groups do not differ significantly is not rejected at a .95 level of confidence. Thus persistent residents who did transfer their patronage were not notably more likely to opt for one of the three newer post offices.

These results suggest that the pace of market adjustment increases with the level of population turnover. Geographical variation in the

TABLE 5.3

CHI-SQUARE SIGNIFICANCE TEST OF BETWEEN GROUP DIFFERENCES IN POST OFFICE CHOICE BEHAVIOUR

	GROUP			
	1		4 AND 5	
	Persistent Residents Frequency		1898 Replacements Frequency	
BEHAVIOUR	Observed	Expected	Observed	Expected
Retained Post Office or Chose Post-1884 Post Office	330	318.9	232	243.1
Chose Pre-1884 Post Office	57	68.1	63	51.9

$\chi^2 = 5.07$ $\chi^2_{.975} = 5.02$

TABLE 5.3

CHI-SQUARE SIGNIFICANCE TEST OF INCIDENCE OF TRANSFER TO POST-1884 POST OFFICES, BY GROUP

	GROUP			
	1		4 AND 5	
	Persistent Residents Frequency		1898 Replacements Frequency	
BEHAVIOUR	Observed	Expected	Observed	Expected
Chose Post-1884 Post Office	42	36.8	29	34.2
Chose Pre-1884 Post Office	57	62.2	63	57.8

$x^2 = 2.43$ $x^2_{.90} = 2.71$

turnover level arguably affects market configuration.

The Market Impact of Population Turnover

The pattern of transience and choice transfer is illustrated in Figure 5.5. At least one 1887 resident remained on 81 per cent of all occupied Euphrasia township lots in 1898. At least one 1887 resident also remained on 84 per cent of the lots in which a change in the preferred post office occurred between 1887 and 1898. Thus local continuity in market allegiance was *not* more likely if there had been simple continuity of residence as well. Figure 5.5 does not, however, establish whether persistent residents or newcomers formed a *majority* on a lot.

Persistent 1887 residents were present on 279 lots in 1898, of which 197 lots exhibited no change in majority post office preference. The average density of 1887 residents on the latter group of lots was 1.9 persons per lot. On the remaining 82 lots the density of persistent residents in 1898 was 1.5 persons. In contrast, the density of new arrivals on the 197 lots was 1.5 persons, and on the 82 lots 1.7 persons. The null hypothesis that there is no significant relationship between occupant composition and the incidence of choice transfer is rejected at the .95 level of confidence (Table 5.4). Persistence does pose a resistance to market area change; its effectiveness is greatest when established patrons are numerically superior to neighbours who are newcomers. This is interpreted as an effect of imitative behaviour; an individual's preference can be reinforced or undermined by the

FIGURE 5.5: RESIDENTIAL PERSISTENCE AND CHOICE TRANSFER: EUPHRASIA 1887-1898

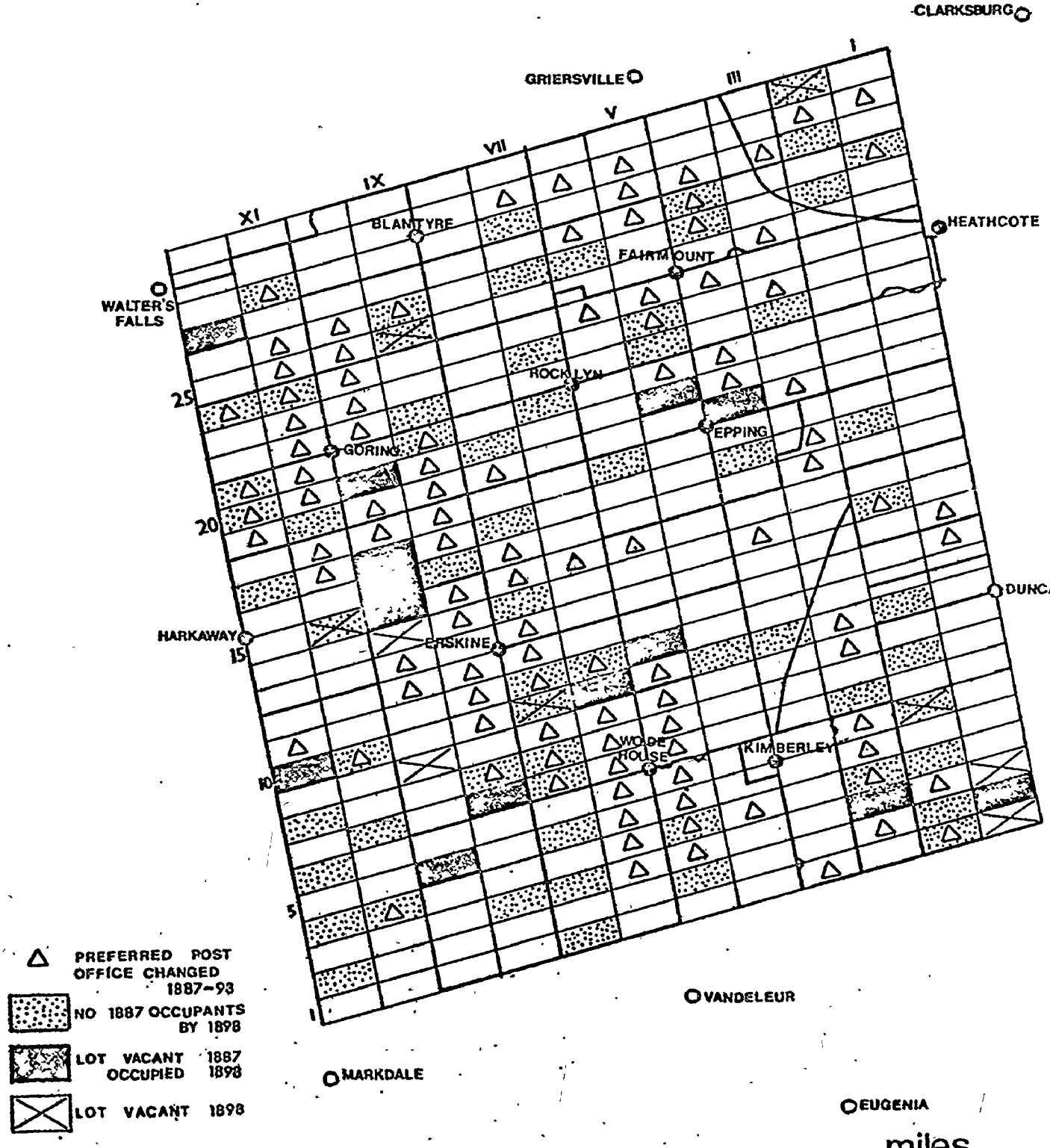


TABLE 5.4

CHI-SQUARE SIGNIFICANCE TEST OF 1898 RESIDENT COMPOSITION VERSUS INCIDENCE OF TRANSFERRED CHOICE ON 279 EUPHRASIA LOTS RETAINING AT LEAST ONE 1887 RESIDENT

	GROUP			
	Remaining 1887 Residents Frequency		1898 Residents Absent in 1887 Frequency	
	Observed	Expected	Observed	Expected
Retained Choice	373	357.8	300	315.2
Transferred Choice	123	138.2	137	121.8

$x^2 = 4.96$ $x^2_{.95} = 3.84$

decision of a majority of his immediate neighbours.

There are therefore two forms of persistence which reduce the likelihood of post office transfer by new residents. Newcomers are least likely to effect change when earlier residents are relatively numerous *and* have been persistent in their post office allegiance.

While the effect of relative numerical strength is apparent at the most local level (Table 5.4) it does not have a similar impact on entire markets, because only minor differences distinguish their residential persistence and level of population replacement. Table 5.5 furnishes two persistence measures specific to individual markets, respectively the percentage of all 1887 residents who subsequently stayed on their lot, and the percentage who stayed within the township. For Euphrasia as a whole these values are respectively 48.9 and 59.3 per cent. All of the twelve largest Euphrasia markets are within 5 per cent of one or both of the township averages. Similarly, township newcomers constituted 51 per cent of the 1898 directory list, and all but one of the twelve markets are within 10 per cent of this value. Thus although the mix of persistent and replacement populations affected the likelihood of choice transfer, it did not influence market division because all markets were in this respect demographically similar.

Newcomers rarely reversed a trend set by established residents. Although residential persistence exhibits minor differences between markets, patronage persistence varies between 31.25 and 93.44 per cent (Table 5.6). Post offices least capable of retaining established patrons also benefited least from the influx of new patrons. Of 790

TABLE 5.5

POPULATION PERSISTENCE AND REPLACEMENT: TWELVE EUPHRASIA MARKETS BETWEEN 1887 AND 1898

POST OFFICE	Euphrasia Patrons 1887	On Same Lot 1887-1898 (Per Cent)	In Township 1887-1898 (Per Cent)	New Residents As Per Cent of 1898 Patronage
Markdale	123	48.8	60.2	56.0*
Kimberley	110	49.1	60.9	56.5*
Heathcote	98	56.1*	62.2	49.5
Blantyre	92	53.3	66.3*	51.5
Rocklyn	87	50.6*	60.9	59.5*
Epping	52	44.3	53.9*	56.1*
Duncan	46	41.3*	58.6	53.4
Markaway	29	48.3	58.6	53.3
Fairmount	28	39.3**	60.7	60.0*
Griersville	27	55.6*	59.2	50.0
Walter's Falls	27	48.1	55.5	73.0**
Vandeleur	16	62.5**	62.5	50.0
	Township	48.9	59.3	51.0

*± 5 - 9.9 Per Cent Departure From Township Value.

**± 10 Per Cent Or More Departure From Township Value.

newcomers, including township migrants, 503 parallelled the choice of at least one 1887 resident. The relative occurrence of such imitative behaviour also varies considerably between twelve Euphrasia markets (Table 5.6). There is a positive association between the level of patronage persistence and that of imitative behaviour. A Spearman rank correlation coefficient of 0.4476 (Spiegel, 1961, page 259) is computed from the rank scores of the two measures (Table 5.6). Thus newcomers tended to either mirror earlier residents' allegiance or replicate their lack of commitment to a particular post office. In consequence, even under conditions of rapid market area adjustment, distinct market boundaries were maintained.

Markets and Rural Society

Market allegiance meant more than a commitment to a place and its business activities. Consider the pattern of churches in Euphrasia; in or near all twelve places listed in Table 5.6 there was a Methodist chapel in 1887 (1887 Directory). There were no other Methodist chapels in the township (Grey County Atlas, 1880). The catchment areas associated with this denomination may well have resembled post office markets. Other denominations, mainly Anglican and Presbyterian, had places of worship in half the villages established by 1887. Schools were as numerous as and usually a short distance from the post offices (Grey County Atlas, 1880). School sections were a cohesive element in the rural landscape. A senior undergraduate at McMaster University has reconstructed several catchment areas associated with the hamlet of

TABLE 5.6

PERSISTENT PATRONAGE AND IMITATIVE BEHAVIOUR OF NEWCOMERS:

SPEARMAN RANK CORRELATION OF TWELVE EUPHRASIA MARKETS

POST OFFICE	Patronage Persistence Per Cent[1]	Rank	Imitation Index Index[2]	Rank	D^2
Heathcote	93.44	1	1.36	10	81
Duncan	85.19	2	2.06	3	1
Rocklyn	83.02	3	2.29	2	1
Harkaway	82.35	4	1.38	9	25
Walter's Falls	80.00	5	2.82	1	16
Markdale	72.79	6	1.79	5	1
Epping	71.43	7	1.59	7	0
Fairmount	70.59	8	1.70	6	4
Kimberley	70.15	9	1.92	4	25
Vandeleur	50.00	10	1.40	8	4
Blantyre	49.18	11	1.22	11	0
Griersville	31.25	12	1.00	12	0

[1]Patronage persistence is equal to

$$\left(\frac{\text{Number of Persistent Patrons 1887-98}}{\text{Number of Persistent Residents 1887-98}}\right) \times 100$$

[2]Derived from

$$\left(\frac{\text{Number of Newcomers Imitating Choice of At Least One 1887 Resident}}{\text{Number of Persistent Patrons Who Remained on Their Lot 1887-1898}}\right)$$

Crieff, Wellington County before 1914. From interviews conducted in 1975, Tom Cowper found that the Crieff school, chapel and post office served almost identical sections of Puslinch Township early this century. Cowper's unpublished results also revealed that deliveries and produce collection were undertaken by merchant's wagon from the nearby large village of Morriston. Contemporary closure of the Crieff general store occurred, and the craftsmen left the hamlet. Mail collection became an after-school task for children. A local history also alludes to this task, in Mountsberg, Wentworth County, circa 1900 (Waterdown and East Flamborough Centennial Committee, 1967). Possibly, children were assigned the task of mail collection because a daily regimen was deemed worthwhile in principle but onerous in practice for adults. Perhaps adults no longer felt drawn by the limited allure of village business and gossip. Implicit in the above preliminary evidence is that before the wholesale adoption of the automobile a mixed strategy of trip behaviour had already evolved. This strategy maintained ties with a particular community, but not necessarily with its businesses. Further evidence of this trend is obtained from post office revenue patterns.

