

THE UNIVERSITY OF HULL

The Geography of Changes in Retail Trading Patterns

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by

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'To my father'

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Contents

1. A Review of Literature	1
1.1 Approaches to the study of retail change	
1.2 A review of literature	
1.3 The aims of the present study	
1.4 Structure of the thesis	
2. Theories of Retail Change	17
2.1 General factors producing retail change	
2.2 Changes in retail organisation	
2.3 The strategy of competition	
2.4 Theoretical notions of retail location	
3. A General View of Retail Change in Great Britain from 1880-1950	38
3.1 Variations in consumer demand	
3.2 Changes in Retail supply	
3.3 Changes in retail structure	
3.4 Retail change within the urban hierarchy	
4. The Innovistic Process as Illustrated by Changes in the Technology and Organisation of Selected Retail Trades	77
4.1 The selection of retail trades	
4.2 The retail meat trade	
4.3 The retail grocery trade	
4.4 The retail footwear trade	
4.5 The service sector; dyers and cleaners	

9. Urban Retail Change From 1880 to 1950

271

9.1 The decentralization of retail activities

9.2 The process of retail change within Hull

9.3 The factors affecting retail change in Hull from 1880-1950

9.4 Patterns of survival of new retailers

9.5 An ecological view of urban retail change

10. Conclusion

307

Volume II Maps and diagrams

Chapter 1

A Review of Literature

"In establishing that retail and service businesses cluster into orders... and that the orders interlock in a spatial pattern, we have only begun to develop a picture of the geography of retail and service business. There are many features of the system still to be remarked on."

Berry (1968)

1.1 Approaches to the Study of Retail Change

In developing a picture of the retail geography of a particular city there are many lines of approach open to the geographer. These range from consumer-orientated studies to those biased towards examining the distribution of retail units. It is within this latter broad category that the present study falls and this is particularly concerned with changes in the retail system over the long term. For, in spite of a great body of research literature on urban retailing there still remain, as Berry remarks, many important areas in which knowledge is lacking.

One reason for the dearth of literature on retail change is that much of the current work by retail geographers has been concerned with cross-sectional studies of retail patterns or alternatively with hierarchical studies of shopping centres. These fields of interest have spanned the inter and intra-urban fields of the subject.

This preoccupation with the identification and description of the retail hierarchy is not so remarkable considering its close relationship with the development of central place theory. Indeed, much of the work was stimulated by the findings of Berry and Garrison

(1959) who identified a hierarchy of retail centres that closely resembled the hierarchy of central places in rural areas. Since then the notion of a hierarchical system of retail centres has been used by many geographers as an organisational framework to examine retail structures.

The analogies and conflicts between shopping hierarchies and the corresponding ones of settlements has been reviewed in some detail by Davies (1972). In this work he stresses the importance of such studies to retail geography, and, whilst this cannot be overrated, it has however distracted interest from other aspects. In particular, there has been very little interest shown in examining the individual retail types that make up the structure of such shopping centres. The geography of specific retail trades within urban areas has received hardly any serious attention. This is somewhat surprising since any change in these component parts must also alter the overall structure of the retail centre. To some degree classification and generalization have taken precedence over the study of individual processes of change. Vance (1973) has observed this phenomena in the related field of wholesaling and has attempted to take a different line of inquiry. In general there has been a complete mistrust of any kind of inductive approach in the study of retail geography and the emphasis has clearly been on cognitive description. Harvey (1969) views morphometric analysis as a particular type of cognitive description and sees the attempts to predict the occurrence of settlement patterns using central place theory as coming within this category. The outcome of this in retail geography is that theories have been advanced, such as central place theory, and rigidly applied to all situations on the basis of a few assumptions and without the advantage of a time perspective. In contrast, this study will take a temporal approach to the subject and follow through an inductive line of reasoning using historical facts as basic materials. Such an approach

will allow a wider comprehension of variations in retail patterns through time and aid the production of a less 'relativistic' theory.

1.2

A Review of Literature

Much of the early work by geographers attempts to find regularity in the spatial organisation of urban retailing. Proudfoot's early work was essentially along such lines and may be seen as a descriptive generalization of shopping centres based on data collected from a number of North American cities (Proudfoot 1939). While he makes no direct reference to changes in the retail structure, such features were hinted at if only by the very nature of the study, since in a negative sense no statements were made concerning the stability of such structures. However, its major contribution was to provide a basis upon which retail geographers were to develop subsequent theoretical frameworks.

By 1948 Ratcliff had extended Proudfoot's study beyond the purely descriptive level with the use of ecological concepts. In his work he also stressed the idea of locations which minimized the costs of movement falling on both the urban activities and the users of such facilities. In a later study Ratcliff (1955) was to return to an ecological framework and was to draw heavily on a much earlier work by Haig (1927). It was in this study that he hypothesized the relationship between the population growth of a city and the displacement of certain retail types from the central business district. He thus introduced a process of retail change, the now familiar decentralization of commercial activities. A more general study which utilized these concepts of change was that of Colby (1933) who introduced and described the operation of centrifugal and centripetal forces in urban geography.

Returning to Ratcliff's study of 1955 we can see that a number of other interesting concepts were introduced, one of which can be especially singled out and this concerns the location of new business types,

another element of change. Ratcliff suggested that because of their similarities with high-order functions they would locate within the C.B.D., for his line of reasoning was that these new activities had similar demands to the high order retailers because they needed to draw upon the entire community for their clientele. A final feature to note about Ratcliff's work is its strong empirical nature, much of it being based on a historical and functional analysis of New York between the years 1921 and 1950.

In Britain research was mainly focused on the structural components of retail centres and on increasing the knowledge about the hierarchy of such centres (Smailes and Hartley 1961). The main emphasis was on classification and little attention was given to the element of retail change. However, a study by Carruthers (1960) did point out evidence of retail centralization, an observation that was added to by Hammond (1964) working on structural change between 1956 and 1962. Carruthers also furnished evidence of retail decentralization within British metropolitan areas, pointing to the withering away of trade in many inner London centres along with centres in the older parts of the Midlands. However, this situation had already been highlighted by Tarver in the United States as early as 1957. He found that regions with the fastest growth in population and retail sales between 1948 and 1954 also displayed the most rapid decentralization of retail sales within metropolitan areas.

Although during the 1960's much of the work of geographers was concerned with the classification of urban retail centres, some small inroads were being made into the field of retail change. This pre-occupation with classification is natural, for without such notions of order it becomes difficult to understand and explain the observed spatial patterns. Likewise it is not surprising that at this time many retail geographers devoted their energies to testing out the applicability

of Christaller's central place theory as an 'a priori' model of retail location.

While these mechanistic types of approach did have their drawbacks (Vance 1973), certain of their features appear relevant to the study of retail change. Perhaps of greatest importance were the modifications provided to the classic central place theory by Berry and Garrison (1959). They brought attention to the twin notions of the 'range of a good' and the 'threshold concept'. Carol (1960) had sometime earlier used such ideas in a deductive study on an intra-city scale but their main impact was to come with the work of Berry.

The most important studies to utilize these ideas within an urban context were those conducted by Berry (1963) and Simmons (1964) on the city of Chicago. The work of Berry was a major step in the study of retail change and to some extent a move away from the cross-sectional studies which had dominated this field of research. Berry focused attention on the aspect of changes in the commercial structure of a city and the subsequent decline of retail centres. An examination was made of the relationship between population movements and the subsequent decline or expansion in the retail system. Measures of vacant shop premises were made and used as an indicator of structural change.

In many ways Berry's work on commercial blight in Chicago was an extension of the studies being carried out by urban ecologists within the field of social geography since in Berry's study changes in retailing were set within a broad ecological framework and had therefore some similarities with Ratcliff's earlier work. The main hypothesis was that a specific process of change will occur in the city retail structure and that this will conform to a specific retail pattern in any given city. This work was later summarized by Berry (1967) and again the relationship with urban ecology was clearly highlighted. The processes of demographic and retail transition were seen as being synonymous and

he outlined a three-stage model of change. Within the context of this study Berry stated that " the exact process of retail transition during social change.. holds the key to the understanding of the problem of commercial blight". Clearly, an important link was forged between urban ecology and retail geography giving the latter points of reference for future studies. The use of ecological terms can also be traced back to the work of Murphy and Vance (1955) who identified the process of invasion and succession in connection with C.B.D. studies.

The work of Simmons (1964) followed on from that of Berry but for the first time much more attention was given to changes in retail location. These features were framed within the context of central place theory and the concepts of the 'range of a good' and 'demand thresholds' were seen as the mechanisms by which changes in retail location took place. Another important contribution of this study was in identifying the factors that interacted to produce changes in the urban retail structure. Simmons distinguished between demand variables, mainly socio-economic factors, and supply variables. These he placed in a multivariate model which he attempted to use for predictive statements.

Despite this switch from normative models and the increasing emphasis on the dynamics of retailing these studies were still based on shopping centres. Little importance was attached to the study of individual retail types and their spatial dynamics. Notions of spatial competition were still naive and based on the classical theories of profit maximization. Yet these features both play considerable roles in the understanding of changes in the structure of shopping centres. Garner (1967) commented on the need for refinements in the classification of business types and a better appraisal of the threshold concepts of

product differentiation between establishments. He considers these factors as being the key to obtaining a closer agreement between models and reality. In turn the understanding of these factors must surely rest on the closer examination of changes in individual trade types, to see for example just how threshold levels do vary.

The response of British geographers to these developments in North America has been rather slow in materializing and no comparative works have been undertaken in this country. Recently, both Kivell (1971) and McEvoy (1971) have examined some of the facets of retail change and made some comparisons with Berry's work while Sibley (1971) and Sherwood (1972) have drawn attention to changes in the long-term trends of retail location. Sibley was concerned specifically with low-order functions and carried out analysis on retail types rather than on shopping centres. However, his prime objective was to describe changes in retail location rather than examining the processes operating but nevertheless his work makes a significant contribution to the understanding of long-term changes in urban retailing.

Apart from the studies mentioned there has been an absence of work on aspects of long-term trends in retailing. This feature has been noted by Scott (1971) who commented "there is still a relatively small literature on the geography of both long-term trends in retailing and other aspects of retail competition". Such absences are especially marked in Britain since Vance (1960) has examined the North American city in the light of important changes in consumer mobility and retailing techniques. From this evidence he suggests that the commercial structure of the American city has evolved through at least three distinct but overlapping phases. Initially, he suggests, almost all retail activity was located centrally within the city, a situation that persisted until about 1890. After this time outlying business centres grew up around tramway routes and the higher order activities became firmly assigned to central

locations. This second stage is essentially the retail pattern described by Proudfoot. The third stage during the 1930's witnessed increasing consumer mobility and the standardization of market demands. Vance saw these factors as making possible the rise in planned shopping centres that usurped some of the city centre's functions.

While this study by Vance was framed within the changes taking place in intra-urban retail centres, it did mention features associated with individual trade types. Indeed, to clarify the locational characteristics of different trade types Vance replaced the durable and convenience goods classification with the idea of a continuum of commodity specialization. This accounted for the dynamic nature of retail types and meant that activities could be ranked in terms of their position in the continuum, which would summarize their threshold demands and therefore their locational characteristics.

No comparable British study exists. A long-term model of retail change has not been derived for our city commercial structures. Information does exist on changes in the organisational structure of different retail types but on a non-spatial basis since it has been provided by economic historians (Jefferys 1954). The growing interest in the field of urban history is one feature that is bringing together both the urban geographer and the economic historian. The latter has already amassed a great deal of information on the operation of retailers in the past and it remains for the geographer to place such work in its spatial context. Considering the empirical information that exists, albeit provided by historians, it is difficult to account for the lack of interest on the part of geographers. It may however, stem from the unfounded belief that the situation in this country is so similar to that in North America that further research is not needed. If the experience of geographers working in the field of urban sociology is anything to go by then quite marked differences will be seen to

exist between North American and British cities. Researchers making social area analysis surveys have found considerable deviations from the classic models put forward by American urban geographers. There is therefore no reason to suppose that similar conditions will not be found within the field of urban retail geography.

1.3 The Aims of the Present Study

From the above review of the literature on urban retailing some distinct gaps in our knowledge of retail change have been identified. The failure to develop a long-term model of retail change for British cities is particularly obvious and this study will attempt to fill this gap by providing a geographical account of changes in the British retail system between 1880 and 1950. The time period is seen as a critical one and was selected for a number of reasons.

First, 1880 marked approximately the advent of the nationally organized retail firms and the growth of multiple retail units in association with these companies. Prior to this date retailing was organized on a local basis and few retailers had developed an infra-structure of businesses that operated throughout the urban hierarchy (Wild and Shaw 1974). The year 1880 also marked the date of improvements in urban transportation, a factor that was to play an important role in changes in retail location. At the other end of the time scale 1950 delimits a further phase of retail development, with the advent of the planned shopping centre and improvements in personal mobility. The former can be seen as the start of local planning interests in the distribution of retail facilities. Prior to this date their manipulation of local retailing was still at a minimum and must be seen as subordinate to the natural market forces operating. A final reason for selecting such a time period is that it has the advantage of being sufficiently long enough to enable long-term structural trends to be examined.

This study, rather than concentrating on changes in the shopping

centre hierarchy, will in the main take the opposite approach and examine changes in specific trades. It is hoped that, by getting away from the typical aggregate approach, fresh light will be shed on the process of retail change. Emphasis will be given to the creation of new retail types and their effect on the existing competitive environment. It is also hoped to show the important role played by the multiple retailers in catering for new demands made by the working-class communities. In geographical terms multiple retailers had quite different locational demands to those of their independent counterparts in the same trade. The entrance of these new enterprises will be placed within a competitive framework in which two types of retail competition can be identified.

The second major field of interest concerns the process of urban retail change. Previous studies have been largely content to analyse changes in the number of shops at different time periods (Sibley 1971). However, these have done little to clarify the forces operating to produce retail change. This study will attempt to go beyond mere shop counts and will present an analysis of market area dynamics. To achieve this end it is necessary to study the spatial 'births' and 'deaths' of retail establishments and to pick out changes in business ownership.

The relationship of this present study to previous work on retail change can best be seen by reference to the total retail system which is presented in Table 1.1. Linked with the three main types of study and their corresponding spatial elements listed in Table 1.1 are environmental components, changes in which affect the retailer's competitiveness. These temporal trends are associated with the spatial elements in the following way. For example, in the 'process stage' new retail methods may be introduced that will produce changes in the spatial pattern of retail decline or expansion. Such new methods will

Table 1.1 Relationships in the Urban Retail Sub-system

(source: Andrews 1971)

Type of study	Spatial elements
Process studies, of both short and long term duration.	In spatial terms these involve an examination of market area dynamics and the distribution of retail births and deaths.
Structural studies, mainly of a cross-sectional nature, often leading to the development of normative type models.	These involve the study of shop distributions usually in terms of the central place hierarchy. Changes in the functional nature of such centres are also examined.
Stage type studies, these are often dynamic in form and determine the level of development of retail system.	These select as their primary task the examination of different types of retail location.

manifest themselves in a structural context by producing changes in retail specialization and the functional mix of goods. Finally these will interact to alter the overall competitive environment and produce a new level of competition which will affect shop location.

It is not intended to elaborate such relationships here since they form part of the thesis. Rather, Table 1.1 is used to show the various types of retail studies and to indicate that the bulk of those conducted so far have been within the second and third categories. The main emphasis in this study is on the processes of retail change and the spatial analysis of retail births and deaths. However, the other two aspects of structure and stage are also involved and specific attention is given to both changes in retail location and levels of competition.

1.4 The Structure of the Thesis

The thesis is in two main parts each dealing essentially with a different spatial scale of retail change.

The first section deals with the three main factors which together effect changes in retailing from 1880 to 1950. The theoretical framework of the study is outlined and a model of retail change is developed. The concept of competition is discussed along with notions of innovistic change and the economic and spatial mechanisms by which the process of retail change takes place are described.

Following on from these discussions, a national view of British retailing within the study period is presented. Retail structural and organisational change is considered with examples providing empirical evidence of the linkages already outlined. The development of multiple retail organisations is traced and their importance highlighted while their distribution and effect on the urban hierarchy is also examined (Chapter 3). Attention is given to the selection of specific trades to study in greater detail and changes in the retail

organisation of these trades are followed through (Chapter 4). Much of this section draws heavily on the work of economic historians and urban economists since few geographers have contributed to this field of research and consequently many spatial aspects remain untouched.

The second section of the thesis is concerned more specifically with intra-urban retail change using the port city of Kingston upon Hull as a case study. The development and characteristics of the study area are presented together with the basic spatial framework of measurement (Chapter 5). Two aspects are then examined, the first of which is the development of a terminology of retail change drawing on demographic models. This is related to the second aspect which is measuring the births and deaths of shops between 1880 and 1950. Attention is given to differentiating between multiple and independent traders and their corresponding mortality ratios. This leads to the development of predictive algorithms for the rates of shop losses (Chapter 6).

The remaining chapters in this section deal more specifically with the geography of urban retail change. Chapter 7 analyses changes in the location of shops and points to strong differences between multiples and independents. In studying locational tendencies attention is drawn to the different methods available for measuring spatial patterns. Following from this discussion the changing relationships between shops and consumers from 1880 to 1950 are studied and this culminates in a multi-variate model that attempts to account for changes in retail distribution. Finally, an analysis is carried out on the actual changes in shop ownership over the city and the factors affecting the spatial births and deaths of retail establishments. Here an ecological model of commercial change, originally outlined by Berry, is modified to fit British conditions.

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Theories of Retail Change

In the analysis of changes in retail location and patterns of shop distribution, a number of interacting concepts need to be explored. These conveniently lend themselves to a broad threefold classification. First, there are the actual factors involved in inducing retail change and their various relationships and second, the necessity to understand the underlying mechanisms that control retail locational shifts. Finally, attention must be paid to the rather neglected aspect of the changes that occur in retail organisations. A discussion of such concepts will not only clarify the situation but also provide a framework within which to conduct the present study.

2.1 General Factors Producing Retail Change

An understanding of the changes in the retail pattern requires knowledge of the dynamics of urban ecology and the processes of urban growth. Several components can be differentiated and the major ones have already been described by Simmons (1964). These consist of changes external to the urban system which induce shifts in the level of income and technology. The growth of the urban system itself, which produces continuous adjustment within the overall system, thereby facilitates the incorporation of changes that are to some degree independent of growth. Attention must be given to changes in the mode of operation of business types and to consumer preferences and mobility. These are related to variations in income and technology which are associated with the first component. (Simmons 1964)

To understand the basic forces and their degree of interaction it is necessary to break down the three major components into a simpler form. Two separate groups of factors can be identified and these have been termed the direct or controlling forces and the indirect or modifying forces (Simmons 1964). Other workers have used different

terminology, thus Hood and Yamey (1951) separate out supply and demand factors and these terms have also been employed more recently by Scott (1970). The two major forces are composed of the following components.

Firstly there are the direct or controlling forces which describe such factors as the population and income of a given area, the assortment of business types and establishments and finally the grouping of business types into conformations. Simmons (1964) describes the causal link between these factors, with changes in population and income being the motivating force. The main inducement to change however, comes from the indirect forces which cover such factors as the level of income, the level of technology and the growth of the urban system. (Simmons 1964)

An alternative model to the one presented by Simmons is that put forward by Agergard, Olsen and Allpass (1970). In this case the two forces which induce the formation of new retail patterns are termed external and internal. The former includes such factors as population, income, levels of consumption and purchasing power, urban growth, transport and retail competition. The internal factors describe the various competitive parameters available to the retailer e.g. price, goods assortment, service and location. (Agergard, Olsen and Allpass 1970) It is argued that the emphasis on one of the parameters of action by the retailer can result in the creation of a special retail structure and consequent locational demands. However, the retailer cannot thoroughly determine the choice of internal parameters without giving consideration to the external forces, which indicate a kind of framework within which the choice is made. This approach is not incompatible with the model put forward by Simmons (1964) and merely adds another dimension, the decision making process of the retailer. The general situation consists of the interaction between direct and indirect forces which takes place in conjunction with the retailer's

parameters of action and it is a combination of all three that produces changes in retail locational behaviour.

In order to understand the interaction of the various forces it is first necessary to discuss each category individually, though the overall relationships must be kept in mind. On the demand side, changes in population and income are probably the most important variables. The rate of increase or decrease in total population will obviously directly affect the demand for retail services and in general the total number of establishments. In theory the more rapid the rates of population change the greater the degree of change forced upon the earlier patterns of shop distribution. Perhaps of greater importance is the geographical variation of total population and related growth differentials within specific urban areas. These intra-urban variations are essentially of a short-run nature, though they are also influenced by the long-term trends that are taking place on a national scale. The short-run trends are often easier to monitor, since the impact of changes in population are more immediate. However, because of the interrelationships between the two trends both need attention. One difficulty is the selection of suitable time scales, especially in relation to short-run change, and as yet little serious consideration has been given to this problem.

Another important factor is the nature and change of the socio-economic groupings of the urban population, especially their spatial variations. This raises the question of changes in income, the affect of which can be viewed on two levels. First there is the actual effect on shops of changes in the real income of consumers and its intra-urban deviations and this relationship has received a good deal of attention from North American geographers (Simmons 1964, Berry 1963). Secondly, there are the long-term effects of changes in income, which are also related to the standard of living, both affecting the consumers' behaviour. The total impact of such factors is on the pattern of

consumer expenditure, especially in relation to the amount of money spent on convenience goods as opposed to non-basic, luxury ones.

This is associated with the concept of 'income elasticity of demand' which is the proportionate change in demand divided by the proportionate change in real income which has brought it about. (Harvey 1965) Thus luxury goods have a high elasticity of demand while basic foodstuffs have a low one. Both these relationships will affect the number of retail establishments and their rate of change.

The other major factor affecting the demand for retail goods is the mobility of the consumer which is related to the level of transportation technology. Changes in the consumer's mobility affects the nature, rather than the actual amount of demand. The more mobile a consumer is, the farther he can travel to obtain the goods and services that he requires; and of equal importance is the fact that he has a more elastic demand curve for the goods of a particular establishment. These factors have two possible effects, the former usually produces an increase in retail concentration and also new types of retail configurations. The latter factor, a more elastic demand curve, will affect the product mix and scale of retail establishments since theoretically the more mobile the consumer, the greater his ability to shop around and make substitutions. When a good can be easily substituted for another its demand tends to be relatively elastic (Harvey 1965). This change in demand has received little attention beyond the purely theoretical level although Simmons (1964) has attempted some basic analysis which included this factor.

In a consideration of the effects of changes in transport on the retail pattern two further issues require clarification. It must be pointed out that the relationships already outlined will vary considerably, depending on the type of transportation system. The mobility created by an improvement in the public transport network

produces different changes to those created by increases in private mobility, due to car ownership. Furthermore, increases in consumer mobility due to changes in transport technology, must also be related to the cost of these facilities relative to net income; since cost will be one of the major determinants in inducing changes in mobility.

The discussion so far has been related almost entirely to the effects of changes in demand on locational behaviour of retailers. However, two other important factors need to be appreciated and these are the role played by innovation and technical change in retailing and the effects produced by the retailer, in stressing the various competitive parameters. Since this study is specifically concerned with the role of innovation in inducing changes in the retail pattern, special attention will be given to these forces in the following sections. Because of the uncertain nature of innovation in retailing, its importance has often been neglected in the study of retail change. Indeed, this is the great shortcoming of the model put forward by Simmons (1964). It is impossible to take into account and quantify the effect of retail innovation. Therefore, his model serves only as a tool for the short-term predictions of changes in the distribution of shops.

2.2 Changes in Retail Organisation

The response of individual retail types to the indirect or demand forces and also to changes in retail technology require a detailed investigation. The changes that are induced by these forces, both in the long and short runs, may best be viewed in terms of retail competition. Here the initial emphasis will be placed on distinguishing various types of competition and in particular with developing the notion of innovistic competition.

In discussing competition it is necessary at the outset to make a distinction between two main types that can be termed repetitive and innovistic. This difference owes a great deal to the work of J.

Schumpeter (1939), who was responsible for formalising the notion of innovistic competition. He identified two main types of competition of which the first is termed normal or repetitive and corresponds to the situation where similar types of retail organisation compete for the patronage of a given market. It has been the level at which most of the geographical studies of retail change have been conducted (Scott 1971). The second type is termed innovistic or disruptive and the importance that Schumpeter attached to this process can be illustrated by the following statement

"In the case of retail trade, the competition that matters arises not from additional shops of the same type, but from department stores, the chain store, the mail order house and the supermarket."

(Schumpeter 1939)

An important point is that this form of competition does not always have its origins in the existing retail environment, but quite often in the area of technology. Schumpeter believed that this was the type of competition that was of greatest importance, so much so that he termed its effect on the existing retail environment as the 'Big Disturbance'. The development and effect of this process will be considered in detail in the following chapter through examples of selected trades.

2.2.1 Retail institutional change

There are many current theories of retail institutional change that seek essentially to find a consistent temporal pattern behind this phenomena and at least four of the major ones have been discussed by Gist (1968). While they all have differences in format, it is also easy to recognise the more common elements and from this to proceed to an attempt to formulate a combined theory.

Probably the least flexible theory is that geared to the evolution of American retailing and this can for convenience be termed the

'general specific general cycle'. Some observers of the American retailing have identified what they believe to be a cycle within which consumers are alternately served predominantly by 'general' shops then 'speciality' shops and then again by the 'general' type of retail establishment (Hollander 1966). The main disadvantage of this theory is its rigidity, seen in the attempt to assign specific phases to particular periods and also its rather naive notions.

Of more general use are the remaining theories which may have been arrived at independently but essentially highlight different aspects of the same process. It is the combination of these that presents a closer view of the workings of innovistic change and the resultant retail competition.

M.P. McNair (1958) observed the institutional changes that had taken place in American retailing and identified what he termed the 'wheel of retailing'. He describes a period of growth for a new retail innovator during which it is successfully competing and taking business away from the established distribution channels that are using more traditional retail methods. However, the innovating institution also experiences a period of maturity which is characterised by a larger physical plant, more elaborate fixtures and displays and an interest in greater promotional efforts. At this stage the retail institution is competing largely against similar organisations, since the more traditional retailers have either adapted to their new environment or gone out of business. Izreali (1973) has criticized McNair's 'wheel theory' and extends the approach to present three 'wheels', one for low order innovators, one for high order and one for conventional stores. While this may make the theory more universally applicable it in no way nullifies the basic concept presented by McNair.

The aspect of adaptation is essentially at the heart of the theory

of natural selection in retailing, an approach that has been presented and elaborated on by Alchain (1950). His approach dispenses with the traditional concepts of profit maximisation and does not rely on the predictable individual behaviour that is usually assumed. The theory essentially embodies the principles of biological evolution and selection and interprets the economic system as an adoptive mechanism which chooses among various exploratory actions generated by the adaptive pursuit of 'success' or profits. In other words adaptive, imitative, trial and error behaviour is utilized in the pursuit of positive profits, rather than its sharp contrast, the pursuit of maximum profits.

This approach provides therefore, one of the mechanisms by which retail institutional changes induce other retailers to adapt to a changed competitive environment. As such it is compatible with McNair's 'wheel theory'. Its maturity phase which is characterised by similar retail institutions competing with one another, soon tends to be followed by top-heaviness. Here the retail firm is portrayed as being too conservative, with a decline in the rate of return on its investment and the firm eventually becomes vulnerable to the next innovistic institution to be successful.

It is apparent that what McNair terms the wheel or cyclical pattern is in fact more a wave-like process, inasmuch as a new retail institution is initially competing with more traditional retailers but is eventually caught up by the growth of similar organisations that have adapted or been created in response to the changed environment. In its early stages the innovating retail establishment can offer lower prices than those of the traditional businesses. These lower prices may have been made possible by either internal or external economies in operation and according to Schumpeter's ideas on innovistic competition the stimulation is more likely to come from changes in technology. But

whatever the particular cause it is only necessary here to note that some factor or combination of factors operated to permit the development of a form of retail institution that had not been feasible earlier.

To elaborate slightly on the economics of the process the theoretical profitability of a new innovistic retail firm must be examined. At the time of its initial appearance the innovating retailer could operate profitably at perhaps a gross margin of 25%. It has already been seen that the operating costs of the new retail institution begin to rise as it enters what McNair calls its mature stage. This factor pushes up the percentage gross margin requirements, in this hypothetical case, to 30%. It is at this point in time, with increasing gross margin requirements, that the retailer is most vulnerable to a new innovator operating on lower margins. McNair and Gist see these requirements being lowered as successive retail institutions develop through different eras. However, this situation need not always prevail and it may be that the new retailer need only have a gross margin requirement equal to that of the original retail institution in its initial state.

It must be stressed that the new retail form is not just a revived version of the previous organisation stripped of its conservatism and acquired bulk. Each succeeding innovation is likely to embody some advantage that was not possible at the time that the original retail institution first appeared. In this sense it may be possible, in some degree, to lower gross profit requirements in the long-run as well as over the short-run life of the innovistic retail firm.

Finally, the theory of the 'dialectic process' developed from Karl Marx's theory of evolution or 'dialectical materialism' has been put forward as a framework for explaining retail institutional change (Blake 1939). In general terms the dialectical process can be illustrated in the following sequence of events. A 'thesis' develops which embodies

some philosophical position regarding a particular issue. After some length of time a position opposed to the 'thesis' may develop, which can be termed the 'antithesis'. This is followed by an amalgam of the 'thesis' and 'antithesis' producing a 'synthesis' somewhere between the two.

Obviously this dialectic process has some applicability in virtually any issue involving change and a number of instances are apparent in which a similar process appears to be operative in retailing. It is possible to recognise this process as being compatible to that outlined in the cyclical theory. As was previously noted, the fully mature retail institution is vulnerable to an innovating retail firm at some particular point in time. In relation to the 'dialectic theory' the first thesis is an institution that is fully mature and Gist (1968) cites the example of the American department store. The traditional department store characterises the 'thesis' institution whose features are a central location in the Central Business District (C.B.D.) with a heavy organisational structure. The 'antithesis' to this is the discount retailer, operating outside the C.B.D. with a minimum amount of organisational expense. The 'synthesis' has been identified as the discount department store, which according to Brand (1963) has learned from both the supermarket and the discount operators.

In terms of a general theory of retail institutional change we can view every maturing retail organisation as the 'thesis' and every new innovistic competitor as the 'antithesis'. The whole process operates under a modified form of biological natural selection, in which the pursuit of positive profits is the overriding factor.

2.3 The Strategy of Competition

Up to this point emphasis has been placed on the development of innovistic competition and the associated theories of retail

institutional change. However, attention needs to be focused on the various modes of operation that are available to the retailer along the competitive front since he can use a number of parameters, both individually or in combinations, in response to new competitive forms and general changes in the retail environment. The whole range of internal parameters has been termed the 'retailing mix', which according to Lazer and Kelly (1961) consists of three basic elements, goods and services, communications and distribution. These competitive parameters represent the basic dimensions through which retail competition is exerted and include for most retailers the seven individual areas of action listed below.

1. Pricing decisions
2. Service decisions
3. Trade area and site decisions
4. Store layout
5. Product mix
6. Organisational decisions
7. Promotional decisions

Obviously, there exists a great deal of interaction between these various areas of operation and it may be that a particular product mix may have influence on a shop's trade area and its actual site location.

One aspect that can be further elaborated upon is the important concept of product differentiation, which can substantially affect the size of a retailers market. This was first highlighted in the theory of 'monopolistic competition' produced by Chamberlain in 1933 which stated "a general class of product is differentiated if any significant basis exists for distinguishing the goods and/or services of one seller from those of another". This definition therefore, embraces to some extent all the retail parameters, since it relates not only to the

attributes of the product but also to the conditions surrounding its sale. Scott (1970) has discussed this aspect in terms of retail market areas and states that "a mere increase in outlet size, unaccompanied by a change in the product mix is unlikely to modify a market area, though it may increase substantially a store's penetration of the market". However, a more varied retail mix may well include goods with higher thresholds and therefore produce more extensive markets than the previously stocked items. If the size of a retail outlet is constant then additions to the product mix can only be achieved by reducing the amount of space allocated to items already stocked and this forms part of the model put forward by Baumol and Ide (1961). The above can be viewed in the following way; the greater the number of items carried by the store the greater, ordinarily, is the consumers reason for expecting the shopping trip to be a success. A customer may find it more convenient, as well as economical in time and transport costs, to buy additional items from the widened product mix rather than make a further trip to another store. Baumol and Ide stress that they are not concerned with the effects of prices and advertising, both of which are assumed to remain constant. In particular it is assumed that they are unaffected by the number of items stocked by the retailer. Briefly, the influence of both these variables operates as follows. When there is a decrease in prices or an increase in informative advertising there will be an increase in the probability of successful shopping trips. This will lessen the uncertainty of the consumer, since they are more likely to know which shop carries the items they want and where to find them offered for sale at acceptable prices.

The above emphasizes the importance of a retailer using a combination of parameters to achieve a more competitive position and probably the one in greatest use is that of price discrimination. In terms of the organisational parameter it is the multi-product firms that can apply

this line of action most effectively. They can impose price cuts on selected, highly competitive items that are demanded by virtually all consumers. McClelland (1959) states that this is most effective when applied to goods with a high unit price, since these promote strong 'transfer effects' and minimise the risk of loss from consumers shopping around. Obviously, a logical outcome of this type of price discrimination is the practice of 'loss leader selling'. This term describes the case in which very low margins are fixed on particular goods or 'loss leaders' in order to increase the sales of other commodities in the product mix. In Britain, however, the practice of resale price maintenance has until recent years reduced to some extent the effect of price competition, especially in the pre-supermarket era. This system eliminates price cutting on those commodities where a manufacturer requires his distributor to resell at not less than a stipulated price. According to Yamey (1952) this type of price control developed almost exclusively in response to the demands of established retailers.

If the use of price discrimination has been successful, or conversely, if it cannot be fully utilized because of resale price maintenance then the retailer may prefer or be forced to concentrate more on the service parameter. This form of non-price competition has been discussed in some detail by Heflebower (1967) and seems most used and effective in markets where the number of retailers is small or where a few outlets account for the bulk of the total sales. It often becomes the mainstay of retail organisations that face intense competition from a newer institutional form that may be concentrating specifically on the price parameter, usually to the exclusion of all others. This is the type of situation that may arise in terms of McNairs cyclical theory, with the arrival of a new retail form.

The use of these various retail parameters has been examined in a more practical and comprehensive way by Holton (1960) using data from

the U.S. Census of Business for the period 1939-1958. Holton saw the use of the parameters of action as being a logical progression based on the economics of the individual retail establishment. He suggests that if a retailer is to expand his sales he must do so not simply in terms of price reductions but also by adding extra non-price inducements to foster product differentiation and attract more distant consumers. These non-price inducements are seen as consisting of advertising, breadth of selection, furnishing of the store and servicing of customers' complaints.

Vance (1962) in a perspective view of the forces affecting the retail structure of North American cities also recognises the importance of non-price factors. Changes in goods emphasize increasing scale and product mix and lead to the boundaries between retail types being of a more fluid nature. This in turn brings about the continual transformation of retail areas. He saw these forces as leading to increasing product specialization and also increasing locational specialization; for example, fewer large supermarkets serving larger market areas rather than many smaller grocers producing a few specialized supermarket locations. Vance also argued that as product specialization increases so must retail locational specialization. However this statement can also be reversed since the two factors are closely interdependent.

2.4 Theoretical Notions of Retail Location

The actual changes that occur both within the retail structure and those influencing its development from the outside in themselves imply nothing about the spatial movements of retail establishments. In order to understand how these processes can be translated into a spatial context one must consider the theoretical notions that are implicit in retail locational models. The two most important notions are those of 'threshold level' which is essentially an economic concept and the spatial concept of the 'range of a good'.

Both these notions, while having their origins closely associated

with Central Place studies, do at the same time, with some small degree of modification, have some relevance to urban retail patterns.

The threshold level, which Berry and Garrison (1958) defined as the "minimum amount of purchasing power necessary to support the supply of a central good from a central place" must be viewed in an urban context.

Within the context of this study the threshold level, which implies that there is an economic minimum size of the firm, may be interpreted as a pattern of typical costs that make it uneconomic to operate below a certain scale. This obviously affects the retailers entry into the market and consequently the range of locational opportunities that are available. Thus shops retailing goods of high threshold levels have few locations that are available to them.

This notion can be illustrated with the help of bid-rent diagrams (Fig. 2.1). A rent paying threshold appears at point A which is the intersection of the rental curve of the business centre and the bid-rent curve of the firm. If the rent corresponds to centrality to customers then a threshold of centrality or accessibility has been defined (Carol 1960). Below this level the firm cannot compete with other land uses which create the composite city rent pattern. A logical conclusion from this is that a retail establishment cannot compete in a centre where this level of centrality or accessibility does not exist.

In practical terms the situation regarding threshold level is of a somewhat more complicated nature. The reason for this is centred around the question of what rent to assume in order to define a specific threshold, especially since highly variable rents are to be found in 'real life' situations. Also there is a considerable range in rent-paying ability among stores of the same function. This is due primarily to variations in the quality of goods, types of operation and mode of organisation. It is best therefore, to view the threshold levels as a

continuum composed of a series of overlapping ranges of possible store locations (Fig. 2.2). However, these problems need not cause undue concern in the present study as they fall largely outside its aims and scope. Concern here is for the role the threshold concept plays in relation to retail change i.e. its temporal connotations. Implicit from the previous section on changes in retail structure and organisation is the idea that the threshold level of goods and hence of the shops that retail them shows no tendency to remain constant through time. Thus a good could change its relative position in the retail hierarchy and spatially this may perhaps result in the creation of a new retail system that would be superimposed on the existing one. The resultant pattern of shops may in fact be an amalgam of such a process of superimposition with each one reflecting a response to a different threshold level. These historical changes can be partially viewed in terms of the changes that occur in retail technology.

The second theoretical notion vital for understanding how changes in the retail structure operate spatially is that of the 'range of a good'. This was again used by Berry and Garrison (1958) in their restatement of Central-Place theory. It was originally defined by Christaller (1966) as "the farthest distance the dispersed population is willing to go, in order to buy a good offered at a place". Its lower limit encloses the threshold purchasing power while its upper limit is the distance beyond which the good cannot be sold, because ideally, the demand for it is zero. In real terms a competing establishment may be more conveniently located. In other words the limit is determined by spatial competition among shops supplying the same good and beyond this limit a shop can no longer economically supply the good. The operation of this spatial mechanism is brought into play by the degree of specialization and/or range of products that are sold by a particular retail establishment.

The variety of products stocked and their particular combinations will, through the above-defined concepts, affect the frequency and distance of shopping trips and thus influence the locational requirements of shops.

Curry (1950) has examined this idea and developed a pseudo model based on Poisson probability curves and some basic elements of the retailer's policy. A similar and more detailed study has also been carried out by W.J. Baumol and E.A. Ide (1961) leading to a tentative, but sophisticated type of mathematical model. The main element is that a retailer's stock relative to his sales must be progressively larger the lower the average sales. If the market area is small, the rate of stock turnover will be slow and the cost of storage excessively large. In order to try and counteract this a shop selling a specialized type of good or service will attempt to increase its potential market by locating, as far as is possible, in a central shopping area.

The importance of this is that variations in specialization occur frequently through time and hence affect locational requirements of retail establishments. Extending this argument it may be expected that new products are likely initially to be rather specialized and as such retailed mainly by shops in central locations. It is extremely difficult to be specific about changes in the degree of specialization over time. Both Scott (1970) and Sibley (1973) have pointed out that this is because there are few studies of retailing that use a commodity approach and identify the outlets through which the specific goods are distributed. Indeed the very value of this approach has been questioned by Curry (1966) who states that it 'misses the boat' from an analytical point of view.

The difficulties associated with this approach, in terms of historical records that offer any degree of accuracy and continuity, seem at first sight to be insurmountable. Probably the best way of tackling

the importance of the changes in product specialization and its temporal relationship to retail location, would be to examine the entrance of a new product line. To ensure the practicability of such a study it would be necessary to be able to pinpoint, with some degree of accuracy the development of such products and their relationships to specific retail outlets. This line of approach will be pursued in the following chapters and a number of specific trades will be examined.

Although many of the above concepts were developed in relatively recent times, and often with particular reference to the advent of the department store and the supermarket (Bliss 1960), they do have relevance to retail changes that occurred in the pre-supermarket era. During the years from 1880 to 1920 new forms of retail organisations did arise in many different trades, largely in response to new products brought about by improved technology. The arrival and acceptance of such new consumer goods has been studied in some detail (Ironmonger 1972), but as yet little attention has been given to the geographical aspects of the retail establishments distributing them. Whether these new retail forms can be described as true innovators remains a question that will be tackled in the rest of this thesis. The identification of a conceptual framework, such as the one outlined in this chapter, that distinguishes different types of retailer in terms of their organisation and competitive strategy is therefore an essential starting point.

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Chapter 3

A General View of Retail Change in Great Britain from 1880 to 1950.

In the previous chapter it was noted how important interactions take place between the various demand and supply variables affecting changes in the structure of retailing. In the light of this discussion two major aspects need now to be explored. First, how do these numerous factors interact in a specific study area over a defined period of time? Such a query needs to concern itself with the growth of a retail system, with its structural variations and more important with any subsequent geographical changes which occur. Secondly, how does the element of innovistic change operate within the retail system? These queries can best be answered by a study of the national trends that took place in British retailing from 1880 onwards to 1950.

3.1 Variations in Consumer Demand

The most logical starting point is to examine the changes that occurred in population growth, standard of living and overall consumer mobility in the national market. It is these factors that provide, in the terminology of Agergard (Agergard, Olsen and Allpass 1971), the retailer's environment within which decisions can be made.

3.1.1 Population growth

Two trends in population growth need to be examined, both of which potentially have a direct influence on changes in retail structure.

The first trend concerns the overall growth of population in Britain which was most rapid up to 1911 when it had reached the 45 million mark. The rate of increase in total numbers in England at least was always greater than 10% per decade throughout the nineteenth century, reaching over 14% from 1871 to 1881 (Royal Commission on Population 1949). This rapid growth up to 1911 is an important phenomena and one

that can be related to the rise of large national retail companies after 1880, though attention must also be given to changes in other factors.

The second trend concerns the increasing rate of urbanisation and population concentration and the effects of such a process on retail change. After 1851, the growth of population took place largely in towns and contributed to an increasing urbanisation of the country. In 1800 just under 17% of the population lived in towns of over 20,000 inhabitants but by 1851 this proportion had doubled and by 1891 had reached 53.5% (Jones 1966). Indeed after 1851 towns of 20,000 plus, excluding London, accounted for about 18.5% of the total rise in urban populations for the four decades up to 1891 (Ashworth 1957). By the turn of the century 77% of the population in England and Wales lived in administratively defined urban areas. Attention must be focused on the period between 1881 and 1901 during which urban expansion was increasing at the rate of over 15% per decade, with rural areas only having an average growth rate of below 3% (Saville 1957). This trend meant that by 1951 81% of the population in England and Wales lived in urban areas (Jones 1966).

Both these trends had implications which affected the retail structure and produced broad-based changes in the distribution of goods and services. The numerical growth of population required an increase in food supply and if nothing else an expansion of the retail sector. However, when such an increase was associated with a dramatic redistribution and concentration of population then further changes in retailing were necessary. The growth of cities encouraged scale economies both in food production and in marketing. This produced, in the late nineteenth century, a direct response from retailers in the form of new techniques and organisation.

3.1.2 Standard of living

In general terms the growing number of urban workers were experiencing practically a continuous rise in real income per head of population (Bowley 1937). General opinion seems to suggest that this increase in money wages took place after 1857, rising to a sharp peak between 1866 and 1869. This trend continued, but on a slightly lower level, for most of the ensuing decade and reached a new high between 1887 and 1890. It remained on this plane until around 1896 and then rose steeply again to 1900, which was followed in the next decade by a general fall. The overall position is shown in Table 3.1 which illustrates the rapid rise of net national income up to 1900, as measured by the percentage change per decade, followed by a slowing down after this date until 1930. These two trends, together with the growing population, served to substantially increase the market for goods and services. This increase is partly reflected by a rise in the consumption of consumer goods as shown in Table 3.2.

These figures illustrate two major aspects that have implications for the retail sector. First, there is the overall growth in consumer expenditure up to 1920, after which time there is a dramatic fall in consumption. This, as we shall see, had important consequences for the total number of retailers and their rates of growth. Second, consideration must be given to the proportions spent on food as opposed to non-convenience items and it has already been noted how this depends on the size of the family income. Allen and Bowley (1935) present contemporary data for the United Kingdom working-class budgets in 1904 (Table 3.3). This illustrates the point that more basic goods, such as bread, occupy less of the consumer's expenditure as average income rises. In a wider context we would expect there to be a greater impetus given to non-food retailers as the general level of money income rises. On a more specific scale, as incomes rise they should

Table 3.1 Net national income per capita at constant 1912 prices
for the U.K. (source: Jefferys and Walters 1955)

Date	Income/ capita £	% change
1870-79	30.4	-
1880-89	35.6	17.0
1890-99	44.4	25.0
1900-09	48.0	8.0
1910-19	49.7	3.5
1920-29	52.7	6.1
1930-39	62.0	17.7
1940-49	73.5	18.6

Table 3.2 Estimates of consumer expenditure at current prices
£ million. (source: Stone and Rowe 1966)

Date	Food	Clothing and footwear
1900	531	153
1910	628	178
1920	1716	795
1930	1275	418
1940	1440	501
1950	2829	1063

Table 3.3 Working-class budgets in 1904 (source: Allen and Bowley 1935)

Average income shillings/week	Percentage spent on:-		
	Food	Non-food	Bread
21.4	67	33	14.3
27.0	66	34	12.3
31.9	65	35	10.3
36.5	61	39	9.2
52.0	57	43	8.3

Table 3.4 Estimates of consumer expenditure on transport at current prices

Date	£ million
1900	87
1910	109
1920	265
1930	288
1940	237
1950	616

Table 3.5 Passenger miles (millions)

Date	Railways	Tramways	Trolley buses	Buses	Misc.	Total
1920	19,214	8,041	17	3,457	1,840	32,569
1930	18,263	9,099	211	12,922	885	41,380
1938	20,009	6,196	1,952	19,037	600	47,794

also stimulate certain sectors of food retailers, in particular butchers, producing a widening of consumer demand.

Attention must be drawn to one further implication of these fairly sharp, defined movements in money wages. Since rising living standards were not being achieved steadily, but in fairly rapid strides followed by periods of stagnation or decline, consumers were constantly having to reappraise their buying habits in a price-conscious fashion. This latter aspect through the onus on the retailer and price competition became common in many trades, especially in the food trade where the multiples had gained considerable ground. In all probability the keenness of price competition would not have been so marked had the gain in money wages been slow and steady (Mathias 1967).

3.1.3 Transport technology and consumer mobility

A final demand variable that can be considered is the role played by improvements in transport technology. The effects of such improvements on the retail sector can be viewed in two main ways. First, there are the broad implications in terms of better food supply and improved links between the retailer and the producer; an aspect not included in the scope of the present study. Secondly, and of particular interest, is the effect on city growth and the release of latent centrifugal forces that came to be expressed in the form of accelerating suburban extension.

In general terms there is little doubt that the population became more mobile, with the amount of money being spent on transportation increasing throughout the period (Table 3.4). The figures in Table 3.4 present only a very general picture, whilst of greater importance is the increase in urban mobility. One measure of this is given to some extent by the amount of use of passenger tramways and, at a later date, buses. Unfortunately, no continuous body of data for such modes of

transport is available and use has to be made of a number of different sources. Despite these problems, a reasonable picture can be built up of the levels of urban consumer mobility throughout the period of study. In the decades up to 1920 the main mode of urban transportation was provided by the expanding tramways whose peak was reached in 1927 when over 14,000 trams were registered (Accounts of British Tramways). In 1878 over 89 million passengers were carried on just under 200 miles of public tramways and by 1890 these figures had risen to 418.4 million passengers on 753 miles of line (Accounts and Papers 1902). This dramatic rise was to continue at an unabated pace until by 1902 over 1,000 million passengers were carried on 1187 miles of tramway line. After 1903, with the passing of the Motor Car Act coaches and buses also became important modes of transport though the number of private cars remained insignificant until 1950. In 1920 there was approximately one car per 221 people, while by 1950 this figure had been lowered almost ten times with one car per 22 people (Basic Road Statistics). The relative importance of the various modes of transport need not be examined in detail since it is sufficient for the purpose of this study to show the increased mobility of consumers in the early part of the twentieth century (Table 3.5). It can be seen that the peak year for tramway use was 1930, with over 9,000 million passenger miles (Table 3.5) after which time numbers fell sharply.

This increase in consumer mobility can be seen as producing two main responses in terms of retail locational tendencies and overall patterns of distribution. On an urban scale it produced new opportunities for retail suburban development and increased site differentiation. The second level of response was related to the variations induced within the urban hierarchy and will be examined in a later part of this chapter.

The study of changes within the retail system can be approached under two main headings. First, the growth of the retail sector in terms of the number of outlets, types of organisation and levels of employment in the distributive trades. The second aspect concerns the structural changes inherent in such a dynamic system and their relationship with the other variables.

These studies are however, made extremely difficult due to the absence of any Census of Distribution, at least until 1950. The only alternative sources of data are the Census of Population and the Census of Occupations. The latter, unfortunately, did not give the number of shops but only totals employed in each trade and these were subdivided into employers, employees and self-employed. Moreover, this breakdown was highly variable throughout the period of this study with significant differences in classification occurring in 1921.

The growth of the retail system in relation to changes in demand variables is an aspect difficult to measure accurately because of the above factors. Certainly the total numbers employed in the distributive trades were increasing at a fairly constant pace between 1880 and 1950. However, to demonstrate that such a trend was operative in relation to retail establishments requires the examination of a number of data sources.

From 1880 to 1921 there are two different sources which can be exploited, the census returns and the reports of the Inland Revenue which terminated in 1929. The latter gives data on residential shops with a value of £20 or over, which were assessed under the Inhabited House Duty Act. These returns show a rather static situation from 1882 to 1892 when the number of shops enumerated in England and Wales remained at 244,000. In relation to the population this represents a decline from almost 94 shops per 10,000 people in 1881 to 82 per

10,000 by 1892. However, over approximately the same period the number of persons listed in the Census of Occupation as being engaged in the retail trades rose from 1,290,566 in 1881 to 1,782,163 in 1891. In terms of retail outlets estimates have to be derived from this occupational data, with the number of establishments tentatively related to those classed as employers or self-employed. From these figures the estimated number of shops in 1881 was around 400,075 and in 1891 487,000. The obvious reason for this discrepancy, apart from doubts about the accuracy of the tax assessments, is that the tax figures do not enumerate non-residential retail premises. It was precisely this sector that was experiencing the major rates of growth, especially in relation to multiple retailers and the development of city-centre shopping.

Estimates based on people who returned themselves as employers or self-employed in the retail trades for 1901 indicate the number of shops to be in the order of 571,817 for England and Wales. A decade later the Census of Population for 1911 enumerated the total number of shop properties in England and Wales as 607,300 of which 28% were lock-up type premises. In addition to this data the Census of Occupation for 1911 made comparisons in certain trades for the period 1901-1911 and these figures illustrate a growth in the number of dealers in most sections of the trades. For example, the total number of dealers in clothing and footwear increased by 55.2% over the decade from 63,800 in 1901 to 99,018 in 1911. These figures exclude drapers, the number of which grew by only 11.3% from 135,657 to 150,968. In the food sector the average rate of increase was much lower, being around 10% with grocers falling just below this figure since their number only increased from 151,184 to 165,981 or by 9.8%. Even after taking into consideration the somewhat unstable nature of the source material it seems reasonable to say that from 1880-1911 the number of shops was increasing, and at a faster rate than the population as in 1881 there were 154 shops per

10,000 people, in 1901 175 and by 1911 the figure had risen to 196 per 10,000.

The 1921 Census of Population listed the number of retail premises in England and Wales as 614,579 and of these 24.5% were classed as non-residential shops. Unfortunately, these figures are not directly comparable with the estimates already presented since the 1921 Census classed public houses as retail premises. To further complicate matters no enumeration of shop establishments was made by the 1931 Census, although estimates of the number of outlets have been derived by Smith (1937) from the Census of Occupation and a survey of city directories. According to his calculations the number of outlets in England and Wales in 1931 was around 575,300 compared with the original figure from the Census of 569,100, the difference being made up by the number of general shops a group which the Census drastically underestimated. If the original Census figure for 1931 is compared with similar data from the Census of Occupation for 1921 then the number of shops increases from 519,324 to 569,100 or by 9.5%. The growth in population over the same decade was only 5.4% which implies a slight increase in the overall number of shops per person. The actual figures are 137 shops per 10,000 people in 1921 and 142 per 10,000 in 1931. The reduction in numbers by 1921 can be attributed to the effects of the First World War and the consequent loss of life and manpower. That the figures had not, by 1931, reached their pre-war levels is significant and points to the operation of a process of rationalization within the retail sector. In terms of the number of independent traders, the effect of intense competition from the expanding multiple retail organisations is one factor of importance.

The figures for the period between 1901 and 1931 can be compared by reference to studies that are to some extent independent of the Census. Ford (1935) used twelve sample towns which he identified as 'typical'

and he calculated the number of retailers therein from city directories using the 1921 Census as an inter-period checkpoint. He showed how, in certain trades, the number of shops had declined in relation to population over the thirty year period. However, if the mean ratio of shops per 10,000 people is calculated for these sample towns it shows a slight rise from 185 per 10,000 people in 1901 to 191 per 10,000 in 1931. Too much attention though must not be given to such studies which may conceal national trends amid local variations.

The number employed in the distributive trades were unquestionably increasing throughout this period and at a faster rate than the number of consumers. In 1920 there were an estimated 1,773,200 people employed in the distribution sector (this includes retailers and wholesalers) and this represented 10% of the total workforce. By 1930 this figure had risen to 2,083,600 and was 12.6% of all employment.

Although no official figures of the number of retail establishments exist for the decade up to 1941, estimates have been presented by Jefferys (1950). Unfortunately these figures refer to the United Kingdom, whereas previous data was given for only England and Wales. He estimated that there were some 750,000 fixed shops in 1938 of which 657,000 were unit retailers. A similar survey was carried out using city directories and telephone books as data sources by the 'Economist' in 1940. This survey gave the total number of shops in the United Kingdom as 768,470 and suggested that this figure was possibly inflated by about 10% due to the duplication of addresses. Assuming the numbers presented by Jefferys are the most accurate then this would mean a ratio of shops to population in the order of 157 per 10,000 people. Bearing in mind that this figure refers to the United Kingdom it can be seen that the number of shops did increase in relation to population between 1931 and 1938/40 from 142 per 10,000 people to 157 per 10,000.

Another reliable indicator is provided by the total number employed in the distribution trades, which amounted to 2,438,200 in 1938

accounting for 12.9% of all employment. Obviously, this figure in itself does not imply a similar increase in the number of retail outlets. As Jefferys (1954) argues, it might merely reflect the growth of large-scale retailing. However, if we accept the above estimates for the number of shops then it still seems reasonable to assume some level of growth despite the effects of scale economies.

In relation to the number of retail outlets and levels of employment in the distributive trades, mention must be made of the effects of a war-time economy. After 1939, the shortage of manpower and forced rationing of products took their toll on the retail system. Contemporary studies testify as to the results of such conditions and Madge (1941) states that in a twelve month period from 1939 17% of Glasgow's 19,000 shops were closed and that the closure rate was increasing in momentum. This is hardly surprising since between 40 and 50 percent of male employees in the retail trades were of military age and 20-30 percent of the employers (Census based figures). In addition around 30% of female shop assistants registered for some form of national service (Worswick 1941). The effect on retailers was not however uniform since it was the small shops that suffered most and had the highest closure rate. According to the work of Madge (1942) in Leeds less than half the closed shops appeared to have gone out of business because of bad trade though war-time factors had contributed to the closing down of the rest. Of the ten percent sample 25% of the small shops closed, 13% of medium establishments and 11% of large shops (Table 3.6). It can also be seen that the non-food retailers were affected to a greater extent than those selling food, especially those dealing in groceries and meat, type A in Table 3.6. Food category B is composed of general shops, cafes, confectioners and tobacconists which had a slightly higher closure rate than other low order shops.

The reliability of the number of retail units is fortunately assured in

Table 3.6 Percentage of shops closed in Leeds since January 1940
(source: Madge 1942)

Type of shop	Single branch	Up to 5 branches	More than 5 branches	Total
Non-food	32%	18%	13%	24%
Food type A	20%	9%	0%	13%
Food type B	19%	2%	10%	14%

1950, with the advent of the first Census of Distribution. This listed the total number of retail establishments in the U.K. as 531,143 a figure which accounts for around 95% of the total. Using Jefferys' estimates for 1938 and adding the missing 5% to the census data for 1951, then the decline in retail outlets is in the order of 25.4% between the two dates. Much of this was in the independent sector that in general failed to meet the increased competition from the multiples and, at this later date, from the department stores.

From the above discussion it is apparent that the changes in the actual numbers of retail establishments were of a variable nature. Apart from the variations in data sources the general trends appear to be complex in character. Irregular growth seems to have been the most common mode of change, which at times greatly exceeded that of the population and in other instances barely kept pace with it.

3.2.1 Multiple retailers

Of particular interest in this study is the development of multiple retail organisations and their growth relative to the demand variables. Some hint has already been given as to the factors stimulating the initiation and evolution of such firms and to these may be added certain general pre-requisites (Jefferys 1954). In the first instance the multiple retailer was dependent on a large homogeneous demand for his products and this was provided by the growth of the urban areas and in particular the increased purchasing power of the working-class consumers. Added to this was the increasing mobility of the consumer. This allowed the multiples to adopt new sales policies and competitive strategies that were essentially based on rapid stock turnover. Such action had an important effect on shop location especially in urban areas and the search by multiples for accessible retail sites most certainly helped to contribute to the formation of a differentiated urban land value market after 1880. An indication of the relationship

between city growth and related expansion of multiple retailers is given indirectly by the example of certain European distribution systems (Table 3.7). There is a definite correlation between the percentage of the population living in urban areas of over 100,000 people and the sales of multiples and department stores; for the five countries listed in Table 3.7 a correlation coefficient (Pearson) of 0.71 was obtained between the two variables, which was significant at the 5% level.

Large scale multiples demanded a steady and large supply of standardized products, which could only be made available by large-scale production techniques. Associated with this were the increased variety of goods being marketed, many of which were new products that in essence demanded new types of retail distribution (Ironmonger 1972).

It was a combination of such factors that led to the development of multiple retail organisations. Since the stimulus and rate of development varied from trade to trade only general characteristics will be examined now and more specific relationships will be studied in a later section.

Of immediate importance here is the actual growth of such organisations in relation to both the overall retail system and market demand. On a national scale the number of multiples continued to increase throughout the entire period of study though after 1930 at a much slower rate. In relative terms their rate of increase was at its highest in the two decades following 1880 when the number of outlets grew from 1,564 to 11,645 in 1900 (Table 3.8). This growth rate was perpetuated up to 1910 after which time there followed a fairly steep fall-off in the war years between 1910 and 1920. The recovery in the decade following 1920 was not however to be sustained and by the end of the period growth was almost non-existent, being only 0.7% (Table 3.8). In relation to the growth of population the multiples continued to increase

Table 3.7 Percentage share of sales by retail organisations in
Europe, 1931. (source: International Chamber of Commerce)

Country	% population in cities over 100,000	% sales multiples/dept. stores	independents
U.K.	39.1	26.2	73.8
Germany	30.5	9.4	90.6
Holland	27.7	19.0	81.0
France	15.4	11.6	87.5
Sweden	13.6	11.0	88.0

Table 3.8 Estimate of the number of multiples in the U.K. 1880-1950
(source: Jefferys 1954)

Date	Total	% increase	per 10,000	No. firms
1880	1564			48
1890	4671	198.6%		135
1900	11,645	149.3%	2.8	257
1910	19,852	70.4%	4.4	388
1920	24,713	24.4%	5.6	470
1930	35,894	45.6%	7.8	633
1939	44,487	23.9%	9.6	680
1950	44,800	0.7%	8.9	638

at a faster proportionate rate. By 1900 there were 2.8 establishments per 10,000 people with the peak year being reached in 1939 when the ratio was 9.6 per 10,000 (Table 3.8). With the slowing down in their growth rate after the war the multiples lost ground and in 1950 the ratio of shops to population had fallen to 8.6 per 10,000 people.

Their growth in relation to the independent retailer can best be viewed not in terms of total numbers but rather with reference to total sales. The reason for this is that the multiples had a far greater impact on the market than their numbers would suggest, since they had such larger trade areas. These figures have been estimated by Jefferys (1954) and if we take the upper limit then the increase in the percentage share of trade would seem to have some correspondence with the number of shop outlets (Table 3.9). This fact suggests that in general terms there was little increase in the size of multiple retail branch outlets during their peak years of growth. From the war years until 1950 the independent retailers managed to retain their proportion of total sales against the competition of multiples, co-operatives and department stores though in numerical terms the independents suffered a fairly dramatic decline due, as we have seen, to the effects of a war-time economy.

The rapid growth of multiple retailers was followed by changes in their structure. The most important change was the increase which took place in the size of their organisational units and this is illustrated by the continued increase in the total number of shops, at a faster rate than the number of retail firms (Table 3.8). This was brought about primarily by a series of mergers and amalgamations, the effects of which were most apparent in the food sector especially in meat and groceries (Mathias 1967). In 1880 the mean number of branch outlets per retail firm was around 32 and this had increased by 1920 to 52. From 1880 to 1939 the number of branch outlets had been increasing together

Table 3.9 Percentage of total trade U.K. 1900-1950

(source: Jefferys 1954)

Date	Multiples	Independents
1900	3- 4.5	86.5- 90.0
1910	6- 7.5	81.5- 85.5
1920	7- 10.0	77.0- 82.5
1930	12- 14.0	71.0- 76.0
1940	18- 19.5	63.5- 67.5
1950	18- 20.5	61.5- 67.5

Table 3.10 Operating expenses as a percentage of sales by size of firm, U.S.A. 1913-30 averages (source: Bellamy 1941)

Number of shops	Expenses
2-5	24.5
6-10	23.6
11-25	23.3
26-50	23.8
51-100	23.0
101-500	19.4
501-1,000	19.0
1,000+	14.2

with the number of retail firms, though at a faster rate. However, after this date the number of firms declined and by 1950 the mean size of firm had around 70 outlets. The advent of such a trend serves to stress the influence of the level of urbanisation and the attainment of retail product specialization by 1950. It also emphasizes the importance of scale economies in retailing, the larger organisations enjoying benefits over and above multiples of a lesser size. If the United States case is typical then a distinct relationship exists between size of retail organisation in terms of the number of outlets and combined operating expenses. Expenses tend to decline as the size of the chain firm increases (Bellamy 1941) as Table 3.10 illustrates.

The changes in the demand variables that have already been observed also affected the retail structure of Britain between 1880 and 1950. Such induced changes produced shifts in the broad categories of trade and on a more detailed scale affected the growth and decline of specific retail types.

In general terms changes in per capita income and the standard of living give rise to increased demand for luxury goods, as income rises proportionately less of the family income is spent on food and basic necessities (Table 3.3). This shift in demand, reflected in consumer spending, obviously affects the number of retail establishments to different degrees. Studies in the U.S. (Simmons 1964) illustrate a rather clear relationship between rises in family income and changes in retail structure. While such changes are detectable in the U.K. in the period of study, the causal relationships cannot be fully tested because of the inadequate nature of the data.

3.3 Changes in Retail Structure

In the nineteenth century the growth of urban retailing was marked by a rapid proliferation of food traders (Wild and Shaw 1974) but equally the clothing sector kept pace with this increase. By 1880 in

Hull, for example, food retailers accounted for over 59% of the town's shops while clothing and footwear made up almost 31% of the total (White's Directory 1880). These figures may be taken as fairly typical of the national average since studies from other regions (Wild and Shaw 1975) indicate a similar breakdown. At a national level the proportion of food shops declined throughout the period and by 1911 they represented only 47.5% of the total establishments (Census of Occupation 1911). The rise in income seems to have stimulated growth in the non-food sector. However, those retailers selling luxury items remained fairly constant up to 1911, around 9.8% of the total. The growth of the clothing and footwear sector was not sustained after 1911 and by 1931 it only accounted for 15.3% of all retail establishments (Douglas 1935). In keeping with the preceeding period the relative position of the food trade declined slightly by about 0.5%. After 1911 the major stimulus seems to have been given to those retailers selling 'luxury' goods, their relative importance increased to over 30% by 1931 as compared with only 9% for 1911. After the 1939-45 period the trends in structural change were modified only slightly with both food and clothing/footwear retailers increasing in relative importance, thus food 51.7% and clothing and footwear 17.9% (Census of Distribution 1950).

The numerical decline of certain trade groups can in some instances be related to changes in specific retail types. For example, the decline in the clothing and footwear trade was associated with the rapid fall-off in the number of milliners and dressmakers. In 1880 these retailers accounted for almost 8% of the total shops but by 1950 they made up only 0.3% of all retail establishments (Census of Distribution 1950).

Changes in the overall retail structure can also be inferred from the pattern of retail sales, estimates of which have been derived by Jefferys (1954) and are presented in Table 3.11. If these figures are

compared with those of per capita income in Table 3.1, then an inverse relationship can be seen to exist between increase in income and the percentage of sales of food (Table 3.11). The sales in the clothing and footwear sector are of a rather erratic nature, their peak being reached in 1920. However, the trend for luxury goods and household durables was one of steady increase throughout the period as per capita income increased.

3.4 Retail Change Within The Urban Hierarchy

In terms of retail change the variations which occurred within the urban hierarchy present a major field of interest. Here, the motivating demand forces combined to produce a clear geographical differentiation. Initially, consideration must be given to the effects of improved consumer mobility and the changes it induced in the order and number of market centres. The effects of both population and income vary throughout the urban hierarchy. Friend and Kravis (1957) have shown that expenditure on both food and clothing increases steadily with resident family disposable income and it is lower in smaller towns for a given income; also that the variations by town size and income are larger in clothing than in food. Two aspects reveal themselves for study. These are, changes in retail market centres and variations in the retail structure of such centres.

Few studies have concerned themselves with the effects of increased mobility on market centres and fewer still have done so within the context of the British Isles, the exception being the work of Davis (1970). Skinner (1964) followed through the effects of improved transportation on Chinese market centres, while a much earlier study by Lalanne (1863) looked specifically at railway systems and population distribution. Skinner's work has been followed up by Rozman (1973) who examines changes in the urban networks of China and Japan. Skinner (1964) found that the introduction of better roads induced villages

Table 3.11 Percentage retail sales by trade types.

(source: Jefferys 1954)

Category	1900	1910	1920	1930	1938	1950
Food	58.8	57.7	50.7	49.8	46.6	40.3
Clothing/footwear	19.2	18.8	24.6	19.0	19.4	18.9
Confectionery/ tobacco	7.6	8.8	9.3	12.8	14.4	21.1
Others	14.4	14.7	15.4	18.4	19.6	19.7

Table 3.12 Percentage distribution of retail establishments by
settlement types, the Halifax-Calder valley.

Order	Settlement type	1870	1900	1930
1	Halifax	45.8	47.0	51.7
2	Mill towns	25.5	27.7	33.1
3	Mill villages	17.7	17.1	13.9
4	Hamlets	11.0	7.5	1.3

to market their goods at higher order centres missing out the traditional low order types whose markets eventually closed. This in fact was a reversal of the traditional process of change where lower centres were added to the system. The new type of change involved a decrease in the overall number of markets and an increase in the size of the market area. A similar process has been recorded in North America, with differential growth patterns between the various levels of centres resulting in the selective thinning out of central place patterns (Berry 1967).

3.4.1 The example of the Halifax-Calder valley

In Britain the process of change has been studied in the late nineteenth and early twentieth century in one specific area, the Halifax-Calder valley region in West Yorkshire (Wild and Shaw 1975). The range of settlements studied was on a much lower scale than the other works quoted but nevertheless it illustrates the underlying changes. Four levels of market centre were studied, the region's centre Halifax, five secondary towns, thirty-six medium and small-size villages and a number of small upland communities or hamlets. This may be related to a comparative study of changes in central places in mid Wales in the early and mid-nineteenth century (Lewis 1970). While the main aim of this was to make comparisons between the hierarchy in 1850 and that in 1964 it also illustrates the dynamic processes involved in functional changes of the system.

The process of market centre change, in terms of the proportion of retail establishments can be traced with the aid of city directories. If attention is focused on each broad class of centre then the trend towards increased retail concentration becomes apparent. In 1870 the lower order centres of the Halifax-Calder valley, mill villages and upland communities, accounted for over 28% of the total retailers of the study area (Table 3.12). By 1930 their contribution had fallen to

just over 15%. Meanwhile, at the opposite end of the scale Halifax had increased its share from 45.8% to 51.7%. However, this shift was not due to any dramatic growth on the part of Halifax since its rate of shop growth was only 1.5% between 1900 and 1930. Rather it was related to a rapid decline of retailing in the lower order settlements, especially in the upland communities where the actual number of retailers fell by 26% over the same time period. The greatest increase was in that category of settlements of the second order, the mill towns, where retail provision expanded by 18% during the twenty years from 1900 to 1930.

These differential retail growth rates within the urban hierarchy are also associated with modifications in the structure of the distribution system. The improvements in consumer mobility are most pertinent to the non-convenience goods sector where this is likely to lead to a focusing of demand in higher order centres which possess a larger range of goods.

In the study area of the Halifax-Calder valley changes in the retail structure were looked at over a period of one hundred years. This was an initial attempt to examine the structural changes both before and after major changes in transport technology. In 1830 the smallest of the four settlement types possessed almost 28% of the food shops. Indeed this sector of retail establishments was distributed almost evenly throughout the range of centres (Table 3.13). The position with regard to clothing and footwear retailers was one of concentration, with Halifax having over 50% of establishments. This situation was even more pronounced in the case of the durable type of retailers with well over 90% of them being either in Halifax or the five mill towns. In terms of the settlement hierarchy it was the third order centres that had the lowest level of retail provision both in terms of regional percentages and shops per person. By 1853, the situation had changed

Table 3.13 Changes in retail structure in the Halifax-Calder valley.

Town	Date	Food	Clothing	Others
Halifax	1830	28.3%	50.4%	60.2%
	1853	36.3%	44.4%	61.8%
	1870	39.9%	50.2%	63.6%
	1900	44.5%	49.1%	62.1%
	1930	50.6%	53.2%	56.1%
Mill towns	1830	25.3%	26.9%	32.6%
	1853	20.9%	24.9%	33.4%
	1870	23.5%	28.2%	28.2%
	1900	28.8%	27.8%	27.5%
	1930	32.9%	34.1%	38.2%
Mill villages	1830	18.6%	10.0%	2.0%
	1853	18.4%	15.7%	1.2%
	1870	21.0%	15.7%	6.2%
	1900	18.7%	16.9%	8.7%
	1930	14.3%	12.0%	5.7%
Upland	1830	27.8%	12.7%	5.2%
Communities	1853	24.4%	15.0%	3.6%
	1870	15.6%	5.9%	2.0%
	1900	8.0%	5.2%	1.7%
	1930	2.2%	0.7%	0.0%

only marginally in all three retail sectors, while in relation to the settlement types the greatest losses were among the mill towns which lost almost 5% of the areas food establishments. Concentration in the clothing and other durable goods sector had at this time not made any significant progress. In fact the clothing and footwear retailers exhibited a tendency towards deconcentration and the proportion that located within Halifax declined by 6% while at the same time it increased in mill villages and upland communities.(Table 3.13) The changes produced over this first twenty year period were not therefore specifically producing increased concentration within the higher order centres. In fact growth was not polarized but evenly distributed throughout the entire range of settlement types.

This position of reasonable equality was sustained to some degree in the period from 1853 to 1870, with increased concentration only being noticeable in the durable group excluding clothing and footwear (Table 3.13). The exception to this was the high loss rate by the upland communities with regard to food retailers, their percentage share falling by almost 9%. The trend towards retail concentration in the higher order centres became more noticeable by 1900 when Halifax and the mill towns had over 73% of the region's food shops.

In the final phase of the study the trend towards concentration proceeded at a much more rapid pace with Halifax having almost 50% of the area's food retailers while both the upland communities and the mill villages had reduced levels of food provision (Table 3.13). The five mill towns, in fact, increased the proportion of retailers in all three sectors of trade.

This latter period can be compared with a study in the same area that was carried out by Ford (1935), though this covered a wider range of settlements. However, this study did not cover all the retail types and so only specific trades can be examined and these

have been selected to represent the three broad categories already used. This data illustrates the same kind of process but from a different viewpoint, relating shop growth to population increase (Table 3.14). From this view it can be seen that the highest rate of retail loss are to be found in the lower order centres, those with populations below 20,000. However, even the higher order towns had a relative decline in the grocery sector although experiencing increases in the durable trades as represented by drapers and chemists (Table 3.14). These differences also reflect changes in income, with a relative decline in the number of convenience goods shops as 'shopping goods' establishments increase.

3.4.2 Regional variations

Examination of structural changes within the urban hierarchy must also include a study of retail organisational types such as multiples and independents which vary in their importance from centre to centre. These spatial variations are dynamically related to family income, consumer mobility and population characteristics. In a comparative study by Hall, differences in the ratio of multiples to total retailers by settlement size were observed between North America and the United Kingdom (Hall, Knapp and Winsten 1961). Within each country studied, systematic variations in the ratio of multiple retailers to town populations occurred in relation to different levels of consumer income.

In the case of food retailers poor regions (in terms of per capita income) experience a sharp rise in the ratio of multiples to total retailers between rural and urban areas, and it continues to increase with city size. In Wales, the poorest region in 1950, the ratio jumps from 4 for centres with populations of around 2,500 up to 11.6 for towns with almost 10,000 inhabitants. The ratio falls in towns with populations of 25-50,000, peaking in higher order centres (Fig. 3.1). In more prosperous regions such as London and the south-east the increase from rural to urban is much more gradual rising from 8.5 to 11.6 (Fig. 3.1).

Table 3.14 Changes in retail provision by settlement size, Yorkshire
1901-1927 (source: Ford 1935)

Settlement type population size	Date	shops per 1,000 population		
		Grocers	Drapers	Chemist
75,000	1901	3.34	1.21	0.31
	1927	2.57	1.24	0.34
20-75,000	1901	2.22	1.21	0.31
	1927	2.19	1.12	0.27
10-20,000	1901	2.23	1.03	0.28
	1927	2.36	0.89	0.26

It is noticeable however, that the ratio peaks at similar town sizes regardless of variations in per capita income.

The explanation for such differentiation between high and low-income areas lies in the fact that multiple retailers have a minimum threshold requirement in terms of turnover and profit margins. In high income regions such conditions may be satisfied even in rural districts and the multiples would find it possible and profitable to function in the lower levels of the market hierarchy. However, such penetration of the rural market may not be possible to the same extent in areas of relatively low income and only a small number of multiples consider such locational policies.

The examination of temporal variations within this context is made extremely difficult because of the lack of data but such a study can be conducted on a regional basis using city directories compiled for the East and West Ridings of Yorkshire (Kellys 1900 and 1930). This type of analysis cannot unfortunately take into consideration variations in consumer income, once again because of the absence of data. Nevertheless, we can consider temporal change in terms of market size and consumer mobility. In 1900, the ratio of multiples to total shops in the food sector was fairly constant throughout the range of market centres studied, though very low order centres with populations below 10,000 had failed to attract any multiple retailers (Table 3.15). The lack of strong differentiation within the urban hierarchy, or the tendency towards a position of quasi-entropy (Berry 1968), is to some extent an indication of the locational policies of the multiple retail organisations. At this early date they had not fully established themselves or any strong competitive strategies. The market areas of such shops were variable in size and little attempt was made to rationalise the organisations until after 1920.

By 1930 the situation had changed considerably and a recognisable

Table 3.15 Percentage of multiple retailers to total shops,
food establishments

Towns size	Yorks.(1900)	Yorks.(1930)	Yorks.(1950)	U.K.(1950)
250,000+	3.6	5.9	11.8	19.1
100-249,000	2.1	4.7	9.3	12.0
50 - 99,999	0.8	2.4	9.5	12.4
25 - 49,999	1.8	3.0	9.6	10.8
10 - 24,999	1.7	1.7	7.5	10.8
2,500-9,999	-	3.5	7.9	10.6
2,500	-	-	4.6	5.2

Table 3.16 Percentage of multiple retailers to total shops,
non-food establishments

Town size	Yorks.(1900)	Yorks.(1930)	Yorks.(1950)	U.K.(1950)
250,000+	3.9	7.4	17.0	19.0
100-249,999	2.1	5.8	20.0	19.0
50 - 99,999	1.1	1.7	23.0	23.0
25 - 49,999	1.3	3.2	17.0	20.0
10 - 24,999	3.7	2.0	14.0	18.0
2,500-9,999	1.7	-	13.0	14.0
2,500	-	-	8.0	6.0

pattern of differentiation throughout the hierarchy can be observed though this was not one of centralisation within the higher order centres but more at specific levels within the system. Indeed, the process operating was one of structural organisation or 'negentropy' as the information content of the multiples increased. The peaks and lows at this time correspond to those existing in 1950, though they occurred at a much greater intensity. Once again however, the ratio does not increase significantly with centre size especially below the 100,000 population mark and this contrasts with the conditions prevailing in 1950 (Table 3.15). It can also be noticed that by 1930 conditions were such that the multiples had still not moved into the very small market centres which can be considered rural in character.

Prior to 1930 the multiples, in their choice of location, were faced with a rather dichotomous situation because of the following factors. First, they were relatively new retail types and some were selling what can be considered, even by 1900, fairly new products (frozen meat). Their innovatory nature in terms of organisation and product specialization meant that they initially depended on relatively large trade areas for their survival. Therefore, in their early years of development from 1880 to 1900 they were to be found almost entirely in towns with populations in excess of 100,000 and certainly never in centres with populations below 10,000. However, the multiples were faced with another factor which tended to erode their dependence on large towns and this was associated with consumer mobility. The relatively immobile nature of consumers, even by 1900, forced the multiples into lower order centres where survival, more than anything, depended on a vigorous sales policy.

3.4.3 Inter-urban comparisons

The factors affecting the distribution of non-food multiples within

the urban hierarchy are of a much more complicated nature than the ones operating in the case of food retailers. Apart from the role of income and population dynamics attention must also be given to the factor of inter-town competition. The success of a low order centre, in attracting multiples, depends on its location relative to centres of a higher order.

In their early years of growth the multiples were forced to move into the low-order centres primarily because of the relatively immobile nature of their customers. In 1900, centres with a population below 10,000 had some non-food multiple retailers while small-order towns with populations in the region of 10,000 to 25,000 had one of the highest ratios of multiple to total shops at this time (Table 3.16). By 1930, with a more mobile consumer market coming into existence the multiples could rationalize their shop locations and to some extent they could abandon the lower order centres. At this time consumers were willing to travel to larger towns to shop for items of clothing and footwear, thereby strengthening the trend towards centralization. That this trend should be reversed in 1950 would seem rather strange but the explanation must lie in the fact that after the 1939-45 war the number of multiple retailers in this sector increased and intense competition forced them to exploit every available market. Another factor to be considered around 1930 is the effect of increased consumer mobility since this would favour the growth of multiples at least in the higher order centres, for those who travel further to shop tend to favour an established name, according to the findings of Hall (Hall, Knapp and Winsten 1961).

The above variations must also be viewed in terms of the evolution of multiple-shop trading and its geographical concentration. Much of the regional differences already mentioned which are not explicable

in terms of income may be attributed to the regional character of multiple organisations. Even the large census regions that are selected in Hall's study, though large enough to minimise the effects of inter-regional income flows, are still not fully closed retail systems as both Scott (1970) and De Coning (1959), working in Africa, point out. They are probably large enough though to contain a heterogeneity of income and the regional averages amalgamate contrasting patterns of consumer expenditure. The historical variations in the development of multiple retailers is one aspect that requires further study since they were most pronounced in their early years of growth. Scott (1970) presents two examples of the effects of such geographical bias for the firms of Timpsons, footwear retailers and Alexandre Ltd. who retail men's clothing. In the case of the former organisation the initial spread of branch shops was influenced by the facilities of rail connections with the head office in Manchester and this to some extent kept the firm out of the midland markets until the 1920's. In the same way many of the early multiple retailers of frozen imported meat confined themselves to the axis between Liverpool and Hull, the two main ports of entry in the north. Obviously, these regional variations will be less important as the system evolves and by 1950 their effect in the U.K. was not as pronounced, though still noticeable.

3.4.5 A model of the distribution of multiple retailers

The construction of a model describing the processes affecting the distribution of multiple retailers within the urban hierarchy is a task made difficult because of the lack of data. Any conclusions cannot therefore be fully tested in an objective way, although partial relationships can be examined in the less complex case of food establishments. In the latter little attention needs to be given to the role of inter-town competition since migrant customers are unlikely to be attracted to convenience shops from other urban areas. In this

instance the two most important variables are those measuring the degree of consumer potential, which can be represented by total population, and per capita income. It is the latter which is the most difficult to measure and for the purpose of testing some basic relationships figures were derived from commercial marketing survey reports (Business Publications Ltd. 1951). This report calculated levels of income for each of the largest British towns using rateable values and other available data based on an index developed by Gray and Corlett (1950). With the aid of this information it was possible to get some measure of the income variations between different centres and relate this to the ratio of multiples present.

This study, to construct a model, was undertaken for the largest 130 towns in the U.K. for 1950, though data availability restricted it to the grocery trade. It was found that the percentage of multiple grocery retailers was directly related to centre size in terms of the total population and the average per capita income per town. Both these independent variables were significantly related (at the 1% level) with the former having a product-moment correlation coefficient of 0.35 and the latter slightly higher at 0.38. The fact that these two variables do not explain all the variance is due to a number of factors, one of which is related to the accuracy of the income measurements. The results may have been improved had population density, rather than total figures, been used since fragmented urban areas require a much greater duplication of food retailers to serve a dispersed population than more concentrated settlements, given the same level of transportation. Mention must also be made of the differences in settlement types, at least in terms of their functional characteristics. For instance, one would expect dormitory towns and seaside resorts to have special retail structures associated with a typical demand. Finally, the historical evolution of multiple organisations and their

geographical bias, as already discussed, would affect such relationships. Considering all these points the correlation coefficients do not appear to be too low.

Although the variables affecting the percentage of non-food multiple retailers in market centres have not been tested due to the lack of data, it seems logical to expect a more complex situation. More attention needs to be given to the aspects of inter-town retail competition and the size distribution of market centres. The movement of customers to higher order centres is much more likely especially given improvements in transport facilities. Hall (Hall, Knapp and Winsten 1964) has suggested that the explanation of the distribution of non-food multiples can be given by the following equation.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 \quad (\text{Equation 3.1})$$

where X_1 = per capita income

X_2 = population change measured over the last 20 years

X_3 = urban population density of towns greater than 2,500

This situation applies to the retail structure of the U.S. market only and perhaps the main modification that can be made in the British case is the inclusion of a further dependent variable measuring inter-town distance. This will give some representation of the level of inter-urban competition which plays a more important role in the British context where there is a greater density of settlement.

The distribution of multiples within the urban hierarchy and their relationship to other retail organisational types has only been briefly explored in the U.K., and while American studies have concentrated on contemporary aspects (Cohen 1961) no attempt has been made to look at evolutionary behaviour. There remains a whole new field of study which should attempt to measure rates of diffusion of multiples within different centres and the factors affecting their development.

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Chapter 4

The Innovistic Process: as illustrated by Changes in the Technology and Organisation of Selected Retail Trades

4.1 The Selection of Retail Trades

The criteria for selecting certain retail trades in preference to others were decided as follows. First, and of overriding importance within the context of this study, was the requirement that a trade had experienced a radically new change in organisation and technology. It was also important that such changes in retail organisation could be readily identified with the limited data sources that were available.

The second criteria was of slightly lesser importance and concerned the need to be able to present a fairly comprehensive and balanced survey of all levels of retailing. The balance could best be achieved by the inclusion of food and non-food retailers and also service functions. To try and achieve some overall equality between these categories, and at the same time include trades that satisfied the major prerequisite, four retail activities were chosen for study. These included grocers and butchers on the food side, footwear, and in the service sector dyers and cleaners. Other trades were also examined but had to be rejected for a number of reasons.

The main type falling within this group was the clothing sector for, although changes in organisation did take place, they were rather fragmented in their effects since they operated at different time periods on different parts of the trade. Another formidable problem was in trying to categorize the individual components of this trade with only the use of city directories.

The historical development of the selected trades can best be examined by looking at the changes that occurred in the technology and organisation of each one and by viewing these developments in terms of the

innovistic process. Three main stages of retail development are essentially involved of which the first is the taking place of some advance in technology. This permits secondly, a recombination of productive facilities from which a new or innovistic type of retail institution develops. In turn this introduces the third stage within which a distinctive type of rivalry emerges for the existing retail forms to compete against (Chapter 3). It is postulated that the multiple retailers who arose primarily in the late nineteenth century were a product of these processes and in terms of organisation and competitive strategy could be considered as innovistic retail types. Within the context of this thesis retailers are classified as multiples if they have over ten branch shops. This follows the definition offered by Jefferys (1954) who justifies it on economic grounds since in most trades economies of scale operate in firms with ten or more shops. Co-operatives, whilst having some similarities with the multiples, are not classified with them as they did not operate the same competitive policies. Indeed in Hull itself the co-operative society's shops did not have a great deal of impact on the city's existing retail structure (Marshall 1951). In the rest of this chapter it is hoped to show how the three stages occurred and how the process outlined above actually operated.

4.2

The Retail Meat Trade

The retail meat trade provides a classic example of the initiation of innovistic change, the stimulus for such development being provided in the late nineteenth century by technical improvements outside the field of distribution.