Post Office Revenue and Place Attraction

For each increment of place attraction, post office revenue rose exponentially. The fact that a consumer collected his mail in a small place did not necessarily mean he spent much money there, even at the post office. Table 5.7 summarises the increases in revenue which

TABLE 5.7

AVERAGE POST OFFICE REVENUE OF PLACES CLASSED BY RELATIVE ATTRACTION: SELECTED DIRECTORY YEARS BETWEEN 1882 AND 1910; EASTERN GREY COUNTY

	ATTRACTION OF PLACE					
	1.00	1.01-2.00	2.01-3.00	3.01-4.00	4.01-5.00	5.01-6.00
1882						
Average Revenue	$29	84	58	66	95	211
No. of Places	4	3	6	5	3	3
1884						
Average Revenue	$29	54	54	84	143	178
No. of Places	3	2	6	6	6	3
1887						
Average Revenue	$23	49	62	109	158	241
No. of Places	2	5	6	8	6	3
1895						
Average Revenue	$45	33	53	94	153	166
No. of Places	4	1	11	6	4	5
1898						
Average Revenue	$87	43	96	143	279	344
No. of Places	7	13	6	5	7	3
1903						
Average Revenue	$53	37	113	294	327	897
No. of Places	9	11	13	8	2	1
1910						
Average Revenue	$64	73	156	358	377	1295
No. of Places	14	4	15	7	3	1

SOURCE: Canada, Sessional Papers, Postmaster General's Reports; and Business Directories.

accompanied increasing concentration of retail businesses. This trend is noticeably absent, however, when the revenue of isolated post offices (attraction 1.0) is compared with that of post office hamlets (attraction 1.01-2.00). In 1895, 1898 and 1903 the presence of one or two other businesses appears to have been detrimental to post office revenue. No similar effect on post office patronage is detectable for either Eastern Grey in 1898 or Euphrasia Township in 1903. It therefore appears that around the turn of this century consumers were rather more willing to spend money in an isolated post office than in one run in conjunction with a general store. Consumer expenditure on locally available business activities was being diverted to larger places as early as 1895. Consumers retained their community post office, but diverted their mail expenditure elsewhere. Expenditure at isolated post offices persisted, however, because this did not entail the embarassment of ignoring general store shelves, cash in hand. This is emphatically a guess from evidence of a most indirect nature. It is interesting to note that the same revenue trend is detectable in post offices which changed their status. Table 5.8 confirms average revenue *increases* for post offices which reverted to splendid isolation, having lost associated businesses, and *decreasing* revenue at three hamlet post offices which had previously been isolated. Newly isolated post offices generally registered lower sales than other isolated post offices, while new hamlet outlets took in as much or more as other hamlet post offices. It seems that the small rural business literally repelled money at the turn of the twentieth century.

TABLE 5.8

REVENUE CHANGE: ISOLATED POST OFFICES AND HAMLETS

	Isolated Post Offices ($W^{il} = 1.00$)				Hamlets ($1.00 < W^{il} \leq 2.00$)			
	Previously Isolated Average Revenue		Previously Hamlets Average Revenue		Previously Isolated Average Revenue		Previously Hamlets Average Revenue	
YEAR	Current $	Former $	Current $	Former $	Current $	Former $	Current $	Former $
1910	71	63	45	33	65	36	75	52
(No. of Places)	(6)		(7)		(1)		(3)	
1903	54	74	47	40	64	90	34	37
(No. of Places)	(7)		(1)		(1)		(10)	
1898	42	43	130	63	40	53	42	48
(No. of Places)	(3)		(3)		(1)		(11)	

SOURCES: Canada, Sessional Papers. Postmaters General's Reports:
29 (1896) Vol. 9, No. 12; 34 (1900) Vol. 10, No. 12;
39 (1905) Vol. 10, No. 34; 46 (1912) Vol. 17, No. 24.

NOTE: "Former" refers to 1903, 1898 and 1895 for 1910, 1903 and 1898 respectively.

Summary

Market area change was accelerated by a low level of population persistence in the study area. The new arrival was prone to alter an established pattern of preference. Population persistence and replacement did not exhibit notable spatial variation within a single township; thus while the pace of market change was affected by these demographic variables, market configuration was not. It would be worth examining market area change in an area exhibiting spatial variation in population mobility. Although newcomers were more willing to effect change, they did not disregard existing trends: if persistent residents were unanimous in maintaining market allegiance, new arrivals followed suit; if persistent residents relinquished allegiance, newcomers did not reverse this trend.

The post office was a part of the social geography of rural Ontario. It retained this role until rural mail delivery was instituted, beginning in 1908. Although consumers maintained their commitment to the social and institutional fabric of rural society, they were withdrawing their patronage of rural businesses as early as 1895. This inference is based on the fact that post office revenue was lower in hamlets than at isolated outlets; in cash terms the small mail collection area was no longer a captive market for the storekeeper or craftsman. Perhaps society had come to place more stress on variety and price and less on frequency and accessibility. Consumer choice and spatial behaviour at the end of the nineteenth century is a problem which demands further research.

CHAPTER SIX

THE CHANGING ARRAY OF BUSINESSES

"The usual progress of a Canadian village is this: first, on some running stream, the erection of a saw mill and grist mill for the convenience of the neighbouring scattered settlers; then a few shanties or log houses for the work people; then a grocery store; then a tavern -- a chapel -- perchance a schoolhouse ..."

Anna Brownell Jameson
"Winter Studies and Summer Rambles" (1837)

Introduction

What led late nineteenth century businessmen to choose apparently unsuitable locations and disregard more logical alternatives? Chapter Three argues that a business location will not occur unless the criterion of array completeness is satisfied. Chapter Four shows that, although incomplete arrays exist, they have an adverse effect on tributary markets. The relative completeness of business arrays between 1882 and 1910 is examined in this chapter.

Departure from array completeness, from perfect order of entry (Christaller, 1966), may be related to market conditions. It is possible that without the presence of all higher incidence activities, a particular location offers a sufficient market because competitors are located at some distance from it. Conversely, a place may be a poor business prospect even if it possesses some lower incidence activities, because the location of competitors is unfavourable. Bell,

Lieber and Rushton (1974) regard such departures from the order of entry principle as reflecting a Löschian behavioural strategy, location decisions which are based on available markets and not on the presence of other business activities. Bell, Lieber and Rushton base their analysis on the assumption that all markets are proximate; thus they disregard the probable effect of business agglomeration on consumer spatial behaviour. This chapter is not concerned with tributary markets; it is assumed that any departure from the order of entry principle reflects inconsistent locational behaviour. Detailed aspects of array completeness in any single year are also disregarded. The focus is the rate and direction of changing array completeness. Chapter Four suggests that business arrays were successively more complete between 1887 and 1898. There is some reason therefore to expect a continuous increase in array completeness between 1882 and 1910. This did not occur. The observed fluctuation reveals that the level of array completeness depends on the general business climate, that is, on the availability of and competition for new locations and on the survival of existing locations.

Scaling the Incidence Matrix

An incidence matrix defines a pattern of business activity locations. Activities (column vectors) are ranked from left to right in order of diminishing frequency of occurrence. Places (row vectors) are ranked from top to bottom in order of decreasing attractiveness. The matrix is the real world counterpart of matrix I in Chapter Three.

The problem is to derive a matrix S, from I, which has the expected properties of I. These are, for the i^{th} row and j^{th} column:

(6.1) if $S_{ij} = 1$ then $S_{i-1,j} = 1$ and $S_{i,j-1} = 1$

(6.2) if $S_{ij} = 0$ then $S_{i+1,j} = 0$ and $S_{i,j+1} = 0$

S is termed the scaled incidence matrix. A scale line within S divides the zero and non-zero components of the matrix. Developed by Guttman (1944), a scaled incidence matrix is a basis for relating n conditional attributes of a sample population to its m cases. Applied by Bell and Frankland (1973), and Bell, Lieber and Rushton (1974) the matrix describes n activities in m places. It is usual that as permutation of rows and columns in I will yield a pattern which satisfies conditions (6.1) and (6.2). The best approximation is therefore adopted, which jointly minimises the number of zero and non-zero cells respectively above and below the scale line. In this analysis, no prior permutation of I is effected, since the sequence of row and column vectors is fixed by assumptions concerning purchase frequency and imparted attraction. The scale line defining S is applied directly to matrix I.

The degree of correspondence of I and S may be expressed, after Guttman, by the coefficient of reproducibility. This measure is defined as the number of cells in I which differ from their counterparts

in S, expressed as a proportion of the total number of cells in S, and subtracted from 1.0. Bell, Lieber and Rushton (1974) derived values of this coefficient between 0.95 and 0.98 describing a pattern of places in Minnesota between 1939 and 1970. Places in Iowa in 1960 and 1970 yielded coefficient values of 0.949 and 0.943 respectively. Comparable values for Eastern Grey County range between 0.936 in 1895 and 0.970 in 1907. For several reasons, this coefficient is not considered to be a useful measure of conformance to the order of entry principle. The narrow observed range and close approximation to 1.0 are both a consequence of the fact that zero entries preponderate in the matrix. Invariably a majority of activities occur in few places and a majority of places contain few activities. The coefficient of reproducibility is extremely sensitive to the dimensions of the matrix. Regardless of when it is located, a single occurrence activity generates n - 1 zero cells, and a single activity place generates m - 1 zero cells. If new activities or new places are added to a pattern, the coefficient will, other things being equal, increase over time; its value is positively related to mn.

In this analysis the predetermined area of matrix I is excluded. This area comprises the following vectors:

1. All I_{i1}. Since all places possess post offices I_{i1} and S_{i1} are always equal to 1.

2. All columns in which $I_{i.}$ is equal to 1. These are those activities which occur in only one place. Most are confined to the town of Collingwood. Their number ranges from 12 of 63 activities in 1887 to 29 of 76 in 1907.

3. All rows in which $I_{.j}$ is equal to 1. These are those places which possess only one activity.

The Scale Line. A best fit scale line is found by

1. First defining the scale line in I expected under conditions of perfect order of entry of activities. This line divides all i from cell i + 1 in each column vector possessing $I_{i.}$ non-zero cells.

2. Defining the scale line expected under conditions of perfect array completeness. The line contains cells 1 through j in each row vector such that

$$(6.3) \qquad W^{il} \simeq \sum_{1}^{j} F_j$$

3. Defining the best fit scale line within 1. and 2. above. The cell area bounded by both prior scale lines is divided to yield the smallest combined total of zero and non-zero cells respectively above and below the division.

Thus by jointly considering the occurrence of activities and the attraction of places, an expected pattern of activities is identified. Activity locations which deviate from this expected pattern are non-zero cells below the scale line; these are termed deviant non-zero cells. Zero cells above the scale line are activity locations which are viable but have not been occupied; these are termed deviant zero cells.

Scaled Incidence Matrices 1882-1910

Incidence matrices describing the pattern in ten years between 1882 and 1910 are scaled using the above procedure. The coefficient of reproducibility exhibits a range between 0.900 and 0.940 (Table 6.1). The coefficient does not, however, increase continuously after 1882; it fluctuates before 1895, increases between 1895 and 1907, and falls between 1907 and 1910. These three phases are reflected in activity incidence (Table 6.1, non-zero cells), which increases to a maximum in 1895 and declines to a minimum in 1907. The number of cells scaled non-zero is in all instances less than the number of non-zero cells. There is therefore a greater tendency for unexpected locations to be occupied than for expected activity locations to be ignored. The number of deviant non-zero cells constitutes between 50.4 and 62.2 per cent of all deviant cells. Thus the departure from an expected norm differs not only in degree but also in composition from year to year, and appears to be associated with absolute change in the pattern of business.

The business pattern changed much more than the simple increase or

TABLE 6.1

CHARACTERISTICS OF SCALED INCIDENCE MATRICES OF ACTIVITIES IN PLACES: TEN DIRECTORY YEARS 1882-1910

ATTRIBUTE	NUMBER OF CELLS, BY YEAR									
	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Activities	45	49	50	53	50	53	44	45	46	47
Places	32	33	38	36	41	42	40	40	35	35
Matrix Area	1440	1617	1900	1908	2050	2226	1760	1800	1610	1645
Non-Zero Cells (Activity Present)	357	375	396	434	467	508	366	338	327	334
Zero Cells (Activity Absent)	1083	1242	1504	1474	1583	1718	1394	1462	1283	1311
Cells Scaled Non-Zero (Above Scale Line)	327	370	375	410	448	485	350	337	311	315
Deviant Zero Cells (Above Scale Line)	46	78	65	72	78	88	57	58	40	54
Deviant Non-Zero Cells (Below Scale Line)	76	83	86	96	97	111	73	59	56	73
New Non-Zero Cells (Occupied Since Previous Year)		58	82	80	91	82	37	38	40	47
New Zero Cells (Vacated Since Previous Year)		40	61	42	58	41	179	66	51	40
New Non-Zero Deviant Cells (Below Scale Line, Current Year)		28	36	43	43	45	16	11	9	27
Persistent Non-Zero Deviant Cells (Deviant Current Year, Occupied Both Years)		55	50	53	54	66	57	48	47	46
Persistent Non-Zero Cells (Above Scale Line)		262	264	301	322	360	273	252	250	241
Reproducibility	.915	.900	.921	.912	.915	.910	.926	.935	.940	.923

decrease in activity incidence suggests. A high turnover in business locations is reflected in the number of new non-zero and zero cells appearing between sampled years (Table 6.1). A qualitative difference between periods is apparent in the number of recent activity locations, that is new non-zero cells, which does not conform to the expected pattern. Such new non-zero deviant cells constitute as little as 22.5 per cent of new locations, between 1903 and 1907, and as much as 57.4 per cent, between 1907 and 1910. The level of wisdom in locational choice varied. Less variation is detectable, however, in the mortality of these errant locations. Deviant persistent locations constitute between 14.4 and 17.4 per cent of all persistent locations, while deviant non-zero cells comprise between 17.1 and 22.1 per cent of all locations. Deviant locations are less likely to survive than expected locations, and this likelihood varies little between periods.