4.2.1 The situation before 1880

Before 1880 the retail meat trade had developed distinctive types of shops that operated not only on economic bases but were also differentiated in terms of customers and locational requirements. Two broad categories

of shops existed which were in most respects mutually exclusive and thereby kept competition down to a minimum. The first and earliest of these retailers was the large-scale butcher who did his own slaughtering and who, more often than not, had a slaughter-house associated with his retail unit. His main clientele was middle class and his shop was located centrally. A share of this trade also went through the marketplace or 'meat shambles' in most towns (Blackman 1963). In mid nineteenth century Hull butchers shops made up over 21% of all food establishments in the main central shopping streets and by 1881, in the same streets, butchers accounted for just over 47% of all food retailers, excluding the public market facilities. This prolonged attraction to these central areas by a low order function, even when much of the indigenous population had declined, can be related to the organisational structure of this trade. Since slaughter-house and shop were one physical unit, any decision to relocate in the suburbs met with some considerable difficulty. This arose mainly because of the Public Health Act of 1848 and the role played by the newly initiated Local Boards of Health, although there had been restrictions on livestock slaughtering before this date in the form of local bye-laws and statutes (Woolley 1830). The advent of such legislation affected the setting up and location of slaughter-houses in urban areas and in Hull the restrictions seem to have been strictly enforced. The official line may be summed up as follows, "The close continuity of slaughter-houses to dwelling houses in thickly populated districts is to be deprecated" (Annual Report of the Health of Hull 1881). In the period immediately following the Hull Improvement Act of 1854, up to 1870, 19% of the applications for new slaughter-houses were rejected. After this date the number of rejections increased to 40% (Local Health Returns 1854-1890). The chances therefore, of butchers wishing to relocate their establishments in suburban areas were severely restricted by these

measures and for those in the centre a certain amount of geographical inertia operated, at least until transport facilities improved. The restrictions on slaughter-house locations became even more intense with the passing of the Public Health Amendment Act of 1890.

The second type of meat retailer was essentially concerned with a working-class clientele and up to about 1850 they mainly operated from market stalls. This trade dealt only with parts of the carcass and obtained its supplies from the producer/retailer who had his own slaughter-house. After 1850 it was these small-scale retailers who followed the consumer into the suburban areas since they were free from the restrictions placed on locations. The cost of transport from shop to slaughter-house (distances over 1.5 miles added 1d per pound to meat prices: Local Health Report 1865) was important but not a vital factor. These traders dealt on a cash basis, were geared to a fairly rapid turnover and retailed only certain joints of meat so overheads were kept to a bare minimum allowing additional money for transport. In locational terms these retailers generally occupied non-central sites, moving into small corner type premises away from the main street suburban shopping complexes. Of the total number of butchers in suburban Hull in 1880, 70% had no slaughter-house facilities and presumably therefore, the majority of them were part of this working-class type of trade.

4.2.2 Innovation in the meat trade

Around 1880 a combination of circumstances evolved that were to radically alter the established pattern of meat retailing and which culminated in the development of multiple retailers. The growth of the multiples was directly related to the development of imported meat. The impetus to change arose from the inability of local meat supplies to match the increased demand. From 1870 to 1890 consumption of meat was increasing and rose from 104.4 pounds per head in 1870 to 114.1 pounds

in 1880 and 124.1 pounds in 1890 (Wood 1899). At the same time there was a decline in the supplies of U.K. food animals which in 1867 had totalled 46.7 million but by 1880 this had fallen to 42.9 million (Critchell and Raymond 1912). This reduction was primarily due to the outbreak of rinderpest introduced from the continent into this country around 1865. The effect of this was to intensify a situation where there already existed signs of demand outstripping local supplies. To combat these shortages there arose, in the short term, the practice of importing live cattle mainly from the U.S.A. and Canada, since the Contagious Diseases Animals Act of 1892 prohibited the importation of livestock from the continent.

In addition, and of greater importance in relation to retail change, was the increasing energy being devoted to the development of meat preserving techniques. With the perfection of freezing and canning (even in 1867 Australian canned meat was being imported) the distant supply areas of Australia and South America could be effectively exploited. The importance of imported meat increased steadily during the period, although the sources of supply were constantly changing (Table 4.1).

This increased volume of imported meat called for radical changes in the retail organisation of the meat trade. The majority of the established butchers either could not, or would not, handle the cheap, and in the early years poor quality, imported meat. This initiated the development of new types of retailers concerned only with cutting up and selling imported meat and prominent among these were the first multiple meat retailing firms.

In northern England some of the earliest multiples were associated with the importation of American live and dressed meat. The retail outlets operated by the American Fresh Meat Company located mainly in the large and rapidly growing urban centres. There were three shops of

Table 4.1 The percentage of imported meat (live and dead) into the U.K.

(source: Wood 1899 and Prest and Adams 1952)

Date	1880	1890	1900	1910	1920	1930	1940	1950
	28.0%	32.0%	36.0%	39.5%	42.5%	47.4%	48.5%	45.4%

Table 4.2 The number of multiple meat retailers in the U.K.

(source: Jefferys 1954)

Date	1880	1890	1900	1910	1920	1930	1940	1950
Number	10	564	2058	3828	3207	3243	3592	3775

this company in Hull as early as 1881 and these were to double in number by 1886. The other main towns in which the company operated appear to have been Liverpool, Manchester and Sheffield (Whites 1881, Blackman 1969). In Hull their development heralded an early phase of price competition between certain types of meat retailer and by 1887 some local traders had taken up the challenge that was being offered by the American Fresh Meat Company. Advertisements appeared regularly around this time in local newspapers from shops offering meat at competitive prices (Eastern Morning News 1887).

The perfection of freezing techniques and the expansion of foreign supply areas served to intensify competition. The desire of the large meat producing companies to control retail outlets in this country was felt from the very outset, partly because of the reasons given above also to be assured of a steady demand for their supplies. The relationship between the expanding industrial areas and the development of multiple retailing can be clearly seen in this case since some of the initial attempts of meat producers to control their outlets occurred in northern cities.

By the first decade of the twentieth century it was possible to distinguish, on the basis of organisation and product specialization, two main types of meat retailer: (1) the existing establishments or independents, a category composed of an amalgam of the middle and working class traders who dealt in fresh locally produced meat and (2) those multiples selling almost entirely frozen, imported produce who operated on entirely different competitive strategies. This division appears valid in the light of contemporary evidence provided by the National Federation of Meat Traders Association (1912) who stated that over 80% of all imported meat was sold by firms dealing exclusively with such meat. The mode of operation of these multiples and their type of product combined to produce a number of constraining factors which

affected their locational requirements.

Initially, many of the branch outlets of the multiple firms did not possess their own cold storage facilities and meat had to be brought regularly from a centrally located plant. This necessitated a quick turnover of meat as storage was very limited and costly. Shops were therefore located on the main shopping streets so as to be able to draw on the largest market possible. This requirement for rapid sales and hence a central site was further reinforced by the fact that profits per pound of meat were much lower than those obtained from fresh meat, often by about 50% (Dunlop 1933). The typical cost and profit structures of these multiples in the inter-war period have been presented by Dunlop (1929) and for example, a multiple firm with 65 branches had a total net profit, as a percentage of turnover, of 4% while the figure for a small independent retailer was 12%. A final factor affecting their locational requirements was associated with the newness of the product being sold. Before it was generally accepted, central locations were needed to ensure the necessary level of demand for the shop's survival. In general these constraints produced a high degree of locational concentration and contemporary evidence suggests that at the height of their development multiples occurred in clusters of from two to twelve stores (Dunlop 1933).

In numerical terms these multiple retailers reached their peak in 1910 when there were an estimated 3828 shops in the United Kingdom (Table 4.2). After this date numbers began to fall off, a trend that was only really reversed after 1930 although the 1910 level was never attained again. The rise in the number of shops selling imported meat between 1900 and 1910 reflects the growing popularity of the product, since during this decade the overall consumption of meat was not rising. One possible reason for this is that the real wages of the working classes fluctuated between high and low rates in this period and so the

demand for cheaper meat rose. However, evidence would suggest that the rate of increase in the number of outlets exceeded actual demand, a situation that arose out of the intense competition between national rivals. This eventually led to the closure of many branch shops and most multiple retailers lost some of their outlets.

4.2.3 The process of amalgamation

The outcome of this internal competition between the multiples was a process of extensive amalgamations, the first of which occurred in 1911. This involved the Union Cold Storage Company which took over the business of another national firm W. and R. Fletcher. By 1914 this same company was involved in further mergers which led ultimately to a selective closing of inefficient and duplicated branch outlets (Jefferys 1954). This is a factor of extreme importance when consideration is being given to the changes occurring in retail location.

At the start of the First World War most multiples had reduced their number of branch shops, a trend that was to be further stimulated by shortages of both staff and supplies of meat due to the war-time economy. In the inter-war period the process of amalgamations reached its final stage when control of the largest multiples passed into the hands of the Union Cold Storage Company. By 1939 this organisation was the parent of eight of the largest chains whose total number of branch outlets in the U.K. was in the order of 1196 (Economist 1939). The process of rationalization continued, though little expansion occurred and gradually the standards of these shops were improved. In terms of urban locations, outlets sited in side streets were closed down and in some instances new properties were acquired on main shopping streets. There was however, no attempt to increase shop size which still remained relatively small, employing on average about four people (Jefferys 1954). The main competitive parameter for the multiples continued to be that of low prices but no drastic inroads were made into the independent

sector of the market, whose total share of trade remained fairly stable at least up to the Second World War.

The war-time economy hit both types of retailer, although as already illustrated in Chapter 3, the independents in general suffered the highest rates of mortality. Mention must also be made of the intrusion by multiple grocery firms into the meat trade. Moreover these retailers handled both imported and home-produced meat and consequently appealed to a much wider market. This type of evolutionary change can be related to the 'dialectic theory' previously discussed, with the development of stores selling both imported and local meat representing a form of institutional synthesis. However, this type of retail unit only emerged as a distinctive competitive force after 1950 and as such it will not be specifically singled out for study in this analysis.

4.3 The Retail Grocery Trade

The situation with regard to the innovistic process is somewhat more complex in the grocery trade but it does however epitomize the general conditions favourable to the growth of multiple retailers. On the demand side there was a rapid increase in the number of urban workers who were experiencing an almost continuous rise in real incomes. Associated with these factors was the increase in the volume of foodstuffs that became widely available and such background factors as the reform of the customs and excise duties with the opening of the free trade era. This latter factor led to a rapid increase in the rates of consumption of certain commodities, especially sugar in the 1860's (Mathias 1967). Similarly, the opening up of new agricultural areas abroad all went towards lowering the price of foodstuffs, as in the case of the meat trade.

Whilst these conditions determined the overall environment within which the changes occurred, the actual process can be associated more closely to the manufacture of new types of food products. One in

particular played an important role in the grocery trade and that was margarine, for which the British patent was taken out in 1867. Although the manufacturing process was originally developed in France by Mige Mauries it was the Dutch firm of Jurgens who put the development into full scale production (Hoffman 1969).

4.3.1 The situation before 1880

Before discussing the implications of the development of margarine for the grocery trade it is first necessary to give consideration to the existing pattern of retailing. This will serve to illustrate how incapable the traditional system was to handle large quantities of new products. In the period before 1880 the grocery trade was composed of a variety of different retail types of which the most prominent was the middle class grocer who in some instances was also part producer. The traditional 'high street' grocer had a completely different product range to that of the small shopkeeper trade. The former would probably stock in depth the grocery and household lines while the latter, more orientated towards the working class trade, would stock horizontally rather than vertically (Alexander 1970). In general the main retail parameter used in competition was that of service, with an emphasis in the middle class trade on long term credit. However, some price competition did occur mainly in the cities and this was greatest initially in the sale of sugar. Indeed, several of the earliest grocers' associations were established with the aim of stopping this practice (Levy 1942). Nevertheless, with the exception of the working class trade in some of the larger urban areas, the extent and the price reducing effects of this early competition were limited. The fact that certain skills were necessary in the grocery trade (Elliott 1938) and the restricted mobility of the consumers plus the widespread practice of granting long term credit all tended to restrain price competition. Competition was further restricted in the sale of tea because until 1869 this product could

only be sold under licence (Pennance and Yamey 1955).

4.3.2 Innovation and the growth of multiples

The existing retail system was rather set as to the amount and type of goods it could and would handle. This was especially the case with a new product such as margarine which because of its storage qualities demanded specific retail facilities. Added to this was the fact that many of the traditional grocers were attuned to the middle and higher class markets and therefore were not in a good position to retail to the new expanding working class sector.

New products, such as margarine, therefore demanded widespread changes in the structure and organisation of the retail grocery trade around 1880. This was the second stage in the innovistic process whereby new retailers emerge that have different selling techniques to those of the existing firms. In the grocery trade these new retail types can in the main be identified with the growth of multiple shop companies. A detailed account of the development of many of the larger firms has been presented by Mathias (1967), while Tousley (1969) considers retail marketing purely in relation to the manufacture of margarine. It required a new type of retailer prepared to operate shops that had multiple outlets on a large scale to realize the opportunities that existed for importing new cheap provisions and selling them in working class districts.

Jefferys (1954) identifies two types of multiple retailer within the grocery trade, a distinction he bases on their mode of origin. The first type he relates to the development of shops selling tea and sugar who originally had been oil and colourmen. Secondly, were those firms that specialized in the sale of a very limited range of products, usually about three or four lines and many of these concentrated on margarine. It is this latter group, which included such firms as Home and Colonial Stores, Liptons and Maypole Dairy, that can be considered

the true innovators and were the real product of the innovistic process.

In terms of the overall growth in numbers it was this latter group that exhibited the fastest rates of growth and they made the main contribution to the rise in the overall numbers after 1900 (Table 4.3). The growth in the number of multiples between 1880 and 1890 was more a response by many of the traditional grocers to the increased suburbanisation of the urban population. The doubling in numbers in the next decade however, can be attributed more readily to the new type of multiple that concentrated largely on margarine.

By 1900 rising food prices brought the mass market to the favour of the multiples who offered their standardized products at very low prices. Maypole Dairy Company, for example, made great increases at this time and their number of branches increased from 185 in 1898 to over 390 by 1903 and reached well over 900 before the 1914 war. The war years halted the development of the multiples but in the 1920's there was a spectacular rise in the number of branch shops (Table 4.3). The only serious setback to their growth came during the Second World War when the number of branch shops in existence fell owing to shifts in population, shortages and enemy action. In the post-war years however, many branch shops were reopened and by 1950 numbers had increased slightly (Table 4.3).

4.3.3 Characteristics of multiples

There was a rise in the price of foodstuffs around 1914 and a general fall in consumption per head of population, both of which intensified competition in the grocery sector. Under the stress of this competition all the retail types reassessed their selling methods and practices. After this time the overall trend in retailing techniques was towards larger shops and selling a wider range of goods in much smaller quantities. These changes all combined to produce a swing in demand away from the specialist grocer.

Table 4.3 The number of multiple grocers in the U.K.

(source: Jefferys 1954)

Date	Number of grocers (multiples)
1880	277
1890	1265
1900	3444
1910	5870
1920	7880
1930	11,761
1940	13,118
1950	13,663

The shops, selling methods and customers of the early multiples contrasted strongly with those of the traditional independent grocer. The typical multiple shop branch unit was initially physically small with a staff of two or three. Standardization was to be found wherever possible both in the commodities sold and in the layout of the shop. To cater for their working-class clientele most trade was undertaken in the evenings, the shops being open until eleven o' clock and often until midnight on Saturdays. It was only after 1900, with distinct improvements in the quality and standard of manufactured foodstuffs, that the multiples really started to compete with the traditional grocer for the middle-class customer.

The main feature of the grocery trade between 1920 and 1950 was the rapid growth of food manufacturing with which was linked the successful expansion of the multiples. This period also saw increased competition between multiple shops and themselves as well as with the independents. In attempts to overcome this many multiples switched emphasis from cheap cash sales to the service parameter. Along with this went a decline in the number of specialist multiples as firms increased their range of products (Jefferys 1954).

4.4 The Retail Footwear Trade

4.4.1 The situation before 1880

In many respects the early nineteenth century development of the footwear trade was similar to the situation that existed in the grocery trade and retail meat trade. By the mid nineteenth century it was essentially a handicraft trade with the producer/retailer being the central figure. The small-scale boot and shoemakers did in some instances look to the early manufacturing firms and journeymen outworkers located in Yorkshire and Northampton to provide them with a type of ready-made footwear and components that could be assembled and finished in the shop. By the 1830's it was normal practice for shoemakers to buy pre-

out soles, tops and tips from leather cutters and footwear manufacturers. In Leicester, Staffordshire and Northampton a division of labour in production had begun to develop but techniques were still at a handicraft stage with neither machines or power being used. Even as early as 1850 the Midland footwear centres had imprinted their production on certain sectors of the market, especially in London (Mayhew 1850).

4.4.2 Innovation in the trade

Between 1850 and 1870 a series of inventions revolutionized the footwear trade leading to the replacement of the handicraft methods by the machine manufacture of boots and shoes. Among the most important innovations were Blake's sole sewer, Crick's riveting process and the Goodyear welding machine. These developments made possible the first semi-mechanization of the trade and represent the first stage in the innovistic process of retail competition that was expounded by Schumpeter (1939). These changes in the method of production led equally to revolutionary changes in the system of retail distribution producing a new organisational shop form. The historical process has been discussed by Jefferys who presents a comprehensive picture although specific firms have been studied.

The demand for a new form of outlet was brought about by the inadequacies of the existing retail system for in the early stages of mechanization the natural outlets were boot and shoemakers, drapers and, to a lesser extent, general clothing shops. None of these traders however, proved capable of handling the steadily increasing quantities of factory-made footwear. Because of this fact the specialist footwear retailer, dealing entirely in machine-made boots and shoes, began to appear in large numbers around 1870 and 1880.

The new retail outlets had a different organisational structure and made greater use of the various parameters of competition. In terms of organisation, the footwear trade was one of the first to witness the

growth of multiple-shop retailing on a scale that was significant. Multiple retailers were emerging in the 1870's at which time Jefferys has stated that at least ten firms existed with more than ten branch shops. Together they possessed some 175 branch establishments and by 1880 these firms had been joined by eleven others. The increase in the number of multiple-shop organisations and the number of branches that they controlled was very rapid after 1880 as the estimates in Table 4.4, taken from Jefferys (1954), illustrate.

By 1938 the multiples accounted for approximately 25% of the total number of footwear retailers in the U.K.; this figure is based on estimates from Jefferys (1954) and the Manchester Commercial Guardian (1938). Indeed, according to Hoffman (1933) the largest firms Trueform Boot Company and Freeman, Hardy and Willis controlled 750 shops alone.

In general terms it is possible to outline the differences between the two types of retailer, those that operated along the old traditional methods and the new innovistic traders with their different selling techniques. Initially the branch shops of these new multiples were small and single-fronted and rarely made use of the locational parameter. However, in marked contrast to the discreet approach of the bespoke boot and shoe maker the multiple shop retailers adopted vigorous and aggressive methods of salesmanship. The first was the use of the price parameter, with the use of marked price tickets on all goods. This proved a great attraction in a trade that had hitherto been dominated by the indefinite pricing of the boot and shoe makers. They also used every method available to advertise their goods, low prices being a dominant part of their trading policies.

By 1910 many developments in the techniques of retailing used by multiple-shop organisations had taken place. At this time these retailers were able to enter practically every section of the market due to improvements in the methods of production and the quality of

Table 4.4 Estimates of the number of multiple-shop firms in the
footwear trade 1880-1950

Date	10+ branches		25+ branches	
	firms	branches	firms	branches
1880	21	500	8	314
1890	45	1231	19	900
1900	64	2589	32	2067
1910	70	3544	39	3074
1920	73	3942	39	3449
1930	81	4767	41	4179
1940	77	5169	43	4671
1950	68	5210	40	4819

the goods produced. One of the major changes that occurred was in the use of the site or locational parameter. A site in the main street or shopping centre became a necessity and more thought was put into the shop layout. The central location was needed because of the differences between the operating margins of the two main types of footwear trader. According to one report these gross retail margins varied from 22.5% for the typical multiple firms to around 40% for the top grade, high style part of the trade. These margins varied according to selling prices, which in turn depended on the type of goods, the class of the trade, the service offered and the stock risks taken. These factors demanded that the multiple trader sold more goods and in general terms had a greater rate of stock turnover. The physical size of the branches tended to increase and many of the newer multiple-shop firms in particular had very large premises. One further change should be mentioned and this was the slight shift in emphasis from the price parameter to the service one by the multiple retailers. This fits in with the theories of organisational change previously discussed in so much that as the innovating firm matures less emphasis is placed on the price factor.

In terms of the innovistic process the rapid spread of the multiple retail form was directly associated with the revolution in the methods of production that took place between 1870 and 1890. The problem that the manufacturer faced was one of trying to obtain a rapid and mass distribution of his new factory-made footwear at very low costs. The problem was solved in most instances by the multiples who assisted by the general economies secured by way of their large-scale buying and low operating costs. Advantages could also be secured through the integration of production and distribution as this ensured a constant outlet for the manufacturer's product. At the outset not all the large manufacturing companies entered directly into the retailing side of the trade. For example, Clark's method of distribution was via the use

of retail agents. This became a problem for the firm around 1930 when they found that their main competitors had set up companies to buy up retail outlets as they came on the market. When this happened Clark's found many of their outlets being closed against them. The multiples had the financial strength which enabled them to purchase the best sites and invest in new shop fixtures. This advantage was perhaps of little importance before the turn of the century when the multiple shop branches were not particularly well sited but around 1920, with the growth of the main street sites, they had considerable advantages over the other firms.

4.4.3 Growth in the inter-war period

After 1930 two distinct trends emerged in relation to the growth of multiple footwear retailers. First, there was a tendency for firms to try and increase their share of the market, not by adding new branch shops, but by expanding existing premises and trying to obtain a higher turnover per branch. This reflects a centrifugal force that resulted in the development of shop clusters in the centre of towns. In addition, multiple retail firms had to face the problem of site competition which by the late 1920's and 30's had become intense. The difficulties which had to be overcome in order to obtain main shopping street sites were at a premium due to the competition from other multiple traders.

The second trend, to some degree, worked against the efforts to rationalize branch outlets and concentrated investment on a lesser number of shops of a larger size for it was concerned with the effects of competition between the different groups of multiple retail firms. The decision to close a branch shop in one area, so as to attract and concentrate customers in a larger branch in another area, is a difficult one to make when outlets of competitors are left unopposed in the former area. This tended to keep the number of branch shops excessive and worked against the development of larger, but fewer

multiple establishments. Levy (1948) noted this competition and its expression in the form of the spatial clustering of shops in main streets. Unlike the situation in the meat trade this intense competition has not been relieved by the advent of mergers and amalgamations. Indeed no agreements had been reached between different multiple firms up to 1950, a factor contributing to the still intense competition in this trade.

4.5 The Service Sector: Dyers and Cleaners

The final trade to receive detailed attention is that of dyeing and cleaning which in this study represents an attempt to analyse the innovistic process at work within the service sector. However, whilst this trade did go through the stages of innovistic growth, leading to the development of a new retail form, detailed evidence supporting this is somewhat lacking.

The stimulus for innovistic change came in the form of an invention that enabled the cleaning of garments by a chemical process which in its initial form originated in France around 1860. Before this invention the main trade of dyers and cleaners had been dyeing and their main clientele was drawn from the middle classes. Some of these established firms adopted the new technique but still remained organized to deal with a limited market and the new service did nothing to diffuse the shops from their central sites. In Hull for example, even by 1880 when the 'French cleaning' techniques had been accepted almost 90% of the dyers and cleaners occurred in one street.

The growth of multiples organized to capture a much wider market was related to the perfection of the chemical process, making it cheaper and more efficient. However, the rising standard of living and increased urbanization played a significant role in producing an effective demand for the new services. Moreover, the multiples with a central processing plant and each branch outlet acting merely as a

receiving office, could benefit greatly from the economies of scale and had the added ability to offer specialist services.

As early as 1880 the multiple type of organisation was established in certain cities notably London, Perth and the Johnson Brothers in Liverpool. Indeed the latter firm had already extended its regional market into Yorkshire and had a shop in York by 1895 (Whites Directory, York and District). On a national scale the number of dyers and cleaners classed as multiples increased their number of branch outlets at a fairly steady rate throughout the period of study (Table 4.5). In contrast, the total number of actual retail firms did not keep pace with the increase in branch outlets, a fact partly due to amalgamations (Jefferys 1954). It is not possible however, because of the lack of data, to make a comparison of the numbers of multiples and independents in this trade although a survey by the Economist (April 27th 1946) suggested that multiples accounted for almost 100% of the business. While such estimates cannot be verified on a national level, it is possible to monitor changes within the study area. In 1890 Hull had only 4% of its dyers and cleaners operated by multiples but by the turn of the century this figure had risen to over 18%. During the 1940's the proportion of multiples in Hull was to rise over the 80% mark but at no time did it reach 100% as the national survey reported. It was after 1930 that the multiples in Hull showed their greatest increase in numbers at a time when the national trend was also one of rapid growth (Table 4.5).

The increased growth was fostered by the steady rise in demand for such services and only really faltered during the depression years between 1931 and 1932, a factor that does not become evident from the general trend figures. However, if a closer examination is made of the main period of growth, in terms of expenditure and levels of consumption, then it becomes possible to account for the growth in multiples. The total

Table 4.5 Estimates of the number of multiples in the dyeing and
cleaning trade 1880-1950
(source: Jefferys 1954)

Date	1880	1890	1900	1910	1920	1930	1940	1950
Number	56	90	304	836	1354	2530	3402	3842

Table 4.6 Estimated levels of expenditure and consumption for
laundry, dyeing and cleaning in the U.K.
(source: Stone and Rowe 1966)

Date	Expenditure (£m)	Consumption index (1929=100)
1920	21.4	69.0
1922	19.0	70.0
1924	19.8	76.6
1926	21.6	84.3
1928	23.7	95.0
1930	26.4	105.9
1932	26.3	110.8
1934	29.4	128.1
1936	31.1	137.1
1938	32.6	133.9

expenditure fell slightly from 26.4 million pounds in 1930 to 26.3 million pounds in 1932 although levels of consumption continued to rise albeit at a slower rate (Table 4.6). To some extent the multiples profited more than the independents in times of consumer hardship since they were able to absorb short term recesses more readily. After 1932 both consumption and overall expenditure increased by substantial amounts, a factor reflected by the rapid growth of multiples during these years.

During this inter-war period the new intrusion of multiples had some different characteristics to those of the early firms mainly in their locational requirements. From around 1930, firms such as the American Hygienic Steam Pressing Company began to operate branches in more suburban locations. They still demanded main shopping street sites but unlike most of the other retailers in this trade they did not locate in central areas.

Their branches, in common with the other multiple trades that have been examined, took up positions along the linear shopping streets that had developed along transportation routes. In some respects these new multiple firms had similar traits to the existing retailers, especially in the use of certain competitive parameters. For example, their shops remained physically small and employment per branch rarely exceeded three persons. Their main competitive advantage came with economies of scale brought about by the use of a central processing plant, with the branch shops merely being collecting depots.

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The Definition of Study Area and Problems of Data Collection

5.1

Selection of Study Area

Two initial and rather basic problems need to be dealt with at the outset. First, the requirements that any potential area of study needs to satisfy and second, the more difficult task of setting up a spatial framework within which retail change can be both observed and measured.

The selected area of study is the port city of Kingston upon Hull which fulfilled two of the essential requirements. Kingston upon Hull is located on a fairly uniform plain and as such there are no major problems of relief to contend with although the river Hull, which runs through the urban area, does present a major physical barrier to east-west movement. The city itself evolved in a monocentral fashion rather than by a process of amalgamation of existing village nuclei. Indeed, the form of urban growth was outward essentially over an unpopulated area and originated from one central location.

A further point that had to be taken into account was the spatial definition of the study area. It is a practical necessity that a meaningful boundary is selected within which the study can be made. It was decided to consider only that part of the city that had developed before the First World War. This ensured that to all intents and purposes the area contained a uniform type of housing and street development and therefore, that the physical layout of the place would not play a major role in explaining variations in shop locations. It also ensured that large areas of local authority housing, essentially of a much lower density and containing planned locations for shopping facilities, were excluded. This situation can be clarified by taking a more detailed look at the physical growth of the study area.

If one examines the physical setting within which the spatial extension of the city took place, it would seem to be an ideal environment for allowing symmetrical development. For Hull was, geographically speaking, an isolated urban area. Within a radius of about twelve miles there existed, in the early part of the nineteenth century, only the ancient boroughs of Beverley, Hessle and Hedon together with a number of small agricultural villages, all of which were beyond the reach of Hull's outward extension until well into the twentieth century. This produced a strongly centred pattern of urban growth since there existed no primary points of population concentration for nineteenth century urban extension to focus on.

However, despite the fact that Hull during the nineteenth century was able to extend over an almost wholly unpopulated immediate hinterland and had no major configurations of relief to affect its developing road and rail networks, morphological growth was strongly affected by the river Hull and the peculiar arrangement of the late eighteenth and early nineteenth century dock system.

The walled medieval town of Hull (the Old Town) had been built within the angle of land between the river and the Humber estuary. Harboursage, until the completion of Queens dock in 1778, had been afforded mainly along the river. The opening of the dock, which in part had been excavated out of the medieval moat outside the fourteenth century town walls, was the initiation of a series of similar dock schemes. It was also to have an important effect on the town's subsequent morphological development. Initially came the constraining influence of the dock on the natural tendency of the city to expand its built-up area outside its medieval halter. During the late eighteenth and early nineteenth century therefore, residential development, largely in the form of small overcrowded courtyards, competed for

space in the Old Town with land uses such as warehousing, small industry and commercial establishments.

Outside the Old Town only two major lines of relief were offered, these being the banks of the river Hull which attracted the larger, communications orientated warehouses and factories; and the area to the immediate west that lay between Queens dock and the Humber (Fig. 5.1). Here, easier contact could be made between the developing suburbs and the historical centre of the town. This latter area was to be narrowed further by the opening of the Humber dock in 1809. In 1829, this process of isolation of the Old Town was to proceed to its final stage with the completion of Princess dock. At this time congestion had reached such a state that many inhabitants of the area, mainly middle and higher income residents, were now moving to suburban areas.

The morphological growth of the city outside this central area took place largely after 1850. Though, even as early as 1831, the Old Town accommodated only 26% of the total population, whereas only twenty years previously it had provided homes for more than 50% of the city's residents. From 1821 to 1851 the population of the Old Town increased slowly at an annual rate of 0.78% compared to 2.82% for the city as a whole. After 1851 the number of inhabitants in the Old Town began to decline rapidly from the peak of 18,108 to 16,822 in 1861 and 14,044 in 1871, this being only 11.1% of the total population of the city.

During this early phase of nineteenth century growth, from 1821 to 1881, the city's population increased at an average rate of 3.9% per annum, while measurements of its total built-up area indicate a somewhat slower annual rate of growth of 3.2%. The increase in population reached its peak between 1871 and 1881, this period correlating with high inward migration rates which in turn were stimulated by the growth of manufacturing industries. To accomodate

both the natural increase and the new migrants the rate of house building similarly increased, resulting in an extension of the urban area. This is illustrated in Table 5.1 which shows a 34.7% increase in the number of houses built between 1871 and 1881. The built-up area of the city increased from 335 acres in 1851 to just over 700 acres in 1881. The main part of this urban development occurred on the west side of the river and in particular formed two main wedges of growth. These areas of urban development were separated, both by the open ground that was occupied by West Park and to a lesser extent by a small area of middle class housing in the same vicinity (Fig. 5.1).

5.2.1 The effect of tramways

Between 1881 and 1911 the city increased its built-up area by about 942 acres, with the number of new houses similarly increasing by well over 200,000 (Table 5.1). From 1898 to 1904 the city had a veritable building boom which reached its peak around 1900. In the main such growth produced an outward movement of population from the city centre, approximately between the years 1901 to 1911. The greatest movement was into the middle class areas of Newland and Beverley wards and the better working-class wards of Alexandra and Southcoates. Much of this late nineteenth and early twentieth century development is reflected in the growth of three main suburban communities extending along major arterial roads.

It is no coincidence that by 1899 Hessle, Anlaby and Beverley Road were almost fully built-up as far as the tram termini. In contrast, extensive development also occurred to the west of Pearson Park where there was no tram line before 1900. However, the area was served by wagonettes and a few horse-drawn buses (Lee 1968).

This type and scale of urban growth was obviously aided by the growth of an efficient tramways system. This was made possible both by the improvements in technology, i.e. the electrification of tramways

Table 5.1 Rates of house building in Hull, 1851-1911

(source: Foster 1969)

Date	Total	Actual increase	% increase
1851	18,171		
1861	20,383	2,212	12.3
1871	26,713	6,330	31.1
1881	35,992	9,279	34.7
1891	46,145	10,153	28.2
1901	56,522	10,377	22.5
1911	64,585	8,062	14.3

and at an earlier date by the legislative acts which enabled the setting up of tram companies in provincial towns and cities. In 1870 the first Act was passed which enabled tramways to be constructed along existing highways, a practice which at that time had been developed on the largely unbuilt up routes of America. Also the 4 m.p.h. and red flag vanguard acts of 1861 and 1865 were replaced by a stipulation that called for an efficient braking system and a 'governor' to shut off the steam at 10 m.p.h. (Dyos and Aldcroft 1969).

In the case of Hull, Lee (1968) concludes that while electric trams did encourage the population to disperse, the horse trams did so even more. This was because they made a real break-through in providing cheap, though not rapid, transport for the working classes in the 1870's and 1880's. In Hull the wagonettes maintained such cheap fares in the 1890's, having forced down the cost to 1d for $2\frac{3}{4}$ miles. These low fares together with the other factors mentioned may have triggered off speculative building along the major tramways.

The suburban growth occurred most dramatically on the west side of the river Hull, with the two main late nineteenth century residential areas being consolidated and expanded. These two new suburbs were similar in size, that is over 300 acres of built-up land. Meanwhile, east of the river the area of residential land only increased by 200 acres again along the main arterial road. This development marked the boundary of the study area and excluded the lower density housing estates that were constructed immediately after the First World War.

5.3 The Spatial Framework of the Study

One of the major geographical problems that presents itself in adopting a temporal approach to any form of change in spatial phenomena, is that of selecting a meaningful study framework. The geographer is faced with the task of developing a spatial framework that will allow comparisons to be made over time, whilst also allowing some degree of

Objectivity. This point was recognised and emphasized by Getis in his early work on the changing pattern of location of the grocery trade at Lansing, Michigan between 1900 and 1960 (Getis 1964). Since his main concern however, was to test a measure of spatial pattern (the nearest-neighbour technique that had been developed by Clarke and Evans (1954)) his study framework reflected the necessary requirements for the application of such a test. The actual analysis is based on the Poisson probability distribution where supposedly, each location has an equal opportunity of attracting a particular phenomena, in this case a retail establishment. To make density calculations easier Getis selected a circular framework which was also used to eliminate areas on the fringe of the city that were less developed. The location of the centre of the circle seems to have been subjectively defined, since no explanation is offered in the text (Getis 1964). These circular areas were expanded through time but again no criteria for defining their boundaries at the different time periods is offered. All he states is that "meaningful study areas were selected, where spatial bias was minimized" (Getis 1964).

This latter point is raised by Sherwood (1970) in a recent British study of Shrewsbury, that in many ways is complementary to that carried out by Getis. Sherwood concludes that it seems likely that such circular areas may have been selected on a best fit basis. In his study Sherwood goes into more detail concerning the selection process of the circular study areas and argues for some form of control over the location of the zones and finds it in the use of the peak land value point. However, despite his constant reiteration for the need to control and minimize spatial bias the expansion of the areas is again achieved in a rather mysterious way, since he gives no clear indication of the criteria involved in the enlargement of such zones.

These studies, and hence the selection of spatial frames of reference,

are geared to some extent to the applications of nearest-neighbour analysis. Their use of circular areas may well be suited to this technique; however, in terms of a meaningful study of urban retail change their forced assumptions appear to be rather naive. The search for convenient mathematical areas that are unbiased over overrides equally important issues that may possibly offer some explanation of changes in retail location. The assumption of uniformity of urban growth in both direction and amount is one such issue. Clearly these circular areas can also be criticised from a more practical viewpoint, which is their failure to take into account the irregular nature of urban areas. This problem is even more acute in a temporal study where measurements need to be made over an ever-expanding suburban fringe.

5.3.1 Urban growth zones

Two basic problems emerge from the above discussion; first, the need to develop a spatial framework that is based on urban growth characteristics and that will take into account the irregular nature of city expansion. Second, the technique must be able to produce comparable spatial units in terms of the amount of actual built-up land. Both these problems are to some degree closely interrelated and as such a common solution can be postulated.

Since concern is mainly focused on the expansion of urban land it seems logical to develop the spatial framework around this concept. That is, to construct what can be termed 'growth zones', which are simply zones or areas based on the amount of built-up land at specific points in time. The idea of defining urban fringe belts is not new as it was first formulated by H. Louis in 1936, although little attention has been paid to the subject. Much of the initial work on the intricacies of fringe belt development has been investigated by Conzen (1960) in a study of Alnwick, Northumberland. This has been added to by Whitehand (1967) who draws attention to their importance when he states that "their recognition provides a genetic rather than a purely descriptive

basis for the analysis of towns".

The notion of growth zones used in this study differs slightly from the more elaborately defined fringe belts that have been described by Conzen and Whitehand. These differences can best be expressed by examining the construction of the growth zones employed in this study.

The first process in establishing these zones was the construction of a smaller spatial unit, this being a network of grid squares, within which the measurements of built-up land could be made. Obviously, this involves an element of subjectivity and for the sake of convenience in both the calculations and also in terms of size in relation to the overall built-up area, grid squares of 10 acres were selected. These appeared small enough to measure a reasonable amount of variation in the levels of built-up land whilst at the same time allowing a general picture to be constructed. The initial grid square was constructed around the peak land value (p.l.v.) point of 1855. This was established with the aid of local rate books and was used as the earliest reliable figure. One problem in this approach is that the p.l.v. itself is prone to drastic movements in its location but in the case of Hull the actual p.l.v. remained fairly constant in its location up to the early twentieth century. It was felt that this was sufficient to warrant using this technique, since the construction of growth zones was only to be carried out up to the First World War.

Having established the starting point, the next problem was that of what type of built-up land should be measured. It had already been decided that the gross area of each grid square was too crude an index since some degree of comparability was called for therefore, only the net built-up area could be used. In the measurement of built-up area only residential and commercial land was considered and such areas as open spaces, parks, railway lines, factories, warehouses and churches were all excluded. This total built-up land was then expressed as a

percentage of the gross area of the square. An arbitrary figure of 25% of built-up land per square was assumed as a cut-off point and the boundary of the growth zone was constructed so that all the squares in it had 25% or above of their area consisting of commercial and residential land. In this way areas of comparable urban development were obtained and while it may appear subjective, it does provide a consistent and meaningful measurement.

A further consideration concerned the selection of the particular time periods at which to construct the above defined growth zones. In practice this choice is, to a large extent, dependent on the availability of suitable large-scale maps of the city for specific dates. In the case of Hull, the best and by far the most reliable of such maps, were to be found in the 1850's and 1880's. Many of the maps that were produced at this time were based on the large-scale town plans that had been published by the Ordnance Survey, which were at a scale of sixty inches to one mile. Two publications in 1853 and 1883, together with a map that was commissioned by Edward Baines in 1823, governed the selection of three of the growth zones, while the outer zone was bounded by the area of built-up land that occurred around 1911. The source for the establishment of this area was a locally produced map that was published in 1911 by M. Harland and Son. Apart from constructing these areas of urban growth a decision was also taken to consider that area enclosed within the dock system, i.e. the Old Town, as a separate unit of study. This was because the Old Town was the early medieval core of the city and as such acted as the first central shopping area. The final study framework is shown in Figure 5.2 and this shows the five major zones of urban expansion which have been identified.

Apart from the availability of suitable town plans, the choice of these dates was also intended to reflect, where possible, distinct morphological changes in the urban landscape. To measure this factor

with a greater degree of accuracy, the above growth zones were subdivided in some instances to allow for variations in types of housing and age of development, within the general period covered by the growth zone. This subdivision was automatic in the outer zones, since various barriers such as the river fragmented the zonal development producing non-contiguous areas. The net result of this finer partitioning was to give twelve basic areas, the locations of which are shown in Figure 5.2. The physical growth of these areas is presented in Table 5.2 which gives the amount of net residential and commercial land at standardized ten year intervals. Since these figures had to be related later to population, census data and also local street directories, it was necessary to adopt this ten year period. Obviously, the main period of growth took place between 1880 and 1911 with the establishment of the outer suburban fringe but, as can be seen, many of the inner zones consolidated their development between these years. It appears that most of the areas did not expand after 1911 since this was the cut-off date for the spatial framework and maximum urban development had already been achieved in these areas.

5.3.2 Characteristics of the growth zones in Hull

The selected time periods and their corresponding growth zones do reflect some significant changes in urban morphology. The areas which developed before 1850 essentially pick out the early locations of pre-byelaw housing and the main working-class districts, these being the area immediately to the west of the Humber dock and in the north around Sculcoates. The latter area was based on early-developed port industries which were drawn there by the harbourage afforded by the river Hull. Both these areas established early shopping centres based largely on the needs of the working-class.

The 1880 growth zone represents the initiation of a linear type of shopping development with the early centres being set up along the

Table 5.2 Levels of net area by growth zones in Hull*

Zones	1881	1891	1901	1911	1921	1931	1941	1951
A	48	48	48	48	48	48	48	48
B	111	111	121	121	121	126	126	126
C	70	73	90	92	92	92	92	92
D	70	73	92	97	97	97	97	97
E	59	63	84	84	84	84	84	84
F	77	78	117	118	118	136	136	136
G	69	73	114	124	124	124	124	124
H	35	35	58	68	68	68	68	68
I	31	39	42	42	42	42	42	42
J	35	35	195	200	200	200	200	228
K	32	61	200	322	322	352	352	355
L	67	82	280	330	330	330	330	340
total	704	771	1,441	1,646	1,646	1,699	1,699	1,740

* figures in acres of built-up land, interpolated for 1941.

main arterial roads. This was brought about by the improvements in tramway facilities between 1870 and 1880 for by 1880 in Hull the tramways operated along Beverley Road, Spring Bank, Anlaby Road and Holderness Road. Their influence increased even further with the arrival of the electric tramcar in the 1890's, though in Hull steam tramways operated in some areas until the start of the twentieth century. This factor gave impetus to the growth of the extensive suburban development which occurred between 1880 and 1911, which is represented by the outer growth zone. The outer growth zone varied considerably in its rate of urban development and the areas occupying land along Holderness Road in the east and between Hessle and Anlaby Roads in the west achieved their peak densities at a much earlier date than the northern zone, along Beverley Road. Indeed, the Beverley Road area was always occupied by a much lower density of housing and in many parts was colonized by a middle-class population.

Two notions are postulated in relation to the formulation and use of these zones in measuring urban retail change. First, it is suggested that as far as possible the above defined zones represent fairly distinct morphological units when related to the sequential stages of urban development; secondly, that they are in themselves similar in terms of the amount of built-up land and the general order of street arrangements. Therefore, in terms of urban densities, we are dealing with spatial units that are significantly comparable.

In order to test the validity of the former statement, concerning the sequential development of the defined areas, a preliminary study of all retail trades was undertaken for the period 1823-1881. Within this study all retail establishments were plotted in terms of the initial ten acre grid square system and then analysis was carried out via the growth zone framework (Wild and Shaw 1974). It became possible to identify the nuclei of early peripheral shopping areas, but more

important a pattern of sequential development could be recognised. This took the form of a recurring type of retail structure that colonized each successive growth zone as urban development proceeded.

Each of the earlier growth zones followed similar stages of evolution, not only in terms of its initial retail colonization, but also in its phases of maturity and subsequent decline. The colonization sequences are illustrated in Figure 5.3 which shows the role of low order type stores in the early stages of a zone's development. The pioneering stage was characterized by a rapid proliferation of shops, very largely comprised of grocers and butchers with , to a lesser extent, various categories of the clothes trade. The results did seem to suggest that the growth zones had some degree of meaning in terms of urban retail evolution.