Given a substantial turnover in business locations, it is not surprising to find that the ranking of activities by relative incidence, and of places by relative attraction, differs from one year to another. These values are given in Appendices Five and Six. Whether a businessman is in a sensible location depends a great deal on the behaviour of other businessmen. Good as well as poor locations are vacated in the course of business turnover; such vacancies leave other businesses stranded in an insecure position. The nineteenth century business community was characteristically transient, an issue explored at length in the following chapter. Accepting this transience as an endemic feature of retail business, a newly vacated but nonethe-

less viable business location cannot be regarded as reflecting unsound practice by the person ceasing business. The location is deviant only in the sense that it has not been reoccupied.

The scaled incidence matrices reveal that, between 1882 and 1910, up to 42 places within the study area provided between 300 and 500 appropriate business locations (Table 6.1). Of these locations, 40 to 90 were neglected by incoming businessmen. Instead, over 50, and in 1895 over 100, unsuitable locations were chosen. The changing degree of correspondence between actual and expected conditions is apparently related to business turnover.

Related Components of Changing Incidence Matrices

The coefficient of reproducibility (Table 6.1) does not distinguish the character of departures from an expected pattern. Two measures of deviance are substituted; both are based on the cell area above the scale line. Zero deviance (Table 6.2) is the number of zero cells above the scale line expressed as a proportion of the total number of cells above the scale line. Zero deviance is greatest in 1884 and lowest in 1907. No temporal trend in zero deviance is apparent.

Non-zero deviance (Table 6.2) is the number of non-zero cells below the scale line expressed as a proportion of the total number of cells above the scale line. Non-zero deviance is at a maximum and minimum in 1888 and 1903 respectively. Its decline between 1895 and 1903 is apparent in Table 6.2.

Total deviance is derived by adding zero and non-zero deviance.

TABLE 6.2

DEVIANCE AND CONFORMANCE OF INCIDENCE MATRICES

	DIRECTORY YEAR									
	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Zero Deviance	0.141	0.211	0.174	0.176	0.174	0.182	0.163	0.172	0.129	0.171
Non-Zero Deviance	0.233	0.255	0.229	0.234	0.216	0.229	0.208	0.175	0.180	0.232
Total Deviance	0.374	0.436	0.403	0.410	0.390	0.411	0.371	0.374	0.309	0.403
Conformance	0.626	0.564	0.597	0.590	0.610	0.589	0.629	0.653	0.691	0.597

Conformance is equal to 1.0 minus total deviance. Maximum conformance to an expected activity pattern occurs in 1907; minimum conformance is found in 1884. Conformance is seen to increase between 1895 and 1907 (Table 6.2).

Because the interval between sampled years varies, changing conformance, deviance and activity incidence are all expressed in per annum terms (Table 6.3). Of the nine periods examined, the three years between 1895 and 1898 register the highest positive rate of change in conformance. Deterioration in conformance is most rapid between 1907 and 1910. Values in Table 6.3 are ranked.

A reasonable initial hypothesis is that the rate and direction of change in conformance is associated with the rate of growth and decline in activity incidence. When the business pattern is growing, it is likely that competition for new locations results in poor locational choices. Moreover, new arrivals are presumably not particularly competent to assess qualitative differences in a range of possible locations.

The degree of association between changing activity incidence and conformance is measured by Spearman's coefficient of rank correlation, r_{rk}. The coefficient is equal to

$$(6.4) \qquad r_{rk} = 1 - \frac{6\sum D^2}{N(N^2 - 1)}$$

TABLE 6.3

ABSOLUTE AND RANKED VALUES OF SEVEN ATTRIBUTES OF CHANGING INCIDENCE MATRICES:

NINE PERIODS BETWEEN 1882 AND 1910

	ATTRIBUTE	PERIOD								
		1882-1884	1884-1887	1887-1888	1888-1892	1892-1895	1895-1898	1898-1903	1903-1907	1907-1910
V1	Change in Conformance (Per Annum)	-0.0310	0.0110	-0.0070	0.0050	-0.0070	0.0133	0.0048	0.0095	-0.0313
	Rank	8	2	6.5	4	6.5	1	5	3	9
V2	Change in Zero Deviance (Per Annum)	0.0350	-0.0123	0.0020	-0.0005	0.0027	-0.0063	0.0018	-0.0108	0.0140
	Rank	9	1	6	4	7	3	5	2	8
V3	Change in Non-Zero Deviance (Per Annum)	-0.0040	0.0013	0.0050	-0.0045	0.0043	-0.0070	-0.0067	0.0013	0.0173
	Rank	4	5.5	8	3	7	1	2	5.5	9
V4	Change in Activity Incidence (Cells Per Annum)	9.0	7.0	38.0	8.3	13.7	-47.3	-5.6	-2.8	2.3
	Rank	7	5	9	6	8	1	2	3	4
V5	Vacated Activity Locations (% Prior Non-Zero Cells)	11.2	16.2	10.6	13.4	8.8	35.3	18.0	15.1	12.2
	Rank	7	3	8	5	9	1	2	4	6
V6	Recent Deviant Locations (% Recent Locations)	48.3	43.9	53.7	47.3	54.9	43.3	28.9	22.5	57.4
	Rank	6	4	7	5	8	3	2	1	9
V7	Recent Locations (% Current Non-Zero Cells)	15.5	20.7	18.4	19.5	16.1	10.1	11.2	12.2	14.1
	Rank	5	9	7	8	6	1	2	3	4
V8	Relative Persistence ($\frac{\%\text{ Cells Persistent Below Scale Line}}{\%\text{ Cells Persistent Above Scale Line}}$)	0.77	0.67	0.63	0.59	0.70	0.74	0.76	0.89	0.92
	Rank	7	3	2	1	4	5	6	8	9

for a sample of N cases. D in (6.4) is equal to the difference in the rank scores of two variables. Use of the coefficient is justified in the absence of intuition concerning the function describing the relationship between two variables.

The rank correlation between per annum change in conformance (V1) and activity incidence (V4) is 0.5292 (Table 6.4). Rapid increase in activity incidence occurred during three of the four periods during which conformance declined (Table 6.3). The initial hypotheses is not rejected; it is clear, however, that the level of conformance depends on more than merely growth or decline in the pattern of activities.

When the two measure of deviance are compared with the conformance measure, it is clear that deteriorating conformance arises largely from increasing zero deviance. The rank correlation between these variables is 0.9292 (Table 6.4). This result suggests that the expected pattern is approached primarily as a result of renewed interest in vacant but viable locations.

Changing activity incidence reflects of course the relative incidence of termination and establishment of business locations. The fact that many locations had been terminated did not however necessarily mean that few new locations had been established. The rank correlation between business vacancy (V5) and recent business occupance (V7) is only 0.4467 (Table 6.4). This degree of independence suggests that these two components of changing activity incidence merit separate attention.

TABLE 6.4

RANK CORRELATION MATRIX: SELECTED VARIABLES DURING NINE PERIODS BETWEEN 1882 AND 1910

	VARIABLE	V1	V2	V3	V4	V5	V6	V7
V1	Change in Conformance	1.0000						
V2	Change in Zero Deviance	0.9292	1.000					
V3	Change in Non-Zero Deviance	0.5750	0.3625	1.0000				
V4	Change in Activity Incidence	0.5292	0.4667	0.4292	1.0000			
V5	Per Cent Cell Vacancy	0.7458	0.6833	0.7125	0.9000	1.0000		
V6	Location Choice Quality	0.7625	0.7333	0.6958	0.6667	0.7833	1.0000	
V7	Per Cent Recent Occupance	0.0792	-0.0667	0.4042	0.7333	0.4667	0.4000	1.000
v8	Relative Persistence	0.3375	0.3000	0.1458	-0.4667	-0.1167	-0.0667	-0.667

NOTE: Variable Sequence is as given in Table 6.3.

As Table 6.3 indicates, the five periods in which business vacancy is greatest are the only five periods in which conformance increases. The rank correlation between these variables is 0.7458. It is argued that this association arises from more than an intuitive relationship between a high vacancy level and the attrition of marginal business locations. The evidence demonstrates that the relative persistence of these marginal locations (V8) did *not* significantly diminish as the incidence of vacancy increased (Table 6.4: $r_{rk} = -0.1167$). Low relative persistence of poor locations is associated with a relatively large number of new locations ($r_{rk} = -0.6667$); it therefore appears that poor locations were dislodged more by competition from new establishments than by a tendency to succumb first in a worsening business climate.

The association between high business vacancy and increasing conformance appears to arise from another factor related to the availability of business locations. The evidence indicates that when a large proportion of prior business locations has been terminated, new locations have been better selected (Table 6.4: V5 and V6; $r_{rk} = 0.7833$). The most obvious interpretation of this relationship is that the choice of new business locations is conservative in a risky business climate. When poor locations disappear, their markets are most easily captured by new businessmen who fit themselves into complete business arrays. Thus even if the total number of business locations grows, as it does from 1884 to 1887 and 1888 to 1892, a large number of vacancies permits an even larger number of soundly

chosen new locations.

Summary

Business array completeness is a location principle to which some adherence is observable in late nineteenth and early twentieth century Eastern Grey County. Adherence vacillates with the extent and composition of business turnover. There is incentive and opportunity to choose a good location when many other businesses are being terminated. It is clear from the extent of business turnover that it is not simply a function of market viability.

The persistence of a business location spans those dates between which the first person enters business and the last person quits. A succession of businessmen may occupy the same location. Thus the persistence of locations is an aggregate measure of the persistence, transience and replacement of individual businessmen. Understanding the behaviour of a business population in the late nineteenth century clearly requires a broader and more human perspective than that furnished by an incidence matrix.

CHAPTER SEVEN

THE RÔLE OF BUSINESS DURATION

"The true criticism of market society is not that it was based on economics -- in a sense, every and any society must be based on it -- but that its economy was based on self-interest ..."

Karl Polanyi "The Great Transformation" (1944), page 249

Introduction

In Chapter Six attention was confined to the presence or absence of business activities in places: in this chapter we explore the duration of individual businesses. Under what circumstances did individual business entry and termination occur? To what extent was business turnover and mobility related to the viability of business locations? Just as the mobility of Ontario's rural population affected the pattern of businesses it supported, were places dependent on a natural ebb and flow of their business population? It is important to determine if a businessman who relinquished a sound location was replaced. Inconsistent business termination and replacement could lead to incomplete activity arrays, especially in places possessing only one individual engaged in the business activity involved. Such an incomplete array could so undermine the attraction of a place that a vacancy induced by a vagary in business turnover could result in further attrition of the complement of businesses. If an apparently attractive

vacancy was created but left unfilled, which alternative opportunities were taken up instead? Did the range of optional locations, in order or relative merit, differ from the set of choices which would maintain complete arrays and thereby provide security to other business activities?

Evidence pertinent to the above questions is largely drawn from an analysis of a single business activity. After examining the business duration associated with a single village and with several different activities, the possibility of identifying patterns of business migration in late nineteenth century Ontario is considered. The balance of the chapter explores the duration and locational behaviour of blacksmiths. Their actions suggest that the decline of the small business centre was brought about as much by businessmen themselves as by the consumers they served.

Business Duration: Some Preliminary Observations

Any preconception that nineteenth century businessmen were in some way tied to the places in which they set up shop would be unfounded: particular buildings, stores or workshops were often occupied by a bewildering succession of retailers and craftsmen. Directories reveal that the Vandeleur general store saw at least three occupants within a decade, the Wode House and Blantyre stores four each. Between 1882 and 1888 the two McIntyre stores were run by six different persons, and the three Feversham stores by eight. The town of Dundalk witnessed the activity of at least 42 general storekeepers between 1882 and 1910, but

possessed no more than ten of these establishments at any one time. Other business types were more durable, but some were subject to even greater attrition.

The duration characteristics of nine of the more frequently encountered business activities are compared in Table 7.1. Only those persons entering business after 1882 and terminating business prior to 1910 are included. Estimates of duration are computed from mid-points between directory years. Postmasters were notably more persistent than persons engaged in the other eight activities listed in Table 7.1: once appointed, postmasters were tenacious of what was in effect a sinecure, albeit a poorly paid one. Of businessmen in the remaining eight activities, no more than one half survived beyond six years or one third beyond twelve years. The four crafts represented in Table 7.1, the blacksmith, sawyer, wainwright and shoemaker, exhibit a similar pattern of duration; these activities were similar too in that sales were limited by demand inelasticity and labour constraints on output. All four activities also required as much or more investment in buildings, tools, or machines specific to the business, location or person as in moveable or saleable stock. In contrast the hotelier or storekeeper required less manual training, was less restricted in his choice of premises, and required little fixed capital. Easy to enter and easy to leave or move as a result of success of failure, these were businesses in which competition was fierce and turnover substantial. Less than ten per cent of the persons entering these activities stayed in business in the same village or town for more than a decade. Builders

TABLE 7.1

ESTIMATED BUSINESS DURATION: A COMPARISON OF NINE ACTIVITIES; 1882-1910

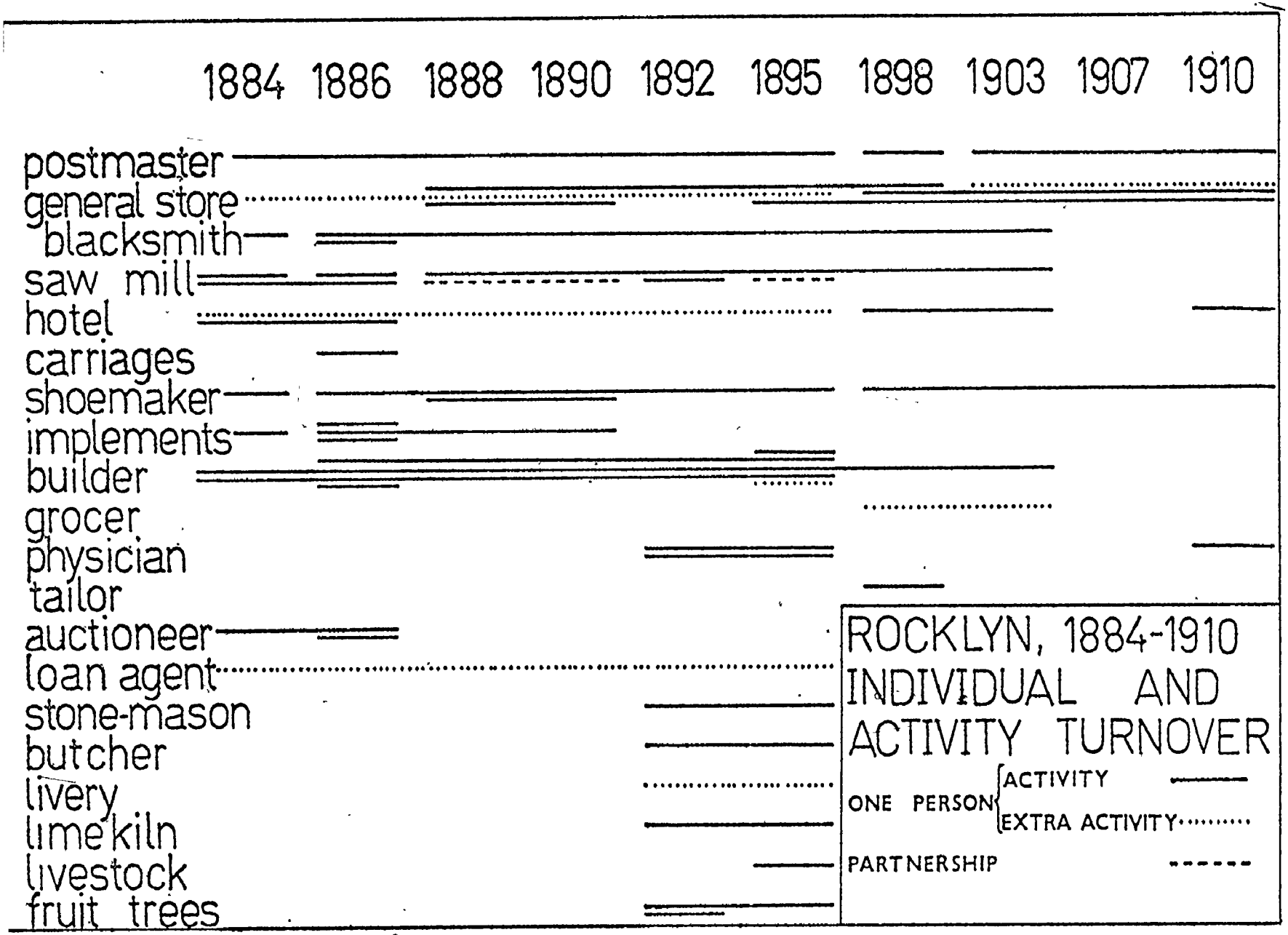
ACTIVITY	NUMBER OF CASES	PER CENT OF CASES WHO REMAINED AT LEAST 3 YEARS	6 YEARS	9 YEARS	12 YEARS	15 YEARS	18 YEARS
Postmaster	73	80	60	55	41	29	23
Blacksmith	109	75	47	39	32	22	18
Saw-Milling	91	69	48	37	32	24	18
Shoemaker	51	67	45	35	29	26	22
Wagon-Maker	57	61	40	30	25	23	18
Building Trades	92	69	36	28	20	3	3
General Store	192	63	33	25	19	9	6
Hotelier	103	58	30	18	13	8	4
Dressmaker	58	40	12	9	3	3	3

and dressmakers, like insurance and other agents, were at the mercy of the discretionary spending of rural consumers: few survived the attrition of business activities between 1895 and 1898, thus very few remained as long as fifteen years between 1882 and 1910. Businessmen were more or less transient depending on the nature of their activity.

Rocklyn: The Turnover of Village Businesses

Rocklyn, one of the larger villages within the area studied, illustrates the degree to which individual places accomodated a transient business population (Figure 7.1). Those activities whose presence in Rocklyn was continuous between 1884 and 1903 possessed two notable characteristics: all were pursued by one or more individuals for at least a decade, and, excluding the postmaster, all were at some time pursued by at least two persons simultaneously. Whereas business replacement was apparently assured prior to 1898, the termination of several long-established businesses after 1903 left unfilled vacancies in the business array. Those persons whose stay in Rocklyn was extremely brief were typically engaged in activities which were at best marginal for a village such as Rocklyn or were individuals who set up shop in direct competition with an existing business. In Rocklyn and larger places, the fifty per cent of all businesses which remained for no more than six years tended to supplement rather than constitute the core array of businesses. Assuming these transient businessmen were seeking a successful niche, it should be possible to trace them to this goal via

FIGURE 7.1


1884
1886
1888
1890
1892
1895
1898
1903
1907
1910
postmaster
general store
blacksmith
saw mill
hotel
carriages
shoemaker
implements
builder
grocer
physician
tailor
auctioneer
loan agent
stone-mason
butcher
livery
lime kiln
livestock
fruit trees
ROCKLYN, 1884-1910
INDIVIDUAL AND
ACTIVITY TURNOVER
ONE PERSON
ACTIVITY
EXTRA ACTIVITY
PARTNERSHIP

a reconstruction of their relocation within the study area.

The Pattern of Business Migration

Despite recent progress in the technique and application of record linkage (Winchester, 1970; Wrigley, 1973) it is doubtful that complete profiles of the geographic and occupational mobility of individuals in nineteenth century society can be reconstructed. In part this is attributable to the fact that location and occupation are themselves linkage criteria, and in consequence if a person has changed his address and occupation he is not only harder to trace but is also, once identified, less conclusively the same person. Also, the memoirs of Wilson Benson (Katz, 1975, pages 94-111) and the diary of David Brindley (Lawton and Pooley, 1975) reveal a locational, occupational and chronological complexity which no record linkage could feasibly replicate. Wilson Benson, for example had tried thirteen different occupations in fourteen places before he settled down to running a general store (his fifth since 1843) in Markdale, Grey County, in 1873 or 1874. His occupational shifts numbered 29 in a 40 year period. His duration in occupations ranged from two days of employment as an apprentice shoemaker to twenty-two years of continuous farming in Artemesia Township, Grey County. Wilson Benson earned his living in Eastern Ontario, Toronto, Orangeville and Grey County: at times he was an itinerant peddler in the winter or employed on a Lake Ontario vessel during the shipping season. The fact that Wilson Benson left a record of his career is in itself unusual, and one cannot assume that all

members of nineteenth century society approached this level of restlessness. Nonetheless, an attempt to identify migrant businessmen within parts of Grey and Simcoe Counties suggests that few persons were tied to a particular occupation within a single region.

All persons known to have been in business in places serving the four Grey County townships were entered on file cards and sorted by surname: 2273 of 2981 ceased business according to the directory record. A second sample comprised those who were in business between 1882 and 1910 in the four Simcoe County townships west of the Grey County study area: 1405 persons quit these places. By matching business termination with business entry elsewhere, 392 plausible cases of migration were identified. Thus only 10.7 per cent of all business terminations were linked with any confidence to an instance of business appearance in one of eighty other places. As Table 7.2 indicates, only 36 per cent of all links effected included no inconsistency: the remainder contained at least one chronological gap or overlap, occupational difference, or name element ambiguity. Chronological inconsistencies and apparent occupational shifts accounted respectively for 59 and 34 per cent of imperfect matches. The results seem consistent with the Wilson Benson example in that most persons cannot be traced within a limited area, and those who are traceable are likely to have changed their line of business or have been elsewhere during the intervening period.

For eight consecutive periods between 1882 and 1910, links effected within the Grey County sample are expressed as a percentage of the businesses which emerged and were terminated. As Table 7.3 indicates,

TABLE 7.2

IDENTIFICATION OF BUSINESS MIGRATION THROUGH DIRECTORY RECORD LINKAGE

LINKAGE CATEGORY	APPARENT RELOCATION			
	Within Grey	Within Simcoe	Between Grey and Simcoe	Total
	Per Cent	Per Cent	Per Cent	Per Cent
No Inconsistency	36.1	38.7	31.6	36.0
One Inconsistency	49.0	46.8	53.2	49.2
Two Inconsistencies	14.9	14.4	15.2	14.8
Number of Cases	202	111	79	392

linked cases constituted at least 8 per cent of all possible arrivals and departures up to 1903: thereafter origins and especially destinations were more difficult to identify. Before 1887, the likelihood of identifying an origin was less than that of tracing an individual's destination. This suggests that local businessmen gave less consideration to alternative local opportunities as the nineteenth century ended. In fact the local migration that did take place between 1895 and 1910 was primarily to larger places (Table 7.4) a pattern significantly different from the preceding period. Also, the identifiable migrants comprised a disproportionate number of persons in the most commonly encountered business activities (Table 7.5), suggesting that individuals engaged in these were more able to find acceptable alternative locations within the study area. Some of these individuals appear to have moved on several occasions: for example, D. G. McLean, a Priceville blacksmith in 1882, was a Ceylon hotelier by 1892, re-appeared in Priceville in his former occupation in 1895, and was running a Dundalk hotel by 1898. In 1903 D. G. McLean had reverted to his Priceville blacksmith's shop, and also operated a general store in the same village. The linked migrant file furnishes many other examples of individuals alternating between two or more activities and places.

There is no evidence that local businessmen moved into the smaller, newer places, station villages excepted. As Table 7.6 reveals, these smaller places were less likely than other centres to receive individuals from other local places. Not surprisingly, places at the edge of the study area received and transmitted proportionately fewer migrants. Also,

TABLE 7.3

LINKED BUSINESS MIGRANTS AS A PERCENTAGE OF ALL BUSINESSES WHICH APPEARED AND DISCONTINUED BETWEEN SELECTED DIRECTORY YEARS (SAMPLE OF 202 MIGRANTS)

PERIOD	$\left(\frac{\text{Linked Out-Migrants}}{\text{Terminated Businesses}}\right) \times 100$	$\left(\frac{\text{Linked In-Migrants}}{\text{Newly Established Businesses}}\right) \times 100$
1882-1884	13	9
1884-1886	10	8
1886-1887	14	9
1887-1892	8	9
1892-1898	9	13
1898-1903	10	8
1903-1907	2	7
1907-1910	5	7

TABLE 7.4

RELATIVE SIZE OF ORIGINS AND DESTINATIONS OF 202 BUSINESS MIGRANTS, 1882-95 AND 1895-1910

	Destination Larger Than Origin Migrants		Destination Equal to Or Smaller Than Origin Migrants	
PERIOD	Number	Per Cent	Number	Per Cent
1882-1895	47	41.2	57	58.8
1895-1910	52	59.1	36	40.9

$\chi^2 = 6.51$ $\chi^2_{.95} = 3.84$

TABLE 7.5

OCCURRENCE OF SELECTED BUSINESS ACITIVITIES IN THE MIGRANT AND TOTAL BUSINESS POPULATIONS

ACTIVITY	All Businesses Per Cent	Out-Migrants Per Cent	In-Migrants Per Cent
Storekeeper	13.2	14.4	13.9
Blacksmith	6.7	13.9	12.4
Saw Mill	6.3	8.4	8.4
Hotel	5.1	5.9	7.9
Builder	5.0	9.9	7.9
Wagon-Maker	3.6	3.5	5.0
Shoemaker	3.5	5.0	5.9
All Above Activities	43.4	61.0	61.4

TABLE 7.6

RELATIVE LIKELIHOOD OF MIGRANT LINKAGE GIVEN ABSOLUTE TURNOVER AND RELATIVE LOCATION OF PLACES, GREY COUNTY STUDY AREA 1882-1910

Number of Businesses Established or Ceased (Places Not at Edge of Grey Study Area)	Number of Places	Number of Possible Links	Number of Actual Links	$\left(\frac{\text{Actual Links}}{\text{Possible Links}}\right) \times 100$
1 - 10 Businesses	4	24	1	4.2
11 - 30 "	12	213	24	11.3
31 - 100 "	12	813	127	15.6
101 - 1000 "	2	520	58	11.2
1001 + "	--	--	--	--
(Places at Edge of Grey Study Area)				
1 - 10 Businesses	4	20	--	0.0
11 - 30 "	2	38	--	0.0
31 - 100 "	5	230	23	10.0
101 - 1000 "	7	1648	132	8.0
1001 + "	1	1006	38	3.8

despite the increasing propensity of migrants to move to larger centres, towns also counted relatively fewer local migrants in their business turnover. The villages with an absolute turnover of 31 to 100 persons, were those places most likely to receive their businessmen from nearby places and also lose them to other local centres.