5.4 Data Sources and Their Accuracy

In common with all historical studies the availability and accuracy of data sources is of crucial importance. In a study of retail change, whether it be on a broad scale or in terms of shifts in shop location, sources are limited in the pre-1950 period. In the measurement of retail locational change there are traditionally two major sources, city directories and local rate books. The material available for studies concerned with overall change that do not require any detailed locational data can be extended to the use of the Census of Occupation, a source limited in its information content when compared with the Census of Distribution initiated in 1950.

As changes in retail location form one of the major themes of this study it is to city directories and rate books that attention must be first directed. The former are the most widely used and prominent data source in this work, as directories represent the only continuous cover available in the examination of retail locational change. They do however have their drawbacks with the main one being their degree of

accuracy and this seems to have varied according to the type of directory used. In general it was found that the locally-produced directories were the ones most prone to error and these had numerous double entries. The compilation of the earliest of such directories has been described by Norton (1950) and it was also briefly mentioned in other studies (Wild and Shaw 1974). Fortunately in this study it was not necessary to consult locally-produced works since a complete cover was provided by the national publishers of W. White (1880) and F. Kelly (1890-1940). The only exception to this was data collected for 1950, when in the absence of national coverage the local directory of Barratts (1950) had to be used. One other advantage of using, as far as possible, one continuous series is that shop classification is constant through time.

Internal checks were made to locate and eliminate any double entries which according to Davis, Giggs and Herbert (1968) can lead to an error of between five and ten percent in the compilation of the total number of commercial premises; though in this study few occurred. One major source of error detected in the earlier directories, especially White's (1880), is associated with shop premises that were listed without street numbers, which therefore could not be precisely located. Two points arise from this; first, this source of error varied from trade to trade being most common in the grocery sector and least noticeable in the dyers and cleaners. (Table 5.3) Secondly, these errors were geographically biased towards the expanding suburbs, places where the very rapid nature of change made accurate data collection difficult even for the experienced directory agents. Indeed, it is this spatial bias that produces the greater error in the low order trades which were the ones colonizing the suburbs. Barratts directory of 1950 also suffered minor lapses in its degree of accuracy and this took the form of underestimating the number of multiple shop retailers. In some cases this

Table 5.3 Error sources in White's Hull directory, 1880

Trade	shops not numbered		
	number	% of total shops	% falling in suburbs
Grocers	50	19%	62%
Butchers	18	11%	56%
Footwear	8	3%	0
Dyers/cleaners	0	0	0

directory only listed the head office or central shop of a firm which was an omission of crucial importance in this study. However, it proved possible to compensate for such deficiencies with the use of telephone directories.

Although internal checks were carried out on each directory to eliminate double entries it proved more difficult to obtain an equally efficient method of checking the overall accuracy of trade directories as reliable data sources.

The idea of comparing directories with rate books to provide an internal check is a task that is fraught with considerable difficulties. It was attempted in this study for the earlier periods of 1880 and 1890 but quickly abandoned. The reason for this was that only shop premises were listed in the rate books and no mention was made of their trade, therefore no individual trade comparisons could be made. A further problem to be considered is that many shops, especially in working-class areas, were not rated as retail establishments since business was conducted from the front room of a house and these were therefore often classified as purely residential premises (Davis, Giggs and Herbert 1968). In view of this there would always be a significant underestimation of the number of retail establishments by the local rate books. However, the rate books did offer information about other aspects of retailing and they were used to calculate the peak land value that enabled the construction of the growth zones. In conjunction with this, general rate surfaces can also be produced and related to the levels of colonization by various retail types. Some preliminary inspection could also be made of the types of property occupied by certain retailers though without detailed data about floorspace only general conclusions could be drawn.

In terms of the overall study of changes in the retail structure published census data can also be utilized although prior to 1950 this

is mainly restricted to the Census of Occupation. Indeed, this has been used by some workers as an external check on the accuracy of street directories. Before examining the relevance of the census data it may first be useful to briefly examine some of the attempts at comparisons since it will highlight some of the difficulties in using both directories and census data for extrapolating information on retail change.

Ford (1935) in such a study mentions the difficulties in using directories but states that it seems probable that in many towns reputable directories were reasonably complete in 1901. For 1931 Ford compared the shop counts derived from directories with records kept by local authorities under the shops act, though he went on to admit that the latter were not accurate. He then turned to the use of census data and had to rely on the number of persons who returned themselves as owners or managers of retail businesses. However, he found that these figures were not directly comparable with the number of shops derived from directories; for example, in Southampton 2,539 persons returned themselves as owners or managers of retail businesses but the directory listed 2,850 shops. A number of reasons for this type of discrepancy are given by Smith (1937) in a comprehensive survey of retailing during the 1930's. He too compared city directories with census data and noted that the Census of Occupation included unemployed as well as employed, a fact which may explain some deviation. He also discusses the problem that arises out of the possibility that the proprietor or manager may reside in an area which is across the census boundary from that in which his shop is located. Smith (1937) also notes a further possibility that could produce deviation between census and directory data and this stems from differences in trade classifications. In a study area selected by Smith the total shops recorded by the census was 56,844 while the estimate based on directories was

59,954, a discrepancy of 5.2%. This can be explained away with reference to the recordings of 'general shops', the census enumerating far fewer than the directories. Many of the general shopkeepers traded on a part-time basis as their business could only provide enough to supplement an income earned elsewhere, hence there was an under-recording of managers by the census. In general it would seem that street directories offer more information on retailers than the published census. Tillott (1972) found that one sixth of directory entries offered information different from, or additional to, that provided by the 1851 census, with reference to traders.

It can be seen that no clear-cut method exists for checking the overall level of accuracy of street directories and that little is achieved by making comparisons with census data, which because of its internal shortcomings seems less reliable than directories.

The main problems in the use of Census of Occupation data for studying temporal changes in retailing lie in its highly variable nature. The census has constantly undergone a process of change both in terms of the type and the amount of data collected and also in the presentation of its statistics. Two major problems need to be contended with in connection with retail trades. First, the classification of shop ownership from which estimates of the number of retailers can be derived. In the 1881 census no breakdown between owner and worker was presented which makes it difficult to estimate the number of retail establishments. From 1891 until 1911 the census classified employers, self-employed and employees, the latter including all workers in retailing and not just shop assistants. This introduces the second problem because from 1921 onwards the breakdown was between managers of shops, shop assistants and salesmen, making figures not directly comparable with the data from pre-1921 censuses. In addition to this, from 1911 onwards more attention was given to accurately enumerating the number of female

employees, especially in the distribution trades, a factor that again produces variations between different census reports.

Therefore, any attempt to enumerate general changes in the retailing structure between 1880 and 1950 must frame its findings within the limitations of the census data, at least until 1950 when the aid of the first Census of Distribution can be sought. Some workers have also used the Census of Distribution as an external check on street directories (Sibley 1972). Sibley's findings seem rather inconclusive since he experienced the same problems as Smith (1937) namely that the census overestimated some shop types e.g. greengrocers, in relation to the number listed in the directories. On the other hand more grocers were recorded in directories than by the census. As with the Census of Occupation many problems arise from this type of comparison. First, the census and directories use separate trade classifications to identify shop types. Secondly, the Census of Distribution is itself not 100% accurate since it only covers about 95% of all retail establishments (Census of Distribution 1950). In the end the problem must remain largely unsolved although one positive factor is that in the greater part of this study only one series of street directories was used. Therefore, it is assumed that discrepancies, should they exist, are constant through time and do not significantly nullify any conclusions drawn from the data.

Other sources that were used relate to specific aspects within the study. Local health reports, both published and unpublished, were consulted in connection with the growth of the trade in margarine and its relationship with grocery retailing. The minutes of these reports gave information about the granting of licences to dealers in margarine and the location of the retail establishment. These figures were useful to supplement the street directories when attention was focused on the intrusion of national grocery companies dealing in such

new commodities as margarine at the end of the nineteenth century. It was possible to look in more detail at the arrival and build-up of the shops of specific companies and also to compare them with the growth of local grocers who had also adopted this product as a major retailing line.

Finally, in relation to the accurate location of retail premises mention must be made of the availability of large-scale maps of the area. It is essential that directory data in the form of street numbers can be readily translated into actual geographical locations.

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Some Aspects of Retail Mortality

In Chapter 2 a more workable notion of spatial competition was presented and this was based, not on the maximisation of profits but rather on the will to survive. A logical extension to this theory would be to view retail change in terms of shop and business survival rates. In looking at the 'births and deaths' of retail establishments, shop success or failure is being equated with the ultimate measures of survival or extinction. It becomes possible therefore to classify shops into different categories based on their survival characteristics. The use of the terms 'birth and death' is in no way considered to be inappropriate as they form a convenient terminology and often adequately describe the processes. Indeed, previous workers in the field of retail changes have found the terms not only useful, but have often seen the retail situation as being analagous to ones found in demography (McGarry 1930, Berry 1968, Andrews 1971).

6.1

Measures of Retail Change

It is possible to isolate two types or forms of retail mortality, one concerned with the loss of a business and the other associated with the loss of a business and also the shop premises. This point requires further explanation as the latter group is perhaps the extreme one in which a retail firm withdraws from the trade and its vacant establishment is not taken over by another business in the same trade. Thus in the study of individual trades a store leaving the trade is regarded as a 'death', even though in some cases it may be taken over by a business of another retail trade type.

The measurement of the mortality of individual retail businesses takes the form of enumerating shops that change ownership but remain in the same retail trade category. This is a situation that could

possibly have been brought ^{about?} above by a number of circumstances, not all associated with the business being an unprofitable undertaking.

The distinction between the two measures of mortality is important, since they both measure different degrees of failure in terms of shop locations within specific trades. Therefore a shop which is badly located is more likely to go out of business and leave the trade. However, there are two possible ways of viewing changes in shop ownership. First, such changes may be associated with establishments that are in good locations and hence attract the demand of other retailers wanting to enter that particular area. Rapid changes in shop ownership could in this case be related to take-overs, especially by the larger multiple types of retailer. Secondly, change in ownership could be purely the result of intense competition or variations in the urban environment. This category could perhaps represent an early indicator of the impending decline of retail activities as for example in an area undergoing strong centrifugal movements of population. These possibilities will be explored more fully in the latter sections of this thesis.

For any one time interval, in this case ten years, there is also another category of retail establishments. This group is composed of successful shops, those who remain under the same ownership. To these shops can be assigned different lengths of stay, though as a reliable indicator of business success this measure is admittedly somewhat tentative. This is especially so in the case of the small family business operating from 'parlour' type premises where an unrealistic cost is placed on labour and profit margins may be so low as to be unaccountable (Lewis 1948). Such a phenomenon is found mainly in the grocery and confectionery trades, in establishments that are listed in street directories as 'shopkeepers'. In an attempt to avoid the complication of this form of business organisation, shopkeepers were not considered in the study of the grocery trade.

A final category that can be computed is the one concerning the entrance of new retail businesses. This may take the form of a business occupying a new retail location as in the setting up of a new shop and could be termed a 'birth' (Berry 1968). It could also be associated with the changes in shop ownership, with new businesses merely locating in existing retail premises.

Within this latter group an attempt was made to measure the survival

rates of new businesses during their first ten years of existence. It is difficult to relate this ten year period to previous work since most other studies cover a shorter time period (McGarry 1930). The facts presented by McGarry suggest that the first year of business is the most critical. However, data for this study was only available for each decade and consequently the first ten years was selected as the next best measure.

It must also be pointed out that not all new shops could be enumerated, but only those entering at the selected dates of study. Similarly, the survival rates of new shops must be viewed within the constraints of the data framework. Some new shops will obviously have arisen during the mid decades. In many cases they may in fact have survived longer than ten years, a feature that would not always be registered in this study. It is with these limitations that the following results must be viewed.

The combination of these measures allows a general account to be made of the amount and type of retail change that is occurring in any specific retail trade. Apart from being able to measure the growth of trades, it is also possible to draw other, more potentially important, inferences. The success of businesses in particular trades can be determined by an examination of their survival rate, which can also be viewed in terms of their date of entry and type of premises occupied.

With the aid of such measurements it is possible to construct a picture

of the mobility and mortality characteristics of specific retail trades.

6.2

Intra-trade Comparisons

6.2.1 The retail grocery trade

The arrival in Hull of the major multiple outlet organisations in the grocery trade can be pinpointed fairly accurately. It is possible in some instances to go beyond the level of information given by street directories and to utilize more detailed data sources such as local health reports. This is the case, for example, with those multiple-shop firms that had margarine as their chief retailing line because this product could not be sold until a licence had been obtained. As can be seen from Table 6.1 two major intrusions of such multiple retailers are discernible with the first one starting in 1900. This corresponds to the growth of the branch outlets of the Maypole Dairy Company. The second peak, 1907 to 1909, represents the establishment of shops by the rival organisations of the Meadow Dairy and the Pearks Dairy companies.

This information shows that the main intrusion of these multiple retailers in Hull was essentially during the first decade of the twentieth century. This initial growth was consolidated up to 1920 at a fairly rapid rate with the proportion of multiples to independent grocers increasing from 6.1% in 1900 to 16.2% in 1920 (Table 6.2). The multiples, whilst not experiencing absolute growth in numbers after 1930, still continued to increase in relative terms. This relative increase was due to the overall decline of the local independent traders after 1910 (Table 6.3).

These figures only give a general indication of the increasing numerical dominance of the multiple grocery organisations during the period of study. A complete insight into their importance could only be provided if such information as retail profit margins was available. All that can be said is that because of their central locations and

Table 6.1 Licences granted to multiple grocers dealing in margarine

(source: Local health reports)

Date	Number granted
1892	0
1894	0
1896	0
1898	1
1900	3
1902	5
1904	1
1906	0
1908	5
1910	6

Table 6.2 Proportion of multiples to independents for Hull

Date	% Multiple/independent
1880	nil
1890	0.8
1900	6.1
1910	9.3
1920	16.2
1930	18.2
1940	26.9
1950	32.3

competitive strategy, they most certainly drew on larger trade areas than the local independent grocer. The factor of differences in shop size does not seem to have played any important role with respect to the larger trade areas of the multiples. Indeed the majority of national grocers operated from branch shops that were of a small and uniform nature, little use being made of size as a competitive parameter. The small size of their shops was to become a major problem for the traditional and older firms during the 1950's and 1960's with the arrival of a new competitive organisation, the supermarket. In response to this new competition many of the multiples had to adopt new retail policies that demanded increases in the size of their shops, if they were to be implemented successfully (Mathias 1967).

The success of the two main types of grocery retailers can best be viewed in terms of their survival rates and general mortality characteristics. The criteria for measuring retail change that was discussed in a previous section (6.1) can be utilized for this purpose. The inclusive mortality characteristics for both multiple and independent grocers are presented in Tables 6.3 and 6.4. One of the apparent differences is that of the greater stability of the multiple grocers throughout the entire period of study. The local independents on the other hand have a much more unstable type of structure for all the time periods. The early decades 1880-1890 and 1890-1900, which illustrate the arrival of the multiples, do show a small degree of business failure but this is primarily attributable to wrongly located branch shops. This is illustrated by the fact that the greatest part of the losses were in terms of shop locations rather than changes in shop ownership at the same location. From 1910 to 1930 the multiples enjoyed conditions of almost perfect stability, with no losses or changes in shop ownership being recorded. However, after 1930 and up to 1950 the situation changes slightly with the number of national grocers' shops being lost

Table 6.3 Retail turnover rates for independent grocers, Hull

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	259	370	428	462	375	384	286
Same owner	84	107	108	181	163	128	54
percentage	32.4	28.9	25.2	39.2	43.5	33.8	18.9
Change in ownership percentage	34	121	99	131	115	78	43
	13.1	32.7	23.1	28.4	30.7	20.3	15.0
Losses	141	142	221	150	99	178	189
percentage	54.4	38.4	51.7	32.4	25.8	46.4	66.1
New shops	252	200	254	63	106	80	107

Table 6.4 Retail turnover rates for multiple grocers, Hull

	1880-90	1890- 1900	1900-10	1910-1920	1920-30	1930-40	1940-50
Total shops	-	3	26	43	61	70	77
Same owner	-	1	22	43	61	49	57
percentage	-	33.3	84.6	100.0	100.0	70.0	74.0
Change in ownership percentage	-	1	1	-	-	-	1
	-	33.3	3.8	-	-	-	1.3
Losses	-	1	3	-	-	21	19
percentage	-	33.3	11.5	-	-	30.0	24.7
New shops	3	24	20	19	9	28	8

from the trade rising and then holding steady at 25% (Table 6.4). This could have arisen through a number of factors, chief of which are increasing competition within the multiple sector of the trade and also the effect of urban growth. The latter process would operate through a depopulation and downgrading of the inner areas, leaving many multiple branch shops wrongly located. These factors will be examined in greater detail in the following chapters.

In contrast to the above situation are the general mortality characteristics of the independents. They present an overall picture of instability, with high percentages of shops lost from the trade in all the time periods (Table 6.3). The severest losses were in the decades 1880-1890 and 1900-1910 when there was a 50% loss rate. These appear to have been interspersed with a short period of relative stability, which had a fairly balanced mortality structure. From 1910 to 1930 this type of balanced structure prevailed and for the first time a situation developed in which the percentage of shops remaining in the trade outnumbered those that were lost (Table 6.3). During the decade 1940-1950 this trend was reversed with as many as 66.1% of the local establishments being lost from the trade.

During the whole of the period 1880-1950 the percentage of independent grocers changing ownership remained at a fairly constant level, with the exception of 1880-1890 and 1940-1950 (Table 6.3). Only once did this category of change exceed the total number of shops lost and this was between 1920 and 1930. Two main explanations for these differing mortality states can be offered at this initial stage of the analysis. First, there was the effect of retail competition both from similar organisational types and, more importantly, from the increasing number of multiple retailers and second, the more general factors of urban change, especially in terms of population movement away from the city centre.

In terms of the overall growth of these two types of grocery retailers attention must also be focused on the ratio of losses to additions of retail establishments. The data are presented in Figures 6.1 and 6.2, which also show the proportion of new grocery shops occupying new locations that survived the first critical ten years of existence. The multiple grocers had rapid growth up to 1930, there being no loss of existing premises. These conditions, which facilitated the rapid growth, were also aided by the fact that the new shops had good rates of survival over the first decade (Fig. 6.1). The two decades following 1930 witnessed a change in the conditions of stable growth and there was not only a rise in the number of shops lost, to almost half the number of new ones, but the mortality levels of these new shops also rose. In the decade 1940-1950, losses for the first time exceeded the number of new shops and this, plus the added fact that the new retail establishments had at this time only a 50% chance of survival, produced a decline in the number of multiple grocers (Table 6.4).

The situation regarding the growth characteristics of local independent traders is more complicated (Fig. 6.2). The period from 1880 to 1900 saw conditions of growth in this sector of the trade, with high numbers of entrants and low numbers of exits (shops lost; Table 6.3). The survival rate of these new shops during this time varied from 59% in 1880-1890 to 47% in the following decade. Between 1900 and 1910 the position began to change with exits almost equal to the entrances, although survival rates of the new shops were slightly more favourable (Fig. 6.2). The higher levels of mortality could be due to the increased level of competition generated by the arrival of large numbers of multiple grocers. In the following decades up to 1950 the number of exits exceeded the number of new shops giving a decline in the total retailers. The one exception to this was in the period 1920-1930, when

losses and entrances had almost similar proportions. This condition of absolute decline was further emphasized by the fact that the survival rate of new shops was fairly low dropping to around 25% between 1930 and 1940 (Fig. 6.2). The rate of survival did however become more favourable in the following decade 1940-1950 when over two thirds of the new shops survived their first ten years of existence.

Retail business survival rates, grocers:

The survival rate of retail businesses is one phenomenon that requires a closer examination. A description of the survival curves of individual businesses is a necessary first stage but whilst this type of analysis has been carried out in such fields as, the turnover of factory operatives (Lane and Andrew 1955, Bartholomew 1959) and residential turnover (Marshall 1971), very little work has been done in relation to retailing apart from the work of Berry (1968).

A comparison of the composite business survival curves for the two grocery types provides a convenient starting point. To calculate these composite totals, the arrival of every new business and its length of stay had to be determined for the two organisational types. This was done in two ways; first, the lengths of stay of new businesses occupying new retail premises were calculated and secondly, the same was done for the new businesses that did not occupy new locations. For the composite view these two groups were combined and there is a marked difference between the two curves thus obtained. The multiple grocers have the longer survival rates and after the first ten years over 70% of them were still in business, while only 30% of the independents had survived over the same interval. The difference between these two data sets derived from the survival curves was tested using a Chi-squared test on an ordinary two by five table and with four degrees of freedom the result was highly significant at the 0.1% level.

The length of stay of new businesses entering at each specific time

interval, in this case every ten years, was also examined. This information provided an extension of that given in Figures 6.1 and 6.2 and serves to emphasize the strong differences between the two grocery types. The survival data for the independent grocers are similar in their structure throughout the period with the exception of shops entering in 1950 (Tables 6.5 and 6.6). In comparison the multiples seem to exhibit a more varying survival structure as the percentages of businesses surviving up to the 20 to 30 year period range from 100% for those entering in 1910 to only 57% for retailers that entered in the next decade (Table 6.5). The critical period of survival is regarded as the first ten years and for this reason the mortality characteristics of the two types of grocery retailer were compared over this time interval to ascertain if significant differences did occur. They were tested using a two by two contingency table, the two divisions being between businesses that survived less than, or greater than ten years and the results of the test are given in Table 6.7. All the differences are significant with the exception of the data for 1930 which has an extremely low χ^2 value suggesting some degree of comparability between the rates of survival for multiples and independents. It could be postulated that for the first time, survival conditions in terms of the overall retail environment, were similar. Such a statement would suggest that conditions for the survival of new multiples were becoming more difficult, due perhaps to increased competition for indeed, the lowest short-term rates of survival were recorded for multiples entering in 1930 (Table 6.6).

A similar type of analysis was carried out comparing survival rates for retail businesses occupying new retail locations in the trade with those which merely took over existing premises. This was to test if new businesses in new locations were more vulnerable to competition and if they had lower rates of survival than those moving into existing

Table 6.5 Survival characteristics for independent grocers, Hull

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+
1890	277 100%	61 22%	14 5%	9 3%	3 1%
1900	292 100%	65 22%	37 12%	19 7%	8 3%
1910	372 100%	133 35%	70 18%	30 8%	13 3%
1920	197 100%	71 36%	22 11%	5 2%	3 1%
1930	227 100%	71 31%	11 5%	1 .4%	— —
1940	164 100%	23 14%	10 6%	— —	— —
1950	144 100%	97 67%	— —	— —	— —

Table 6.6 Survival characteristics of multiple grocers, Hull

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+
1900	27 100%	18 66%	18 66%	18 66%	16 58%
1910	20 100%	20 100%	20 100%	16 80%	10 50%
1920	21 100%	20 95%	12 57%	9 43%	3 14%
1930	11 100%	5 45%	4 36%	2 18%	— —
1940	15 100%	8 53%	1 7%	— —	— —
1950	9 100%	3 33%	— —	— —	— —

Table 6.7 Results of a Chi-squared test between survival rates of multiple and independent grocers

Year of entry	χ^2 value	level of significance
1900	10.2	very significant at 0.5% level 1 d.f.
1910	9.1	very significant at 0.5% level 1 d.f.
1920	7.4	significant at 1.0% level 1 d.f.
1930	0.1	not significant
1940	6.5	significant at 1.0% level 1 d.f.

Table 6.8 The proportions of new and existing retail premises

Date	independents		multiples	
	existing	new	existing	new
1900	29.7%	70.3%	11.1%	88.9%
1910	23.9%	76.1%	25.0%	75.0%
1920	67.5%	32.5%	9.5%	90.5%
1930	52.4%	47.6%	18.1%	81.9%
1940	50.0%	50.0%	6.6%	93.4%
1950	25.0%	75.0%	33.3%	66.7%

premises. The composite data for each type of trader and for each locational category are given in Figure 6.4 and the two main sets of curves do show some differences apart from those between multiples and independent local retailers. A Chi-squared test was carried out to test for differences between retail businesses occupying old locations as opposed to new ones, though at no time did the results prove to be significant. Despite this fact some useful inferences can be made with the first one concerning the survival rates. In general terms it would seem from the data that independent grocers, occupying new locations, have a slightly better chance of long-term survival than those businesses moving into existing grocery premises. In contrast to this is the situation in the multiple category, here chances of a longer stay would seem more likely to accrue from new businesses going into existing premises. However, this is the case only after the 20-30 year interval (Fig. 6.3).

A second inference that can be drawn from the data concerns the relative importance of new, and existing, premises in relationship to the entrance of new businesses entering at different time periods. The local independent grocers seem to have a variable position with the two different types of premises dominating at different time periods (Table 6.8). From 1890 up to 1920, new shop locations are the dominant type of premises and this is to be expected in an expanding urban environment undergoing some degree of suburbanisation. However, from 1920 onwards this development of new shop locations slowed down considerably, with less than a third of the new businesses occupying new grocery premises (Table 6.8). Over the next two decades the situation began to reach some kind of equilibrium with equal numbers of new grocery businesses moving into both types of locational category. Finally, a complete reversal of trends occurred in the last decade of the study with new shop premises assuming their dominance once more and accounting for 75% of the total. In relation to this analysis it

must be remembered that the data only refers to that part of the city that lies within the boundaries of the study area.

The multiple grocers exhibit a more uniform pattern throughout the entire period and in every decade the number of new businesses going into new shops always exceeded those entering establishments that had been previously occupied by grocery firms. The proportion of businesses entering new shop premises never falls below the 60% level with the lowest figure being recorded in 1950 (Table 6.8). This would suggest that multiple grocers require special retail locations, in that they are unable, or do not seem to be able to occupy existing grocery shops that have been vacated by an independent type of retailer. The low turnover rates of multiple grocery establishments has already been noted, implying that few opportunities would exist for new businesses to move into previously occupied premises. A combination of circumstances therefore, forced the new national multiples to occupy new premises.

6.2.2 The retail meat trade

The retail meat trade is the second low order distribution type to receive detailed attention and as such provides a ready comparison with the situation that existed in the grocery sector. It has already been shown how the growth of large scale multiples in this trade can be related largely to the development and perfection of meat freezing techniques (Chapter 4). The growth of multiples in Hull is similar to that pertaining on a national scale with the main development occurring after 1890. The relative growth of multiple traders on a city-scale illustrates the main trends (Table 6.9). Multiples show their greatest relative importance between the years 1910 and 1920 and this decade was also important in terms of the local traders whose numbers reached their peak at this time. After this period the multiple retailer dealing largely in frozen meat experienced a relative decline

Table 6.9 The proportion of multiples to independents in Hull

Date	% multiples/independents
1880	1.3
1890	5.6
1900	14.4
1910	22.1
1920	13.8
1930	10.9
1940	8.8
1950	11.6

and by the decade 1930-1940 they only accounted for 9% of the total meat shops within the study area (Table 6.9).

In terms of the overall growth of multiples and independent retailers the actual situation is slightly more complex, when reference is made to the number of entrants and exits for each decade (Figs. 6.5 and 6.6). It must be remembered when examining these figures that reference is made only to premises that leave the meat trade and shops taken over by businesses; the actual turnover of businesses will be covered in a later section.

The local, independent traders experienced a continuous period of growth from 1880 until 1910, in which losses never exceeded entrances (Fig. 6.5). This increase was further enhanced by the fact that the new shops had high survival rates, never falling below 60% and reaching the 80% level in the decade 1900-1910. This period of increase was halted by a high rate of shop loss and only a small number of entrances in the years 1910 to 1920 and in the following decade the overall trend was one of decline. Indeed, the survival rates of the new shops were much lower than the pre-1910 period and exits exceeded entrances.

The situation with regard to the growth of multiple meat retailers is somewhat similar to that just described for the independent traders. The trend is one of a rapid increase in numbers up to 1910 and from then onwards a decline (Fig. 6.6). However, some differences are worth noting, such as the much more rapid rate of increase in the multiple retailers. The number of exits was very low before 1910 although in the decade 1900 to 1910 the new shops experienced high mortality rates as competition increased e.g. over 66% of the new entrances were lost after their first ten years of business. After this period of growth a dramatic decline occurred and between 1910 and 1920 the number of exits greatly exceeded entrants. This was a situation that was repeated in the decade

following 1930, though on a much lower level (Fig. 6.6).

In terms of businesses and retail premises, the success of the two main types of meat retailers is illustrated by their general mortality characteristics (Tables 6.10 and 6.11). The stability of each trade is measured not only in terms of its actual growth but also by the proportion of shops that remain under the same ownership in each decade.

The local meat retailers have a fairly stable mortality structure in the early period from 1880 to 1890 with losses divided between changes in ownership and establishments leaving the trade. For the two decades between 1890 and 1910 the percentage of shops remaining under the same owner was no longer the dominant category but this, however, was followed by fewer shop losses and for the first time the shops remaining under the same owner rose above the 50% mark (Table 6.10). One feature that does deserve notice is that category composed of shops that changed ownership since it plays a relatively important part. During the whole period of study the proportion of independent meat retailing establishments falling within this category only once fell below 20% and this occurred between the years 1910 and 1920. This would seem to provide an initial indication that old premises play a relatively important role for new businesses, a factor that will be looked at in more detail at a later stage.

The multiple meat retailers have in many ways a similar mortality history to that of the independent traders. In their initial period of entry the category measuring establishments that changed ownership is of importance as between 1890 and 1900 it accounted for 60% of all shops (Table 6.11). The main view presented by the multiple organisations is a variable one with periods of stability (1900-1910) followed by high loss rates, with these being equally shared between shops leaving the trade and those which merely experienced a change in ownership. After 1920 there was a reduction in losses and this

Table 6.10 Retail turnover rates for independent butchers, Hull

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	151	179	201	218	162	218	203
Same owner	74	58	75	115	91	102	77
percentage	49.0	32.4	37.3	52.7	56.2	46.8	37.9
change in ownership	45	46	49	37	51	53	22
percentage	29.8	25.7	24.4	17.0	31.5	24.3	10.8
Losses	32	75	77	66	20	63	104
percentage	21.2	41.9	38.3	30.3	12.3	28.9	51.3
New shops	60	97	94	10	76	48	11

Table 6.11. Retail turnover rates for multiple butchers, Hull

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	2	10	29	48	22	24	18
Same owner	-	2	17	3	20	14	8
percentage	-	20.0	58.6	6.2	91.0	58.3	44.4
Change in ownership	1	6	2	13	1	2	3
percentage	50.0	60.0	6.9	27.1	4.5	8.3	16.7
Losses	1	2	10	32	1	8	7
percentage	50.0	20.0	34.5	66.7	4.5	33.4	38.9
New shops	9	21	29	6	3	2	0

sector of the trade experienced stable growth once more.

Retail business survival rates, butchers:

Attention must also be given to the mortality experience of actual businesses as opposed to retail premises, indeed this aspect probably provides the most fruitful line of inquiry. A convenient starting point is the consideration of composite business survival curves for independent and multiple organisations. Unlike the data presented in the previous section on the grocery trade, no significant differences appear between these two retail types. The composite survival curve for the independent meat retailers falls less steeply than that of the multiples and the difference is most pronounced over the 20-30 year range for length of stay (Fig. 6.7). Thus after twenty years only 11% of the multiple shops remained in business while the corresponding figure for the independents was 20%. However, over the long term the multiples had a slightly higher rate of survival than the local retailers although this difference is only in the order of 2% (Fig. 6.7). The comparability of these two curves was verified by the results of a Chi-squared test which gave a value of 4.9, which with four degrees of freedom was not significant.

A breakdown of these composite curves in terms of the length of survival of businesses entering at different times throughout the period of study gives a closer insight into the mortality history of this trade. The independent retailers have an increasing level of both short and long-term business survival, reaching a peak for those businesses that entered in 1920 (Table 6.12). Of the 46 new independent local businesses that entered in 1920, 63% survived their first ten years and just over 10% survived beyond the forty year mark. After this date and up to 1950 business survival rates were greatly reduced and of those that entered the trade in 1940 only 30% managed to survive the first ten years. In 1950 the situation, as regards short-term

Table 6.12 Survival characteristics for independent butchers,Hull

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+ years
1890	101 100%	22 22%	8 8%	4 4%	2 2%
1900	146 100%	49 34%	31 21%	16 11%	10 7%
1910	138 100%	68 49%	43 32%	28 20%	9 7%
1920	46 100%	29 63%	18 39%	8 17%	5 11%
1930	117 100%	49 42%	21 18%	9 8%	- -
1940	94 100%	29 31%	16 17%	- -	- -
1950	31 100%	18 58%	- -	- -	- -

Table 6.13 Survival characteristics for multiple butchers, Hull

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+ years
1890	16 100%	2 13%	2 13%	2 13%	2 13%
1900	32 100%	18 56%	1 3%	1 3%	0
1910	36 100%	2 6%	2 6%	2 6%	1 3%
1920	26 100%	15 58%	9 35%	4 15%	4 15%
1930	15 100%	6 40%	2 13%	1 7%	- -
1940	6 100%	0	0	- -	- -
1950	3 100%	3 100%	- -	- -	- -

survival, improved although entrances of new businesses were greatly reduced (Table 6.12).

Comparable data for multiple organisations shows an initial low rate of short-term business survival, as is to be expected when shops retailing new products first enter a market and perhaps the wrong locational decisions are made (Table 6.13). While the short-term survival rate of businesses entering in 1900 was relatively high, 56%, the long-term position was just the opposite with no businesses remaining after 40 years. The following decade, ending with 1910, witnessed one of the lowest rates of survival for new businesses with only just over 5% surviving their first ten years. Nineteen-twenty was the most successful year in terms of new business survival, with both short and long-term rates being relatively high and this situation continued, to a lesser degree, into the next decade after which mortality rates increased (Table 6.13). When this survival data for independent and multiples is compared no significant differences are apparent and in a Chi-squared test carried out on the two organisational types only the results for businesses entering in 1910 proved to be significantly different at the 0.1% level with one degree of freedom. This was primarily due to the low survival rates of multiple retailers who were experiencing intense internal, as well as external, competition.

One factor that can be touched upon here is the role played by new premises as opposed to ones already being used to retail meat. The first question that can be posed is whether these types of premises differ in their importance through time between local independent traders and the innovating multiple firms. The initial assumption is that new product retailers, such as frozen meat shops, on entering a market for the first time would demand differently located premises than the ones used by the older order. Indeed it would also be logical

to find a high percentage of new shop premises when the total number of retailers is increasing, as with the independent traders around 1900. To a great extent the multiple traders follow the expected trend with initial high numbers of businesses entering new premises, over 80% in 1890 and 1900 (Table 6.14). The main reversal of this trend was after 1930 when new premises played a subordinate role to existing shops and one of the main reasons for this was that many of the new multiple businesses took over existing firms and their branch shop outlets. In Hull there were three cases of this takeover practice during the period of study and most of these occurred after 1910. In many respects the importance of existing premises to the independents was on a comparable level to that of the multiples (Table 6.14). Predictably, new shops were most important in the early stages when the urban area was rapidly expanding and the number of meat retailers increasing.

Another aspect of this study is the possible relationship between the type of premises and the length of stay of new businesses. One tentative hypothesis is that new businesses in new establishments are perhaps more vulnerable to competition and therefore have lower rates of survival. However, the actual situation is made more complex due to the differences in organisational types and the decline of urban areas, both of which affect the survival level of businesses entering new locations.

To a great extent the local independent traders follow the above pattern with the businesses that enter new premises having a lower short-term survival level (Fig. 6.8). Thus after 10 years only 36% remained in business while over the same time period 39% of the retailers who entered existing premises remained. These positions are reversed when a longer time period is considered for after 20 years over 22% of businesses in new shops survived while the figure

Table 6.14 Proportions of new and existing premises: butchers

Date	independents		multiples	
	existing	new	existing	new
1890	31.9%	68.4%	18.7%	81.3%
1900	27.4%	72.6%	14.9%	85.1%
1910	30.4%	69.6%	57.1%	42.9%
1920	67.3%	32.7%	25.0%	75.0%
1930	37.6%	62.4%	74.0%	26.0%
1940	55.3%	44.7%	69.2%	30.8%
1950	67.7%	32.3%	100.0%	0.0%

Table 6.15 Proportion of multiples in Hull

Date	% of total
1880	4.4
1890	6.4
1900	6.6
1910	9.9
1920	15.1
1930	24.4
1940	34.6
1950	48.7

for existing premises had fallen to 11%.

The multiples also follow the expected trend, with new shop locations having a greater level of survival. However, unlike the independent traders, no variations over the time scale are to be found. In fact the differences between businesses in new and existing locations increase in favour of the former through time. After the first ten years 35% of retailers entering new premises survive compared with only 32% for those in existing shops and this gap widened considerably from 3% to 6% after a thirty year period (Fig. 6.8)

6.2.3 The retail footwear trade

This particular trade was one of the first to experience a substantial development of multiple retailers with many of the Midland footwear manufacturers opening up retail outlets. Their growth in Hull was no exception to the national trend and in the decade 1880-1890 twelve such retailers established themselves in the city. In absolute terms their growth was of a fairly regular nature with an increase in total numbers throughout the period (Table 6.15). It is the growth of these multiple retailers that is perhaps of more interest. In 1890 they constituted only 6.4% of the total number of footwear retailers, excluding purely shoe repairers, and by 1920 this figure had risen to 15.1%. Their relative importance was to increase even more and by 1940 they accounted for almost 35% of the total number of footwear shops within the study area (Table 6.15).

In terms of the overall growth of these two types of footwear retailing attention must be given to the ratio of losses to gains of establishments. These data are presented in Figures 6.9 and 6.10 which also illustrate the proportion of new businesses occupying new premises that survived their first critical ten years. From 1880-1890 the independent retailers had more new shops than ones leaving the trade, although few of these new stores survived longer than ten years. After this first decade the number of shops lost always greatly exceeded

the rate of entry of new establishments. Indeed the long-term survival rate of these new stores was very low throughout the entire period (Fig. 6.9).

The situation concerning the multiple shop traders stands in contrast to that of the independents, if only because of its variable nature. The decade 1890-1900 saw higher losses than entrances of new shops and hence a decline in the overall numbers. However, this setback was only of a temporary nature and the following decade witnessed a reversal of this trend (Fig. 6.10). This continued until the 1930's when once again the number of entrances was exceeded by the number of exits, a situation that was to remain until 1950. This latter decline was brought about chiefly by the reorganisation that was taking place in the multiple footwear sector; the chief characteristics of which were more central locations and increases in the size of retail establishments. In Hull many of the centrally-located multiples doubled their floor space, either by taking over adjoining premises or alternatively by using two floors as salesrooms.

As in the case of the low-order food trade distinctive features can be readily identified between independent and multiple organisations. The main mortality groups for these two types are presented in Tables 6.16 and 6.17.

The picture presented by independent footwear retailers is one of instability, especially during the decades up to the First World War (Table 6.16). This took the form of heavy losses of shops from the trade which reached 61% in the period 1900-1910. In conjunction with this few businesses were changing ownership during these years which suggests that perhaps many of the local establishments were in wrongly-located premises. During the same period however there were also large numbers of new shops entering the trade. (Fig. 6.9) The short-term failure rate of these new establishments was high and up to 1900

Table 6.16 Retail turnover rates for independent footwear retailers

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	261	277	242	192	124	99	51
Same owner	102	88	75	88	58	38	11
percentage	39.1	31.7	30.9	45.8	46.8	38.4	21.6
Change in ownership	16	22	18	8	13	3	4
percentage	6.1	7.9	7.4	4.2	10.5	3.0	7.8
Losses	143	167	149	96	53	58	36
percentage	54.8	60.4	61.5	50.0	42.7	58.6	70.6
New shops	159	132	99	28	28	10	5

Table 6.17 Retail turnover rates for multiple footwear retailers

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	12	19	17	21	22	32	27
Same owner	5	11	10	20	14	16	13
percentage	41.6	57.8	58.8	95.2	63.6	50.0	48.1
Change in ownership	-	1	-	-	3	5	-
percentage	-	5.2	-	-	13.6	15.6	-
Losses	7	7	7	1	5	11	14
percentage	58.4	36.8	41.2	4.8	22.8	34.4	51.9
New shops	14	5	11	2	15	6	6

never fell below the 50% level. After 1910 the mortality structure of this section of the trade was essentially of a more stable nature and this brittle stability persisted until the decade between 1940 and 1950 when over 70% of the shops withdrew from business.

One feature that does stand out concerns the number of independent footwear shops that changed ownership. Throughout the entire period of study their level was always very low, especially when compared with the situation that existed in the low order trades. One possible reason for this is the question of central locations and the importance attached to such sites.

The mortality characteristics of the multiple retail firms shows a different picture although, in the early decades from 1880 to 1910 loss rates were high in this section of the trade and in the decade 1880-1890 well over 50% of the shops were lost (Table 6.17). This however seems to be the case with the early establishment of the branch shops of multiple retailers, as the grocery and meat trades have already illustrated. It seems logical to account for such initial high rates of failure by making reference to badly located stores and general changes in the locational strategy of the organisations concerned. After these initial high rates of shop loss the situation changed to one of stability and a growth in numbers and in the two decades following 1910 the number of establishments remaining in the trade under the same ownership was proportionately very high (Table 6.17). The depression years of the 1930's and the milder slumps of the late 1940's witnessed an increase in shop losses once again and these equalled the businesses that remained unchanged. As in the case of the locally organised footwear retailers little importance can be attached to that category of shops that remained in the trade but changed ownership.

Retail business survival rates, footwear:

The composite business survival curves of the two sectors of this trade provide a clear illustration of the differences in mortality (Fig. 6.11). After the first ten year period only 35% of the independent businesses remained while just over 58% of the multiple traders had survived. The curve for the independent retailers falls off sharply and long-term survival rates are extremely low, only 1% after 40 years. In contrast the multiples have a much less steep curve and long-term business survival is substantially higher at around 11% after 40 years. The differences between these two curves were compared using a Chi-squared statistic and found to be highly significant at the 0.1% level ($\chi^2 = 47.2$ with four degrees of freedom).

This picture of business mortality can be further analysed by examining the lengths of stay of new businesses entering at each decade (Tables 6.18 and 6.19). The survival data for the independent traders suggests three broad zones of retail mortality (Table 6.18). The first one covers the period from 1890 to 1900 when new businesses entering had high failure rates with only around 28% surviving the first ten years; the long-term survival rates were equally low, only 0.6% of businesses entering in 1890 survived over 40 years. The second period covers businesses entering in 1910, 1920 and 1930 all of which exhibited higher survival rates for their short-term survival rates, over the first ten years, were all over the 40% mark. However, there was much greater variation in the long term with new businesses entering in 1920 having the lowest rate of survival. In the third period after 1930 the situation was much more variable as Table 6.18 shows.

The multiple retailers once again have more variable survival characteristics which show little sign of following any discernible trend. The businesses with the greatest level of short-term survival are those that entered in 1910 and 1950 with 83% and 85% respectively surviving their first ten years (Table 6.19). The entrances for the

Table 6.18 Business survival rates for footwear retailers, independents

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+ years
1890	165 100%	47 28%	18 11%	9 5%	1 .6%
1900	150 100%	41 27%	14 9%	9 6%	3 2%
1910	114 100%	56 49%	27 23%	8 7%	1 1%
1920	36 100%	15 41%	3 8%	- -	- -
1930	32 100%	15 47%	5 16%	4 13%	- -
1940	11 100%	3 27%	3 27%	- -	- -
1950	9 100%	6 67%	- -	- -	- -

Table 6.19 Business survival rates for multiple footwear retailers

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+ years
1890	15 100%	8 53%	6 40%	6 40%	3 20%
1900	6 100%	2 33%	2 33%	2 33%	2 33%
1910	12 100%	10 83%	7 58%	3 25%	3 25%
1920	4 100%	3 75%	1 25%	1 25%	1 25%
1930	22 100%	12 55%	9 40%	6 27%	- -
1940	11 100%	4 36%	4 36%	- -	- -
1950	7 100%	6 86%	- -	- -	- -

years 1900 and 1940 had the lowest short-term survival rates.