In general, local business relocation rarely occurred; it diminished in intensity after 1898, and reflected neglect of the smallest places. Local relocation was most frequent among businessmen engaged in the more common activities. Since the villages were dominated by such activities, the relative occurrence of local business relocation was greater in these places. Repeated migration by the same individual suggests that such movement was associated with those who were more rather than less secure in the business community, with those who were tied by their market, their family, their craft or their property. Since local business migration was the exception rather than the rule, it is argued that the pattern and context of duration of *all* businessmen in an activity provides the best basis to assess the role of mobility.

Blacksmith Duration

For several reasons the blacksmith merits detailed study. An adequate sample size is required; blacksmiths were less numerous than general storekeepers but more numerous than businessmen engaged in other activities. General storekeepers' duration, however, is difficult to compare with market conditions. General stores were very numerous

in the largest places; these stores relied on urban markets which cannot be reliably reconstructed from directory evidence. Blacksmiths were, in contrast, no more numerous in urban places than one would expect from tributary rural markets. The 1892 directory attributes 29 general stores to Collingwood but lists only 4 blacksmiths. By selecting an activity which occurs at many post office locations, it is possible to employ post office patronage as a surrogate of the pattern of blacksmith markets. Finally, it is demonstrable that the relative duration of blacksmiths typifies that of several other business activities (Table 7.1).

Is blacksmith duration related to array completeness? In Table 7.7, a transition to a succeeding directory year is employed as a frame of reference. From the inference that an incomplete array is detrimental to business, a relationship is expected between the arrival and departure of storekeepers and blacksmiths. Between 1882 and 1910 there are 279 observed cases in which a place retains at least one blacksmith, loses its last blacksmith, or acquires the activity. In Table 7.7, these three events are considered in conjunction with the four possible contingencies of general store location. Association indices are derived from relative frequencies. The indices generally accord with the pattern of events one would expect. The relative likelihood of blacksmith termination is least if a place has retained at least one general store and greatest if no general store is present in either directory year. In three-quarters of all cases observed, a place retains both a blacksmith and a general store. If at least one black-

TABLE 7.7

INDICES OF ASSOCIATION: RETENTION, ACQUISITION AND TERMINATION OF BLACKSMITH AND GENERAL STORE BUSINESSES

(NUMBER OF CASES IN BRACKETS)

	Place Retained Blacksmith	Place Lost Blacksmith	Place Acquired Blacksmith	Total Cases
Place Retained General Store	1.07 (213)	0.60 (10)	0.65 (12)	(235)
Place Lost General Store	0.86 (8)	2.53 (2)	1.15 (1)	(11)
Place Acquired General Store	0.69 (7)	1.15 (1)	4.22 (4)	(12)
Place Lacked General Store	0.51 (9)	4.63 (7)	3.01 (5)	(21)
Total Cases	(237)	(20)	(22)	(279)

smith is retained, it is relatively unlikely that a general store is absent in either directory year. When a place acquires a blacksmith, it is relatively likely to gain its first general store. It is also relatively likely, however, to possess no general store, which is inconsistent with the criterion of array completeness. As is apparent in Table 7.7, however, such a logically poor choice of location is also a typical context for subsequent termination.

Although the presence of only one blacksmith intuitively provides less insurance that a place will not lose the activity, such isolated blacksmiths are less likely to cease business than their counterparts placed in a direct competitive context, that is, in places possessing two or more blacksmiths. Not until the end of the period 1882-1910 are isolated blacksmiths less durable than those forced to share a market with immediate neighbours (Table 7.8).

Despite the apparently greater security an isolated blacksmith possessed, 10 of the 49 places studied never possessed a blacksmith between 1882 and 1910. Of 134 blacksmiths known to have begun business, only 22 pioneered or re-occupied a place that had lacked the activity in the previous directory year. The proportion of blacksmiths who were isolated did increase from less than 15 to circa 30 per cent (Table 7.9), but this was largely due to the attrition of blacksmiths in a competitive context rather than a developing preference for a solitary location. As Table 7.9 indicates, the percentage of blacksmiths who occupied such a location vacillated over time. As soon as thirty per cent or more of all blacksmiths were isolated, that is from

TABLE 7.8

PER CENT OF INDIVIDUAL BLACKSMITHS WHO CEASED BUSINESS BETWEEN DIRECTORY YEARS: BUSINESS TERMINATION IN A COMPETITIVE AND NON-COMPETITIVE CONTEXT

PERIOD t_i t_j	Ceased Business In Competitive Context (More Than 1 Blacksmith at t_i) Per Cent of Blacksmiths	Ceased Business In Non-Competitive Context (1 Blacksmith at t_i) Per Cent of Blacksmiths
1882-1884	37.4	12.5
1884-1886	25.5	14.3
1886-1887	17.0	0.0
1887-1888	18.4	0.0
1888-1892	33.3	7.7
1892-1895	22.7	5.9
1895-1898	40.0	35.0
1898-1903	42.4	21.4
1903-1907	39.4	25.0
1907-1910	20.0	26.7

TABLE 7.9

COMPARISON OF BLACKSMITHS WHO ENTERED OR CEASED BUSINESS IN ISOLATION, AS A PERCENTAGE OF ALL BLACKSMITHS WHO ENTERED OR TERMINATED BUSINESS

PERIOD t_i t_j	Isolated Blacksmiths As a Percentage of Those ...		
	Who Ceased t_i t_j	In Business t_i	Who Entered t_i t_j
1882-1884	5.0	13.6	0.0
1884-1886	7.7	13.0	33.3
1886-1887	0.0	20.3	0.0
1887-1888	0.0	19.7	11.1
1888-1892	5.9	21.3	29.4
1892-1895	9.1	27.9	40.0
1895-1898	30.4	33.3	10.0
1898-1903	17.6	29.8	26.3
1903-1907	23.5	32.7	16.7
1907-1910	36.4	30.0	37.5

1895 on, they were also notably more prone to terminate their business.

Blacksmiths were less likely to cease business if they had been established for several years: the 47 blacksmiths extant in 1910 included eight persons who had worked in the same place since 1882 or earlier. As Table 7.10 demonstrates, each cohort of recent blacksmith arrivals shed forty to sixty per cent of its number within five years. Over longer periods the surviving percentages show greater dissimilarity: the 1886 arrivals were notably persistent, the 1884 cohort less so. The blacksmiths who entered in 1887 and 1888 all ceased business within a decade. This temporal difference suggests that just as some individuals were more successful than others in securing an acceptable niche in the business community, the availability of such niches also varied from one period to another.

Owing to the constantly changing pattern of businesses and custom, incoming blacksmiths could not and did not secure a market by simply replacing those who ceased business. In the average directory interval of 2.8 years, only 58 per cent of places experienced no net change in the number of blacksmiths they possessed. Just over 18 per cent registered a net loss of one blacksmith, and just under 18 per cent gained one blacksmith. The remaining 6 per cent of places experienced a net gain or loss of two or more blacksmiths. From Table 7.11 it is clear that the 58 per cent experiencing no net change mainly comprised places registering no gross change either. If one blacksmith had ceased, the likelihood of there being no replacement was more than twice that of exactly one blacksmith taking his place. The effect of

TABLE 7.10

DURATION OF BLACKSMITH BUSINESSES: COHORTS SPECIFIED BY YEAR OF FIRST DIRECTORY APPEARANCE

YEAR OF FIRST DIRECTORY LISTING	Per Cent of Blacksmith Cohort Remaining After . . . 0	5	10	15	20	25 Years
1882	100	58	40	31	22	17
1884	100	40	28	13	7	7
1886	100	60	44	28	19	11
1892	100	60	30	18	16	n.a.
1898	100	55	23	n.a.	n.a.	n.a.
1903	100	53	n.a.	n.a.	n.a.	n.a.

NOTE: Values interpolated from known percentages in directory years.

TABLE 7.11

CONDITIONAL PROBABILITY MATRIX OF THE NUMBER OF BLACKSMITHS ENTERING BUSINESS GIVEN THE NUMBER THAT HAD CEASED BUSINESS SINCE THE PREVIOUS DIRECTORY YEAR

NUMBER WHO CEASED BUSINESS t_i t_j	Number Entering Business in Place t_i t_j			
	0	1	2	3 OR MORE
0	0.762	0.212	0.020	0.006
1	0.583	0.285	0.119	0.013
2	0.429	0.285	0.190	0.096

business turnover was amplified by the fact that simple replacement of departing businessmen was the exception rather than the rule: newcomers tended either to establish new locations or, more commonly, to occupy a location which had not lost an established blacksmith. The conclusion is inescapable: duration and replacement were related to local market conditions.

Business Duration and the Character of Places

Attention is now shifted from the fact that a minority of the blacksmiths present in 1882 were still in business fifteen years later (Table 7.10) to observing where these particular businessmen remained. Despite the earlier observation that solitary blacksmiths were generally more persistent, this was not true of the 1882 cohort. Only 20 per cent of these isolated blacksmiths survived in business to 1898, while 25.5 per cent of those located in a competitive context did so. The 1882 blacksmiths who remained longest were situated in larger places, whose median complement of activities was more than twice that of those places which had lost all their 1882 blacksmiths by 1898 (Table 7.12). Moreover, whereas the 15 durable blacksmiths constituted 38 per cent of all blacksmiths in their twelve locations in 1882, sixteen years later they constituted 60 per cent. The 17 blacksmiths present in 1898 in the places in which the 1882 cohort was not represented, represented a larger percentage of the 1882 complement than the 25 blacksmiths in those places retaining members of the cohort. The percentages were respectively 77 and 64. Thus even if some 1882 blacksmiths had

TABLE 7.12

THE RELATIVE DURATION OF 1882 BLACKSMITHS AND SELECTED CHARACTERISTICS OF THE PLACES THEY OCCUPIED

	Places Which Retained At Least One 1882 Blacksmith By 1898	Places Which Had Lost All 1882 Blacksmiths By 1898
Number of Places	12	14
Number of Blacksmiths, 1882	39	22
Number of 1882 Blacksmiths, 1898	15	--
Number of Blacksmiths, 1898	25	17
Median Number of Activities, 1882	20	15
Median Number of Activities, 1898	9	7

remained in the predominantly smaller places, they would have faced more competition for a smaller available market. Despite the greater turnover of businessmen in the larger places, these were also a haven for the most persistent, and apparently increasingly secure, blacksmiths. A lucrative business and assured future was the preserve of a few successful townsmen. A monopoly of village business, although it promoted persistence, was a less compelling niche than the established town business. Among those who took the latter path to security, those who had the widest choice of good locations, that is the earliest persons in business, were in a majority.

The degree to which initial advantage encouraged persistence appears to have depended on the freedom of action left to newcomers. In 1882 there were 17 places which possessed one or more carriagemakers, at most (1895) there were 19 places. Presumably the places that could support this activity were almost all occupied at the beginning of the period studied. Subsequent carriagemakers did not fare well, for only one of the 1884 arrivals lasted beyond 1892. In contrast 10 of the 17 places possessing a carriagemaker in 1882 still held at least one of these men in 1898. Their duration appears to have rested in part on the fact that few new locations eroded their market, and in part too on their ability to successfully resist direct competition. Storekeepers, however, present a very different picture: only 5 of the 23 places retained an 1882 storekeeper later than 1898, and 1884 newcomers were as persistent as the 1882 cohort. The number of general store locations rose from 23 to 36 between 1882 and 1895: this not only furnished

newcomers with a wider choice of niches, it also undermined the market, and thus the duration, of earlier businessmen in pre-existing and larger places. It therefore appears that the association between blacksmith persistence, direct competition, and location in the larger places, is indirect. It is suggested that this association devolves from the size of market blacksmiths were able to command in the larger places, even when the market was shared with several competitors.

Business Duration and Tributary Markets

It is assumed that the market commanded by a blacksmith in place i is equal to

$$(7.1) \quad \frac{M^{ij}}{b^i}$$

when b^i is the number of blacksmiths present, and M^{ij} is the local post office market plus the markets of all other post offices which:

1. lack a blacksmith in the place in which they are located; and

2. are attracted to P^i rather than any other available blacksmith location, that is, if no alternative exceeds r.

$$(7.2) \quad \frac{W^{ij}}{D}$$

for all alternative combinations of W and D, when D is the distance between the place lacking a blacksmith and a place possessing this activity.

It is therefore assumed that post office markets are nested within blacksmith markets. This assumption is adopted to simplify calculation: from Chapter Three it is clear that consumers within a post office market lacking some other activity would not necessarily be unanimous in choosing an available location.

Now suppose that a succession of blacksmiths locate in places such that each takes the maximum market available to him, and that the last entrant is just satisfied by a market Q. If

$$(7.3) \quad \frac{(b^i + 1)(M^{ij})}{b^i}$$

is less than Q, no further blacksmiths will enter P^i. Thus a blacksmith's market will not be eroded by further immediate competitors if it is less than

$$(7.4) \quad \frac{(b^i + 1)(Q)}{b^i}$$

Finally, it is assumed that in the real world the actual number of blacksmiths present approximates the number permissible within a range of markets the limits of which are Q and (7.4), above, minus one consumer.