Although the composite figures for the two types of footwear retailer are significantly different no such claim can be made for the survival data for each decade. The results from Chi-squared tests comparing data for the two types proved not to be significant in any of the cases.

In connection with business mortality a further analysis can be undertaken on the composite curves of each organisational type. This consisted of measuring the lengths of stay of businesses occupying new retail premises (new in the sense that they had not been previously occupied by that particular trade type) and comparing them with survival rates of businesses entering existing footwear premises. The tentative hypothesis is that new businesses in new locations are more vulnerable to competition and therefore more likely to have higher mortality rates. In the case of the independent traders the reverse situation held, in that businesses occupying old locations had a slightly lower rate of survival (Fig. 6.12). However, this situation need not appear anomalous since many of the old premises were establishments that had changed ownership, which in itself may be symptomatic of a decline in trade. This would appear logical in the light of the fact that locational requirements, even for the independent retailer, were changing dramatically throughout the period of study.

In the case of the multiples the short-term survival rate of businesses entering new footwear premises was higher than for businesses in existing premises (Fig. 6.12). However, the reverse situation occurred in relation to long-term survival with the rate falling to 1% for the forty years plus period. It must be pointed out however, that chi-squared tests revealed no significant differences between the two sets of data for multiple and independent retailers.

In conclusion the footwear trade presents a picture of contrast between independent and multiple retailers, in terms of both general

mortality characteristics and business survival rates.

6.2.4 The service sector, dyers and cleaners

The final trade category studied, that of dyers and cleaners, represents the service sector. It has already been noted that this particular trade experienced much of its greatest expansion in the late nineteenth century due to a series of technical innovations (Chapter 4). While these new techniques were adopted by the locally organised firms, it was the multiple outlet firms who profited most by the improved processes. However, these large scale multiples did not come to dominate in Hull until around 1920. After the decade 1910-1920 they rapidly increased in number and came to dominate the trade from 1930 onwards (Table 6.20).

This position arose because of two factors, first the independents had started to decline in numbers primarily because of the competition from the multiples. Secondly, the early-established multiples were joined, after 1920, by larger firms operating on a national scale. The actual growth rate of these two types of organisation illustrates more clearly the trends involved. The independent traders show a general decline from 1880 except for the decade 1900-1910 when for the first time new shops exceeded those lost from the trade, although the survival rate of these new shops was not very high and over 60% of them went out of business in under ten years. This short period of growth was followed by an increase in the number of shops leaving the trade whose numbers greatly exceeded the new shops for the decade 1910-1920 (Fig. 6.13). The general trend of decline was arrested between 1920 and 1930 when entrants exceeded exits but these new establishments did not however, have favourable survival rates. From 1930-1940 the situation reversed once more with heavy losses and few entrances and among the new shops high mortality levels prevailed. It can be seen that while the overall trend was one of decline, this

Table 6.20 The proportion of multiples in Hull

Date	% of total
1880	0.0
1890	3.8
1900	16.7
1910	20.0
1920	45.0
1930	63.0
1940	79.5
1950	69.0

was achieved in a rather spasmodic fashion with short-term durations of growth and decline alternating throughout the period.

As with the other trades studied the multiple-outlet dyers and cleaners provide a contrasting history to the one just presented. The period from 1880 to 1920 was one with a steady, but small, rate of increase and the new shops had extremely high survival levels (Fig. 6.14). During the whole of this period of early growth few, if any, shops were lost from the trade. The decade 1920-1930 witnessed a rapid increase in the number of new establishments although this was accompanied by higher mortality rates with nearly 50% of the shops going out of business within ten years. In the two following decades up to 1950 the number of entrants continued to remain at a fairly high level however, internal competition was starting to develop and this led to increases in the number of establishments leaving the trade (Fig. 6.14). Despite this latter factor the multiple organisations in general flourished at the expense of the independent traders.

The differences between these two types of organisation are also apparent when consideration is given to their general mortality or turnover characteristics (Tables 6.21 and 6.22). The independent dyers and cleaners have a fairly unstable structure, with shop losses always exceeding that category of establishments that remained under the same ownership. The one exception to this was during the decade 1940-1950 when 50% of the shops remained in business (Table 6.21).

The situation with regard to the multiples provides a direct contrast. Throughout the entire period of study a stable structure was to be found, with loss rates always being exceeded by establishments that remained under the same ownership (Table 6.22). In both organisational types few establishments commanded such a valuable location as to be taken over by other firms and the proportion of shops whose ownership changed is correspondingly low. In the independent sector the figure

Table 6.21 Retail turnover rates for independent dyers and cleaners
in Hull

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	33	25	20	24	11	17	8
Same owner	13	12	8	6	3	6	4
percentage	39.4	48.0	40.0	25.0	27.2	35.3	50.0
Change in	2	2	1	4	2	-	1
ownership							
percentage	6.0	8.0	5.0	16.6	18.1	-	12.5
Losses	18	11	11	14	6	11	3
percentage	54.6	44.0	55.0	58.3	53.5	64.7	37.5
New shops	10	6	15	1	12	2	8

Table 6.22 Retail turnover rates for multiple dyers and cleaners
in Hull

	1880-90	1890- 1900	1900-10	1910-20	1920-30	1930-40	1940-50
Total shops	-	1	4	6	9	29	31
Same owner	-	1	4	4	8	17	15
percentage	-	100	100%	66.7	88.9	58.6%	48.4
Change in	-	-	-	-	-	2	2
ownership							
percentage	-	-	-	-	-	6.9	6.5
Losses	-	-	-	2	1	10	14
percentage	-	-	-	33.3	11.1	34.5	45.1
New shops	1	3	2	5	21	12	16

never rises above the 20% level while the average for the multiples is just over 6%.

Retail business survival rates, dyers and cleaners

The composite survival curves for the two organisational types provide a total history of the associated business mortality rates (Fig. 6.15). Differences between the sectors are readily apparent although perhaps not as marked as those in say the grocery trade. The multiple organisations have a much higher rate of survival with around 54% of the businesses surviving the first ten years. However, long-term survival rates do fall off more steeply and only just over 10% of businesses remains after 40 years. In contrast the independent firms had higher mortality levels despite the fact that their survival curve had a similar proportionate rate of decline to the multiples (Fig. 6.15). Survival rates were therefore on a much lower level and after ten years only 37% of businesses remained intact. The long-term situation was slightly more stable with 6% surviving from 30-40 years and 4% after 40 years. The results of a Chi-squared test on the two composite sets of data proved not to be significant, the level falling below the 5% mark ($\chi^2 = 8.7$ with 4 degrees of freedom). The breakdown of these composite trends in terms of the survival history of new businesses entering at each decade gives further insight into the differences between the two traders (Tables 6.23 and 6.24).

Independent ~~dyeing~~ and cleaning firms had at the start of the period reasonably stable survival curves with over 40% of businesses remaining after the first ten years (Table 6.23). However, from 1900 until 1920 short-term survival rates fell constantly with each decade. The decline of long-term rates of survival, while more sporadic, was also very pronounced but the exception to these trends was the mortality history of businesses that entered in 1930 which had comparatively high long-term survival rates. The following decade, 1940,

Table 6.23 Business survival rates of independent dyers and cleaners

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+ years
1890	12 100%	5 42%	2 16%	1 8%	0 0%
1900	8 100%	3 38%	1 13%	— —	— —
1910	15 100%	4 27%	1 7%	1 7%	1 7%
1920	4 100%	1 25%	— —	— —	— —
1930	17 100%	5 29%	3 18%	2 12%	2 12%
1940	2 100%	— —	— —	— —	— —
1950	11 100%	8 73%	8 73%	— —	— —

Table 6.24 Business survival rates of multiple dyers and cleaners

Date	Length of stay				
	0-10	10-20	20-30	30-40	40+ years
1900	4 100%	4 100%	3 75%	3 75%	3 75%
1910	2 100%	1 50%	1 50%	1 50%	— —
1920	5 100%	4 80%	2 40%	2 40%	2 40%
1930	24 100%	11 46%	3 13%	3 13%	3 13%
1940	20 100%	8 40%	8 40%	7 35%	— —
1950	17 100%	11 65%	11 65%	— —	— —

also proved particularly exceptional in terms of both the smaller number of new businesses, only two, and their extremely high rate of mortality. Finally, 1950 saw an increase in the number of new businesses and a much improved level of survival.

The multiple organisations had much higher survival rates throughout the period, both in the long and short term (Table 6.24). In contrast to the independents no clear-cut trend^{is} discernible though long-term survival does decrease steadily from 1900 to 1930. New businesses entering in 1950 had much better chances of short-term survival with over 64% remaining after twenty years.

6.3 Inter-trade Comparisons

Attention so far has been focused on establishing that significant differences, in terms of mortality characteristics, do exist between retail organisational types within the same trade. However, of equal importance is the examination of inter-trade variations.

In a comparison of the four main selected trades by organisational type it was postulated that some basic differences would be apparent between high and low order categories. This assumption to a large extent is based on rather tentative evidence gained from the work of McGarry (1930) in Buffalo, for a period between 1918 and 1927. One of his main findings was that a higher rate of business mortality existed in low order shops, such as grocers and general dealers. This was to be expected given their overall conditions of entry, for many such retailers were poor both in business 'know-how' and working capital, which could explain their high failure rate (McGarry 1930).

Unfortunately, no comparable studies exist which could help to provide a basis for the present examination of retail mortality. However, reference can be made to one small pilot survey carried out in Hull in which one hundred small shops were studied (Klingender 1951). The survey revealed that out of the hundred traders studied only fifty had

previous experience in retailing and most of this was as employees.

While this study does not provide retail mortality data it does illustrate the inexperience of many shop owners, a factor pertinent to business survival. In connection with retail mortality little work has been undertaken in Britain though some preliminary points have been outlined by Douglas (1935). She quotes estimates of five thousand retail businesses being lost per annum and examines in more detail the mortality of businesses owned by females (Douglas 1935). Again the point is made that in many of the small-scale enterprises few new owners have any previous knowledge to draw on. These few studies are all that are available for comparisons and it is upon this rather poor basis that the present examination is framed.

In this study no clear distinction regarding retail mortality is apparent between low and high order independent retailers. The highest rates of survival are in the meat trade and these are similar to those for the dyers and cleaners (Table 6.25). In general the short-term survival rates are somewhat similar for all the trades ranging from 39% after ten years for the butchers down to 31% for grocers. After the twenty-year period the difference becomes rather more noticeable with only 9.8% of the grocery businesses surviving compared with over 20% for meat retailers and dyers and cleaners (Table 6.25). Long-term survival rates are more variable in nature with dyers and cleaners having the most favourable position and footwear the lowest.

From this it would appear that no clear indication of retail business mortality can be made in terms of low and high order trade groupings. It seems more reasonable to attribute the levels of survival to the ease with which new retailers can enter a particular trade. Thus, the meat trade requires not only a great deal of capital for shop fixtures but more important a sound expertise. Therefore, by necessity, these

Table 6.25 Business survival rates for independent retailers in

Hull from 1880 to 1950

Trade	Length of stay in years				
	0-10	10-20	20-30	30-40	40+
Butchers	673 100%	264 39%	137 20%	65 10%	26 4%
Grocers	1673 100%	521 31%	164 10%	64 4%	27 2%
Footwear	517 100%	183 35%	70 14%	33 6%	6 1%
Dyers/ cleaners	69 100%	26 38%	15 22%	4 6%	3 4%

Table 6.26 Business survival rates for multiple retailers in

Hull from 1880 to 1950

Trade	Length of stay in years				
	0-10	10-20	20-30	30-40	40+
Butchers	134 100%	46 34%	16 12%	10 7%	7 5%
Grocers	103 100%	74 72%	55 53%	45 44%	29 28%
Footwear	77 100%	45 58%	29 38%	18 23%	9 12%
Dyers/ cleaners	72 100%	39 54%	28 39%	16 22%	8 11%

conditions of entry limit a retail category, such as the meat trade, to people possessing some previous experience and preclude rash business decisions. The opposite is true in the grocery sector where entry conditions are relatively simple and initial capital outlay small. It must be pointed out however, that the majority of very small grocery undertakings are more likely to be classed as shopkeepers, a category excluded from the analysis. The independent footwear retailers, whilst having some limitation on entry, such as the need for capital outlay, did not have the expected high rate of survival. The reason for this is probably to be found in the increasing intensity of competition from the multiples.

In the case of the multiple organisations no clear expression as to the expected rates of survival can be formulated since conditions of entry are highly complex. The highest rates of survival are to be found in the multiple grocery trade with over 71% of businesses surviving their first ten years (Table 6.26). Higher order trades, represented by footwear and dyers and cleaners, have the next best level of survival with over 50% remaining after the first ten years. The lowest rates of survival are to be found in the retail meat trade where only 5.2% of the businesses remained after forty years (Table 6.26). The mortality situation in this trade is however highly affected by the number of amalgamations that occurred among national multiples (Chapter 4). Many of the closures were due to company reorganisations and attempts to rationalize the location of branch outlets to avoid undue duplication of shops. This certainly is the case in Hull where company amalgamations and take-overs resulted in a reduction in the number of branch outlets. A further factor contributing to these low rates of survival was the intense amount of competition that the multiple meat shops had to face from the independents.

The highest rates of survival accrued to the grocers, with over 28%

of businesses remaining after forty years. That a low order trade should head the list of business survival is in no way dichotomous. It must be noted that all the multiple retailers had a similar locational policy, at least by the second decade of the twentieth century. This factor cuts across the more formal boundaries between high and low order retail types and after 1910 the branch shops of the large-scale multiples were seeking similar locations and premises. Indeed the competitive parameters of the multiple firm in the footwear trade were as much geared to a rapid turnover of stock as the grocers or the frozen meat retailers.

Survival data and fitted probability distributions:

Reference has already been made to the work undertaken in other fields in relation to turnover and survival rates (Bartholomew 1959, Silcock 1954, Lane and Andrew 1955, Marshall 1971). While these studies have primarily been concerned with the underlying processes they have also given attention to more general relationships. In connection with the latter aspect use has been made of probability distributions to facilitate easy comparisons and, more important, to model the processes operating (Marshall 1971). Four main distributions have been found useful in relation to the study of the length of stay of factory manpower and these are, the exponential, the mixed exponential, the Pearson type XI and the log normal distribution.

Obviously, in the case of retail businesses different processes underly the rates of survival, nevertheless it may be possible to fit similar distributions as an aid to an initial quantitative description. To understand the implications of such probability distributions in relation to business survival it is first necessary to discuss some of the notions associated with such mathematical models. Where there is a constant probability that a given individual, a retail business, will be lost in the next time interval then the underlying distribution

is likely to be exponential (Silcock 1954). This may however, not strictly correspond to the nature of retail survival, for while it could operate for businesses lacking experience it is less likely to do so for retailers with sound knowledge. Their chances of survival are probably much greater and as such their rate of loss would be associated with the mixed exponential distribution or the Pearson type XI which gives similar results (Bartholomew 1967). An alternative to the above is the log normal distribution which allows length of stay to be influenced by past experience; in terms of factory manpower the employees probability of leaving diminishes with increasing length of service (Lane and Andrew 1955, Aitchison 1955). A further factor that needs to be considered before using such techniques on the present survival data concerns the length of time over which measurements are made. In this study the time periods were of a much greater duration, substituting decades for years. It is with these facts in mind that the following attempts at fitting probability distributions are made.

Of the four types of distribution considered the ones having the best fit, as measured by a Chi-squared test, were the exponential and log normal (Table 6.27). This curve fitting procedure was performed not only on the long-term data for Hull but also on McGarry's short duration study conducted in Buffalo (McGarry 1930). The results of this procedure on the data from Buffalo proved to be the most interesting from the point of view of distinguishing low and high order trades. The former had survival curves that best fitted the exponential form achieved by plotting the data on logarithmic paper with time on the linear axis (Table 6.27). The higher order retailers, such as 'drug stores', have a lognormal function which adequately fits their pattern of business mortality, as is indicated by the low Chi-squared value between observed and expected values (Table 6.27). The tests for the goodness of fit are based in this instance on the work of Marshall

Table 6.27 Chi-squared tests indicating the 'goodness of fit' for
each trade and probability distribution

Trade	Distribution	χ^2	degrees of freedom
Multiple grocers	Lognormal	0.41	1
Multiple footwear	"	0.05	1
Multiple dyers/cleaners	"	0.61	1
Independent grocers	Exponential	1.14	2
Independent footwear	"	1.61	2
Independent dyers/cleaners	"	1.18	2
Chemists (Buffalo,Pittsburgh)	Lognormal	2.00	6
Footwear " "	"	1.80	6
Grocers " "	Exponential	2.12	6

Table 6.28 Ranking of shop types based on their estimated median
length of business survival

Trade	Length of stay
Multiple grocers	21.0 years
Multiple footwear	14.0 "
Multiple dyers/cleaners	14.0 "
Independent butchers	12.0 "
Multiple butchers	8.0 "
Independent dyers/cleaners	7.5 "
Independent footwear	7.0 "
Independent grocers	5.5 years

(1971) who has derived the following formulae for calculating the degrees of freedom:-

Lognormal, degrees of freedom = number of classes - 3

Exponential, degrees of freedom = number of classes - 2

The short time-period figures were also supplemented with similar data derived by Boer from a study of Pittsburgh (Boer 1937). This illustrates the importance of past experience in retailing and the survival rates of businesses, for example in the case of chemists over 70% of the entrants had experience in this trade. In contrast to this situation is the one relating to entrants into the grocery sector of which only 37% had any past experience in groceries. Unfortunately, it is not possible to refer to any such data regarding the long-term study carried out in Hull. However, it seems logical to assume that the multiple retailers would have a wide range of past experience to draw upon in comparison with the entrants to the independent sector. It was found that for all the trades studied in Hull, with the exception of the meat retailers, the lognormal distribution fitted the business survival data for the multiple retailers (Table 6.27). In the same way the best fit for the independents was the exponential distribution, suggesting a fairly constant probability of businesses leaving the trade, though once again butchers had a slightly different pattern. Indeed, while the independent meat retailers did not fit the exponential it was found that the multiple ones did and this is again a reflection of the intense competition occurring in this trade. An attempt was made to fit the independent meat retailers to an exponential distribution, but as has been mentioned, the distribution did not fit and perhaps a better fit could have been obtained using the mixed exponential.

With the use of these probability distributions it was also possible to estimate from the fitted curves the median length of stay for each

trade type. This procedure enables aready comparison to be made for each trade on their business survival rates. In the Hull study the multiples had in most cases the highest rates of survival, with multiple grocers having by far the highest ranking (Table 6.28). This group of retailers, including multiple butchers, had a wide range of business survival rates ranging from eight years for butchers to twenty-one years for grocers (Table 6.28). In contrast the independents had a much narrower range of survival rates from 5.5 years for grocers to twelve years for butchers. Two trends are readily apparent, first, that in the long term the main division in terms of business survival is between multiples and independents. Secondly, there does not exist a clear-cut division between high and low order trade types especially with regard to the multiples, where grocers have a higher median length of stay than footwear retailers (Table 6.28). The situation is however, much clearer in the case of the independents with grocers having the lowest length of stay, though butchers do present an anomaly. In the case of the short-term data collected from Buffalo and Pittsburgh the data follows an expected pattern with the high order retailers having the longest survival rates.

This study has been an initial attempt to measure and model the processes influencing the rates of retail business survival using techniques originated within other fields of interest. The main shortcoming of this approach has been the lack of data concerning the past experience of the entrants into specific trades. However, notwithstanding this it is felt that a useful measure of retail mortality has been developed.

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Changing Patterns of Retail Location

The general examination of the rates of business turnover and mortality characteristics discussed in the previous chapter illustrate that a clear distinction in these respects exists between multiples and independent traders. It can be further demonstrated that their patterns of distribution on a city-wide scale differ, especially in relation to changes in locational demands and changes in the general pattern of retailing. Two major themes emerge as being important to the argument.

First, the spatial relationships between the two main types of retail organisation need to be examined. Do these two types coexist or do they compete for similar shop sites? Obviously, any such association will be dynamic and will fluctuate from trade to trade.

The second theme concerns the discernment of specific changes in the pattern and distribution of retail establishments where once again a differentiation between multiples and independents must be made. Here, attention needs to be directed towards the detection of the structure and organisation of retail spatial patterns in relation to locational theory and at the same time the dynamics of such distributions should be recognized.

7.1 Locational Segregation

The spatial interaction between the multiple and independent retailers is one aspect that has received very scant attention. Important differences have already been shown to exist between these two types of organisation in terms of their growth and business mortality characteristics. A further important difference has now to be considered, between their locational requirements. Theoretically, if the two shop types compete for similar locations then they would

be expected to be relatively unsegregated or 'mingled' together. Conversely, if they did not compete then the expected pattern should be one of spatial differentiation or locational segregation. Similarly, if the multiples and independents had achieved some level of spatial coexistence and the two retail types were existing with a degree of equilibrium then the level of segregation or non-segregation would be expected to remain constant through time.

The initial problem in such a study is to find an adequate means of measuring the spatial relationship between two shop types. In doing so, it must be borne in mind that certain points need consideration. First, the degree to which individuals in a two-species population are co-located is an intrinsic property of the entire population and therefore, independent of scale. This implies that it is meaningless to use some form of measurement based on grid squares, since the results will then obviously depend on the size of the quadrats (Greig-Smith 1957), and although several quantitative methods have been developed to measure the association between two species (Forbes 1907, Dice 1945, Cole 1949) they have all to some extent suffered from this disadvantage.

One way of overcoming this problem would be to use quadrats of different sizes, adjusted so that each contained exactly N individuals. If the two shop types were randomly located together in the proportions p_A and p_B (where $p_A + p_B = 1$) then the expected number of quadrats containing r A's and $(N-r)$ B's is given by the Binomial distribution (Peilou 1969). However, this method is laborious and not entirely satisfactory since the main objective is to study the relative patterns of the two shop types independently of their spatial configurations.

Some work has been carried out by geographers along the above lines using linear transects in connection with retail spatial associations. One method has been derived by Getis (1967) for studying the sequences of retail establishments and is based on combinatorial theory. The

technique does however, have certain drawbacks not least of which is the difficulty of determining the length of a sequence. There is also the problem of the definition of a 'link' as Getis does not accept the shortest distance as the only measure. In terms of our requirements the major shortcoming of this approach is its inability to cope with non-linear distributions. It must also be pointed out that the results from this analysis have not been particularly revealing (Getis and Getis 1968).

One method independent of quadrat analysis is that proposed by Dice (1952) which is based on the sector method of nearest-neighbour analysis. It assumes that a histogram of the square root of inter-species distance measurements, in a uniformly distributed population, will approximate to a normal curve (Dice 1952). By the same argument, in a two-species population the distance measurements between species A and B, if measured by the sextant method, will have a normal curve if no association exists between the two species. Alternatively, a distribution with a significant skew to the left indicates some degree of attraction while skewness to the right represents species repulsion (Dice 1952). This technique has unfortunately not received much attention and no results of skewness and interspecies association have been presented. Another shortcoming of the method is its failure to measure the degree of attraction or repulsion and, as Dice admits, "It is not anticipated, however, that skewness or any other simple statistic can measure the strength of association between two given species" (Dice 1952).

Probably the most appropriate method is one that uses distance measurements, i.e. some form of order neighbour technique that is independent of spatial pattern. Pielou (1961) has developed such an approach that can deal with two-species populations but the population must be small enough to allow all the individuals to be taken into

account since no sampling statistics have been derived (Pielou 1969). The method consists of examining each individual in turn and noting the type of species that is its nearest neighbour as measured by straight line distances. The results of this can then be arranged as a two by two contingency table, thus;

		type of nearest neighbour	
		A	B
type of base shop	A	a	b
	B	c	d
		r	s
		m	n
		N	

m,n,r,s=row and collumn totals N= grand total

Pielou (1961) suggested a coefficient of segregation S as derived in equation 7.1 where a mixed pair denotes an individual of one species having an individual of another as its nearest neighbour.

$$S = 1 - \frac{\text{observed number of mixed pairs}}{\text{expected number of mixed pairs}} \quad (7.1)$$

$$\text{thus } S = 1 - \frac{N(b+c)}{ms + nr} \quad (7.2)$$

The value of S ranges from 0 in an unsegregated population to +1 in a population that is fully segregated. Pielou (1969) also describes the case for negative segregation where S equals -1, this consists of a single central species, type A, surrounded by a ring of another species, type B, with each B having A as its nearest neighbour. This situation may be applicable in terms of retail segregation, especially in relation to spatial competition between multiple branch stores and more peripheral independent local shops. It must also be noted that because distances are measured from the centre of each individual, in this case shop locations, it is impossible for any single shop to serve as nearest

neighbour to more than five others.

The significance of such a coefficient of segregation may be determined by the application of a Chi-squared test to the original contingency table. If the null hypothesis is that the population is unsegregated, the alternative hypothesis being that any segregation will be positive, then a one-tailed test is indicated. However, in the case of retail establishments it is possible that a distribution is as likely to be negatively as positively segregated and in this instance a two-tail test is needed.

In terms of retail distribution the defined segregation index can measure the degree to which different organisational types compete for specific locations. The basic assumption is that if the 'population' of retail establishments is unsegregated then it would seem reasonable to state they had similar locational requirements. On the other hand, if the distribution was found to be segregated then it may be suggested that the two store types had different requirements and locational competition did not exist to any great extent. Another dimension can be added to this analysis if changes in retail segregation are considered over different time periods. This may be suggestive of changes in the locational policies of different organisational types which could either lead to increased segregation, or alternatively, produce a tendency towards unsegregated patterns.

7.1.1 Retail segregation in Hull

The segregation analysis for the retail grocery trade shows a pronounced trend towards increasing segregation with time. However, the early decades could not be examined because of insufficient data, there being too few multiples. By 1900 the index could be applied but the results suggest a very low degree of segregation. In fact the value was not significant at the 0.1% level and therefore the null hypothesis, that the shop types were unsegregated, can be accepted. However, by 1910 a significant degree

of segregation was recorded and the index increased rapidly up to 1930 (Fig. 7.1). After this date the degree of segregation continued to increase though at a much slower rate and it reached its peak at the end of the period. These trends reflect two basic underlying processes that tended to produce and intensify segregation. First, after 1900 the multiple grocery organisations gave more attention to the locational parameter and branch shops selected more central sites in an attempt to increase their trade areas. This was associated with the second factor, the creation of linear shopping centres on main tramway routes and nodes. A further process that must be taken into consideration concerns the degree of competition between multiples and independents. The success of one type of shop over another will result in increased segregation due to the thinning out and suppression of the least successful retail types. This is especially the case if the greatest rates of failure are associated with those shops that are located in close proximity to the dominant retailers. In the case of the grocery trade it was the multiples that gained supremacy in the more centrally located areas, forcing out the local independent traders and thus creating a more segregated distribution. If shop losses had occurred more within one-species type clumps, suggesting a situation of internal competition between shops of a similar type, then the trend would have been for segregation to decrease.

The latter situation is illustrated by the retail meat trade and the locational policies of the independent and multiple organisations. It was essentially after 1890 that the segregation between these two types of trader increased to any significant degree. The maximum level of segregation was attained in 1910 with a coefficient of approximately 0.4 (Fig. 7.2). This was the main period of growth for the multiples and central sites became fairly important however, internal competition was high within this trade and this produced large rates of shop

failure (Chapter 6). These factors, plus the successful competition provided by the local retailers, led to a thinning out of multiples selling frozen, foreign meat. This is reflected in the rapid decline of the degree of segregation between local independent traders and multiples after the peak year of 1910 (Fig. 7.2).

Similar data collected for the retail footwear trade showed hardly any of the above clear-cut trends, although throughout the period of study the degree of segregation was always significant, though variable in its overall intensity (Fig. 7.3). Despite the fluctuating nature of the curve of segregation it is possible to distinguish three phases of shifts in locational strategy. The fall in the degree of segregation between 1880 and 1890 can be accounted for by the intrusion of many more new multiple retailers which did not locate in central areas. In fact they competed for sites with the independent traders rather than the few multiples that were already established in the city. However, after 1890 the factor of central location was increasing in importance within the overall trading policy of multiple organisations. This, together with the fact that the number of independent retailers began to decline after 1900, led to a sharp increase in the degree of locational segregation. The expanding multiples successfully competed for the most central sites and forced out the local independent traders.

The second phase, after 1910, once again witnessed a rapid fall-off in the intensity of locational segregation. This decline, which continued until 1930 can be attributed to the increase in internal competition within the multiple sector, with new arrivals having to establish themselves in less central locations. The result of such competition and also the changes in organisation led eventually to a third phase, in which segregation increased and attained a peak value in 1950. This was due to the movement of multiples into central areas of the city, often at the expense of the more peripheral branch-shop locations.

- In contrast to the above three trades the situation with regard to the service sector, as represented by the dyers and cleaners, shows a rather indeterminant pattern. There is no discernible trend and segregation is not a characteristic of the trade at any point in time before 1950. Indeed in 1900 the index of segregation was a negative value, -0.1 , although this was not significant. The gradual dominance of the multiple sector in this trade has been illustrated on both a national scale and in terms of the study area. This numerical dominance by the multiples did not however lead to spatial segregation and at no time are significant segregation indices recorded. The highest value is 0.22 for the 1930 period. Unlike the other trades there seems no tendency, despite the success of the multiples, for locational differentiation to occur. As a general maxim both retail organisational types seemed to have been seeking similar locations.

The above analysis may be viewed as an initial attempt to formalize the study of retail location in terms of competitive strategy. It provides a basis, albeit a rather tentative one, upon which notions of locational competition can both be tested and related to. The degree to which it serves as an indicator of locational policies of different retail types depends to a great extent on how the technique is handled. Its use in isolation from documentary evidence relating to the retailers under study is obviously a rather risky undertaking.

With regard to the practicalities of using such a technique, two other points must be mentioned. First, it is important that attention is given to the level of significance and the appropriate type of test used. Secondly, for more complex spatial patterns consideration should perhaps be paid to the question of spatial symmetry. Tests for such a factor have been described by Pielou (1961) who also discusses the implications of population symmetry with reference to spatial segregation.

- The segregation index provides therefore a means of examining the

spatial relationships in a two-species population and, in relation to retail establishments, offers a means of analysing the patterns of locational competition. In addition, with the use of temporal data, the index can also provide an insight into the changes in locational requirements of competing retailers.

7.2 Changes in the Pattern of Retail Location

Geographers on the whole, whilst having a great interest in spatial statistics, have failed both to develop them and, perhaps more important, neglected the conceptual framework that lies behind their use; many instances of such mishandling exist but the reader is referred for examples to the work of Theakstone and Harrison (1970). The measurement of spatial pattern requires detailed attention to be given to the development of a suitable technique and to the definition of selected terminology. In connection with the latter aspect the term 'pattern' has been readily used by geographers but with little regard to its actual meaning and few attempts have been made to define the term. Sibley (1971) discusses this aspect and uses the definition offered by Hudson and Fowler (1966), who regard pattern as referring to the "geometrical relationship between points which are independent of the area of study". The inference is that pattern and dispersion are two distinct phenomena (Sibley 1971), the latter being the measure of spacing of a set of objects in relation to the shape of a given area (Rogers 1969). From the above discussion certain aspects need further clarification as a pre-requisite to the study of retail spatial patterns. First, 'pattern' must be defined in relation to the technique of measurement adopted. Secondly, the development of such a technique must be considered and some indication of its powers in relation to the postulated definition given.

Pielou (1969) has identified two distinct aspects of a spatial pattern - which she has termed 'intensity' and 'grain'. The former refers to the

extent to which density varies spatially, thus in a high intensity pattern the differences are marked with dense clumps of objects alternating with sparsely populated zones. The 'grain' component of a pattern is independent of 'intensity' and refers to the distribution of objects throughout the area of study. If the whole range of different densities are encompassed in a small space then it can be termed a fine-grained pattern. Alternatively, if the objects under study occur in relatively widely-spaced clumps then the pattern could be referred to as coarse-grained.

7.2.1 Techniques of measurement

Having adopted this definition of spatial pattern and outlined some of the basic associated terminology it now remains to decide upon an appropriate technique of measurement. The initial decision is to choose between techniques that involve the use of quadrats as opposed to those employing distance measurements. The latter type was selected for three main reasons, first, it does not require the establishment of artificial sampling units, grid squares, the size of which affects the outcome of the pattern analysis. While it is recognised that the effects of quadrat size can be met by varying their sizes and sampling at different levels, it remains an unsuitable method for measuring objects dispersed over a continuous surface as opposed to location in discrete areal units (Pielou 1969). Admittedly, quadrats have frequently been used for such purposes and in particular for the study of retail patterns (Rogers 1969, Sibley 1971).

Little use has been made so far of distance measurements in studying patterns beyond the crudest and simplest of levels (Getis 1968). No attention has been given to its use as a means of measuring pattern 'grain' as Pielou (1969) points out; "it remains to be discovered what can be learned about a pattern from an examination of a curve of index of aggregation (based on distance measurements) versus rank of the

order neighbour used for its calculation". An additional and powerful reason for selecting a spatial statistic based on distance measurements is the recent development of the automatic digitizer system that enables much faster measurements and basic calculations to be made.

Within the group of statistics based on measurements of distance two main methods may be identified. There is the sector method, whose development can be attributed to Dacey (1962) and uses a circle divided into N equal sectors. This is placed over each point in turn and the nearest neighbour recorded in each sector. The probability density function is in the form of the Poisson distribution and is used to derive the expected order neighbour distance. The nearest neighbour or R-value is computed by dividing the observed distance by the expected one.

The second method, the order neighbour measure, is the one employed in this study, the use of which was greatly facilitated by the digitizer. Several forms of this exist but probably the most widely acceptable is the method developed by Clark and Evans (1954). This method is also based on the Poisson distribution and the expected distances are calculated using equation 7.3 the derivation of which has been presented by Clark and Evans (1954). The R-value is again calculated by dividing the observed by the expected distances with the results falling within a range of values 0 to 2.1491.

$$\bar{r}_E = 0.5\sqrt{(A/N)} \quad (7.3)$$

where A = area of study

N = number of points

Under conditions of maximum aggregation all the individuals occupy the same locus and the distance to the nearest neighbour is therefore 0. At the other extreme, conditions of maximum spacing, the individuals will be distributed in an even, hexagonal pattern and consequently every point will be equidistant from six other individuals so that the mean distance

to the nearest neighbour is maximised (Clark and Evans 1954). This measure of spacing is based on the degree to which individuals depart from randomness ($R=1$) and as such, attention must be given to the choice of area since it is assumed that any point has the same opportunity of occurring in any position and, that any sub-area has the same chance of receiving a point as any other sub-area of that size. The implications are, that the area under study is, for the purposes of this technique, an isotropic surface. Attention therefore, needs to be given to defining the actual study area in terms of a 'biotope space' (Hudson 1969), which for an urban environment involves measuring the built-up area. Obviously, for retailers to have an equal opportunity of locating anywhere, a number of types of land use must be taken out of the measurements. In this study such a surface has already been defined for the purposes of growth zone construction (Chapter 5).

One other point that can be raised concerns the appropriate distance measurements. Thus in an urban environment it could be argued that it is more valid to measure distances between shops via the street network rather than by conventional straight line distances. This problem was resolved by correlating the net built-up area of each growth zone against the total length of streets in that zone. A correlation coefficient of +0.96 was obtained and this was significant at the 0.1% level with 11 degrees of freedom. The implication of this test is that all the zones have a similar ratio of streets to built-up area, suggesting that straight line measurements would not give spurious results. Had the relationship been low then some areas may have had a totally different ratio and the degree of competitive spacing of retail establishments would only have been effectively measured by using street distances.

Little work has been undertaken to compare the two main types of nearest neighbour tests, though Dacey and Tung (1962) suggest that the order method seems more efficient in the detection of clustering while

the sector method is more applicable when the pattern tends towards uniformity. However, this observation is of little value since the majority of spatial patterns contain both clustered and uniform elements.

Other workers have applied varying extensions to the standard nearest neighbour techniques, notably Dice (1952), Morisata (1959) and Cowie (1968). This has largely been in the pursuit of a better understanding of spatial pattern and an attempt to replace single statistic measures with more embracing ones. Cowie (1968) has identified some of the basic problems associated with distance statistics in pattern analysis and one of the major ones is connected with the fact that a mean value summarizes a distribution in a single number. He goes on to resolve this problem by the use of cumulative frequency techniques and presents a standard set of curves that represent random, uniform and clustered patterns. This presents an interesting extension of the normal nearest neighbour method but, unfortunately, little work has been undertaken using this approach and Cowie himself only presents a few one-dimensional examples (Cowie 1968). The problem of complex patterns being represented by single statistics has also been tackled by Dice (1952). In this instance he used some measurements of dispersion, i.e. skewness and kurtosis, to analyse spatial patterns translating distance measurements into histograms. However, his initial approach and preliminary conclusions were based on the sectorial method and it still remains to be seen how relevant such an extension would be to ordered measurements.

Before proceeding to apply the nearest neighbour method based on distance measurements it remains to relate the approach to the definitions of spatial pattern presented, in order to find out just what aspect of pattern is being measured. From the description of the technique developed by Clark and Evans it is clear that it is the intensity of the pattern that is being examined. Since the distances are measured from point to point, the denser the clumps of points the shorter the

measured distances and consequently the lower the value of R. In order to be able to measure the 'grain' of the pattern an extension to the above technique is required and this takes the form of measuring order neighbour distances up to the N^{th} value and calculating the corresponding value of R. The formula for such measurements has been derived by Thompson (1956) and takes the form of equation 7.4;

$$\text{expected distance to } N^{\text{th}} \text{ neighbour} = \frac{1}{\sqrt{m}} \frac{(2n)!}{(2^n \cdot n!)^2} \quad (7.4)$$

where m = density per unit area

n = order of nearest neighbour

When measurements are taken to the N^{th} order neighbour then clearly some idea of the scale upon which certain points are occurring can be made. In theory, by plotting rank order of the neighbour against the appropriate R-value a measure of the 'grain' or scale of pattern intensity can be achieved. Thus, in terms of mean distance if the pattern was of a fine-grained nature then a plot of rank order neighbour against mean distance would give a curve of only gradual increase, with a smooth profile. Conversely, in a coarse-grained pattern such a curve would be less smooth with sharp increases as distance measurements become of a group to group nature. One problem in applying this technique concerns the number of neighbours to which measurements should be taken for as Cowie (1968) states, "there is no objective method to indicate how many neighbours should be employed". In the few attempts at this type of analysis the number selected has been in the order of three (Cowie 1968, Sibley 1971). The present study seeks to go beyond these levels and uses in some cases measurements up to the tenth order neighbour. In selecting such a high order an attempt was made to try and cover the widest possible scale so as not to miss any significant

pattern components.

This extension has applications in two main areas of this study. First, in the examination of the distribution of shops in the city study area and secondly, in the detection of the scale upon which various point pattern processes operate. In terms of retail location and the corresponding spatial patterns of shops two points must be examined. The first concerns the actual pattern intensity of retailers, both by trade and organisational types, in an attempt to examine the changing spatial relationships between such groups. Secondly, attention will be given to the little-studied topic of pattern scale and, while recognizing the importance of scale inquiries in geographical research it is not anticipated that the knowledge of such components in spatial patterns will lead to predictive statements as some geographers would have us believe (Harvey 1968).

The examination of the spatial pattern of retailers must be placed within the context of the documentary evidence already presented, for only by doing so can meaningful interpretations be made. In the light of this, it is therefore necessary to make a clear distinction between multiples and independents since they have distinct locational policies. The recognition of such a division may appear obvious, but it has not been undertaken by other geographers in their examination of retail locational change (Sherwood 1972, Rogers 1969, Sibley 1971). Sibley (1971) went to considerable trouble to place locational decisions within a three-tier system of competitive environments, to which various categories of high and low order retail types were assigned. However, he never made the more crucial distinction between the locational strategies of multiples and independents, within each trade group. Had he done so, then many of the complexities of spatial pattern and some of the inconsistent trends which he found could have been explained.

In this trade multiple and independent retailers have distinctive spatial patterns which reflect different types of locational strategy (Chapter 4). The temporal variations in such patterns also reveal some marked differences between the two organisational types with the independent retailers following slightly the 'U' shaped curve outlined by Getis (1968) and in a British study by Sherwood (1970). These previous studies present a pattern of grocers shops that changes through time from random to clustered and back to random conditions. An examination of the first order neighbour distances for independents shows that while the values tend to have a slight 'U' shaped trend, with R values decreasing in 1910 and 1920, the pattern character never becomes significantly clustered. Indeed the overall local pattern is one that is fairly constant, never deviating from randomness.

The expected spatial clustering of grocers in the early twentieth century, due to consumer dependence on public transport inducing retail aggregation at nodal points, did not operate for the independents. That such differences in site accessibility did not exist at this time is not questioned. The reason independents do not fit in with the expected trend as presented by Sherwood lies in the fact that they could not compete for such sites. It is also suggested that for the majority of independent grocers locational policy did not change radically enough to produce such clustered patterns on a local scale.

In this case the clustering element can be attributed almost entirely to the effect of multiple grocery chains. An examination of the first order nearest neighbour values shows clearly the change from a 'regular' to a 'clustered' pattern (Table 7.1). It is noticeable however, that significantly clustered patterns are only to be found after 1920. During their initial period of entry the pattern of multiples tended significantly towards regularity, a condition that

Table 7.1 Trends in the pattern of grocers,Hull. 1st order neighbours

Date	Independents			Multiples		
	R	pattern type	N	R	pattern type	N
1880	1.042	random	259			
1890	1.310	regular	368			
1900	1.029	random	423	1.539	regular	25
1910	0.928	random	462	1.284	regular	40
1920	0.980	random	353	1.201	regular	45
1930	1.000	random	390	0.839	clustered	71
1940	1.089	random	286	0.779	clustered	72
1950	1.087	random	199	0.688	clustered	58

R= nearest neighbour value N= number of shops

Table 7.2 Distance measurements for grocers in Hull, 1st order neighbour

Date	Independents		Multiples	
	$\bar{x}$	skewness	$\bar{x}$	skewness
1880	58.6	2.673		
1890	65.8	3.799		
1900	65.3	3.057	405.6	0.943
1910	57.7	1.642	287.0	0.590
1920	74.5	1.776	254.6	0.745
1930	72.5	1.305	143.6	2.000
1940	92.1	1.317	132.1	2.195
1950	110.2	0.570	128.5	2.005

$\bar{x}$ = mean distance to nearest neighbour in yards

persisted up to 1910 (Table 7.1). The force behind this trend, that produced increasingly greater levels of clustering, can be attributed to site competition among multiples. The majority of multiple grocers were demanding main shopping street sites and therefore competing with other multiple traders after 1920 (Chapter 4). The decline in numbers between 1940 and 1950, from 72 to 58, also contributed to the increase in local clustering as most shop losses occurred in isolated sites.