From these assumptions the expected distribution of blacksmith markets in 1887 and 1898 is generated. Blacksmiths and unserved markets are iteratively allocated to places until no blacksmith is able to increase his market by relocating. Based on 54 blacksmiths present in 1887 and 48 in 1898, computed values of Q are respectively 56 and 94 listed consumers. Adjusting the former value to allow for the absolute difference in the length of the two directory lists yields a comparable 1887 value of 73 consumers. As Table 7.13 demonstrates, a minority of blacksmiths actually commanded a market within the range expected; this minority was larger by 1898, but nonetheless many blacksmiths either served a less than satisfactory or unexpectedly large market.

The effect of this disparity on blacksmith turnover is detectable in Table 7.14. Given excess and deficit markets, net addition or loss tended respectively to ensue if the status quo was not maintained. Newcomers favoured those places with a surplus market rather than places with no extant blacksmith. Thus between 1887 and 1892 two adequate but entirely unserved markets were passed over in favour of three places already occupied by blacksmiths. Two of these furnished appreciably larger markets than the two neglected locations, while the third was a station village whose listed tributary market certainly understated

TABLE 7.13

ACTUAL VERSUS EXPECTED DISTRIBUTION OF BLACKSMITH MARKET SIZES IN 1887 AND 1898

	Market Per Blacksmith		
YEAR	Less Than Expected (No. of Blacksmiths)	Within Expected Range (No. of Blacksmiths)	Greater Than Expected (No. of Blacksmiths)
1887	22	19	13
1898	16	21	11

TABLE 7.14

ACTUAL VERSUS EXPECTED NET CHANGE IN THE NUMBER OF BLACKSMITHS PER PLACE: 1887-1892 AND 1898-1903

	Actual Net Change		
	Decrease No. of Places	No Change No. of Places	Increase No. of Places
Expected Net Change 1887-1892			
Decrease	6	4	0
No Change	1	16	1
Increase	1	5	2
Expected Net Change 1898-1903			
Decrease	3	6	1
No Change	3	22	4
Increase	0	5	3

available demand. The two viable locations lacking a blacksmith were also ignored by those who entered between 1898 and 1903: once more these newcomers chose larger market shares available at three occupied locations, and the potential business of the two station villages, Ceylon and Proton Station.

Blacksmiths who commanded the largest markets were characteristically of 1882 vintage; of the five places furnishing the largest market share in both 1887 and 1898, four were occupied by at least one 1882 blacksmith. Of course it is unlikely, given the time in which these men had built up their custom, that 1882 blacksmiths had merely an equal share with their direct competitors. Little wonder then that despite an apparently more than adequate market share in the large villages and towns, blacksmiths other than those long established tended to leave within a few years. Nor is it surprising that so few of these were local migrants, for these would be aware that the apparent business prospects in these places would not materialize. Instead (Table 7.14) many accepted the status quo, even if business was less than brisk. The fact that apparently viable but unoccupied locations were passed over contributed to the demise of the small places, not only by the resultant transfer of consumer patronage to other centres but also because the presence of activities other than the store and post office was to some extent conditional upon the presence of a blacksmith's shop. Also, the disproportionately low levels of consumer expenditure in the smaller business places, discussed in Chapter Five, gave arriving blacksmiths an additional incentive to ignore these places. The pattern of

business duration, related as it was to qualitative differences in markets, provides a further key to understanding the changing pattern of activities in places in the late nineteenth century.

Summary

Business duration was characteristically brief; only a few businessmen spent their career within one place or area. Local migrants typically worked in the more common trades, moved from smaller to larger places, and were under-represented in the hamlets and towns. The intensity of business turnover required that several businessmen, prompt replacements, or just one unusually persistent person, were required to maintain the presence of an activity in a place. Direct competition, however, raised the incidence of business termination; replacement was by no means guaranteed, and although solitary businessmen were initially persistent, by 1900 there was no obvious association between isolation and durability. In fact the oldest businesses were in the larger places, dominating exceptionally large markets. Newcomers tried, usually without success, to cut into these markets; they ignored the slimmer pickings elsewhere. Since the more attractive locations captured the markets of smaller places whenever an activity was lost in the course of business termination without replacement, the market dominance of larger centres and older businesses was cumulative.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS

> Arrakis teaches the attitude of the knife--chopping off what's incomplete and saying *"Now, it's complete because it's ended here".*
>
> Frank Herbert (1965) *Dune*

Business location and consumer behaviour in late nineteenth century rural Ontario are complex phenomena. Their complexity is due largely to the endemic mobility of nineteenth century society. This analysis has explored the role of population transience as a background of location and choice. The impact of transience was treated in depth in Chapters Five through Seven. The empirical findings of these chapters are particularly significant in view of the analytical sequence by which they are preceded. This sequence is, briefly, a simultaneous procession from an abstract to a real world of the past, and from a static to a dynamic view of past geography. These transitions demonstrate the value of a theoretical perspective in historical geography. As a whole, this perspective comprises: the articulation of propositions which are logically derived, reasonable and testable in an historical context; the evaluation of such propositions, and the evaluation of unexpected results through the medium of additional hypotheses concerning the real world. Thus a vantage point firmly grounded in theory facilitates rather than precludes broad empirical analysis. Such

analysis will continue to be a central feature of scholarship in historical geography.

The Abstract World

Central place theory and theoretical approaches to firm competition or consumer behaviour were reviewed in the second chapter. Although this extensive literature offers many theoretical insights, it is deficient in two vital respects. The first is that the behaviour of firms and consumers, although intuitively interdependent, has not previously been explicitly viewed as such. The second deficiency is a relative lack of theory concerning efficient forms of tripping as these relate to consumer *needs*, the *frequency* with which needs are satisfied, and the *effort*, as a function of distance, required to satisfy them.

Historical central place studies have repeatedly confirmed departures from theory, but have not substituted testable hypotheses concerning consumer and firm behaviour. Behavioural theory within historical geography is practically limited by a focus on deceased populations. Such a focus requires indirect means of access to past patterns of choice and context (Mannion, 1976; Norris and Konrad, 1976). The abstract synthesis of consumer choice and business location attained in Chapter Three is a significant contribution to theory in marketing geography. This synthesis is, however, aimed specifically at present and future research in historical geography, as a demonstration that inferences from *some* explicit assumptions concerning human behaviour can be developed and tested in an historical context.

Of those assumptions in Chapter Three based on prior critical examination of the existing literature, two stand out: multi-purpose tripping and the concept of purchase frequency derived from business activity incidence. To the extent that the latter *reflects* consumers' needs specific to a selected area and period, the purchase frequency assumption is abstract more in its application than in its derivation. Purchase frequency provides a basis for measuring the relative attractiveness of places as points of purchase of any single good. Multi-purpose trippping encourages the presence of a complete array of activities in a place in diminishing order of purchase frequency. Thus the orderly agglomeration of firms is found to be a corollary of consumer behaviour rather than merely of firm competition or uncertainty.

In a linear market abstraction of real world conditions, it is deduced that market division is a function of the relative distance and attraction of places. Agglomeration of firms offering the same or different goods is shown to develop in the course of market division. The spacing of places is also shown to depend on market division. Uniform spacing of places is not general. Initial advantage is imparted to places because the agglomeration of business types is cumulative in diminishing order of their associated purchase frequency.

The most significant feature of this abstract world is that market division and business location are interdependent phenomena. Another significant characteristic is that places and markets, although orderly, are *not* necessarily uniform in size or configuration, which accords with empirical observation. Furthermore, this abstract system of places and

markets can *evolve*, conforming simultaneously to the agglomeration and order of entry principles and to the relationship between place attraction and market division. Finally, this world suggests propositions which are testable in the real world of the past.

The Real World

This thesis has achieved a more complete reconstruction of a changing pattern of business locations and markets than any previously attempted within historical geography. Evidence and its treatment is almost an obsession in historical studies, which are concerned with phenomena that cannot be directly observed (Moodie and Catchpole, 1975; Harris, 1967). The reality of individual behaviour in the past is doubly elusive and, notwithstanding cautionary statements concerning their reliability (Spelt, 1972; page 96; Davy, 1970, page 77), directory sources have been successfully employed in this research as an avenue to the location, choice, context and persistence of individuals. Record linkage is a key element in the desirable objectives of evaluating source reliability and reconstructing individual profiles in the past. Linkage of directory sources (Bowden, 1971), indeed of historical records in general, is characteristic less of research in historical geography than in social history.

The particular characteristics of consumers and businessmen identified in this research are limited in scope, and set aside from broader issues of economic, demographic and social change in the late nineteenth century. Attention is confined to those characteristics of demonstrably local and arguably central importance in the changing pattern of places and markets:

these characteristics are the location, occupation, duration and migration of retail businessmen, and the location, choice and persistence of their patrons. Just as the Canadian postal system, and contemporary directory sources, provide a practical means of evaluating markets and places, the post office is also clearly of basic importance in the location of rural centres and in their function as activity and information foci. This importance is amplified by weekly newspaper circulation via post office outlets. The post office market may also reflect access to credit through storekeeper-postmasters in the late nineteenth century. As a known and relatively inflexible *bond* to a place of business, the postal address has no parallel as evidence, in either significance or availability.

Based on the expected effect of place attraction and on a given pattern of business activities in 1887, the expected division of post office markets was mapped in Chapter Four. The result was at odds with reality, but less so than a proximate division of the four township market. Minimum distance travel is definitely not universal in the area and period examined.

Further analysis in Chapter Four revealed qualifying effects on tributary markets of post office age and business array completeness, which are consistent respectively with the expected impact of consumer choice inertia and of restricted opportunities for multi-purpose tripping. Including these two factors with place attraction as market determinants yields a close approximation of actual market division in 1887. Applied to places in 1898, the model provides an even closer approximation of actual market conditions. With the passing of time, the relative importance of post office age as a

reflection of consumer choice inertia diminishes. As business arrays become more complete completeness is also, not surprisingly, of reduced relative importance as a criterion of consumer choice. Based on expected trends in 1887, the progressive adjustment of the market pattern toward the theoretical norm is seen to occur as a result both of transferred patronage and selective business location decisions between 1887 and 1898. Thus the fundamental *interdependence* of market division and business location is confirmed, based on characteristics of relevance to all of rural Southern Ontario in the late nineteenth century. The results obtained in Chapter Four indicated further empirical analysis of consumer behaviour and the business location decision.

Territorial change in markets was observed in Chapter Five at the level of a single township. Detailed preliminary examination of one locality within Euphrasia Township revealed a pattern of choice transfer which appeared to be consumer-specific as well as location- and place-dependent. While shopping behaviour as a whole clearly arises from a variety of household attributes, some of which can be identified in municipal assessment rolls, the most obvious attribute pertaining to post office choice is that of prior residential persistence. This association is clarified in Chapter Five. Residential persistence promotes choice persistence. Localized market shifts, however, are associated not only with the mix of persistent and new residents but also with the unanimity of allegiance of persistence neighbours. When population turnover varies little from one market to another, as is the case in Euphrasia Township between 1887 and 1898, its impact is confined to the rate of market area adjustment. The results suggest further research in an area of stable population density but of

spatially variable turnover.

It is unlikely that consumer choice persistence was based on allegiance to individual businessmen, because few businessmen stayed long enough in one place to develop such allegiance. Choice persistence does, however, appear to be related to rural community structure. Changing post office revenue patterns suggest that the post office as a social focus and service survived the post office as a basis for shopping behaviour. In Eastern Grey County this trend is first detectable in 1895, and is consistent with the failure of hamlets and villages to recover business lost between 1895 and 1898. Elsewhere in Ontario this divergent trend in the pattern of revenue and patronage may have occurred earlier than in the area studied. Case studies of rural trip patterns, social networks, and the sales areas of town and village tradesmen are required to substantiate the inference that consumer expenditure by-passed small places long before rural mail delivery and automobile adoption transformed the Ontario countryside. The last two decades of the nineteenth century in rural Ontario may be viewed as a period during which the spatial organization of society--institutional, social and commercial--was transformed by internal as well as external forces. In the post office, chapel, school-house and village businesses lay a basis for a simple division of the rural landscape, reinforced by social and kinship patterns. It is probable that such a division was of diminishing clarity from as early as 1880. In the pattern of choice of consumers and businessmen is reflected the passing of the hamlet as focus. In its disregard of the hamlet the population of Grey East was also implementing, wilfully, the disintegration of rural communities defined

in broad terms. This part of Ontario was acquiring a twentieth century cast well before 1900.

The business location decision is found to be equally complex in a dynamic framework. The order of entry principle is both theoretically sound and intuitively appealing as an arrangement of businesses in rural space. General correspondence to this principle is identified in Chapter Six, but a continuous increase in the level of correspondence is absent. Rather, the level of correspondence fluctuates, and is attributable less to the mortality of poor business locations than to temporal variation in the quality of new locations. In turn this variation depends on available vacancies in the business structure and on the number of businessmen seeking locations. Indiscriminate attrition of businesses after 1895 was thus offset by the incentive and opportunity for newcomers to choose well. In order of entry terms to choose well after 1895 comprised the gradual filling of gaps in the business structure of towns and some larger villages. Small village and hamlet locations were not, as a rule, sensible choices for retail businessmen at the end of the nineteenth century. This interpretation is supported by an examination of individual business duration.