A further examination of these spatial patterns can be undertaken using the basic data of distance measurements and comparing measures of dispersion (Table 7.2). In general terms the mean distance was increasing between independent grocers throughout the period of study with the one exception of 1910. Associated with this trend was a decrease in the level of skewness of first order neighbour distances. In the late nineteenth and early twentieth centuries the pattern of independent grocers was one with a high degree of positive skewness, e.g. 3.799 in 1890 (Table 7.2). This indicates that there was a strong bias towards the small end of the distance scale with the majority of shops being located fairly close to each other. The movement towards a fairly normal distribution in 1950 is an indication of a more balanced pattern of shop locations. The multiples have an opposite trend with a movement towards increasing skewness and a decrease in mean distances between shops (Table 7.2).

The scale components, intensity and grain, of these two shop types stand in distinct contrast to the local elements, i.e. pattern intensity previously described. This is especially so in the period prior to 1940 when multiples and independents had marked differences in pattern scale.

The independent grocers had a trend that was relatively stable both spatially and less so through time. This was characterized by local

randomness giving way to clustering on a city-wide scale, producing a relatively fine-grained pattern. There was some temporal variation in scale components which gives some measure of the pattern complexity. In 1880 the differences between the first order and tenth order neighbour values was only 0.282 showing some degree of similarity between local and scale components.(Fig. 7.4) This however, is not only a reflection of the spatial behaviour of the retail units but also dependent on the size of the urban area. At this early date only a small degree of suburban development had taken place, thus limiting the opportunity of shop dispersal. The other main feature about the pattern of independent grocers, as measured here by a plot of order neighbour against R value, is the absence of any grouping of shops. The curves (Figs. 7.4 to 7.7) are of a relatively smooth nature with no irregular increases in R values indicating a fine-grained pattern.

The relative clustering of independent grocers on a large scale as measured by the tenth order neighbour is the result of the growth of main suburban shopping streets after 1880, which effectively divided up the city into distinct areas. The majority of independent grocers could only compete for sites within these zones and could not afford to locate along the major routeways. It is this effect that the scale analysis is measuring, with grocers being randomly distributed locally in response to the population (Rogers 1969) but clustered in fairly large groups on a city scale.

In response to the nature and locational policies of the multiple grocers it seems reasonable to expect the opposite type of effect. This is in fact the case, but only after 1920 when their competitive strategy made greater use of the locational parameter.

During their initial period of entry this was not the case since the shops had a strong degree of pattern regularity at both the local and city scale. The trend over the whole range of spatial scale was

fairly uniform in the initial stages of their growth in 1900 (Fig. 9.5). In the following two decades this uniform trend started to disaggregate as shown by the order neighbour curves which became rather irregular (Figs. 7.5 and 7.6). Local regularity gave way to city-wide randomness though the overall pattern of shops was rather complex. This can probably be attributed to the lack of a set of common locational goals among the multiples and main street sites were by no means the norm. By 1930 the situation had largely been resolved and local clustering occurred, although these aggregations of shops were distributed fairly randomly on a city-wide scale (Fig. 7.6). These conditions however, were to change in the following decades with the distribution of these localised clusters becoming more aggregated on a large scale producing a coarse-grained pattern. In turn the curves of the R values against order neighbours are less irregular which seems to suggest overall a less complex pattern (Fig. 7.7).

7.4

The Retail Meat Trade

In this particular trade the two organisational types, multiples and independents, had very different pattern characteristics. Throughout the entire period of study both types of meat retailer exhibited considerable variations in their pattern 'intensities', with the independent traders only achieving some measure of local clustering after 1920 (Table 7.3).

The independent retailers had initially a pattern of establishments that tended towards uniformity on a local scale, conditions that prevailed up to 1900. This group attained a significantly clustered pattern only after 1920 with random elements persisting for the two decades following 1900 (Table 7.3). These basic patterns are however, complex in nature, a feature that can be better examined with reference to measures of nearest neighbour distance dispersions about

Table 7.3 Trends in the pattern of butchers, Hull. 1st order neighbour

Date	Independents			Multiples		
	R	pattern type	N	R	pattern type	N
1880	1.136	regular	151			
1890	1.184	regular	165	1.195	random	8
1900	1.027	random	199	0.828	clustered	26
1910	0.988	random	215	0.649	clustered	57
1920	0.904	clustered	159	1.000	random	23
1930	0.888	clustered	210	1.129	random	24
1940	1.097	random	199	1.352	regular	17
1950	1.066	random	95	1.253	random	11

R = nearest neighbour value N = number of shops

Table 7.4 Distance measurements for butchers in Hull, 1st order neighbours

Date	Independents		Multiples	
	$\bar{x}$	skewness	$\bar{x}$	skewness
1880	85.4	1.654		
1890	89.1	2.532	407.8	0.223
1900	96.1	1.855	211.7	1.020
1910	95.1	1.860	121.4	1.651
1920	101.8	1.672	296.2	1.321
1930	87.9	1.817	331.1	0.815
1940	102.1	1.334	430.2	-0.007
1950	157.8	0.814	540.7	-0.632

$\bar{x}$ = mean distance to nearest neighbour in yards

the mean values (Table 7.4). It can be seen that only slight variations are detectable in the mean distances between shops, the range for the entire period being only 16.4 yards. In contrast, the actual distribution of first order neighbour distances is much more variable although strong positive skewness was always their main characteristic (Table 7.4). The earlier decades, 1880 to 1900, in which the spatial patterns of shops tended towards uniformity could be an indication of some attainment of equilibrium within this trade type. This would be most likely the product of the very low level of price competition between independent retailers during the late nineteenth century and their ineffectual use of the locational parameter. The switch to random patterns after 1900 could have been the result of competition from the expanding multiples that prompted a review of siting policies. This period of local randomness may also be tentatively postulated as one of disequilibrium for the independents when both the movement of urban consumers and increased spatial competition induced an overall change in shop locations. The result of this was possibly the movement to a significantly clustered pattern after 1920, when independent retailers were seeking more main street sites.

These views may be slightly modified in the light of evidence presented by a study of the scale at which these local patterns operated. The independent retailers had a marked diversity in their pattern 'grain' with the initial decade of study having a very irregular curve of R values against rank order neighbour (Fig. 7.8). This type of curve is typical of a pattern that is composed of a series of large scale 'clumps', each of which contain varying numbers of shops. Thus, the regularity of the first order neighbour values is broken down on a larger scale into groups of retail establishments which in terms of the entire city area appear relatively aggregated with R_{10} having a value of 0.85 (Fig. 7.8). This would be a clear reflection of the

prevailing situation since independent retailers were still, to some degree, tied to slaughter-house facilities and tended to be loosely clustered around these. The similarity of conditions in the next decade, 1890, that were previously observed in relation to R_1 values are lacking when reference is made to large scale pattern processes. By 1890 the variations in R values of different levels of order neighbour had largely been suppressed, producing a reasonably smooth curve. This is an indication that many of the large scale clumps had been disaggregated although the city scale trend was still towards overall clustering (Fig. 7.8). In this sense therefore the equilibrium conditions previously referred to may already have been in a state of flux by the decade 1890 to 1900 (Figs. 7.8 and 7.9).

One further feature concerns the variations in the local and scale components of order neighbour values through time. The temporal trend was towards smoother rank order curves indicating a fine-grained pattern, thus in 1890 the difference between R_1 and R_{10} was 0.30 and by 1930 this had declined to only 0.04. The overall pattern was becoming less spatially complex through time with local clustering being reproduced on a large scale.

The pattern of multiple meat shops stands in complete contrast to that of the independents on both a local and city scale. Initially the multiples had a pattern that tended towards randomness, which in terms of actual distance measurement almost approximated to a normal distribution (Table 7.4). After 1900 this trade type moved into a new phase of development and their pattern was one of local clustering, the degree of which increased in the following decade (Table 7.3). This is an expected situation in view of the competitive strategy of this sector whose retail economies demanded fairly central locations to ensure a large market area and rapid stock turnover (Chapter 4). However, because of internal competition in the inter-war period and

sweeping amalgamations, the pattern of clustering changed after 1920 to one of randomness. The large clusters of meat retailers common around 1920 had been significantly reduced due to the closing down by the new firms of duplicated branch shops. This led to the production of a random pattern, which in terms of the overall number of multiples represented some form of spatial equilibrium relative to both population and competitors.

The contrast with the independents is also shown with reference to the pattern 'grain' or scale components of the multiples. Their initial scale variations could not be examined because of too few data points, a factor that would nullify this type of analysis. However, after 1900 numbers had increased sufficiently to allow examination and a plot of R values against rank order neighbour reveals an interesting curve (Fig. 7.9). The local clustering was on a fairly small scale and set within an overall pattern of randomness during the period 1900 to 1910. In the next decade both the intensity and scale of local clustering increased and retail aggregations contained anything up to four shops. This is indicated by the breaks in slope of the curve at these order neighbour levels (Fig. 7.10). The large scale pattern was still one characterized by randomness, with the overall 'grain' becoming coarser as the difference between R_1 and R_{10} values increased after 1910.

After 1920 the local element of clustering was replaced by a random pattern whilst the scale component tended towards regularity. The overall curve was still of an irregular nature, an indication of a coarse-grained pattern with loosely associated 'clumps' of shops (Fig. 7.10). By 1930 the general pattern appears much less complex with local and large scale components converging to some degree and the curve is much smoother. The variation between local and scale measurements was still however one of change from randomness to city-

wide regularity.

7.5

The Retail Footwear Trade

For footwear retailers two points are readily apparent even from the study of first order data. First, it is clear that there is a difference between the locational trends of the two organisational types (Table 7.5). The multiples, with the exception of the decade 1890 to 1900, always exhibited a tendency towards clustering. While the trend was not uniform through time, the ultimate state was towards the creation of a highly clustered pattern which was reached in 1940. Departures from the general trend occurred mainly in the period 1920 to 1930 when the pattern showed a slight tendency away from clustering towards randomness.

The locational trend of the independent footwear retailers was less variable in nature and although it too tended towards a clustered state the process took longer to achieve. In the late nineteenth century the independent traders showed a significant tendency towards regularity and this is acceptable if one takes into account the localised nature of retail trade and the readiness of footwear shops to locate in residential areas on a rather indiscriminate basis. The achievement of a clustered pattern came in the period from 1940 to 1950 when there was a significant trend away from randomness towards clustering (Table 7.5).

The second main point to notice is that both retailers in the long run were seeking similar distributions, i.e. clustered. This would suggest that similar locational policies existed in each of the organisational groups by 1950. However, in making this suggestion attention must also be paid to the segregation data previously presented since this shows that in spatial terms the multiples and independents were becoming far more segregated as time went on. The combination of both indices presents a more complex picture and one possible hypothesis is that whilst both types were moving towards a clustered state the

Table 7.5 Trends in the pattern of footwear retailers, Hull

Date	Independents			Multiples		
	R	pattern type	N	R	pattern type	N
1880	1.053	regular	256			
1890	1.264	regular	275	0.915	random	19
1900	0.975	random	235	0.630	clustered	16
1910	0.919	random	189	0.684	clustered	21
1920	0.991	random	124	0.873	clustered	22
1930	0.923	random	99	0.640	clustered	32
1940	0.863	clustered	52	0.426	clustered	29
1950	0.781	clustered	22	0.591	clustered	19

R = nearest neighbour value to 1st order neighbour N = number of shops

Table 7.6 Distance measurements for footwear retailers in Hull,
1st order neighbours

Date	Independents		Multiples	
	$\bar{x}$	skewness	$\bar{x}$	skewness
1880	60.7	2.48		
1890	73.7	1.72	203.3	0.95
1900	84.0	0.95	208.2	1.02
1910	94.3	1.14	205.8	0.86
1920	126.4	0.76	248.2	1.67
1930	132.0	0.59	162.5	0.79
1940	171.9	3.86	113.2	1.92
1950	335.5	1.45	271.7	3.51

$\bar{x}$ = mean distance to nearest neighbour in yards

actual location of such retail clusters was geographically distinct within the city area.

Whilst both multiples and independents moved towards similar locational goals differences in their basic pattern characteristics existed (Table 7.6). For example, the average distance between independent footwear retailers was increasing throughout the period from just over 60 yards (average distance to nearest neighbour) in 1880 to 171 yards by 1940 (Table 7.6). In contrast the mean distance between multiple shops was decreasing during the study period. These measurements give some indication of the variation in size of the clusters of multiple and independent shops. Measurement of the skewness of shop distances do not reveal any marked trends though independents have stronger degrees of positive skewness (Table 7.6).

In terms of pattern scale the independents exhibit a fine-grained pattern as a plot of rank order neighbour against nearest neighbour illustrates (Figs. 7.12, 7.13 and 7.14). The resultant curves are of a smooth nature with little deviation away from the overall trend which is towards general clustering. At high order neighbours the R value is low and significantly clustered, indicating a high degree of large scale clustering. Thus the pattern of independent footwear retailers is one characterized by local randomness changing to slight clustering through time but these trends are set within a wider context of a highly clustered pattern operating on a large scale. There is also an indication that their pattern is becoming less complex through time with the local and general components converging to some extent. However, by 1950 their pattern had changed considerably with the rank order neighbour curve becoming similar in nature to that of the multiples. Their general pattern by 1950 was small scale clustering giving way to large scale regularity (Fig. 7.15).

In contrast, the multiples have a much more complex pattern with

marked variations occurring at different scales of measurement (Figs. 7.12 to 7.15). Indications are that the multiples have a much coarser-grained pattern though with a much stronger element of localised clustering. The curves of rank order neighbour against R values are of an irregular nature but a general trend is discernible. This takes the form of an increase in the R values over the second and third order neighbours and in some instances the increase in the R value, to conditions of randomness, covers a much wider range e.g. orders two to four for the period 1890 to 1900 (Figs. 7.12 and 7.13). However, too much emphasis must not be placed on the variations of higher order neighbour values due to the low number of points in the sample. The results of the scale analysis seem to suggest that the multiple footwear shops occurred in loosely associated clumps that varied in size; at a large scale they were composed of as many as five shops. Their variable size is indicated by the step-like nature of the curves and this is also shown if one plots mean nearest neighbour distance against rank order neighbour.

7.6

Dyers and Cleaners

The temporal variations of the nearest neighbour values (R_N) show distinct trends in this particular trade for both multiples and independents. In the latter group there is a movement away from a clustered pattern in the decades prior to 1900 and towards one with some significant degree of spatial regularity (Table 7.7). This was achieved in two stages; first, a fairly rapid rise in the R_N value after 1900 which was followed by a levelling off period when random conditions occurred. Second, there followed after 1930 a trend towards spatial regularity which was rapidly attained after 1940. These trends seem logical in view of the locational requirements of dyers and cleaners, especially those of the independents (Chapter 4). In the late nineteenth century their clientele was almost entirely composed of middle-class

customers, hence their central locations in the study area. To this may be added the fact that many of the services offered were at this time comparatively new and this necessitated central locations to ensure a large enough trade area. With the rise in standards of living and the wider acceptance of dyeing and cleaning services the shops no longer had such rigid locational requirements. They were able to follow the population into the suburbs and take up non-central locations. This eventually resulted in the creation of a regular pattern which was evident after 1930 (Table 7.7).

The small amount of data available for the multiple sector would seem to suggest a trend completely opposite from that of the independents. In the period prior to 1920 there was an insufficient number of these establishments to warrant a detailed analysis. However, the available results illustrate a movement away from a significantly regular pattern towards one of randomness (Table 7.7). Evidence suggests that the early locational policies of such organisations would fit this trend, with shops being sited well apart in central retailing areas (Chapter 4). The change to a random pattern of branch outlets after 1940 was partly a result of a wider acceptance of this service and increased competition among multiples.

In terms of overall pattern complexity both organisational types present fairly uniform features as indicated by the distribution of first order neighbour distances. The independents had over the first two decades after 1880 a fairly normal distribution of distances with very low values of positive skewness (Table 7.8). After 1900, when random conditions prevailed, the degree of positive skewness increased. This was probably the result of new retailers introducing different locational elements into the existing pattern. These conditions changed only slightly after 1930 with the switch back to a pattern tending towards regularity in the last decade reflecting the survival pattern

Table 7.7 Trends in the pattern of dyers and cleaners in Hull

Date	Independents			Multiples		
	R	pattern type	N	R	pattern type	N
1880	0.807	clustered	31			
1890	0.725	clustered	24			
1900	0.925	random	20			
1910	1.006	random	23			
1920	0.996	random	11	1.501	regular	9
1930	1.105	random	17	1.244	regular	29
1940	1.697	regular	8	0.982	random	31
1950	1.703	regular	13	0.907	random	33

R = nearest neighbour value to 1st order neighbour

N = number of shops

Table 7.8 Distance measurements for dyers and cleaners in Hull,
1st order neighbours

Date	Independents		Multiples	
	$\bar{x}$	skewness	$\bar{x}$	skewness
1880	134.3	0.599		
1890	142.8	0.597		
1900	273.4	1.797		
1910	296.1	1.342		
1920	427.0	1.100	711.2	1.198
1930	384.4	1.582	330.7	0.509
1940	861.4	0.824	252.6	1.220
1950	847.7	0.905	247.4	1.105

$\bar{x}$ = mean distance to nearest neighbour in yards

of the independents in the face of intense competition from the multiples. This latter group had no clear trend in terms of pattern characteristics with the dispersion of first order distances changing from a negatively skewed distribution in the decade 1920 to 1930 to a slightly positive skew in the following decade (Table 7.8).

Attempts to examine the scale components in the spatial pattern of these two organisational types is restricted because of the lack of data. The number of retailers in this trade at any one particular decade never exceeded thirty-one and in many instances falls below ten. For this reason it was considered unwise to analyse the patterns beyond the third order neighbour and the inferences drawn must be framed within the restrictions enforced by the data. It was decided to therefore limit analysis to the first three order neighbours and the results of this are shown in Table 7.9.

During the last two decades of the nineteenth century local and scale pattern components were very similar with the greatest variations occurring in the second order neighbour measurements. The pattern of independent establishments did however show a greater degree of divergence between small and relatively large scale elements after 1900. The difference between first and third order neighbour values increased from 0.014 in 1900 to 0.2 by 1910. The trend during these years was towards large-scale clustering with significant elements of local randomness. After 1920 the large-scale clustering disappeared and the shops moved towards spatial regularity as the service became more acceptable to a wider market. On a city scale the same process was operating for the multiples as the shops competed for main street sites outside the central area giving the element of local clustering (Table 7.9).

Table 7.9 Scale components, order neighbour measurements for dyers
and cleaners

Date	Independents			Multiples		
	R ₁	R ₂	R ₃	R ₁	R ₂	R ₃
1880	0.807	0.926	0.879	-	-	-
1890	0.725	0.910	0.802	-	-	-
1900	0.925	0.909	0.909	-	-	-
1910	1.006	0.892	0.888	-	-	-
1920	0.996	1.304	1.373	1.501	1.793	1.739
1930	1.105	1.079	1.230	1.244	1.463	1.514
1940	1.697	1.371	1.193	0.982	1.241	1.413
1950	1.703	1.298	1.152	0.907	1.052	1.261

Behaviour of Selected Urban Retail Functions

The previously calculated nearest neighbour values (R) can also be used to facilitate a comparative analysis of changes in retail locational behaviour. In this study particular interest will be given to the multiple outlet retailers, a rather neglected sector of the retail market. This group had very similar competitive strategies and it may be that this feature was reflected in some common locational behaviour, producing similar spatial patterns. Following on from this is the possible argument that differences in trade types, as between low and higher order categories, would be insignificant in accounting for differences in retail patterns.

Several geographers have used spatial statistics to rank retail functions based on the locational behaviour of shops in terms of their pattern characteristics (Artle 1959, Rogers 1969, Sherwood 1970 and Sibley 1971). A review of these studies reveals that they have a high degree of agreement concerning the ranking of trade types despite the fact that the measurements were made in a number of quite different urban environments. Thus Rogers compared selected retail functions in Ljubljana in Yugoslavia and San Francisco, obtaining similar results. The general picture presented by such studies is that the degree of dispersion is inversely related to the order of the retail function. For example, high order trades have a low degree of spatial dispersion and low order ones a high element. This seems logical in the light of theories of retail competition as the high order or shopping goods retailers would benefit from locating in close proximity to each other since the consumer wants to compare goods and prices. Alternatively, low order retailers selling convenience goods that are in constant demand are pulled towards the location of the consumers. This factor, together with the hazards of competition, induces such shops to repel

each other in locational terms.

While the studies quoted may have illustrated this view of retail behaviour it is still nevertheless a gross oversimplification of the situation. A number of other points can be raised, the first of which concerns the question of change or do such rankings of retail functions remain constant through time? Secondly, would a similar scale of rankings be obtained if multiple and independent retailers were examined separately? The third point is specifically related to the changes in locational behaviour of the multiples.

The first aspect has already been examined by Sibley (1971) who found that the functional rankings were fairly constant through time when ranked by the degree of dispersion. Alternatively, when the functions were ranked by their levels of clustering, as in this study, then their positions changed through time. This latter spatial statistic is measuring the movement of individual retail types towards specific locational goals. In this study a similar degree of changes in rank order can be seen to exist for the independent retailers (Table 7.10). It should be noted however that many of the differences in R values are not very significant, a factor that will affect any conclusions drawn from such a study. In general terms the major differences are between functional rankings before 1900 and those after this date (Table 7.10).

Of greater interest in this context is the examination of changes in the ranking of multiples based on degrees of clustering. In this trade sector some knowledge already exists as to the changes in locational goals and also of the similarities in competitive strategy. Indeed an examination of first order nearest neighbour distances for multiples illustrates some degree of similarity of locational behaviour that is independent of functional type, although in terms of levels of clustering footwear shops always rank first, apart from

Table 7.10 Ranking of independent retailers by the degree of clustering, Hull 1880-1950

Date	Rank			
	Footwear	Grocers	Butchers	Dyers/cleaners
1880	3 (1.05)	2 (1.04)	4 (1.13)	1 (0.80)
1890	3 (1.26)	4 (1.31)	2 (1.18)	1 (0.72)
1900	2 (0.97)	4 (1.03)	3 (1.02)	1 (0.92)
1910	1 (0.91)	2 (0.92)	3 (0.98)	4 (1.00)
1920	3 (0.99)	2 (0.98)	1 (0.90)	4 (0.99)
1930	2 (0.92)	3 (1.00)	1 (0.88)	4 (1.10)
1940	1 (0.86)	2 (1.08)	3 (1.09)	4 (1.69)
1950	2 (1.08)	3 (1.09)	1 (1.06)	4 (1.70)

(*) is the nearest neighbour value

in 1910 (Fig. 7.16). Of greater significance however is the temporal paths of these R values that illustrate the changes in locational goal seeking. These trends have a common element in at least three of the trades and that is a movement towards a relatively clustered pattern. The intensity of such clustering varies in relation to the type of retail function, with the one exception of butchers (Fig. 7.16). This group have an entirely different temporal trend and had achieved a significantly clustered pattern by 1910. After this date the movement was towards a pattern that contained a significant degree of spatial regularity.

It is noticeable from the figures presented that there is a close accordance between the levels of clustering for so called low order trades e.g. grocers and the high order category such as footwear. The assumption is that the common locational behaviour of the multiples is the result of their similar competitive strategies and that it is possible to delimit a general sequence of spatial patterns.

During the initial period of entry into the urban market the pattern of multiples had either strong elements of randomness or regularity. At this stage most multiple retail organisations had not fully formulated their strategy and had not achieved any definite locational policies. This may be recognized as the first stage which is characterized by low levels of competition, little or no use of the siting parameter and a pattern which is either random or regular. The second stage is characterized by an intensification of competition with retailers using most of the available parameters and especially the locational one. The product of this is a pattern of spatial clustering of retail establishments.

While the above description is a close representation of the locational behaviour of the majority of multiples studied it does not fit the butchers (Fig. 7.16). This group had a similar entry phase

but then rapidly moved to a position of spatial clustering in 1910, to be followed by a trend towards pattern regularity. The multiples in this trade were forced out of the main shopping areas due to the intense competition by the more successful independent butchers.

It is possible to recognize a number of underlying factors that can account for the temporal variations in the above levels of locational behaviour for the multiples. The first, and possibly the most influential, is the level and type of competition since it appears that the multiples which were most successful in competing against independents attained an equilibrium pattern characterized by clustering. A second variable that needs to be considered is the period of entry by the multiples as the late arrivals into the study area, i.e. grocers and dyers and cleaners, had initial patterns with strong elements of spatial regularity. The final factor is one that has already been mentioned and concerns the functional order of the trade and from a view of the multiples it seems that this affects the intensity at which certain locational goals are attained (Fig. 7.16).

In general it seems that the type of competitive environment is the most important factor affecting the locational behaviour of multiples, with functional order playing a much smaller role.

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Chapter 8

An Examination of the Factors

Affecting the Distribution of Urban Retailers

In the latter half of the nineteenth century population increase, suburban development and the improvements in public transportation combined to initiate the growth of a differentiated land value market. Retail sites became more varied in their powers of attraction for different shop types, a feature reflected in the complexity of the urban land value market.

Within Hull the evolution of the urban land market can be measured to some extent using data from local rate books which provide an idea of the value of retail sites and premises. In this study rateable values have been combined for each street and a mean figure calculated in terms of this spatial network. For exceptionally long streets measurements were made in units defined by significant breaks in the commercial structure of such streets. The mean values, that were located centrally within each street section, gave a number of data control points from which a general isoline map of rateable values could be produced. It should also be mentioned that these values are expressed not in absolute terms but as a relative percentage of the peak land value. This was an attempt to allow some degree of comparability between different time periods.

In the study area the competition by 1860 for commercial locations by retailers was such that the only real area of site differentiation was within the dock area or the 'Old Town' (Fig. 8.1). Here a land value gradient had developed in response to the retailer's demand and willingness to pay for more accessible locations. It was steepest to the east of the peak land value, where the value of retail sites fell off rapidly towards the river Hull. Outside this central area the

rest of the city remained relatively uniform in terms of commercial land values and no noticeable site differentiation had developed. The one small exception to this was the area of land immediately due west of the city docks and located on one of the routeways into the newly developed suburbs.

With the expansion of suburban development and the improvements in public transport brought about by the introduction of tramways the distribution of land values changed greatly. In 1880 the land value gradients within the 'Old Town' became much steeper and more sharply defined leaving much larger areas in the lowest land value category than occurred in 1860. The main shopping streets of the Market Place and Whitefriargate became clearly defined and a zone of high land values extended from the peak land value down Whitefriargate to the junction of the two town docks (Fig. 8.2). Outside the 'Old Town' the main routeways to the north and west and their points of intersection became relatively more expensive for shop locations. The development of tramways along these streets greatly increased their importance and retail establishments sited along them could expect to draw on much larger trade areas. The tramways were also responsible for the growth of certain outliers of higher commercial land values in both east and west Hull. To the west of the river Hull a ridge of relatively high land values extended from the town dock area following the main roads to the west and north. This area of high value property formed a continuation of the ridge running along from the peak land value in the 'Old Town' (Fig. 8.2).

The main changes after 1880 and up to 1900 took two forms. First, there was an extension of the areas of high value land mainly along suburban routeways and this was especially noticeable in east Hull. Secondly, there occurred an intensification of these linear areas of high land values in relation to the peak land value figure and this

feature was mainly a characteristic of the area west of the river. In the west there also developed more compact areas of high value land in particular between Hessle Road and Carr Lane. This was in fact an early shopping centre which grew up after 1850 in response to a working-class demand (Wild and Shaw 1974). However, the rise in land values only really took place after 1880 with the increased competition for retail sites close to the city centre. In fact by 1900 this area was to some extent changing its basic function from that of being a localised shopping centre to one more city-orientated. This situation does however only refer to the main retail streets of this centre. After the First World War the suburban routeways continued to increase in locational importance for retailers with the consequence that areas of high land value were extended and intensified. There also took place a shift in the peak land value around 1930; the area around Carr Lane and immediately outside Junction Dock assumed an equal value to that of the old commercial centre within the 'Old Town'.

8.1 The Relationship Between Land Values and Retail Locations

The relationship between commercial land values and retail locations is not, as one would imagine, a one way causal process but rather a symbiotic one. For, while the existing pattern of land value surfaces may play a great part in determining retail locational decisions this same pattern is itself the product of all shop siting policies. In the late nineteenth and early twentieth centuries the effect of tramway development was to provide the opportunity for a great differentiation of retail sites. Retail firms had a much wider set of locational environments to choose from and were presented with a greater potential for adopting new competitive strategies, especially ones that involved the use of the site parameter. In general the main users of these new sites were initially multiple retailers many of whom, because of their degree of product specialization, required large

trade areas and hence accessible locations. Their influence after 1890 undoubtedly intensified site differentiation, a process that was best reflected in the development of a spatially more complex land value market.

In the study of urban land values and retail activity the main emphasis hitherto has been on the evolution of shopping centres at the expense of examining the locational decisions of individual shop types (for example see Scott 1971). The evolution of innovistic retail organisations provides an ideal opportunity for remedying the deficiency and providing information concerning their initial locational policies as reflected by their positions within the land value market.

The innovistic nature of these multiple retailers both in terms of competitive strategy and product specialization demanded initially large trade areas to ensure survival. The distinction between these multiples and the existing independent retailers in the late nineteenth century is probably best considered in terms of locational specialization and its related concept of product specialization. The former is based on the minimum trade area, in terms of population or purchasing power, that is needed to support a shop; for example a retail establishment with a small minimum trade area has little locational specialization. The relationship between the two concepts is essentially a direct one for as commodity specialization increases so must also locational specialization. As Vance (1962) points out the effect of this association will depend also on whether the product is of a mass-appeal type or alternatively of limited appeal. In this context the multiples could be classified initially as commodity specialization stores dealing in potentially mass-appeal type goods. However, before such products as frozen meat, margarine and machine-made footwear were generally accepted they could be regarded as being limited appeal products solely because of their innovatory nature. Such a situation should in theory

make the shops selling these products demand specialized locations which would be less necessary as the products became more widely acceptable. In terms of the urban land value market they would be expected to occupy central locations and both Simmons (1964) and Vance (1962) predict that such retail types will initially concentrate in the Central Business District. Duncan (1952) originally studied one aspect of this hypothesis and examined the relationship between urbanization and the intra-city localization of retail facilities, suggesting that the most urban types of retailers are also those which are most heavily concentrated in the C.B.D..

In an urban environment where consumers depend entirely on public transport and fixed lines of movement the most accessible areas would be in the city centre (Seyfried 1966). Since this process was operating in the late nineteenth and early twentieth centuries it would be expected that the C.B.D. would provide the most receptive environment for these innovative retailers.

In the late nineteenth century the multiple retail organisations dealing in relatively new products may be regarded as commodity specialization shops and they can provide the necessary examples with which the above hypothesis can be tested. However, before examining any such studies it is essential to introduce some basic facts associated with urban land markets and retail location. Isard (1956) suggests that urban locations can best be viewed in terms of substitution analysis in which the retailer substitutes various parameters of action to acquire additional revenue potentials. Such decisions in spatial terms can be represented by indifference surfaces which for the retailer will be a set of combinations of outlay and revenue at given locations within the urban area.

Assuming the peak land value and the central core represent the most accessible points it is an acceptable assumption, in a centralized city

when movement is dependent on public transport, that this would be the site with the largest trade area. The urban rent of a retail firm will, according to Isard (1956) depend on the effective distance from the centre, accessibility to potential customers, number of competitors and their locations and finally the proximity to land devoted to an individual use which may be complementary in terms of attracting consumers. If the size of the retail unit is held constant then Alonso (1965) suggests a mathematical solution in the form of a location equation for the spatial behaviour of an urban retail firm (Equation 8.1).

$$0 = V_t - C_v V_t - C_t - q \, dp/dt \quad (8.1)$$

where: V_t = the marginal revenue lost from moving distance
dt from the peak land value

$C_v V_t$ = marginal operating costs arising from the change
in volume of business V_t

$q \, dp/dt$ = decrease in rent

This may however represent the extreme situation since the basic assumption is that the location will be the one that maximizes profits. It seems more reasonable to assume that in the case of the early multiples the location represented the site that promised the best chance of business survival. In some instances this would obviously be the same site as that which offered profit maximization but this need not always be the case.

8.1.1 Retail indifference curves

With the aid of data extracted from the local rate books it was possible to construct general indifference curves for multiple retail organisations located within the study area. Because of the nature of the inquiry special emphasis was given to deriving such information for their initial periods of entry into the retail market in an attempt to illustrate early locational policies. Two main retail types will be

considered, those of butchers and footwear establishments, principally because of their similar dates of entry into the city. In addition such a selection provides some comparisons between low and high order trade types though such boundaries may be obscured by the concept of product specialization. The indifference curves that are used plot shop rent, based on local rates, as a percentage of the peak land value figure against the distance from the peak land value. They are based on fitted regression lines and essentially represent the combination of locational and rent conditions for broad retail types but they are not strictly comparable with those described by Alonso (1965).

If a comparison is made between the indifference curves of multiple outlet meat retailers for Hull at the time of their initial intrusion and for those that arrived in the following decade then two main differences are apparent. First, the curve for 1880 has a relatively steep gradient and secondly, it covers only a narrow range of urban locations (Fig. 8.3). By 1890 the multiples overall indifference curve was much shallower and the range of acceptable sites had been considerably extended (Fig. 8.3). It can be postulated that as the product became a more normal part of the consumer's diet then the extent of commodity and hence locational specialization was considerably lessened opening up a wider range of possible sites. To present this as the sole explanation would be rather naive since other factors were operating of which one of the most important was that of increased consumer mobility. Improvements in public transport, as produced by the extension of tramway routes, produced new locational opportunities along suburban routeways. These sites in Hull were increasing their degree of consumer accessibility and consequently attracting more retail establishments. Such changes in public transportation would in theory drastically alter retail indifference curves causing them to

shift bodily in the long run as transportation nodes, associated with fixed lines of movement, become more accessible and retailers are willing to pay greater rents. However, in the short run such conditions may merely extend the curve without changing its overall gradient as the retailer is able to move further out.

During the period of study all types of low order multiples had some high degree of locational specialization. However, on a macroscopic urban scale this appears to have shifted its area of importance from the C.B.D. towards the routeway nodes. The multiple meat retailers showed some deviation from the above trends as by 1900 the product specialization of these shops was such that locational opportunities had been extended in particular into the C.B.D.. The occurrence of this process is a reversal of the one expected and outlined by Vance (1962) and Simmons (1964), since their initial locational requirements were met outside the central area. The relative increase of these shops in the centre at a time when the product had become more acceptable appears paradoxical. However, the increase can be explained in terms of consumer orientation. Frozen and chilled meat in their early stages of development were of poor quality and consequently appealed largely to a working-class clientele. Improvements in production techniques and in storage facilities greatly improved the quality with the result that they attracted a wider clientele, including middle-class consumers who frequented the central area. It then became worthwhile for retailers to pay higher rents in order to locate in the C.B.D. and exploit the new marketing opportunities there.

The indifference curve of the retail footwear multiples for 1880 (Fig. 8.3). shows a complete dependence on locations close to the peak land value. Indeed the majority of retailers had sites within half a mile of the commercial centre of the city at this early date. The curve has a fairly steep gradient that compares with that of the

multiple meat retailers at a similar date. In the latter case the gradient of the curve was -20.0 while for the footwear shops it was -17.5; However, ten years later the range of locational opportunities for multiple footwear retailers had been increased though the central area still played a dominant role (Fig. 8.3). The increasing land values of areas outside the city centre are well illustrated by the flattening out of the indifference curve, the gradient being only -11.2 in 1890.

8.1.2 Shopping centre types

In terms of urban location it is also possible to examine the types of shopping centre that attracted the early multiples. This is incidentally one of the best ways also of examining the role played by the C.B.D.. In simple terms it is possible to recognize three main shopping centre environments within which the multiples could initially locate. The first is the C.B.D. itself which would be the expected reception area for new retail types and the second can be identified as main shopping street sites which in the late nineteenth century were predominantly tramway routes. Finally, the most heterogeneous group is composed of side street locations and isolated shop sites. While these groupings may appear very simple in the light of other types of classification (Berry 1968) they nevertheless serve to delimit a locational framework. Indeed as Scott (1971) states, "almost all hierarchical classification, despite the claims of a few classifiers, are to a greater or lesser degree arbitrary" and Parker (1962) goes even further in criticising the arbitrary nature of shopping centre classifications.

An examination of all the multiples under study regarding their early location within the above framework illustrates the importance of the C.B.D. for the high order trades. In 1880 75% of multiple footwear retailers were located within the central area, with the

other 25% of the shops having main street sites. By 1890 there is sufficient data to make a comparison between three of the trades (excluding dyers and cleaners) and it can be seen that some differences do exist (Table 8.1). There has been a distinct shift in the relative locations of footwear retailers, the C.B.D. no longer being the most important area as it has only just over 36% of all shops. In contrast is the location of multiple grocery shops which show a strong bias towards the C.B.D. having two thirds of their shops sited there. The multiple butchers provide another contrast in that the dominant urban location was the main shopping street and they had no stores within the C.B.D. (Table 8.1).

It would seem therefore that the C.B.D. did play an important but unequal role for some early multiples but not for butchers. The role of the C.B.D. also changed with time and the more established the shop type became the less reliance was placed on the central area. Footwear retailers were heavily concentrated in the C.B.D. in their early years of entry in 1880 but it played a subordinate role by 1890. Similarly, the grocers were initially mainly located in the C.B.D. but by 1900 main street sites outside the central area accounted for 73% of the shops. McClelland (1966) has noted that multiples tend to set up shop in recognized shopping centres which he defines as streets with a registered chemist or post office. He states however, that the difference between multiple locations and independents was not as great in 1958, as is shown in Table 8.2.

8.2 The Distribution of Urban Consumers

There has been a good deal of attention given to the examination of this facet of urban growth, largely in relation to the general theories of urban land use. The majority of the initial work was directed towards the fitting of a regular function to variations in urban population densities. The most successful and widely used of

Table 8.1 The distribution of multiples within main shopping centre types for 1890

Location	Grocers %	Butchers %	Footwear %
C.B.D.	66.7	nil	36.7
Main shopping street sites	33.3	75.0	52.8
Side streets, isolated sites	nil	25.0	10.5

Table 8.2 The distribution of multiples and independents by street types for 1958 (source: McClelland 1966)

	% of shops in streets with chemist	% of shops in other streets
multiples	14% of all shops	6% of all shops
independents	77% of all shops	88% of all shops

these is the first-degree exponential, usually expressed in linear form as in equation 8.2.

$$\log_e D_d = \log_e D_o - bd \quad (8.2)$$

where D_d = population density at distance d from the
city centre

D_o = population density at the centre of the city

b = density gradient

This regularity was originally recognized by Bleicher (1892) and more recently discovered and widely used by Clark (1951,1958). Clark's original work made use of data collected in the nineteenth century for European cities. Apart from Bleicher, other work was carried out by the French scientist Meuriot in 1898 in an outstanding study of urbanization that included many population density maps of European cities. Since Clark's work alternative models have been proposed by Tanner and Sherratt (1960) in which the density gradient is assumed to be a negative exponential function of time.

Much of the later work on population density gradients has stemmed from disagreements over the internal structure of the city which have led to a synchronic explanation of why a given structure should exist (Winsborough 1962). These explanations are frequently based on the principle of equal advantage and this is expressed through the costs of housing and transportation in locating at any distance from the centre of the city. Here is a close parallel to the model presented by Alonso for the urban firm, a fact that some retail geographers have used to study changes in shop location (Sibley 1972).[?] Indeed Alonso and Muth (1961) have both provided a satisfactory explanation of the observed regularity of urban population densities in terms of the rent-transportation and cost trade off of individuals in different stages of the family cycle, at different incomes and at varying distances from the city centre. The negative exponential shape

of the decline in density stems from the nature of the production function for housing and the shape of the price-distance function (Muth 1961). These various rationales for the differing descriptions of the city's internal structure have been reviewed in some detail by Hawley (1950).

Muth (1961) has formalized elements similar to Hawley's line of reasoning producing a model which predicts an exponential form for the inverse relationship between population density and distance from the city centre. This was justified in a study of 46 North American cities in 1950, within which the relationship between the density gradient and the characteristics of the local transportation system and the availability of cars in each city was examined. He computed the number of route miles of the local transport system per square mile of urbanized area and vehicle miles operated per mile of line. The expectation was that the greater either of these measures was then the smaller would be the transport costs, therefore both should be related negatively to the population density gradient. In conjunction with this two aspects of age were also included, based on the premise that the older the urban system the less adaptable it would be for a change in transport technology and therefore the greater the transportation time and costs.

The general impression is that population growth can be accommodated for either by an increase in congestion or by a decrease in concentration or some combination of both. Duncan's (1960) findings suggest however that the extent to which cities have depended on deconcentration may be a function of their pattern of growth through time. In the light of these studies Winsborough (1962) proceeded to investigate the mechanism by which the growth pattern affects the pattern of population density in the city.

Of specific interest to this study are the variations in the slope

parameter which measures the degree of deconcentration in an expanding city. Clark (1951) stated that this was largely dependent upon the costs of intra-urban transport and that declining transportation costs caused density gradients to flatten out. However, the naivety of this assumption has been criticized by Mills (1970) on the grounds that Clark omitted to consider the opportunity costs of time spent travelling. The argument is that this latter factor is a large part of commuting costs and if the opportunity costs rise with income then transportation costs may increase through time.

Alonso (1964) discusses the substitution of commuting costs for congestion costs as income rises, giving the familiar situation of strong centrifugal forces operating on middle and upper income groups. This also implies that low income groups, consuming relatively smaller amounts of land closer to the centre of the city, will have steeper density gradients and low centrifugal tendencies. With a more equable distribution of incomes the slope parameter of the aggregate population density curve will be less. Berry (1964) has taken this one stage further and derived an empirical relationship between the density gradient and time, the rate of change being a function of population change. On the same theme Newling (1966) argues that the basic logic of the urban spatial system can be identified if distance is dispensed with and the rate of population growth is related to population density. Since both are functions of the distance from the peak land value they can be related in the following expression.

$$1 + RD = AD^{-k} \quad (8.3)$$

where RD = the % rate of growth during a given period when the density at the beginning of the period is D .

k = the ratio of the intra-urban growth gradient (g) to the population density gradient (b)

8.2.1 Problems of measurement

Most of the above studies have been concerned with measuring gross population densities rather than net figures. Duncan in an investigation comparing changes in the city-wide growth with changes in internal growth patterns deals briefly with the two types of measure. Although Duncan used gross area, because it was more readily available, its use has a number of drawbacks. For example, intensive urban land use need not be residential in form and areas in which houses have given way to industrial use may appear not yet built-up on a gross density criterion. Along the same lines of reasoning Mills (1970) has also criticized some of the methods used by Clark relating especially to the sources of error produced by the variations in the size and shape of the statistical units used in different censuses. He has stressed the need for a measure of suburbanization that does not depend on the historical accidents of the locations of central city boundaries and one that is also independent of changes in the location of city boundaries. This point has also been emphasized by Duncan who states that temporal and areal variations in the rate of suburbanization for cities can be accounted for only by a set of factors which include indicators of the growth context, especially the spatial configuration of the built-up areas.

This review of past studies reveals that the basic problems regarding the measurement of net or gross area and the structure of a spatial framework have received little practical attention. In the present study a framework based on urban growth zones has already been developed which would solve some of the problems mentioned by Mills (Chapter 5). These zones are both indicators of the urban growth context (Duncan) and they are also independent of census boundary changes (Mills).