It is important to stress that the approach to business duration in this research is distinctive in one major respect, that is an emphasis on context, particularly on geographical context. It is a noteworthy, but hardly new finding, that business duration in Eastern Grey was characteristically brief and varied with business type. This research has determined that local business relocation was unusual. The changing retail structure was implemented largely by individuals who were new to business, or to the

study area, or both, and by persons who quit business or the study area altogether. Thus this late nineteenth century rural business pattern does not reflect a local search strategy which converges on an acceptable location after one or more trials. Improving, even maintaining, a position within retail business was, for most, a matter of frequent and long-distance moves. In absolute and relative numbers, the few local business migrants favoured large villages and were engaged in activities most characteristic of these places. Such migrants were part of a minority group which belonged properly within the more persistent elements of the area's business population.

Business duration is related to several attributes of places: with array completeness, the presence of direct competition, and the available market. Initial advantage is reflected in the relative persistence of the businessmen present in 1882, and especially in their persistence in the largest centres serving Grey East. Although hamlets offered no direct competition to the incoming businessman, they were in other respects deficient in those qualities promoting their initial selection and subsequent retention as a business location. By the end of the nineteenth century, the agglomeration of firms in towns and the dearth of a replacement business population in small places reflects the market *share* offered by the former in comparison with the smaller *market* attainable in the latter. Thus the transfer of markets to the larger places, and the increasing proportion of study area businesses located in them, were interdependent, cumulative and endogenous phenomena. This interpretation is further underscored by indirect evidence of the changing pattern of rural consumer

expenditure, and by direct evidence of the array-conscious business location decisions typical of the period 1895 through 1907. Business failures in large places left their attraction almost unimpaired. Business termination in small places undercut their attraction. Ensuing market contraction diminished the likelihood that the replacement businessmen in the study area would re-occupy hamlet and small village locations.

The real world of location and choice in the past is more than merely a laboratory within which abstract inferences may be tested. Business location and consumer behaviour in Eastern Grey can be understood in the limited sense that they accord with a set of postulates concerning the criteria upon which decisions are made. It is more important to recognise that an orderly relationship between markets and places was maintained, and continuously revised, through the medium of population turnover and a diminishing interest in small places as centres of activity. Elsewhere in Ontario the transience and attitudes of the population may not have paralleled the example of Grey County, yielding a distinct pattern of change which nonetheless retained the basic structural order identified in this study. It is a task of the historical geographer to bring a conception of such structure to the changing economic and social landscape of the past, for there is no other obvious method by which the impact of population transience can be assessed.

Further Research

The interpretation of change adopted in this study suggests that neither price inequalities nor non-local competition were crucial factors

in the decline of small places. Mail order selling, consumer taste and consumer income have been similarly disregarded. Further research will, therefore, undoubtedly modify the interpretation of location and choice adopted in this thesis. A framework now exists for detailed case studies of late nineteenth century consumer travel behaviour and purchase patterns. Such studies, by providing information beyond the level of post office choice, will also furnish a basis for associating the characteristics of individual consumers with their shopping behaviour. The particular difficulty that will beset such research, however, is that detailed information concerning travel behaviour prior to 1900 will be neither plentiful nor necessarily representative. Although cultural background, socio-economic status, and precise measures of persistence can be sought in manuscript records, a sensible limit must be set to the effort and information applied to a consumer decision as basic as that of post office choice. It is, then, a question of seeking other manifestations of individual choice behaviour in the past that are available for large, representative localized and linkable populations. Tangible evidence of past choice, such as the cemetery marker or farm-house, is one means by which the historical geographer can identify and comprehend individual behaviour (Norris and Konrad, 1976). Other means must be sought.

The characteristics of individual businessmen which merit further examination are age, wealth, household size and kinship ties as factors underlying occupation, location and duration. The relationship bewteen transience and context established in this thesis suggests that those businessmen who were young, single and mobile were confined largely to

locations from which a prompt departure was rational on other grounds. What were the attributes of the last businessmen in the hamlets? There is also a pressing need for further research in nineteenth century business migration: the results of this research indicate a research design which embraces a large area at one or more intervals of no greater than two years. Directory sources do not, however, provide linkage criteria to establish business migration with any certainty. It will be necessary to establish the reliability of such linkage by resorting to assessment rolls with a random sub-set of pre-linked cases. Occupational mobility within the retail sector was clearly often a corollary of geographic mobility.

Historical geography must confront the fact that aggregate past spatial patterns are mere traces of individual behaviour in an environment of movement and change. This thesis has made a further step toward identifying and comprehending such environments.

APPENDIX ONE

ATTRACTION OF PLACES 1882-1910

PLACE	YEAR	ATTRACTION, W^{ij} 1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Badjeros		2.92	3.80	4.09	4.34	3.71	3.87	2.61	2.18	2.17	2.22
Banks		1.00	1.00	1.80	1.00	1.76	1.00	1.64	1.00	1.00	2.02
Blantyre		2.36	2.41	2.52	2.48	2.47	2.50	1.57	2.18	2.64	2.61
Camperdown						1.00	2.24	1.00	1.00	1.00	1.00
Ceylon		4.45	5.19	4.46	5.00	4.55	4.54	4.09	3.60	3.53	3.53
Clarksburg		8.49	9.54	7.11	9.10	8.65	9.37	6.88	5.69	5.79	5.49
Collingwood		11.39	11.08	10.76	10.69	10.86	11.35	8.16	7.40	7.91	7.64
Craigleith		2.23	2.94	1.52	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Duncan		2.12	2.92	2.85	2.60	2.52	4.26	1.64	2.18	2.17	2.16
Dundalk		8.61	8.59	9.78	9.86	10.00	10.74	8.05	6.68	7.32	6.97
Epping		2.89	3.41	2.90	3.57	3.18	3.08	1.76	1.73	1.53	1.00
Erskine					1.00	1.69	1.72	1.00	1.00	1.00	1.72
Eugenia		5.86	4.97	4.47	4.86	5.76	5.31	3.30	2.49	2.99	2.51
Fairmount		1.44	1.67	1.80	2.91	3.63	3.78	1.64	1.61	1.64	1.00
Feversham		4.89	3.99	4.97	5.53	6.49	7.03	4.23	3.47	3.85	3.42
Flesherton		9.98	9.83	8.18	9.97	9.85	10.11	6.80	6.23	7.08	6.68
Gibraltar		1.00	2.11	3.54	3.15	3.16	3.22	1.57	1.43	1.47	1.45

ATTRACTION OF PLACES 1882-1910 (cont'd.)

PLACE	YEAR	ATTRACTION, W[11] 1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Goring				2.65	1.74	2.80	2.50	1.57	1.57	1.11	1.59
Griersville		3.39	3.46	3.04	2.91	1.89	3.50	2.21	2.18	1.53	1.00
Harkaway		1.00	1.00	1.00	1.00	2.62	2.65	1.00	1.00	1.00	1.00
Hatherton						1.69	2.82	1.57	1.43	1.00	1.00
Heathcote		4.92	4.35	3.97	4.68	5.75	6.07	4.37	3.39	2.66	3.36
Inistioge		4.31	3.55	3.30	3.17	1.93	2.54	1.80	1.43		
Irish Lake						2.24	2.44	1.57	1.43	1.00	1.00
Kimberley		5.22	5.10	5.15	4.91	6.40	6.34	4.22	2.78	3.11	2.68
Kolapore				1.57	2.41	2.58	2.65	2.30	2.12	2.11	2.10
Lady Bank		1.00	1.00	1.57	1.81	1.69	2.11	1.57	1.43	1.00	1.00
Loree				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mairs Mills								1.00	1.00	1.64	2.32
Maple Valley		3.55	4.14	4.20	4.55	4.39	4.56	3.01	2.61	2.28	2.87
Markdale		9.76	9.89	9.76	9.99	10.60	10.75	8.46	7.38	7.59	7.28
Maxwell		4.61	5.79	5.12	6.02	5.93	6.71	4.43	3.87	3.13	3.32
McIntyre		1.64	2.99	4.15	5.46	5.58	5.97	3.78	2.85	2.40	2.43
Minniehill									1.00	1.00	1.00

ATTRACTION OF PLACES 1882-1910 (cont'd.)

PLACE	YEAR	ATTRACTION, W^{11} 1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Nottawa		6.95	7.10	6.54	6.91	7.18	8.05	4.81	3.23	3.32	4.01
Port Law								1.00	1.61	1.64	1.59
Pretty River Valley					1.00	1.00	1.00	1.00	1.00	1.00	1.00
Priceville		7.98	8.07	6.64	7.48	8.05	8.03	5.22	4.92	4.59	4.30
Proton Station					3.05	5.38	5.58	4.42	3.82	3.61	3.65
Ravenna		4.50	4.82	3.45	5.12	4.22	4.91	3.63	2.96	3.20	2.43
Redwing		1.44	2.22	3.38	3.57	4.51	5.10	3.31	2.85	3.20	2.61
Rob Roy		2.36	1.64	2.76	2.91	3.67	3.82	1.36	1.27	1.00	2.16
Rocklyn		2.92	4.98	5.10	5.15	5.67	5.52	3.97	3.39	1.87	2.28
Rock Mills											1.00
Singhampton		7.00	7.23	5.87	7.88	7.83	8.47	5.01	3.96	3.51	3.03
Thornbury		8.90	9.71	8.95	9.62	10.07	10.82	8.07	7.10	7.14	6.61
Vandeleur		2.92	2.25	2.77	2.98	4.05	5.73	2.00	1.32	1.00	2.16
Walter's Falls		6.01	6.38	7.24	7.21	8.39	8.68	5.20	4.14	4.52	4.52
Wareham		3.27	3.08	3.62	3.72	3.63	3.63	1.87	1.53	1.96	1.00
Wode House							2.50	2.21	2.61	2.11	3.18

SOURCE: Business directories.

APPENDIX TWO

POST OFFICE PATRONAGE: 1887 AND 1898

POST OFFICE	NUMBER OF LISTED PATRONS		POST OFFICE	NUMBER OF LISTED PATRONS	
	1887	1898		1887	1898
Badjeros	60[ab]	100	Kimberley	112	137
Banks	67	61	Kolapore	29	37
Blantyre	116	92	Lady Bank	19	35
Camperdown		15	Loree	27	20
Ceylon	33	102	Maple Valley	36[ab]	51
Clarksburg	132	247	Markdale	370	367
Collingwood	180[b]	251[b]	Maxwell	181	182
Craigleith	21	29	McIntyre	87	112
Duncan	68	88	Nottawa	166	223
Dundalk	147[ab]	375	Port Law		30
Epping	52	57	Pretty River Valley		42
Erskine		19	Priceville	204	276
Eugenia	98	146	Proton Station		107
Fairmount	28	45	Ravenna	83	89
Feversham	134	203	Redwing	54	70
Flesherton	275	299	Rob Roy	47	66
Gibraltar	63	76	Rocklyn	87	144
Goring	12	64	Singhampton	137	212
Griersville	100	90	Thornbury	136[b]	164[b]
Harkaway	44	94	Vandeleur	72	83
Hatherton		35	Walter's Falls	113	194
Heathcote	175	216	Wareham	55	98
Inistioge	65	52	Wode House		47
Irish Lake		25			

[a]Data incomplete; only part of market covered by 1887 directory.

[b]Not included in regression analysis.

SOURCE: 1887 and 1898 county directories.

APPENDIX THREE

ARRAY COMPLETENESS AND STABILITY

PLACE	YEAR	COMPLETENESS INDEX, C^{il} 1887	1895	1898	STABILITY INDEX, S^{il} 1886-1887	1895-1898
Badjeros		90[a]	84	94	a	0.67
Banks		100	100	100	1.80	1.64
Blantyre		100	100	96	1.00	0.63
Camperdown			90	100		0.45
Ceylon		80	90	92	0.99	0.90
Clarksburg		92	95	97	0.94	0.74
Collingwood		90[a]	96	91[a]	a	a
Craigleith		84	100	100	0.66	1.00
Duncan		79	84	100	1.00	0.38
Dundalk		81[a]	97	97	a	0.75
Epping		64	82	80	1.00	0.56
Erskine			97	100		0.58
Eugenia		91	92	93	1.00	0.62
Fairmount		100	75	100	0.69	0.43
Feversham		94	95	95	1.00	0.60
Flesherton		88	93	97	0.94	0.67
Gibraltar		98	100	96	0.97	0.49
Goring		86	100	96	2.65	0.63
Griersville		98	83	100	1.00	0.63
Harkaway		100	57	100	1.00	0.38
Hatherton			67	96		0.56
Heathcote		97	89	98	1.00	0.72
Inistioge		81	68	81	1.13	0.71
Irish Lake			98	96		0.64
Kimberley		100	97	95	1.00	0.66
Kolapore		87	82	83	1.00	0.87
Lady Bank		87	84	96	1.00	0.74
Loree		100	100	100	1.00	1.00

ARRAY COMPLETENESS AND STABILITY (cont'd.)

PLACE	YEAR	COMPLETENESS INDEX, C^{il} 1887	1895	1898	STABILITY INDEX, S^{il} 1886-1887	1895-1898
Maple Valley		86[a]	84	95	a	0.66
Markdale		93	97	98	1.06	0.79
Maxwell		97	94	95	0.91	0.66
McIntyre		80	97	99	1.00	0.64
Nottawa		82	94	91	1.04	0.60
Port Law				100		1.00
Pretty River Valley			100	100		1.00
Priceville		94	86	95	1.10	0.65
Proton Station		87[a]	91	95	a	0.79
Ravenna		96	97	94	1.00	0.74
Redwing		83	88	93	1.00	0.65
Rob Roy		79	91	83	1.00	0.36
Rocklyn		91	84	96	1.00	0.72
Singhampton		82	94	81	1.05	0.59
Thornbury		94[a]	97	96[a]	a	a
Vandeleur		77	88	72	1.00	0.35
Walter's Falls		91	88	89	1.15	0.60
Wareham		88	97	85	1.00	0.52
Wode House			100	100		0.88

[a]Not included in regression analysis.

SOURCE: Business directories.

APPENDIX FOUR

POST OFFICE DATE OF ESTABLISHMENT AND REVENUE

POST OFFICE	YEAR ESTABLISHED	REVENUE IN DOLLARS BY YEAR								
		1882	1884	1887	1895	1898	1903	1907	1910	1929
Badjeros	1875	89	105	125	215	152	151	142	229	559
Banks	1876	38	31	26	53	40	47	67	95	
Blantyre	1863	61	74	86	55	108	90	84	141	
Camperdown	1890				109	96	109	124	191	183
Ceylon	1876	121	153	153	312	325	380	531	591	986
Clarksburg	1862	588	603	642	810	815	897	1,071	1,295	2,064
Collingwood	1853	4,861	5,020	5,373	7,173	7,147	9,674	13,005	13,889	20,837
Craigleith	1857	51	75	55	58	82	59	88	79	56
Duncan	1866	20	28	31	80	63	87	94	124	136
Dundalk	1856	1,002	1,316	1,208	1,609	1,414	1,705	1,995	1,991	5,600
Epping	1858	94	61	68	95	48	46	57	90	
Erskine	1888				33	20	36	33	65	
Eugenia	1862	170	184	221	192	181	202	281	209	315
Fairmount	1878	85	84	50	25	27	32	56	45	
Feversham	1857	150	165	192	352	299	297	449	533	749
Flesherton	1851	1,081	1,397	1,377	1,263	1,131	930	1,185	1,285	2,530
Gibraltar	1872	43	48	64	50	58	60	73	83	
Goring	1884			73	54	26	32	47	52	93

POST OFFICE DATE OF ESTABLISHMENT AND REVENUE (cont'd.)

POST OFFICE	YEAR ESTABLISHED	REVENUE IN DOLLARS, BY YEAR								
		1882	1884	1887	1895	1898	1903	1907	1910	1929
Griersville	1854	107	89	88	66	71	49	53	40	
Harkaway	1875	10	18	7	46	274	106	85	54	
Hatherton	1889				14	25	21	28	32	
Heathcote	1848	265	239	258	291	262	268	313	343	320
Inistioge	1851	54	41	39	22	13	17			
Irish Lake	1889				17	14	17	34	42	
Kimberley	1868	98	97	194	192	206	204	231	296	360
Kolapore	1884			103	115	86	74	64	67	
Lady Bank	1881	27	37	12	23	17	19	35	28	
Loree	1884			38	30	22	25	32	30	27
Mairs Mills	1898					2	18	16	27	
Maple Valley	1851	59	59	63	64	87	103	157	138	
Markdale	1851	1,235	1,410	1,560	1,681	1,620	2,026	2,644	2,833	5,651
Maxwell	1861	271	284	282	258	354	311	296	328	424
McIntyre	1861	129	180	159	113	110	106	275	327	
Minniehill	1900						52	52	46	
Nottawa	1854	323	331	328	406	266	279	257	230	670
Port Law	1896					90	64	55	91	

POST OFFICE DATE OF ESTABLISHMENT AND REVENUE (cont'd.)

POST OFFICE	YEAR ESTABLISHED	REVENUE IN DOLLARS, BY YEAR								
		1882	1884	1887	1895	1898	1903	1907	1910	1929
Pretty River Valley	1888				40	23	27	27	26	
Priceville	1852	743	616	575	589	422	389	571	549	1,230
Proton Station	1887				289	241	303	310	281	927
Ravenna	1864	110	112	164	157	106	175	187	214	363
Redwing	1880	39	33	58	104	118	128	125	127	112
Rob Roy	1868	20	23	41	64	62	47	58	50	55
Rocklyn	1875	104	98	152	190	201	229	239	304	294
Rock Mills	1907							42	118	
Singhampton	1853	288	316	289	348	334	285	286	290	547
Thornbury	1853	995	1,178	1,242	1,414	1,293	1,300	1,708	1,814	3,095
Vandeleur	1870	52	64	73	54	74	50	90	75	
Walter's Falls	1855	117	145	156	306	275	265	283	330	416
Wareham	1867	21	26	40	74	57	45	66	78	
Wode House	1890				102	107	58	239	142	

SOURCES: Campbell (1958); and Postmaster General's Report, *Canada Sessional Papers*.

APPENDIX FIVE

RANK ORDER OF PLACES 1882-1910

PLACE	RANK OF ROW IN INCIDENCE MATRIX I									
YEAR	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Collingwood	1	1	1	1	1	1	2	1	1	1
Markdale	3	2	3	2	2	3	1	2	2	2
Dundalk	5	6	2	4	4	4	4	4	3	3
Flesherton	2	3	5	3	5	5	6	5	5	4
Thornbury	4	4	4	5	3	2	3	3	4	5
Clarksburg	6	5	7	6	6	6	5	6	6	6
Walter's Falls	10	10	8	9	7	7	8	8	8	7
Priceville	7	7	6	8	8	10	7	7	7	8
Nottawa	9	9	9	10	10	9	10	16	13	9
Proton Station			31	27	18	17	12	11	10	10
Ceylon	17	12	16	16	19	23	16	12	11	11
Feversham	14	19	13	12	11	11	14	13	9	12
Heathcote	13	17	20	19	15	14	13	14	19	13
Maxwell	15	11	12	11	13	12	11	10	16	14
Wode House						36	26	22	26	15
Singhampton	8	8	10	7	9	8	9	9	12	16
Maple Valley	19	18	17	20	21	22	22	21	22	17
Kimberley	12	13	14	17	12	13	15	20	17	18
Blantyre	27	28	33	33	34	37	35	25	20	19
Redwing	31	30	23	23	20	20	20	19	14	20
Eugenia	11	15	15	18	14	19	21	23	18	21
McIntyre	30	25	18	13	17	15	18	18	21	22
Ravenna	16	16	24	15	22	21	19	17	15	23
Mairs Mills									29	24
Rocklyn	23	14	11	14	16	18	17	15	28	25
Badjeros	24	20	19	21	24	25	23	24	23	26
Duncan	29	27	28	32	33	24	32	26	24	27

RANK ORDER OF PLACES 1882-1910 (cont'd.)

PLACE	RANK OF ROW IN INCIDENCE MATRIX I									
YEAR	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Rob Roy	26	33	30	30	25	26	40	40	*	28
Vandeleur	22	29	29	28	23	16	27	39	*	29
Kolapore			36	34	32	33	24	28	25	30
Banks	*	*	35	*	38	*	33	*	*	31
Erskine				*	40	42	*	*	*	32
Port Law							*	31	30	33
Goring			32	36	30	38	36	32	35	34
Gibraltar	*	31	22	26	29	30	34	34	34	35
Camperdown					*	40	*	*	*	*
Craigleith	28	26	38	*	*	*	*	*	*	*
Epping	25	23	26	24	28	31	30	29	32	*
Fairmount	32	32	34	31	27	27	31	30	31	*
Griersville	20	22	27	29	37	29	25	27	33	*
Harkaway	*	*	*	*	31	34	*	*	*	*
Hatherton					39	32	37	35	*	*
Irish Lake					35	39	39	37	*	*
Lady Bank		*	37	35	41	41	38	38	*	*
Loree			*	*	*	*	*	*	*	*
Minniehill								*	*	*
Pretty River Valley				*	*	*	*	*	*	*
Rock Mills										*
Wareham	21	24	21	22	26	28	28	33	27	*
Inistioge	18	21	25	25	36	35	29	36	a	a

*Isolated post office.

[a]Discontinued post office.

APPENDIX SIX

ACTIVITY INCIDENCE

BUSINESS ACTIVITY	NUMBER OF PLACES POSSESSING ACTIVITY									
YEAR	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Post Office	36	36	40	42	45	46	47	49	47	49
General Store[1]	23	25	32	31	34	36	30	30	30	29
Blacksmith	26	26	29	31	32	33	27	28	25	28
Saw Mill[2]	23	23	23	28	31	33	27	21	22	22
Hotel	20	21	21	21	20	21	19	15	12	13
Carriagemaker[3]	17	17	19	18	18	19	17	13	14	13
Shoemaker	17	17	18	17	18	18	14	14	11	9
Grist Mill[4]	16	19	16	18	21	19	14	12	12	15
Building Trades[5]	15	18	9	22	24	25	9	8	6	8
Implements	11	12	13	12	13	17	9	11	12	13
Physician	12	9	8	9	12	14	11	11	9	12
Tailor[6]	8	7	9	11	10	13	14	12	11	10
Furniture[7]	10	11	9	11	9	10	11	8	8	7
Harness-Maker[8]	8	7	10	10	11	13	11	7	7	7
Butcher	7	8	9	11	12	13	9	8	8	9
Woolen Mill	9	9	8	10	9	9	8	6	5	5
Insurance and Loans	8	7	8	13	16	17	8	8	5	7
Real Estate[9]	10	8	8	8	10	12	7	4	2	3
Hardware[10]	7	7	7	7	7	7	6	7	7	7
Undertaker	4	4	4	6	8	8	6	7	9	8
Dressmaker	7	9	6	7	12	17	4	5	4	4
Drug Store	6	6	7	6	6	6	6	6	6	6
Jeweller[11]	6	6	5	5	5	6	6	6	5	6
Barber	2	4	4	6	7	7	6	6	6	4
Baker	4	3	6	6	6	5	6	5	5	6
Newspaper[12]	5	5	5	5	5	6	6	6	6	6
Bank	4	4	4	4	5	6	6	6	6	6

ACTIVITY INCIDENCE (cont'd.)

BUSINESS ACTIVITY	NUMBER OF PLACES POSSESSING ACTIVITY									
YEAR	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Livery Stable	1	2	5	6	6	7	6	5	5	5
Pump-Maker	7	6	5	4	6	6	5	5	5	4
Vet	5	4	4	6	9	8	6	3	5	4
Lawyer	3	4	6	5	5	5	6	5	5	5
Cooper[13]	7	6	4	2	6	7	4	4	3	4
Tanner	6	3	5	4	3	3	4	5	5	4
Auctioneer	4	5	5	5	4	7	3	4	2	2
Sash and Door[14]	4	3	3	4	7	7	4	4	4	4
Photographer	3	3	4	5	5	5	4	4	5	4
Livestock	1	5	4	2	11	8	2	3	5	4
Milliner	6	9	3	6	4	6	3	3	3	3
Weaver	5	6	3	5	6	4	1	2	2	2
Music Teacher	2	4	4	2	2	8	1	3	5	6
Foundry[15]	3	2	3	3	5	5	5	4	3	4
Bricks	3	3	5	6	4	2	4	3	2	3
Confectioner	3	3	3	3	3	3	2	4	3	3
Dentist	1	2	2	2	1	2	4	4	5	5
Sewing Machine Agent	3	3	3	3	1	3		2	2	2
Lime Kiln	2	2	4	6	3	4	1			
Creamery		2	6	6	5	8	1			1
Surveyor	1	1	2	2	2	2	2	1	1	1
Fancy Goods	1	1	3		1	4	3		1	1
Wines and Liquor	2	1	2	3	1	1	1	1	1	1
Musical Instruments	1	2		3	3	1	1		2	1
Stationer	1	1	2	2	1	2	1		1	1
Apiarist		2		2	2	1	1	1	1	1
Laundry					1	1	1	2	3	3
Coal Dealer	2	2			1	1	1	1	1	2

ACTIVITY INCIDENCE (cont'd.)

BUSINESS ACTIVITY	NUMBER OF PLACES POSSESSING ACTIVITY									
YEAR	1882	1884	1887	1888	1892	1895	1898	1903	1907	1910
Fishmonger	1	1	1	1	1				1	1
Florist		1		1	2	1	1	1	1	1
Restaurant		1	1	2	2	1	1		1	1
Bicycles						1	3		1	1
Architect	1	1	1	1	1				1	1
Gunsmith		1	1	1		1	1			
Fruit Tree Agent					2	3	1			

The following activities occurred in no more than four years, in only one place: optician; billiard hall; plumber, second-hand goods; broker; electrician; furrier; artist; picture framing.

Additional activities included in title were:

[1]Grocer, dry goods merchant.

[2]Lumber dealer

[3]Wagon-maker

[4]Flour and feed dealer

[5]Contractor, carpenter, painter, mason, plasterer

[6]Clothier

[7]Cabiner maker

[8]Sadler, whip-maker

[9]Conveyancer

[10]Stove dealer, tinsmith

[11]Watchmaker

[12]Printer and publisher

[13]Hoop-maker, stave-maker

[14]Planing mill

[15]Machinist, boiler-maker.

SOURCE: Business directories.

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