The initial problem was to transform the census data into the urban growth zones and thereby facilitate comparisons with the shop counts derived from city directories. This highlights the problem of the unsatisfactory nature of census divisions as units within which to compare population and shop distributions. Census wards, and to a lesser extent enumeration districts, have boundaries that often lie down the middle of major shopping streets. This makes comparisons difficult and would, if used, involve much double counting of retail establishments. The growth zones do not suffer from this disadvantage to the same degree and therefore little double counting of retailers is needed.

Perhaps greater importance can be attached to the fact that the growth zones reflect city expansion and therefore logically offer a meaningful framework within which to view the distributions of shops and population. While this method has several drawbacks, not least in its level of accuracy, it does provide a reasonable picture of population distribution.

The population data were abstracted from the census returns in the form of ward totals for every decade from 1881 to 1951. In order to convert this data from the census wards to the more meaningful growth zones it was necessary to plot, with some degree of accuracy, the population density of each ward. This was achieved by measuring the population density per net built-up area for each of the city's wards. To aid in this task the number of inhabitants per house was also derived from the census figures to ensure that there were no drastic variations over the city. In general few problems of high population densities from tenements and pre bye-law housing arose.

The next stage was to use these net population densities to produce an isopleth map, using the mean centre of each ward as the basic control points. A computer mapping programme (Symap) was used to

construct the isopleth maps and it produced surfaces of computer characters each of which represented a specific population density. These could then be converted into values for each growth zone and this was done by simply counting up the number of different types of computer characters that fell in each zone. With the use of equation 8.4 it was possible to calculate the net population density of each zone.

$$\text{Population density} = \sum_i \left(\frac{N_i \cdot i}{x} \right) \quad (8.4)$$

where i = value of computer character

N_i = number of computer characters of value i

x = total characters per growth zone

8.2.2 The distribution of consumers within the study area

The urban density functions calculated in this study are essentially of a different nature to those presented by previous workers such as Clark and Mills. First, net and not gross population densities are considered, a factor which will affect the gradient of the density slope. Secondly, only areas of pre-1950 urban development are considered and the result of this is to produce less differentiation between density gradients at different time periods since the housing was of a fairly uniform density. Finally, no attempt was made to delimit the C.B.D. and to extract this area from the calculations as suggested by Clark. This is also one of the reasons why the density gradient changes from a negative function to a positive one. The data presented here must be viewed as forming only part of the total population density function of the city if they are to have any degree of comparability with previously calculated density gradients.

The use of net area in the population density calculations gives a clearer insight into the changes in the urban structure. It makes it possible to monitor the results of intensified urban building or

the infilling of certain areas by residential development. The implications of this are that when the data are plotted the resultant curves are often of an irregular nature. It does not produce the classic smooth curves with a single peak that moves outwards from the city centre with time. These small irregularities can be smoothed out by taking the logarithm of the population densities (log to base e, see Clark 1951) and this would produce a straight line function when plotted against distance from the city centre.

With the aid of the growth zones it is possible to examine population distribution in different sectors of the city. This recognizes the fact that urban growth and hence population distribution occurred at differential rates over the city. An examination of these population density curves for Hull reveals this geographical variation of population densities.

The population density curve for west Hull in 1881 shows a fairly uniform decline in net population density outwards from the city centre for about a quarter of a mile (Fig. 8.4). The rest of the city, extending to the early suburbs just over three quarters of a mile in distance, had a uniform density. Similar trends can be observed in the northern and eastern sectors at this time (Figs. 8.5 and 8.6). In the former area the fall off in density was of a steeper nature especially between the city centre and the inner suburbs.

At the turn of the century the population of the inner city (zone A)¹ had fallen to 147 persons per net acre giving a total number of inhabitants of around 7,130. This represents a fall in the 'Old Town's' population of 33.6% between 1881 and 1901. It was about this time that the three main sectors of the city began to show some marked differences

¹ these letters throughout this chapter refer to the growth zones, the locations of which are shown in Figure 5.2

in their population density curves.

To the west of the city centre taking a transect through growth zones A to L, the peak population density was located in zone E which was between a half and three quarters of a mile from the peak land value and had a net density of 175 persons per acre. The decline in the outermost areas was not of a great magnitude and fell to a low of 107 persons per acre in zone L. In the northern area the peak population density was again found at a distance of between a half and three quarters of a mile from the city centre (Fig. 8.5). In contrast to the western sector the decline in population density was much sharper on the outskirts of the city (zone K). This decline showed in a fall, over a distance of about three quarters of a mile, from 208 persons per acre to 70. The population density curve for the eastern part of Hull again had its own distinctive features. There was an area of relatively low population density adjacent to the 'Old Town' followed by a peak at approximately three quarters of a mile out from the city centre (Fig. 8.4).

By 1921 the number of inhabitants in the city centre had declined to about 3,700 giving a net density of 77 per net acre. To the west of the centre the population density rose steeply attaining a peak of 175 persons per acre in zone F (Fig. 8.4). The outer suburbs, over one mile from the centre, had also experienced an increase in population density between 1901 and 1921 although the northern sector stands in contrast to this situation since no considerable increase in population density was experienced in 1921 (Fig. 8.5). This lowering of overall density can be attributed to the largely middle class status of this area and the associated larger and more widely spaced houses. East of the river Hull the population density gradient conforms more to that of the western sector with the one notable difference being the stationary nature of the peak density in growth zone I between 1901 and 1921

(Fig. 8.6).

The establishment of a population density crater became clearly evident in 1921 and by 1951 it had intensified following a further decline in the 'Old Town's' population. This fell to just over 20 persons per net acre in 1951. The lowering of all the population density curves between 1921 and 1951 presents clear evidence of the general movement of people out of the entire study area. At this time the most irregular density gradient was to the west of the city centre and here a fairly low level of population densities extended to just beyond half a mile of the peak land value, with overall densities never exceeding 85 persons per net acre. The two outermost growth zones in this western sector, F and L, had similar average densities of around 105 persons per net acre (Fig. 8.4).

The extended area of low population densities, a characteristic of west Hull, was not evident in the northern and eastern sectors of the city. In the former the general level of population density had fallen substantially between 1921 and 1951. It is also worth noting that the outer growth zone K had still not attained peak density within the sector (Fig. 8.5). In east Hull the population gradient rose almost uniformly from the city centre to the edges of the study area (Fig. 8.6).

The population surfaces generated by this method and represented in the form of sector density gradients show two major features. First, the pronounced movement of population out of the city centre towards the outer suburbs, a phenomena much discussed for western cities. Secondly, the approach emphasizes the spatial variation in population densities in different parts of the city that are of a similar distance from the centre. This is a considerable improvement over the density gradients that present only an average situation. Both these factors aid in an attempt to understand the temporal and spatial variations in the urban retail system.

An examination of the spatial relationships of urban consumers and shops provides a basic starting point in any study of retail change. With the aid of the growth zones it is possible to measure such spatial interactions at least on a broad scale, though no attempt at the delimitation of trade areas is possible.

8.3.1 Low order functions

Grocers: At the start of the study period there was a relatively uniform pattern of consumers per grocers shop (Fig. 8.7). The mean value for the city was 697 persons per shop¹ and of the central areas only the 'Old Town' had a higher ratio than this i.e. 896. Beyond this inner zone and with only one exception the area up to the 1881 urban fence was more favourable for the consumer (Fig. 8.7). In the outermost suburbs, which by this data had hardly been developed, the ratio of population per shop was predictably much more variable. In the east of the city (zone J) grocers served on average between 1081 and 1465 persons. The northern suburban extension had the next poorest level of retail provision with the western zone L having the best ratio and one more comparable with the rest of the city. The more specific relationships within these developing suburban areas will be considered in a later section.

Between 1880 and 1900 the number of grocers in the city increased at a rapid rate (Tables 8.3 and 8.4). The decline was so great that in absolute terms the mean number of persons per grocers shop fell from 697 in 1880 to 437 by 1900. The overall geographical relationships between grocers and consumers also changed radically by 1901 (Fig. 8.8). All the areas of the city had improved their levels of retail provision from the consumers point of view. In relative terms the immediate city centre had a greater number of persons per shop than the rest of the city. There had also developed two distinct areas of high grocery

Table 8.3 The number of independent grocers in Hull

Growth zones		1880	1890	1900	1910	1920	1930	1940	1950
'Old Town'	A	11	14	10	8	8	6	4	2
	B	44	40	37	35	24	17	7	1
Inner city	C	27	40	30	22	17	20	9	4
	D	23	38	33	30	24	21	24	15
1881 growth zone	E	26	31	22	27	25	27	14	2
	F	43	21	37	49	37	39	21	14
	G	27	30	42	46	35	38	26	10
	H	9	39	39	28	28	24	25	7
	I	12	28	38	30	24	22	14	4
Outer suburbs	J	4	22	34	52	47	52	34	25
	K	9	13	32	49	42	50	48	33
	L	24	55	67	91	70	74	52	41

Table 8.4 The number of multiple grocers in Hull

Growth zones		1880	1890	1900	1910	1920	1930	1940	1950
'Old Town'	A	1	2	2	2	2	2	2	0
Inner city	B	0	0	2	5	5	8	5	5
	C	0	0	2	2	1	1	1	1
	D	0	0	3	2	6	7	7	7
1881 growth zone	E	0	0	2	2	5	5	1	0
	F	0	0	2	2	2	4	7	6
	G	0	0	1	2	3	3	3	3
	H	0	0	1	2	2	3	1	2
	I	0	0	1	1	2	3	4	3
Outer suburbs	J	0	0	3	6	8	9	11	10
	K	0	0	4	6	12	15	10	8
	L	0	0	3	8	14	16	19	16

shopping provision one of which was located in the 1881 growth zone to the east of the river (zone I) and the other to the north in zone H (Fig. 8.8). In both these areas the total number of grocers increased at a faster rate than the city mean, from 9 to 40 in zone H and from 12 to 39 in zone I. Over the same period their respective populations only increased by 7.9% and 13.8%, thus giving a massive increase in overall retail facilities.

If the eastern city sector is considered as a sample area and all the contiguous growth zones are amalgamated the following picture emerges. The sector's total population increased by 15.5% between 1881 and 1901 while the number of grocers grew by 72.8%.

After 1901 a distinct decline occurred in the number of grocers occupying locations within the central city area although this decline could only be associated with the independents (Table 8.3) since the multiples actually increased their numbers in these inner areas (Table 8.4). Between 1901 and 1921 the three inner growth zones, delimited by the 1823 urban limit, had experienced a 31.3% decline in the number of grocers and if only the independents are considered then the decline in numbers amounts to 36%.

Within the 'Old Town' population had fallen at a much faster rate than shops, with the result that the area had a lower ratio of persons per shop than in 1901 (Fig. 8.9). However, the other two inner suburbs, zones B and C, both witnessed increases in the number of people served by each grocers shop and this figure ranged from 487 to 695. With the exception of zone E the entire area between the 1823 and 1881 urban fences experienced a decline in retail provision with the number of grocers falling by 12%, rising to 18% if only independent grocers are considered. Unlike the central area the decline in shops was not associated with losses of consumers as these zones had increases in population density in all three sectors of the city. The result of

this was a higher ratio of persons per shop (Fig. 8.9). This decline in independents cannot be attributed to a massive increase in competition from multiples either since they accounted for only 11.5% of all grocers in these areas, the lowest proportion in the city.

In the three decades after 1921 the number of grocers located within the central area declined from 57 in 1921 to only 7 by 1951, a fall of 87.7%. This was no doubt in response to an equally dramatic fall in population which declined by 65.7% over the three inner growth zones (A,B and C). The acceleration in the general trend of decline after 1941 can be attributed to the effects of war-time bomb damage which undoubtedly added to the other centrifugal forces that were already in operation. The end result was a lowering of retail provision in the central area and the inner suburbs (Fig. 8.10). Areas of better provision within this general locality, for example zone D, can be attributed to much lower rates of retail decline. Thus, the number of grocers in zone D only fell by 26.6% between 1921 and 1951 compared with over 68% for the rest of the zones within this group (Tables 8.3 and 8.4). To some extent this was because of the effect of multiple grocers whose numbers did not fall and they accounted for a large proportion of shops in zone D.

The overall relationship between all grocers and consumers by the end of the study period 1951 is illustrated in Figure 8.10 which shows that at this date the outer growth zones in all sectors had similar levels of shopping provision, all within one standard deviation below the city mean.

Butchers: As with the grocers this trade presented a relatively uniform distribution of persons per retail outlet in 1881, at least in the inner city areas. In terms of the overall provision butchers had a higher average ratio of population per outlet than the grocers (Fig. 8.11). Within the 1881 urban limits only two zones had higher ratios of

retail provision than the city mean of 2090 persons per shop. These two zones, G and H, were located between areas of good shopping provision and it may be that some form of peripheral effect was in operation where some shops just outside the zones provided a high degree of provision. The three outer suburbs (J,K and L), which had not yet been fully developed, showed great variations in population per shop ratios. It was in the western zone L that the highest ratios were to be found (Fig, 8.11).

In the following decade the number of butchers continued to increase even in the central city area which had already started to lose consumers. By 1900 the number of persons per shop for the city had fallen to 839, showing a considerable improvement in shopping provision. At this date the number of butchers in the 'Old Town' had declined from 11 in 1890 to 6 by 1900. The decline was entirely on the part of the independents since the multiples were still increasing in this area. At the same time the ratio of persons per shop rose, although the figures given do not take into account the effect of the market stall which played an important role in meat retailing. The general pattern of population per shop at this date was one of variability within the inner areas and the fairly uniform pattern of 1880 had by then somewhat disaggregated (Fig. 8.12). Areas of relatively high provision had been developed in zone B where the average number of people per shop was only 625. This zone also contained the highest density of multiple butchers and these no doubt drew upon trade areas outside the immediate growth zone. In the three outermost suburbs the pattern had not changed a great deal from that of 1880 although zones J and L had more variable levels of retail provision with the northern suburb having the lowest ratio (Fig. 8.12).

By 1920 the mean ratio of population per butchers shop had risen considerably from that of 1900 to a value of 1424. This was due to an

overall fall in the number of butchers by 19.8% between 1900 and 1920. In relative terms the multiples suffered greater than the independents since their number fell by 31%, having reached their numerical peak in 1910 (Tables 8.5 and 8.6).

In geographical terms the inner city area (zones A,B and C) experienced a much greater fall in numbers which amounted to almost 56% between 1900 and 1920. This seems quite disproportionate when compared to only a 19.9% fall in the area's population. However, much of the area had a better level of retail provision than the city mean with the exception being the 'Old Town' (Fig. 8.13). The less favourable level of shopping provision in the three outermost suburbs could not however be related to the decline in the number of butchers (Fig. 8.13). In this area the number of butchers increased by over 31% but they did not keep pace with the rapidly rising population that had grown by almost 65%. It can be seen therefore that similar changes in retail provision in different parts of the city were the products of essentially quite different underlying processes.

The relative levels of retail provision continued to decline in the outermost zones so that by 1950 there was an average of 1271 to 1761 persons per butchers shop in these areas (Fig. 8.14). This fall in shopping provision in the outer areas can be attributed to some degree to a fall in shop numbers of 37% between 1920 and 1950. In contrast provision in the central areas rose, compared with the 1920 position, largely because shop numbers declined less rapidly than population (Fig. 8.14).

8.3.2 Footwear retailers

The spatial relationships between consumers and shops in an essentially non-convenience trade type such as footwear is such that no distinct patterns are to be expected. The implications are that most footwear retailers have trade areas far in excess spatially of the constructed

Table 8.5 The number of independent butchers in Hull

Growth zones		1880	1890	1900	1910	1920	1930	1940	1950
'Old Town'	A	10	11	4	3	0	0	2	0
	B	26	26	25	11	10	13	9	6
Inner city	C	18	19	14	15	9	8	12	6
	D	17	21	22	20	12	16	11	3
	E	18	19	14	15	11	13	11	5
	F	20	22	22	17	10	16	19	9
1881 growth zone	G	10	13	20	19	12	15	11	5
	H	4	8	9	11	9	12	11	5
	I	8	7	11	9	9	11	9	3
	J	5	8	16	18	19	25	28	12
Outer suburbs	K	8	9	17	36	32	43	38	18
	L	7	12	29	42	33	43	41	23

Table 8.6 The number of multiple butchers in Hull

Growth zones		1880	1890	1900	1910	1920	1930	1940	1950
'Old Town'	A	0	0	2	4	1	1	1	1
	B	0	5	6	1	1	1	0	0
	C	0	0	2	2	0	1	1	0
Inner city	D	0	2	3	8	3	4	2	2
	E	1	1	3	5	1	1	1	1
	F	0	1	1	7	3	4	1	1
1881	G	0	0	1	3	1	1	0	0
growth zone	H	0	0	2	1	1	1	1	0
	I	1	1	1	2	1	0	0	0
	J	0	0	4	8	3	3	2	2
Outer suburb	K	0	0	2	6	2	2	3	2
	L	0	0	2	7	3	5	5	1

growth zones. This argument would apply especially to the larger establishments that occupied central locations and for this reason the geographical variations in population per shop are not as important a feature as say in the convenience trades previously examined.

In 1880 the average number of persons per footwear shop was 753, with the three central city zones A,B and C having ratios much lower than this. However, there does not appear to be any marked dominance by these central shopping areas at this date. Indeed some of the outer suburbs had fairly good levels of retail provision and zone G had a ratio of 644 persons per shop while zone E possessed the lowest ratio within the city at 238. Obviously at this date the footwear trade was not entirely a central function and retailers located and flourished in the outer areas.

By 1900 the overall ratio of population per shop outlet had grown to 804 with the areas to the west of the river showing a better level of provision. This was not due however to any growth in the number of retailers as in fact they showed an overall decline. Rather it was associated with a more rapid fall in population. In the 'Old Town' 30% of its footwear shops were lost between 1880 and 1900 (Tables 8.7 and 8.8), while population declined by almost 34%. To the east of the river the level of retail provision had fallen from that in 1881 since the growth of retailers had failed to keep pace with that of population. Thus in 1880 there were 840 persons per shop in east Hull whereas by 1900 this figure had risen to 890. Areas of poor retail provision were also to be found in the two growth zones north of the city centre.

In the outermost suburbs which were mainly being developed between 1900 and 1910 footwear retailers reached their peak numbers at these two dates (Tables 8.7 and 8.8). But by 1921 their overall number had declined by almost 40% from that in 1900 and at the same time the population of these areas had continued to increase, thereby giving

Table 8.7 The number of independent footwear retailers in Hull

Growth zones		1880	1890	1900	1910	1920	1930	1940	1950
'Old Town'	A	19	12	12	10	5	5	4	3
	B	59	52	39	20	17	17	11	4
Inner city	C	20	21	13	11	8	4	1	0
	D	17	25	15	10	6	7	2	0
	E	54	40	30	21	11	8	1	1
	F	25	28	25	20	11	7	4	2
1881 growth zone	G	24	16	16	10	8	6	4	1
	H	5	15	11	9	3	3	1	0
	I	6	12	13	8	6	6	1	1
	J	7	10	13	10	9	9	6	2
Outer suburbs	K	9	18	17	23	19	14	8	2
	L	13	28	38	37	9	15	9	4

Table 8.8 The number of multiple footwear retailers in Hull

Growth zones		1880	1890	1900	1910	1920	1930	1940	1950
'Old Town'	A	4	5	4	3	4	7	5	2
	B	7	6	5	5	5	7	7	5
Inner city	C	1	2	2	2	2	2	0	0
	D	0	0	0	2	2	0	1	1
1881 growth zone	E	0	2	2	1	1	2	0	0
	F	0	2	3	4	4	2	2	2
	G	0	1	0	1	1	1	0	0
	H	0	0	0	0	0	0	0	0
	I	0	1	1	2	2	2	2	1
	J	0	0	0	2	2	2	4	3
Outer suburbs	K	0	0	0	0	0	2	3	1
	L	0	0	0	0	2	5	4	5

much higher ratios of population per shop. Indeed by this date the ratio for the city had increased to 1861 persons per shop. There was however, little change in the level of provision offered by the central areas despite a decline in the number of retailers in zones A,B and C by at least 45%. This was far less rapid than the fall in local population over the same twenty year period. The remaining areas, excluding the three outer suburbs, all experienced an increase in the ratio of population per shop, a situation brought about by the fall of 53% in the number of retailers.

During the next three decades the city continued to experience a decline in the number of footwear retailers. In absolute terms the three inner zones witnessed the greatest loss in numbers, by 66% between 1920 and 1950. However, two other factors must be considered here of which the first is that local population had declined equally as rapidly. Secondly, the total capital investment in footwear shops probably increased due to the fact that retailers were making use of the size parameter and shops were increasing in size. By 1950 the ratio of population per retail outlet had increased to 4418 for the entire study area, illustrating the rapid decline in the total number of outlets.

8.4 The Distribution of Multiple and Independent Retailers

In most instances the independent retailers had fully established themselves throughout the city at the time of the arrival of the multiples. It would however be a gross oversimplification to assume a direct relationship between the functional order of the independents and their degree of spatial dispersion. While such an association may have operated in general terms quite notable exceptions could be found. The footwear trade may be classified as one such exception, especially during the period up to 1900 at which time footwear shops were to be found in the outermost suburbs and were active in the

colonization of new urban areas (Wild and Shaw 1974).

The diffusion of both multiples and independents can be examined in relative terms with the aid of the urban growth zones. Measurements again consist of net shop densities, an index more meaningful than total shop counts. The use of net densities gives equal weighting to the newer developing suburbs since only their built-up area receives consideration. It has already been shown that their demand, measured in terms of the number of consumers, was as considerable as that of the central suburbs and, indeed, the often spatially dispersed type of residential development in such areas required more retail facilities since they might have been duplicated spatially. By accepting this notion the pull or attraction of outer areas in their early stages of development becomes necessarily stronger than previously anticipated. The effect of such areas on the new multiple retailers is a further factor that requires consideration.

8.4.1 The food trades

It has already been shown how, in the decades up to 1900, the shops retailing food items had a fairly widespread pattern of location. This was to some extent their response to the movement and expansion of the city's population, a process that increased its momentum in the latter part of the nineteenth century. By 1900, when the multiples arrived in some force, the distribution of independent traders was relatively equal over the city.

In terms of overall shop density then the pattern can be seen in Figure 8.15 which shows the distribution of grocers in 1900. At this date shop densities reached a peak in the 1880 urban growth zone, with the outermost areas having much smaller densities. The complete range of shop densities varied from 0.18 shops per net acre to just over 0.7. The inner areas, especially the 'Old Town', still represented an area of high investment in grocery shops and, indeed, this area had the

highest proportion of multiples with over 16% of its shops being of this type (Fig. 8.15). The proportion of multiples in the other areas was much less and decreased considerably towards the areas of high overall shop densities, areas of obvious competition. This seems to have been reversed in the outer suburbs where the percentage of multiples increased, most notably in the north (zone K). Therefore, whilst the central area proved to be most attractive for the early multiples the outer suburbs also offered suitable sites.

The position in the retail meat trade at this time was similar to that in the grocery sector though shop densities were much more equal over the city (Fig. 8.16). In contrast to the grocers the range of shop densities was much less, varying from just below 0.1 to a maximum of 0.28 per net acre. In the meat trade the percentage of multiples within the innermost zones was much greater than in the grocery sector for in the central area multiples constituted almost a third of all butchers (Fig. 8.16). Their relative distribution in relation to the independents extended into the suburbs on two main fronts, to the east of the river and in larger numbers to the north of the city centre (Fig. 8.16). The percentage of multiples declined most rapidly in the west of the city especially at a distance of one mile from the peak land value.

It can be seen that the pace and direction of the dispersal of multiples even within the low order functions was by no means uniform.

Twenty years later the basic distribution of grocers had not changed to any large extent though overall densities had been reduced (Fig. 8.17). The most noticeable feature was the increase in the proportion of multiples in certain districts such as the central areas, especially zones B, E and F to the west of the river, where the percentage of multiples was in the order of 20%, compared with values of 7% in 1900. The other zones that had major increases in the proportion of multiples

were the three main outer suburbs where values ranged from 15% in the east to over 20% in the north, zone K (Fig. 8.17). In 1921 the butchers showed a much greater variation in the overall shop densities that ranged from 0.02 to just over 0.2 shops per net acre (Fig. 8.18). Although the multiples obtained a complete dominance of fixed shop retailing in the 'Old Town' by 1920 total shop numbers had fallen dramatically. It must be remembered however, that meat retailing within this area was still important through the market stall.

The other inner zones had all experienced a decline in the proportion of multiples and they reached their peak numbers in 1910. In relative terms the outer suburbs all had similar percentages of multiple retailers though the total number of shops had not greatly increased. In general, shop densities declined in all zones from the centre to the 1881 urban limits between 1900 and 1920. It appears that multiples declined less than independents in some areas, notably zones D, F and G and thereby increased their percentage share of the market (Fig. 8.18).

By 1950 the central areas of the city had already lost a good number of its food retailers. In the grocery trade this decline was selective both geographically and in terms of business types. The 'Old Town', although still maintaining a fairly healthy density of retailers, had lost most of its multiple shop premises. These had come to dominate the next growth zone (B) which had suffered a severe decline in shop densities per acre from 0.23 in 1900 to 0.03 in 1950. It may be that the independents were forced out of this area because of rising land values and increased competition from the multiples. This was, after all, the expanding section of Hull's C.B.D. (Newton 1971). Beyond the immediate inner city areas the proportion of multiples increased in all suburban areas, a feature most noticeable in the zones to the east of the river Hull (Fig. 8.19). For example, in zone J the proportion of multiples increased from 15% in 1920 to well over 33% by 1950.

In the meat trade by 1950 shop densities had fallen in all parts of the city, with the single exception of the 'Old Town' (Fig. 8.20). The multiple retailers had become concentrated into certain growth zones that formed a recognizable geographical pattern and this was composed of the 1851 growth zones and the 1911 growth zones. These areas together with the 'Old Town' formed three bands of multiple shop development, interspersed by areas containing only independent butchers (Fig. 8.20).

8.4.2 Footwear

This trade provides some distinctive contrasts to the retail categories previously examined. In 1900 there was a relatively even distribution of shops in terms of density per net acre although there was some bias towards the central areas of the city and shop densities reached their peak in the inner three growth zones (Fig. 8.21). The variations between the city centre and the developing outer suburbs were not however that great and, for example, zone A had 0.35 shops per acre while zone L had slightly less at 0.34 (Fig. 8.21). Although the 'Old Town' had the highest proportion of multiples other zones had already been colonized by such retailers. Three main wedges of multiple shop development can be identified by 1900 and these ran to the east, immediately due north of the 'Old Town' and to the west of the centre (Fig. 8.21). In these areas the percentage of multiples to total shops varied from 13% in zone C to 6% in zone E.

The following decades witnessed the initiation of strong centripetal forces in this trade so that by 1920 shop densities had declined considerably in the outer suburbs (Fig. 8.22). This however, did not deter the new multiples from setting up branch shops in these suburban areas, a feature absent only in the northern zone. In all the other zones the proportion of multiple retailers continued to increase with the 'Old Town' having the highest ratio, around 44% (Fig. 8.22). This

was associated with a decline in shop density as the number of retailers fell from 16 in 1900 to 9 by 1920. Indeed, all parts of the city experienced a decline in the overall net density of footwear shops between these two dates.

This decline in densities was a feature that was to become more pronounced in the decades up to and including 1950. By this time the shop densities in the outer suburbs had fallen from an average, for the three zones, of 0.032 shops per acre in 1920 to only 0.016 in 1950. Other suburban areas had experienced a far greater decline than this and some lost all their footwear shops, e.g. Zone H (Fig. 8.23).

The centripetal forces had by 1950 become fully operative and shop densities fell rapidly beyond the immediate city centre (Fig. 8.23). The only areas to maintain a relatively high shop density were the two most central zones, although these had also experienced a decline from an average of 0.18 shops per acre in 1920 to 0.08 by 1950. The proportion of multiples had however continued to increase in most areas and even the outer suburbs exhibited this trend. Multiples had also come to dominate the central zones and, for example, zone B had 69% of its footwear shops operated by multiples in 1950.

8.5 The Factors Affecting Retail Distribution

At present only a description of the relationship between population and retailers has been presented and no attempt made to assess the various factors affecting the distribution of shops. Such factors can be subdivided into two main types of locational differentials which are strongly associated.

The first set of differentials consists of those variables that control the location of retailers with respect to three important features that make up their environment. The first of these concerns the spatial variation in population densities, since if all other factors remained equal increases in population density in any given area of the

city should attract more retailers. The effect of high population densities has also been seen by Ratcliff (1949) as demanding fewer shops and the line of reasoning here is that concentrated populations require less shops because well-located outlets in a compact settlement will be convenient to a larger number of consumers. This argument however, completely ignores the question of competition and the increased profits that these well-sited firms make will soon induce other competitors to move into the area in the hope of sharing such advantages. Given this profit motive the end result is more likely to be an increase in retail activity when population densities increase. Obviously, the effect of this variable will vary from trade to trade.

In this study population densities have already been derived and plotted in terms of the urban growth zones. Ideally this variable should include some measure of households and their purchasing power since these represent the important factors but this is prevented here due to the unavailability of suitable data. The importance of these factors has already been stressed in the majority of American studies on this topic and, for example, Horton (1968) notes that high order goods attract larger numbers of consumers when sited in high income areas rather than low ones. This merely restates Berry's (1963) original work though he went further and stated that increases in consumer income permit both commodity and locational retail specialization. While this operates for a number of retail types certain important exceptions can be found such as the multiples, whose degree of specialization was in response to limited income conditions chiefly in working-class sections of the city. On a large scale it has already been shown how fluctuations in money income affect the growth of certain multiple types (Chapter 3).

The second variable within this set is associated with changes in population levels through time. This is represented by the percentage population change over ten year periods for each growth zone. It was

considered to be a reasonable measure of changes in consumer demand in the absence of any socio-economic factors. However, two problems do raise doubts about the total validity of this variable and these are levels of consumer mobility and the question of time lag operations. Variations in urban consumer mobility have already been mentioned but no such quantitative variable could be derived for this study. This is important if the retail unit is located close to a major shopping centre since in the case of high order trades and commodity specializing multiples this will considerably affect the trade area. Here it can be noted that a situation could have developed in which a growth zone experienced a decline in indigenous population yet retailers remained because they were located in a major shopping complex that attracted consumers from outside this zone. The identification of lags between population decline and a corresponding response by retailers is difficult to determine. In this study the selection of a time period over which population change could be measured was determined by the availability of census data and this precluded the use of a time scale that was less than a decade and made time lag identification that much more difficult.

A final environmental variable is the mean distance of each growth zone from the city centre and this is represented here by the peak land value point. This gives some measure of the importance of the central area to specific trades, given the other factors that were operating. It could be particularly useful in monitoring the progress of multiple retailers that were initially commodity specializing functions.

The second major set of variables are those that effectively attempt to measure the degree of retail competition. Here the emphasis is placed on the competition generated between different business types, between multiples and independents. Another reason for distinguishing between

these two organisational types is that within each trade they demanded different urban locations and therefore some attempt can be made to assess these differences.

8.5.1 Empirical analysis

The relationship between the above variables and the location of multiple and independent retailers within specific growth zones was tested at every decade from 1880 to 1950. The analysis was conducted with the aid of a multiple linear regression model and this was constructed for both multiples and independents in each of the four major trades studied. It was used in two ways, first, to assign some explanatory power to the considered variables and secondly, to monitor the relative importance of each individual variable through time. These two aspects are related since a lowering of overall explanation will also be a reflection of the decline in importance of specific variables.

The basic model may be stated as in equation 8.5;

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e \quad (8.5)$$

where X_1 = net population density per acre for each growth zone

X_2 = percentage population change over a ten year period
for each growth zone

X_3 = mean distance of each zone from the peak land value

X_4 = net density of independents or multiples per acre
in each zone

$a, b_1, \dots, b_4$ are empirically derived constants calculated from the multiple regression procedure and e is the error term.

The application of this linear regression model to the different organisational and trade types yields some interesting results that vary considerably over time. The expected powers of explanation are on average very low but this can be attributed to the absence of any

socio-economic variables.

8.5.2 Independent retailers

An examination of the explanation of this model for independent retailers shows a distinct variation over time for all the trades studied. This can best be appreciated by considering changes in the multiple correlation coefficient which expresses the relationship between the dependent and independent variables.

The first notable feature concerns the very low degree of explanation offered by the model for the decade 1880 to 1890. The multiple correlation coefficients were all insignificant and the total variance explained ranged from 4% for grocers to just under 7% for butchers (Table 8.9). At this date there were insufficient multiples in all trades to warrant their inclusion in the regression equation which contained only the variables X_1 , X_2 and X_3 . To suggest reasons for the low explanation is difficult especially when the relationship between population and shop density was the lowest zero order correlation coefficient in the case of the grocers. At a time of only limited levels of consumer mobility it would be reasonable to expect a stronger link between these two variables and it may be possible that the use of net densities had some influence as many of the outer zones even at this early date had high population densities in net terms though only small total populations. In most cases the retailers failed to respond to this situation and most of the outer zones had quite high negative residuals thus indicating an under-provision of shops. However, perhaps the most important factor was the failure of these retail types to respond fully to the rapid changes in the spatial demand for goods and services as suburban growth intensified. It must also be pointed out that socio-economic differences played a major role at this time and, for example, many grocers dealt solely with the middle and upper-class end of the market.

By the following decade, 1890 to 1900, all trades showed a considerable increase in the multiple correlation coefficients (Table 8.9). At this date there was still a general degree of comparability in terms of the level of explanation offered by the regression model. For footwear retailers a further variable had been added to the equation which was designed to measure the competitive influence of multiple retailers. Their numbers had not increased sufficiently at this time to warrant inclusion in the other trades. The highest level of explanation was marginally in the meat sector giving an R^2 (variance) value of almost 33% but this is still however, a very low level of explanation considering the included variables and it was not significant at the 5% level.

Between 1900 and 1910 the levels of explanation began to diversify to some degree (Table 8.9). In the case of butchers and footwear retailers the model continued to offer a substantial increase in explanation, increasing for the former trade to over 63% (R^2). Surprisingly however, explanation in the grocery sector showed a marked fall and this was despite the inclusion of a further variable measuring the effect of the location of multiple grocers (Table 8.9).

From 1910 to 1920 the model was able to explain away over 72% of the variance in the case of grocers which represented a substantial increase from the previous decade. This however was not maintained for butchers and footwear retailers, both of whom had a much lower coefficient of correlation (Table 8.9). Included at this date for the first time was the service trade of dyeing and cleaning which, considering its locational requirements, had around 57% of variance explained away by the multiple regression model.

Over the next decade the levels of explanation varied little in the case of butchers though grocers suffered a loss of explanation by around 18%. Indeed this was to set the tone of overall decline in the explanatory

Table 8.9 Multiple correlation coefficients for independent traders
1880 to 1950

Date	Grocers		Butchers		Footwear		Dyers/cleaners	
	R	R ²	R	R ²	R	R ²	R	R ²
1880-1890	0.203	0.041	0.264	0.069	0.239	0.057		
1890-1900	0.521	0.271	0.573	0.328	0.514	0.264		
1900-1910	0.465	0.216	0.793*	0.628	0.690 [♯]	0.476	0.748*	
1910-1920	0.851*	0.724	0.715*	0.511	0.502	0.252	0.753*	0.567
1920-1930	0.733*	0.537	0.760*	0.577	0.618	0.381	0.760*	0.577
1930-1940	0.553	0.305	0.572	0.327	0.471	0.221	0.741*	0.549
1940-1950	0.467	0.101	0.561	0.314	0.482	0.232	0.792*	0.627

* significant at 2.5% level

[♯] significant at 5% level

In the text R² is given as a percentage of the total variance

powers of the model for independent retail firms. In all but the service category multiple correlation coefficients were much lower and the values fell below the 5% level of significance (Table 8.9).

The variation in the amount of variance explained away by the regression model is a reflection of the rise and decline in importance of specific variables within the equation. In this context it would be of value to examine such changes in individual components and to assess their relative values for each of the specific trades. The most efficient way of investigating these changes in independent variables is through the use of partial correlation coefficients because they enable a more complex situation to be assessed and therefore are selected in preference to zero order correlation coefficients. It may however, be necessary from time to time to refer back to the original zero order correlation coefficients as aids in the final analysis. Coefficients of partial correlation measure the correlation between the dependent factor, in this case the density of shops, and each of the several independent variables while eliminating any linear tendency of the remaining independent variables to obscure the relationship.

As with coefficients of multiple correlation it is possible to assess the amount of explanation that each individual independent variable contributes to the overall coefficient of determination (R^2). Thus, the coefficient of partial correlation may be defined as a measure of the extent to which that part of the variation in the dependent variable, which was not explained by the other independent factors, can be explained by the addition of a new variable. Here attention will be directed towards measuring the importance of the independent variables over time.

From the lists of partial correlation coefficients for independent grocers (Table 8.10), it can be seen that population density played

Table 8.10 Variations in partial correlation coefficients for
independent grocers, 1880 to 1950

	1880-90	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
X_1	-0.15	-0.05	0.68	0.86	0.69	0.66	0.55
X_2	-0.42	0.68	-0.29	0.85	-0.02	-0.23	-0.48
X_3	0.28	-0.22	0.53	-0.38	-0.10	-0.06	-0.02
X_4	no data		0.12	0.20	-0.12	0.16	0.15

Table 8.11 Variations in partial correlation coefficients for
independent butchers, 1880 to 1950

	1880-90	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
X_1	0.33	0.25	0.88	0.79	0.74	0.58	0.51
X_2	0.15	0.57	-0.64	0.60	0.16	-0.26	-0.22
X_3	-0.29	-0.74	-0.54	-0.17	0.22	-0.10	-0.18
X_4	no data		-0.03	0.12	-0.41	-0.39	-0.41

X_1 = net population density per acre for each zone

X_2 = percentage population change over ten years for each zone

X_3 = mean distance of each zone from peak land value

X_4 = net density of multiples per acre in each zone

only a minor role in determining overall shop distribution up to 1900. Indeed within the overall model there was a small negative relationship between population density and the density of grocers. The low value of the distance variable (X_3), adds weight to the view that most grocers still had a high degree of centrality (Table 8.10). While the zero order correlation between distance from the peak land value and the distribution of grocers is positive for the period 1890 to 1900 with a value of 0.26 the partial correlation is negative, the latter analysing the relationship after controlling the variables X_1 and X_2 . After 1900 the population density becomes the predominant variable affecting the distribution of independent grocers (Table 8.10). At no period in time did the location of multiple grocery outlets become a major factor in repelling the location of independent shops. It may be however, that some of the locational segregation already described was obscured by the use of the fairly large growth zones as units within which to measure shop distribution, since most of the spatial competition occurred within these areas, rather than between them, with the possible exception of the central city zones.

The closest approximation between population and shops was in the period 1910 to 1920 after which time the partial correlation coefficients declined towards 1950 (Table 8.10), and this probably reflects the level of consumer mobility.

The independent butchers provide but few contrasts to the situation just outlined and once again the attraction of population becomes most strongly evident after 1900 (Table 8.11). In this trade high shop density is associated rather more with areas of greatest population change and, with the other variables held constant, negatively related to distance from the city centre. In relative terms there was a greater degree of influence by multiple traders especially after 1920 when there appears to be some element of repulsion from areas colonized by

multiples (Table 8.11). As with grocers the influence of distance decreased with time and was at its strongest between 1890 and 1900.

In the footwear trade the situation is somewhat more complicated for the independent variables assume different levels of importance over relatively short periods of time (Table 8.12). From 1880 to 1930 the influence of population density is extremely variable, assuming a relatively important role between 1900 and 1930 as footwear retailers moved into the growing suburbs. After 1930 its importance declined markedly and this, together with a negative influence of distance from the peak land value, indicated a centripetal force controlling overall locations. One feature of interest is the strong positive relationship between the distribution of multiples and independent shops. This suggests that they were attracted to similar areas of the city but previous evidence indicates that they occupied different locations within these broad urban growth zones.

The independent dyers and cleaners had quite distinct temporal variations in partial correlation coefficients as Table 8.13 illustrates. There was always a negative relationship between shop density and net population density and this strengthened through time reaching a peak in the final decade. In contrast changes in population (X_2) never became significant and its variations from a positive to a negative correlation over time reflect the movement of population. Shop density was significantly related to the density of multiples at every decade and, although operating along different lines, they were attracted to similar areas.

8.5.3 Multiple retailers

The same regression model was applied to the distribution of multiple retailers with the dependent variable (Y) being the net density of multiples in each growth zone.

The earliest group to locate in Hull in any great numbers were the

Table 8.12 Variations in partial correlation coefficients for
independent footwear retailers, 1880 to 1950

	1880-90	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
X_1	0.32	-0.13	0.73	0.44	0.58	-0.09	-0.08
X_2	0.15	0.61	-0.34	-0.02	0.48	-0.38	-0.39
X_3	-0.27	-0.04	0.31	-0.16	-0.55	0.15	0.18
X_4	no data		0.42	0.32	0.49	0.39	0.41

Table 8.13 Variations in partial correlation coefficients for
independent dyers and cleaners, 1900 to 1950

	1900-10	1910-20	1920-30	1930-40	1940-50
X_1	-0.08	-0.14	-0.23	-0.45	-0.66
X_2	-0.20	-0.21	-0.22	0.18	0.24
X_3	0.30	0.31	0.30	0.25	0.22
X_4	0.83	0.84	0.81	0.83	0.87

X_1 = net population density per acre for each zone

X_2 = percentage population change over ten years for each zone

X_3 = mean distance of each zone from peak land value

X_4 = net density of multiples per acre in each zone

multiple footwear retailers who had effectively colonized certain areas by 1900. In terms of total variance explained the regression model seems best fitted to the footwear trade as the coefficients of multiple correlation remained fairly steady above the 0.6 level except for the period from 1900 to 1910 (Table 8.14). The level of variance accounted for by the model ranged from a low of 41% to a maximum of almost 61%.

The explanatory value of this model when applied to the other multiple retailers was, however, considerably less. By far the lowest levels of explained variance were to be found in the grocery sector in which they rapidly declined from an R value of 0.45 between 1900 and 1910 to one as low as 0.14 in the final decade (Table 8.14). A similar decline occurred in the meat trade though the model seems to have had a slightly better fit in the earlier periods of study. The situation with regard to the dyers and cleaners is one of total variability for no clear trend is discernible and the amounts of variance accounted for range from significantly high values of almost 65% to ones as low as 6% (Table 8.14). In general it appears that the regression model has a rather poor fit for the multiple retailers with a great degree of variance being unaccounted for.

An examination of the partial correlations for the multiples shows that in their initial period of entry all the trade types had some measure of centrality. This is most pronounced for grocers and dyers and cleaners, both of whom have high negative correlations with distance from the city centre (variable X_3 in Tables 8.15 and 8.18). Although butchers and footwear retailers had lower correlations with the distance variable in their early stages the values did increase in the decade 1900-1910 (Tables 8.16 and 8.17). In the latter trade this was to stay at a high level until after 1920 when some decentralization of shops appears to have occurred. At this same date multiple grocers

Table 8.14 Multiple correlation coefficients for multiple retailers
1890 to 1950

Date	Grocers		Butchers		Footwear		Dyers/cleaners	
	R	R ²	R	R ²	R	R ²	R	R ²
1890-1900	no data		0.48	0.23	0.64 ϕ	0.40	no data	
1900-1910	0.45	0.20	0.46	0.21	0.78*	0.60	no data	
1910-1920	0.37	0.13	0.41	0.16	0.67 ϕ	0.44	0.81*	0.65
1920-1930	0.22	0.04	0.37	0.13	0.64 ϕ	0.40	0.25	0.06
1930-1940	0.23	0.05	0.28	0.07	0.67 ϕ	0.44	0.52	0.27
1940-1950	0.14	0.01	0.21	0.04	0.64 ϕ	0.40	0.81*	0.65

* significant at the 2.5% level

~~ϕ~~ significant at the 5% level

In the text R² is given as a percentage of the total variance

Table 8.15 Variations in partial correlation coefficients for
multiple grocers, 1900 to 1950

	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
x_1		-0.14	-0.30	-0.06	-0.19	0.10
x_2		-0.02	-0.21	-0.40	-0.40	0.07
x_3		-0.47	-0.30	0.29	0.40	-0.09
x_4		0.12	0.20	-0.12	0.16	0.15

Table 8.16 Variations in partial correlation coefficients for
multiple butchers, 1890 to 1950

x_1	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
x_1	-0.26	-0.32	-0.32	-0.22	-0.25	0.08
x_2	-0.08	-0.10	-0.20	-0.41	-0.43	0.10
x_3	-0.20	-0.38	-0.52	-0.31	-0.23	-0.17
x_4	0.06	0.16	0.15	0.01	0.10	0.18

x_1 = net population density per acre for each zone

x_2 = percentage population change over ten years for each zone

x_3 = mean distance of each zone from peak land value

x_4 = net density of independents per acre in each zone

Table 8.17 Variations in partial correlation coefficients for
multiple footwear retailers, 1890 to 1950

	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
x_1	-0.02	-0.35	-0.18	-0.39	-0.49	-0.40
x_2	-0.60	-0.22	0.52	-0.42	-0.03	-0.01
x_3	-0.16	-0.68	-0.68	-0.03	-0.13	-0.31
x_4	0.65	0.42	0.32	0.49	0.40	0.42

Table 8.18 Variations in partial correlation coefficients for
multiple dyers and cleaners, 1910 to 1950

	1890-1900	1900-10	1910-20	1920-30	1930-40	1940-50
x_1			0.34	-0.03	-0.32	-0.35
x_2			-0.38	-0.01	-0.16	-0.40
x_3			-0.52	0.20	0.23	0.42
x_4			0.80	0.70	0.73	0.85

x_1 = net population density per acre for each zone

x_2 = percentage population change over ten years in each zone

x_3 = mean distance of each zone from peak land value

x_4 = net density of independents per acre in each zone

also appear to decentralize and the correlation with distance becomes a positive one (Table 8.15). The same observations can be made concerning dyers and cleaners with the partial correlation coefficient between shop density and distance increasing from 0.20 in 1920 to 0.42 between 1940 and 1950 (Table 8.18).

Given that the other variables were held constant then all of the trades show low negative relationships with population density. It seems that as a general locational force closeness to consumers was not demanded by the multiple retailers. Similarly, they were not associated with areas of high population change with many only colonizing the outer suburbs when population levels had stabilized. Finally, it would also seem that areas of high local shop densities did not usually repel multiples since in all trades where this variable was highly correlated it was so in a positive manner. Therefore, given the low levels of explanation offered by the multiple regression model it seems that the multiple retailers were not greatly affected by changes in the urban environment or at least not as much as the independents.

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Chapter 9

Urban Retail Change From 1880 to 1950

In this chapter two main features of retail change will be examined. The first concerns the process of retail decentralization and the second the spatial features of market area dynamics. An attempt will be made to assess changes in shop ownership and to use the information to provide indicators of urban retail decline or expansion. Reference will be made to an ecological model in an attempt to determine the factors affecting the various birth and death processes of shop ownership.

9.1 The Decentralization of Retail Activities

The process of retail decentralization is difficult to define within the context of the present study, concerned as it is with long-term trends. Decentralization was recognized as operating by urban economists as early as the 1920's and 30's, with the suburbanization of retail facilities causing some concern (Ford 1935). The bulk of geographical literature however, has been concerned with the loss of commercial activities from central areas during recent times, mainly after 1950. In contrast, it has already been shown that in British cities a significant redistribution of retail activity from city centres was already underway in the nineteenth century (Wild and Shaw 1974).

Many of the manifestations of urban change that are classified as decentralization have been seen by Ratcliff (1965) as being wrongly associated with such a process, in the strictest sense. By and large such centrifugal movements of activities are responses to the basic growth occurring where land is best available, usually at the edge of the city. In terms of retailing this has often been a response to the movement of population, and in many instances total commercial

— investment continued to increase or be maintained in the central area.

Therefore, 'literal decentralization' as defined by Ratcliff can only be said to have occurred if an overall decline in activities and investment has taken place. In this study the term decentralization is used in a broader sense than that defined by Ratcliff.

Ratcliff went on to list a number of forces that produced such a decentralization process. Added to these may be the ones more recently identified by Kivell (1971) for whilst his study was carried out after 1950, many aspects of its framework can be usefully extended to other time periods. He suggests that there are five interacting forces producing retail decentralization, which are:-

1. The decentralization of population
2. Increased personal mobility
3. Unsuitable city centres
4. The availability of land for commercial use
5. Institutional factors

The basic relationship between retailers and population has already been examined and was seen to exert a great influence over the movement of the food trades to the suburbs (Chapter 8). Kivell also discusses a further facet of this process, first pointed out by Berry, the effect on shop movements of spatial social selectivity. The identification of such a mechanism in this study is extremely difficult and it may not have been that important before 1950 for two reasons. First, much of the decentralization of population in Hull before the Second World War was associated with the expansion of working-class suburbs and second, these working-class areas appear to have had the greatest impact on the retailing system (Chapter 3).

The movement of both population and shops is closely dependent on the current transport system, a feature that has been given greater emphasis by some geographers. For example, Sibley (1973) suggests that the retail decentralization process is not necessarily a fundamental

aspect of urban growth, but is more particularly associated with cities having a heavy dependence on private transport. This would imply that decentralization came mainly with the advent of the car but such processes did not operate only in the 1930's but as early as the latter half of the nineteenth century, in an era when public transport was dominant.

The availability of land, covers not only the actual amount of space available in any area, but also its cost. The congestion of central areas is the product of the heavy demand for sites and often manifests itself in very high property values, the effect of which may be to force out certain activities that cannot afford to pay such high rents. This type of decentralization, which is partly the product of centripetal forces, may be observed during the study period and is a continuing process of urban dynamics. Ratcliff sees this as a normal product of urban growth, brought about by a constant effort by both the consumer and the retailer to minimize the costs of spatial friction. Sibley (1973) has identified the decentralization process operating on low order retailers and presented distance decay curves for such shops. These show for grocers the development of a density crater in the city centre around 1920, which intensified rapidly up to 1950.

9.1.1 Decentralization of retail activities in Hull

The suburban growth of Hull up to 1950 occurred in a number of distinct phases, largely in response to increases in the city's population. Some of the effects of the suburbanization of consumers on retail location have already been mentioned in the previous chapter, but further observations can be made. There are two main features that are important of which the first concerns the timing of this decentralization of retail activities, while the second is associated with the variations between different trades.

Little has been known hitherto about the timing of such movements of

retailers from the city centre. Past researchers seem to point to a major dispersal of shops occurring around 1920. Ford (1935) put forward a few untested observations along such lines, while more recent work by Sibley identifies the formation of quasi-diffusion waves of shop dispersal. The latter author seems to suggest that the great bulk of retail decentralization took place after 1920. However, work on nineteenth century cities points to much earlier beginnings of such suburbanization processes and it therefore calls for further attention.

The second aspect relates to the timing of the decentralization process for different retail types. It is suggested that multiples and independent traders had quite different rates of movement and different population thresholds at which such mechanisms were set in motion.

In 1881 Hull's population was approximately 162,000 and in the next decade it was to exceed the 200,000 mark. During this time the amount of food retailing in the city centre entered a phase of relative decline. In the grocery sector, as early as 1880, the city centre only accounted for 15% of all the city's grocers and the bulk of activity, as measured by the number of retail outlets, was within a half to one mile of the city centre. This area accounted for almost 60% of all grocers and beyond the distance of one mile the proportion of shops fell off rapidly to below the 25% level (Fig. 9.1).

By 1900 the proportion of grocers locating in the city centre had fallen to only 7% and the number in the inner suburbs ($\frac{1}{2}$ -1 mile from the centre) had also fallen to 55%, as shops followed population into the growing suburbs. The critical change in such distributions came after 1910 and marked the onset of further suburbanization. At this date the city had a population well over the 275,000 mark and a new phase of growth was occurring. This is clearly reflected in the decentralization of grocers since the proportion in the centre continued

to decline and the majority of shops located in the area between one and one and a half miles from the centre (Fig. 9.1). The relative decline of the city centre intensified after 1910 and reached its lowest level in 1940. In this case centrifugal tendencies were accelerated by the effects of war-time bombing on the city centre.

The situation in the meat trade follows a similar pattern to that of the grocers, with the main shift in emphasis from the inner areas to the outer suburbs coming after 1910. However, the transition was much more gradual, with shops being more equally distributed over the city (Fig. 9.2). The decline of the city centre was also slower in this trade and by 1880 it still accounted for 23% of butchers shops compared with only 15% of grocers. By 1950 its share of the city's butchers fell below the 10% level although the market place still accounted for a large share of the distribution. In general, the movement of the butchers towards the outer suburbs was much slower than that of the grocers (Fig. 9.2)

The overall relationship between city size, as measured by population, and the decentralization of food retailers can be seen in Table 9.1. This again emphasizes the distinctive break that occurred in 1910 when the city's population had surpassed the quarter of a million mark. This may be suggestive of a critical population threshold at which retail decentralization rapidly increases, however, there is more likely to be a series of thresholds that operate for different retail types. Another significant feature is that as early as 1880 retail decentralization of the food trades was already very active thus, retail suburbanization is not merely a product of an environment dominated by private transport as centrifugal processes were well under way before the coming of the motor car.

The decentralization of non-food retailers, as represented here by footwear shops, provides a less clear situation. In the nineteenth century shoe shops tended to be small affairs and because of more

**Table 9.1 The relationship between population and the percentage
of all food retailers in the city centre for Hull**

Date	Population *	Percentage of retailers
1880	162,194	26%
1890	200,044	21%
1900	240,259	16%
1910	277,991	9.8%
1920	287,150	7.0%
1930	313,649	6.0%
1950	299,105	4.9%

*** Population is taken to the nearest census**

frequent demand followed the population out of the city centre (Chapter 4). By 1880 the city centre only accounted for 29% of the city's footwear retailers, and the greatest proportion were located between half and one mile from the centre. The decline of central locations continued right up to 1910, at which time the city centre had only 14% of all footwear shops. Suburbanization had increased and two areas between a half and one mile, and one to one and a half miles from the centre contained the bulk of the shops. However, by 1920 the situation in the city centre had started to stabilize and the relative decline in shops was halted. In the following decade the proportion of footwear shops in the central area increased to 21% while in the outer suburbs the percentage fell from 15 to 11%. This process continued and by 1940 the outer areas accounted for only 8% of the shops, while the proportion in the city centre increased to 27%. By this date two areas of concentration could be seen, one in the city centre and the other at some distance from the central area, this latter representing the development of established suburban shopping centres at a distance of between one and one and a half miles from the centre.

In this non-food trade, decentralization did occur at an early date, but operated only up to 1920, after which time there appears to be some indication of the operation of a centralization force. It seems unlikely that this is related to city size, but rather to changes in the operating characteristics of footwear retailers and in the nature of consumer demand.

The above observations have all been made in connection with the movement of independent retail organisations. It still remains to test the hypothesis that multiples had different rates of decentralization to those of the independents within the same trade. The major feature of the multiples was the rapid manner in which their branch shops colonized suburban areas.

In the grocery sector the early dominance of the central area was quick to decline and by 1910 the largest proportion of multiple grocers were in the zone one to one and a half miles from the centre. At the same time however, the percentage of multiple grocers in the city centre did not decline as rapidly as that of the independents. For example, in 1910 only 6% of independent grocers were located within the central area compared with just over 15% of the multiples. Even by 1940 the latter group of shops still had 10% of their establishments in the city centre, while the independents had only 2%.

The branch shops of the multiple meat organisations were slower in colonizing the outer suburbs and by 1930 the largest proportion of these shops were still in a zone between a half and one mile from the centre. This trade also has some elements of urban centralization for in 1890 the city centre accounted for 11% of all multiple butchers and this figure was to rise to over 21% by 1900. However, decentralization took place rapidly after this date and by 1930 the central area had only 5% of the city's multiple meat retailers.

In general, it seems that the multiples were much quicker at colonizing the outer suburbs when compared with their counterparts run by independents. The majority of their branch shops were located at a distance of between one and one and a half miles from the city centre as for example in 1910 when this area accounted for 39% of independent butchers and over 47% of multiples.

In the non-food trades the multiples had only low rates of decentralization, as characterized by the situation in the footwear trade. At no time did the proportion of multiple footwear retailers in the city centre fall below the 30% mark. Surprisingly however, branch shops of these multiples did penetrate the more distant suburbs so that by 1940 the area between one and a half and two miles from the centre accounted for 25% of the shops.

In conclusion it can be stated that retail decentralization in its widest sense, was already taking place by 1880, but that much of the suburbanization of facilities occurred with the city expansion after 1910. It must also be pointed out that there is no evidence to suggest that the overall importance of the central area was declining. Selective decline in food retailing was more than compensated for by the growth of other trades and overall investment in retailing was maintained. Indeed, the multiples continued to have a strong hold over central sites and became the major outlets of food products in the city centre. In reality there were really two main waves of retail dispersal, an early one associated with the independently-owned shops and a slightly later wave of multiple firms, opening branch shops in the more distant suburbs.

9.2 The Process of Retail Change Within Hull

Changes in the geographical distribution of shops can be brought about in three main ways;

1. The closure of establishments
2. Investments in new shop sites and the creation of new retail businesses

3. The movement of a business from one site to another

A study of such processes can be extended to consider both the loss of shop premises and the turnover of retail businesses. In the analysis of retail area dynamics the definitions developed in Chapter 6 will be used to measure such changes.

9.2.1 Net shop growth

The difference between shop closures and the creation of new establishments obviously measures the growth or decline of the retailing system. If such indices are calculated for intra-urban areas they provide a basic measure of spatial change. In this instance the growth zones have been amalgamated into broader areas that represent distinctive urban regions in terms of their development characteristics. The 'Old Town'

and the inner city represent the main retailing core and, in west Hull, are synonymous with the C.B.D. while the inner, middle and outer suburbs are based respectively on the 1851, 1881 and 1911 urban growth zones (see Chapter 5 for definitions).

An examination of the net changes in the number of shops illustrates the differential growth of commercial activity over the city. In the decade after 1880 the food trades were still expanding their numbers within the inner areas of the city with the 'Old Town' and the inner city having together a net increase of eleven grocers and butchers (Table 9.2). In the inner suburbs the number of shops also showed a net increase of twenty-three establishments, but by far the greatest rates of net growth were to be found in the middle suburbs, the area up to the 1880 urban fence (Table 9.2). It is also noticeable that the outermost suburbs, as yet undeveloped, had large increases in the number of their food retailers.

In contrast, both the footwear and the dyeing and cleaning trades showed net losses in the central area and inner suburbs. In the latter trade net losses were recorded in all the areas and it would seem that there was no geographical pattern, rather that there was a general decline in the trade that affected all the areas in a similar manner. The net losses and gains did show some spatial variation in the footwear sector with the middle and outer suburbs having increases. That the largest gain should be in the outer area that was not fully urbanized reflects the pioneering nature of this trade.

By the following decade, 1890 to 1900, all four trades showed net losses within both the inner city and the inner suburbs. Together, in this area, the grocers and butchers had a net loss of forty-two shops. Whether this marks the real shift of the food trades into the suburbs is not clear, but it certainly was the start of an absolute decline in city centre food retailing. For the first time shop losses were

Table 9.2 Net gains and losses of retailers, by city areas, for
Hull between 1880 and 1890

Area	Grocers	Butchers	Footwear	Dyers and cleaners
Old Town	+5	+1	-6	-1
Inner city	+5	0	-6	-2
Inner suburbs	+17	+6	-9	-3
Middle suburbs	+65	+12	+6	-2
Outer suburbs	+53	+11	+28	no shops

not being replaced by new establishments and in absolute terms the city centre was losing certain parts of its total retail structure. At the same time the middle and outer suburbs increased their number of grocers and butchers by one hundred and thirty-five shops.

At the turn of the century the net decline of food trades in central areas continued for independent retailers. Losses in the inner city increased and only the outer suburbs showed a significant net growth in numbers, for example grocers had a net increase of seventy shops between 1900 and 1910. However, grocery shops owned by multiples showed net gains within the central area and compensated for the decline in independents. Nevertheless, the main net increase in multiple retailers was in the middle and outer suburbs where, for example, grocers gained twelve shops between 1900 and 1910. At this period both independent and multiple footwear retailers were experiencing substantial net losses in all but the outer suburbs. In the inner and middle suburbs alone the net losses of footwear shops totalled twenty-eight establishments between 1900 and 1910.

By 1950 the process of net retail decline had extended over all the city. Suburban growth at this time had proceeded beyond the boundaries of the study area and in doing so had taken the zone of shop growth still further from the city centre.

9.2.2 Changes in shop ownership

The process of retail decentralization is a product of changes in the urban retail system. The response of retailers to changes in the urban and competitive environments can be measured in terms of their mortality ratios, and the measurement of changes in shop ownership is a valuable way of analysing such factors. These changes can be placed into three categories of which the first is the loss of a business from a particular trade and the subsequent removal of that shop site. Second is the change in ownership of an establishment that remains in the same

trade type and finally, shops that remain under the same ownership. The implications of such processes of change have already been discussed and it now remains to examine their geographical distributions. The retail grocery trade will be used as an example to illustrate the spatial and temporal trends in shop ownership since it was the largest and most widespread in occurrence.

A map of changes in shop ownership of grocers during the period 1880 to 1890, shows the dynamic character of this trade (Fig. 9.3). At this time in every part of the city lost shops and changes in business ownership exceeded in number those establishments that had remained under the same owner. By far the largest of these categories is that measuring the loss of shop sites. This group does not seem to have any clearly developed spatial pattern, but they did reach their peak ratios in the outer growth zones (Fig. 9.3), accounting for over 50% of all shops. Changes in shop ownership appear to be a relatively unimportant part of this trade during the late nineteenth century and in general the situation is one of great instability. This is shown in the case of the northern outer growth zone, which lost 90% of its shops between 1880 and 1890.

By 1900 multiple grocery firms had become well established in the city and the pattern of retail change altered considerably. Between 1900 and 1910 the major theme was still one of instability but this time the main element was changes in shop ownership. This category had increased in importance from its position in the late nineteenth century and exceeded in many areas the number of shops that remained under the same owner. The areas showing the greatest increase in this category of retail change were situated largely in the middle suburbs. No stable areas could be said to exist with regard to the independent grocers since high business loss rates were recorded. It could be said that shop sites were becoming more stable but that business survival

was still as precarious as ever. This was especially so in the outer growth zones, both in the middle and outer suburbs while in contrast the multiple grocers had a very stable situation with only a small number of central growth zones showing any shop losses.

In the following decade, 1910 to 1920, the proportion of grocery shops lost declined much further. However, the situation was still highly dynamic in nature but the major element of change was that of changes in shop ownership. In geographical terms it was the inner growth zones that showed the largest decrease in the percentage of shops lost and they gave the impression of being more stable areas (Fig. 9.4). The proportion of shops lost in the 'Old Town' fell to below 10% but this stability was achieved largely through a reduction in the overall number of retailers. In the outer zones the percentage of shop sites lost had also been reduced but despite this they were still relatively unstable as far as business survival was concerned (Fig. 9.4). Once again the multiples showed a very stable situation with no changes in shop ownership being recorded.

Between 1920 and 1930 the situation was much more stable and the proportion of shops lost from the trade continued to dwindle. The major percentage of shops fell into the category that remained under the same ownership. Areas of marked stability were to be found both in the city centre and the outermost suburbs, with stable zones also falling between the two (Fig. 9.5). Variations are noticeable between the area to the east of the river Hull and that to the west for in the former sites appear to be more stable, since there is a greater proportion of changes in shop ownership than losses of actual shop sites (Fig. 9.5). The three outer growth areas reflect this feature also, for, although they have similar proportions of shop sites lost from the trade, the levels of changes in shop ownership are much more variable (Fig. 9.5).

In the following two decades up to 1950 the situation was to change

markedly. Between 1930 and 1940 the proportion of shop sites lost increased to well over 75% in the inner zones of the city and few sites survived over the ten year period. In the other parts of the city, although losses of shops did increase they usually still remained below the 50% level. However, the overall trend for independent shops was one of instability and the only stable parts of the retail scene were the multiples. After 1940 however, even the outermost zones became unstable areas as the proportion of shop sites lost from the trade rose above the 50% level (Fig. 9.6). Changes in shop ownership were again relatively unimportant and the major element was the loss of actual shop sites. In geographical terms the most unstable areas were located in the inner and middle suburbs and in zone B all the grocery establishments were lost, there being a complete turnover of businesses and retail sites (Fig. 9.6). At this time even the multiples were showing signs of instability in certain parts of the city, especially the inner growth zones, but losses also occurred in the outer suburbs (Fig. 9.6).

In terms of the grocery trade, which is taken as being representative of the food sector, three distinct phases of shop change can be identified.

First phase; This was from 1880 to around 1900 and characterized by large proportions of shop sites being lost. Site locations had not yet been fully worked out and there was little continuation of shop premises. This may reflect the dynamic nature of the urban environment, or more likely the attempts of retailers to evolve some locational strategy.

Second phase; This was approximately between 1910 and 1930, with the decade 1900 to 1910 being a transitional period. The scene was still one of much change but this change was of an essentially different nature. It was characterized, not

by losses of shop sites, but by changes in shop ownership and retail site locations had a greater degree of permanency. In the second part of this phase conditions became more stable, especially in suburban locations.

Third phase; This phase began after 1930 and was associated with high rates of shop site loss. This process was more spatially selective than in the previous phases, with the inner city areas suffering the most. These were the manifestations of an overall decline in the city centre produced by changes in the urban structure and it was no longer a question of intensive competition but an overall shift in retail activity.

9.3 The Factors Affecting Retail Change in Hull from 1880 to 1950

The interaction of the variables producing changes in the distribution of retail establishments have already been outlined in the previous chapter. However, a similar interplay of factors produce changes in the spatial births and deaths of retail businesses. Here attention will be given to the factors which affect the changes in shop ownership and to how these vary over time. The variables can be classified into two major categories, those measuring changes in the urban environment and those concerned with the competitive environment. The first group will include the level of consumer demand, represented by the density of population, variations in this demand as assessed by changes in population and a measure of decentralization. This latter variable is measured using the distance from the peak land value. The role of the competitive environment is assessed using the density of retailers and is subdivided between independents and multiples.

9.3.1 The food trades

In this analysis the data for butchers and grocers were combined to

give some notion of the general trends operating in the food trades during the period 1880 to 1950. In the late nineteenth century the role of the urban environmental variables does not appear to be of great significance in relation to shop stability. A table of zero order correlation coefficients shows the basic relationship between changes in shop ownership and the urban and competitive variables (Table 9.3). Areas that have high rates of business survival, as measured by the density of shops that remain under the same ownership, do not correspond to areas of high population density. They are however, significantly related to the distance component and this relationship is negative, suggesting that high rates of survival are in the city centre. The other significant urban variable is that of population change which is negatively related to the degree of shop stability. The only significant variable affecting changes in shop ownership and the loss of retail premises is that measuring the density of all food retailers. This suggests that it was the competitive environment that was most important at this time in determining the rates of shop and business loss, especially in central areas.

By 1920 the multiples were a dominant force in food retailing but, rather unexpectedly, there does not appear to be any relationship between the density of multiple retailers and the loss of independent stores (Table 9.4). The most important variable affecting the loss of independent food shops was their own competitive environment, since high densities of shops led to high shop loss rates. The relationship was even more significant for changes in shop ownership, a reflection of the intense level of competition at this time (Table 9.4). The importance of population density had increased from its role in 1880 and areas of high population density had large numbers of retailers who did not go out of business. In general, although the competitive environment was still the most dominant factor, the urban variables

Table 9.3 Zero order correlation coefficients between shop change
and other variables: Food retailers 1880-1890

Variable	Density of shops lost from trade	Density of shops changing ownership	Density of shops staying the same
Population density	0.15	0.31	0.12
Population change	-0.65*	-0.36*	-0.01
Distance from peak land value	-0.51*	-0.15	0.12
Density of independent shops	0.57*	0.56*	0.86*

* Significant at 0.1% level with 23 degrees of freedom

Table 9.4 Zero order correlation coefficients between shop change
and other variables: Food retailers 1920-1930

Variable	Density of shops lost from trade		Density of shops changing ownership		Density of shops staying the same	
	I	M	I	M	I	M
Population density	0.58*	-	0.72*	-	0.72*	0.22
Population change	-0.46*	-	-0.26	-	-0.36*	-0.37*
Distance from peak land value	-0.03	-	0.34*	-	0.16	-0.03
Density of independent shops	0.63*	-	0.83*	-	0.85*	0.16
Density of multiple retailers	0.20	-	0.23	-	-0.14	0.91*

* Significant at 0.1% level with 23 degrees of freedom

I= independent M= multiple

Table 9.5 Zero order correlation coefficients between shop change
and other variables: Food retailers 1940-1950

Variable	Density of shops lost from trade		Density of shops changing ownership		Density of shops staying the same	
	I	M	I	M	I	M
Population density	0.39*	-0.51*	0.60*	-	0.51*	0.62*
Population change	0.05	-0.31	0.36*	-	0.26	0.44*
Distance from peak land value	0.31	-0.53*	0.57*	-	0.12	0.50*
Density of independent shops	0.95*	-0.31	0.57*	-	-0.09	0.47*
Density of multiple retailers	0.33*	0.41*	-0.02	-	-0.12	0.89*

* Significant at 0.1% level with 23 degrees of freedom

I= independents

M= multiple

had increased their importance. The exception to this was the distance component which was not significant in 1920 implying that, given similar levels of population and shop density, the rate of business survival did not vary much between one part of the city and another.

The factors affecting the survival of multiple food retailers during the period 1920 to 1930 were very similar to those operating in the independent sector as Table 9.4 shows. The other groups could not be examined because of the insufficient number of stores lost.

After 1930 the situation began to change and by the period 1940 to 1950 the urban variables had become the most important as regards their effect on retail survival rates. For independent food retailers business survival is most strongly correlated with population density and population change, with the density of food shops being insignificant (Table 9.5). However, losses of shop sites were still determined by the overall competitive environment and the multiple retailers were starting to have a greater impact on loss rates, as the increased correlation of this variable suggests (Table 9.5). In the multiple sector the effect of the urban variables on the loss rate of shops was much more significant. Their strong negative correlation with distance from the city centre indicates that the highest failure rates were achieved in central zones.

Therefore it would appear that after 1930 the major factors affecting changes in shop ownership were associated more with changes in the urban environment than the competitive one.

9.3.2 Non-food retailers

In this group the footwear retailers and dyers and cleaners were combined although the latter had few establishments and did not play any significant role. In the decade 1880 to 1890 only independent traders are considered since the multiples were not established. The factors affecting the categories of shop change have similar correlations for each group as Table 9.6 illustrates. The most highly correlated variable

Table 9.6 Zero order correlation coefficients between shop change
and other variables: Non-food retailers 1880-1890

Variable	Density of shops lost from trade	Density of shops changing ownership	Density of shops staying the same
Population density	0.33*	0.22	0.54*
Population change	-0.26	-0.26	-0.47*
Distance from peak land value	-0.35*	-0.10	-0.47*
Density of independent shops	0.97*	0.41*	0.90*

* Significant at the 0.1% level with 23 degrees of freedom

is that of shop density followed by population density, the latter being strongly related to areas with high rates of business survival. The fact that these are also negatively associated with the distance variable serves to indicate that higher rates of survival were to be found in the inner areas. By 1920 the situation had not changed to any great extent and the best rates of survival were still in the central areas, although these suffered many shop losses too (Table 9.7).

Distance from the city centre seems to be the main factor affecting the survival of the multiple retailers around 1920 since high densities of shops surviving were strongly negatively correlated with the distance variable (Table 9.7). At the other extreme high rates of shop loss were only slightly correlated with distance and this was a positive relationship. Areas of high shop density appear also to give the best chance of business survival since these variables are significantly correlated (Table 9.7).

Between 1940 and 1950 there was not any great change in the variables affecting the survival rates of footwear retailers and the major elements continued to be distance from the city centre and total shop density. The high negative correlation between distance and density of multiple shops lost would indicate that mortality rates had risen in the central area (Table 9.8). Areas of high population change also seemed to experience high densities of lost shops in both the multiple and independent sectors of the footwear trade. (Table 9.8)

9.4 Patterns of Survival of New Retailers

The other major element in the process of retail change is the addition of new establishments. Such a category of shops has been studied from the point of view of the overall retail system, but not as yet in terms of their patterns of survival. In this instance a 'new' shop refers to the addition of a new business in a specific trade. Therefore, it is not essentially associated with a completely new building though

Table 9.7 Zero order correlation coefficients between shop change
and other variables: Non-food retailers 1920-1930

Variable	Density of shops lost from trade		Density of shops changing ownership		Density of shops staying the same	
	I	M	I	M	I	M
Population density	0.03	0.26	0.48*	-0.14	0.11	-0.11
Population change	-0.18	0.15	0.10	-0.10	-0.61*	-0.52*
Distance from peak land value	-0.59*	0.11	0.26	-0.27	-0.63*	-0.69*
Density of independent shops	0.88*	-0.03	0.38*	0.35*	0.80*	0.55*
Density of multiple retailers	0.38*	0.08	0.00	0.12	0.82*	0.94*

* Significant at the 0.1% level with 23 degrees of freedom

I= independent M= multiple

Table 9.8 Zero order correlation coefficients between shop change
and other variables: Non-food retailers 1940-1950

Variable	Density of shops lost from trade		Density of shops changing ownership		Density of shops staying the same	
	I	M	I	M	I	M
Population density	0.01	-0.89*	-0.09	-0.74*	-0.61*	-0.29
Population change	-0.47*	-0.75*	-0.08	-0.50*	-0.39*	-0.29
Distance from peak land value	-0.23	-0.83*	-0.16	-0.62*	-0.47*	-0.30
Density of independent shops	0.70*	0.38*	0.22	0.32	0.71*	0.74*
Density of multiple retailers	0.03	0.89*	-0.12	0.93*	0.86*	0.76*

* Significant at the 0.1% level with 23 degrees of freedom

I= independent M= multiple

obviously these are included. Survival rates will again be measured over the first ten years of a business's life for the reasons previously given (Chapter 6).

The pattern of development of new shops and their rate of survival, for shops entering in 1890 is given in Table 9.9. The increase in new establishments out towards the growing suburbs is a natural feature but it does show some variations between the two food trades, with grocers being the earliest colonizers. In all the trades there is a much better chance of shop survival in the outer areas though this varied considerably between food and non-food retailers. In the newer suburbs the best rates of survival were found among the butchers, 80% of whom survived their first ten years (Table 9.9). For all the food trades the correlation between distance from the centre of the city and the ratio of business survival was +0.49 (significant at the 0.1% level with 23 degrees of freedom). The same correlation for footwear was not significant and yielded a correlation coefficient of only +0.04. Indeed of the forty-seven new footwear shops in the outer suburbs only 45% survived their first ten years.

In 1890 of the 53% of new grocers who went out of business in the inner city only 19% involved the loss of an actual shop site as the rest involved changes in ownership. In the outer suburbs the situation is reversed with 61% of all new grocers lost involving a loss also of a shop site. This implies that shop sites in the city centre were far more stable than those in the newer suburbs. During this period there was no significant relationship between population density and the growth of new shops, in fact the correlation between these two variables was negative. The same holds true for shop survival rates so new shops were expanding much faster into the suburbs than the population.

At the turn of the century the distribution of new retailers continued to be spatially biased towards the outer suburbs even in the footwear

Table 9.9 The distribution and survival rates of new retailers in
Hull for 1890

Area	Grocers		Butchers		Footwear	
	No.	% surviving ten years	No.	% surviving ten years	No.	% surviving ten years
Old Town	10	50%	1	0%	5	40%
Inner city	43	47%	11	36%	36	28%
Inner suburbs	41	51%	16	37%	33	39%
Middle suburbs	77	61%	20	50%	36	36%
Outer suburbs	77	68%	15	80%	47	45%

trade. By this date butchers had increased their number of new establishments in the outer suburbs as in 1890 only 24% of all new butchers located in the outer suburbs while by 1900 this figure had almost doubled to 41%. The survival rate of these new retailers remained most favourable in the middle and outer suburbs but, however, the area for survival for new footwear retailers was marginally the 'Old Town' where 40% survived their first ten years.

In 1910 the number of new shops of all trades, locating in the outer suburbs, reached its peak. At this date 50% of all new grocers located in this area and just over 49% of all new shoe shops. This area also had the best rates of business survival and for example, 70% of all new grocers survived here compared with less than 40% in the inner suburbs. The relationship between areas of high shop densities and the survival rates of new establishments illustrates this point even more. The correlation coefficient between these two variables for independent grocers at this time was -0.49 which is significant at the 0.1% level with 11 degrees of freedom.

Between 1920 and 1930 the number of new shops entering was greatly reduced in all the trades mainly because of external factors (Chapter 6). However, their geographical occurrence in terms of the city growth zones and their rates of survival were similar to the conditions described for 1910. The outer suburbs continued to get the highest proportion of new shops even in the footwear trade which had 41% of its new establishments located here.

The pattern of new shop distribution and subsequent business survival did not alter to any great extent between 1920 and 1950, apart from fluctuations in total numbers. The new shops that entered in all the trades in 1940 had similar levels of survival, which in the outer suburbs was around 42%. The increase in the number of new retailers entering in 1950 was no doubt in response to the end of the war-time

economy. This factor also probably accounts for the increase in the survival rates of new shops at this time. For example, grocers lost only 40% of their new shops locating in the city centre and only 11% in the outer suburbs.

The multiple retail organisations had a very different distribution pattern of new shops, in this case branch outlets. Although multiple grocers did have some similarities with the independents in that they were more biased towards the outer suburbs, with 53% of new branch shops in 1900 located in such areas, they differed in the one respect that all the branch establishments survived their first ten years of business. The multiple footwear branch shops did remain more concentrated in the city centre and the inner suburbs unlike their independent counterparts and their rates of survival, whilst fluctuating through time, did not show any discernible pattern. This was not the case for multiple grocers, whose best rates of survival after 1920 were in the outer suburbs for of the new shops entering in 1930 73% survived in the outer zones compared with none in the central area.

9.5 An Ecological View of Urban Retail Change

The invasion of new urban areas by retail establishments and the subsequent decline of the city zones provide the simple basis of an ecological model of change. Within this context the elements of invasion and succession can be identified for retailers and related to changes in the urban environment.

Berry (1963) has already conducted such a study in Chicago in which he recognized three distinct phases of retail change. He associated these with changes in the socio-economic structure of the urban environment. The first phase was one of 'the anticipation of change' and it was characterized by two important features which were the rise in commercial vacancy rates and a reluctance on the part of the retailer to invest in shop improvements. The second phase was that of

high rates of population turnover in which consumer demand falls off rapidly and in such areas the vacancy rates would rise to between 33% and 50% of all commercial establishments. The third phase is one of 'Stabilization' with much blighted property and vacancy rates of around 20% Of commercial establishments.

Berry saw these phases occurring in an area that was being invaded by a different social group, with the ecological transition of retail units going hand in hand with demographic transition. Such a concept has not been tested in British cities and it may prove too rigid a notion in such cases. McEvoy (1971) in a study of the retail structure of the Manchester conurbation, has substantiated a number of the features recognized by Berry as operating in this country. However, this study is of a short-term nature and may not be of direct relevance here. McEvoy states in his work that there is no connection between population change and the growth or decline of retail centres. This null relationship requires further study since it may be the result of time lag effects that were not considered. The present study, because of its long term nature, requires a slightly different approach. Nevertheless, the same ecological concepts can be meaningfully applied in an attempt to recognize stages of retail change.

9.5.1 Suburbanization and the process of change in Hull

The initial starting point is the examination of retail colonization which can be examined in the outermost growth zones as these were only starting to be developed after 1880. The fastest colonizers were the food retailers and of these the grocers were the first to become fully established in the new suburbs. It is for this reason that this trade will be selected as an example to illustrate the sequence of change.

The relationship between the growth of population and retail facilities is illustrated in Table 9.10. Between 1880 and 1890 the population of the outer suburbs increased by 87.5% but the number of

Table 9.10 Population and shop growth in Hull's outer suburbs

	1880	1890	1900	1910	1920	1930	1940	1950
Population	25,700	48,193	58,977	88,811	97,261	98,109	*	83,630
Grocers	37	90	133	192	159	176	134	152

* No data available

Table 9.11 Retail mortality characteristics for grocers in the outer suburbs

Decade	Shops staying under same ownership	Shops changing ownership	Loss of shop site and business	New shops	Survival rates of new shops over ten years
1880-90	22%	19%	59%	77%	68%
1890-1900	27%	40%	33%	78%	46%
1900-10	27%	21%	52%	137%	70%
1910-20	43%	28%	29%	22%	73%
1920-30	38%	33%	29%	47%	57%
1930-40	42%	23%	35%	32%	41%
1940-50	24%	19%	57%	75%	89%

grocers grew by 143%. This trend of shop growth, out-stripping that of population, was to continue up to 1900 with the increase in grocers being double that of population in the decade 1890 to 1900 (Table 9.10). This initial stage of colonization was therefore characterized by a rapid increase in the number of food retailers as the growth of butchers shows similar features. However, the survival rate of these new retailers was very low with only 22% of businesses surviving between 1880 and 1890 and 27% from 1890 to 1900 (Table 9.11). The high rate of business failure was equally matched by high levels of shop site loss, with 59% of premises being lost from the grocery trade between 1880 and 1890 (Table 9.11). These losses were however, more than compensated for by the location of new establishments. These new retailers had far better rates of business survival than the established shops and of those entering between 1880 and 1890 approximately 68% survived their first ten years (Table 9.11).

Between 1900 and 1910 the population of these outer zones continued to rise and at an increased rate, growing by over 51%. However, the rate of shop growth had fallen below this and was only in the region of 44%. The peak number of grocers in the outer suburbs was reached in 1910 although population was only to reach its peak around 1930 (Table 9.10). During this period of maximum shop densities the proportion of businesses lost from the grocery trade increased to 57% of all establishments. The low number of new shops entering between 1910 and 1920 is probably a reflection of the war-time economy rather than a feature of over-shopping in this area. The resultant reduction in density in the following decade did not however mean more stable conditions since only 38% of all new businesses survived (Table 9.11). The high loss rate of shop sites had nevertheless fallen considerably, from 52% in the decade 1900 to 1910 to only 29% by 1930. From a locational aspect the structure of food retailers in the suburbs had

become more stable. Between 1930 and 1950 the decline of shops kept pace with that of population, the former falling by 14% and the latter by almost 15%. This introduced a new period of stability into the suburban environment and between 1930 and 1940 42% of the businesses survived.

In 1930, when the population of the outer suburbs had reached its peak and the density of independent food retailers was declining, the gap was filled by the multiples. They had reached their maximum number in this area by 1930 and maintained it unchanged for the following decade. Their methods of suburban colonization were entirely different from those of the independents. They did not experience high rates of business failure during their initial phase of colonization and peak shop growth was not followed by heavy shop losses.

9.5.2 A model of changes in retail mortality for suburban Hull

The phases of retail change recognized in the outer suburbs can also be identified in the other growth zones. In the middle suburbs, that area developed between the 1850 and 1880 urban fences, the same features can be recognized. However, the area was colonized much earlier and was well developed by 1880. Taking grocers as a representative of the food trades, peak shop density was attained in 1900, a decade earlier than in the outer suburbs. The same rapid increase in shop numbers was to be found and this was again double that of population growth for between 1890 and 1900 population increased by 17% and shops by 32%.

The inner suburbs and city centre both reached their peak grocery shop densities in 1890 but the latter area was perhaps an exceptional case since it was already showing signs of decline by 1880. The situation in the inner suburbs was more typical of the other zones and again peak shop density was attained a decade before the maximum population levels. In this area the stage of retail decline was taken further and by the end of the study period much higher rates of shop losses were recorded here than in any other district of the city.

In all the urban growth zones the development of the multiple retailers did not match that of the independents. Their shop numbers increased in central areas at a time when population was declining and this was no doubt a reflection of their scale of operation which demanded much larger trade areas. Accepting that the multiples did not conform to the situation operating for independents, a four-stage model of retail change can be identified. This is not based on the retail structure but on changes in business and shop site survival rates. It will therefore illustrate the spatial selectivity of retail birth and death processes in an urban environment.

The first stage may be termed the 'colonization period' and this is characterized by a high rate of shop growth that often out-strips that of population. This results in a very high level of retail provision, disproportionate to the level of consumer demand. The large numbers of new shops have generally low rates of business survival, but they still compensate for the shops being lost from the already established retailers. In terms of business failure high rates are encountered and are often associated with wrongly located establishments. Losses of shop sites are excessive and always well over the 50% mark, with only around 20% of businesses surviving.

The second stage is characterized by much lower rates of shop loss, around 30% of all establishments, and is the period during which the retail structure becomes established. The growth of new retailers is still high, usually exceeding those lost shops in the ratio of two to one. These new shops have a much better rate of survival with around 60% to 70% surviving their first ten years of business. The survival rate of businesses already established also increases reaching the 40% mark. During this 'establishment' phase population is usually continuing to increase but still at a lower rate than the growth of shops.

The above factors quickly lead to a situation of 'retail saturation'

which we can recognize as the third stage, where retail provision greatly exceeds demand. It is characterized by high shop densities and lower levels of business survival. Losses of shop sites are however, still low and do not exceed 30% of all establishments. The main element of change is that of shop ownership, with sites being more stable, and this may be an indication of intensive competition. However, urban areas in this stage remained attractive to new retailers since population was still increasing.

Once population levels had levelled out or started to decline shop densities also began to fall. This marks the onset of the fourth stage which may be termed that of 'retail decline'. The main characteristic is one of high shop loss rates but this may be variable, depending on the intensity of the decline in retail facilities. For example, in the inner growth zones loss rates were as high as 72% but in the outer suburbs they only reached 52%. These figures refer to the number of actual shop sites lost and reflect the fall-off in total retail capacity. This factor, together with low rates of new shops produced a decline in retail provision, since population was not declining as rapidly.

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Chapter 10

Conclusion

One of the major aims of this study has been to demonstrate the importance of the innovistic process in retail locational change, at a time when the effects of the car were negligible and 'out of town' shopping centres had not developed. Within the time period covered by this thesis significant differences were seen to exist between independent traders and multiple shop organisations. Further, it was found that the growth of these multiple organisations followed closely the innovistic process initially outlined by Schumpeter (1939). These multiples had new competitive strategies and locational policies that differed significantly from those of the established retailers. The realization of these differences led to an important distinction being made between different types of retail competition. A fundamental line of demarkation can be drawn between repetitive competition and innovistic competition, with the latter being the most important in changing the locational demands of shops. Whilst this division had been previously recognized it had not hitherto been integrated into a practical study of retail change.

The distinctions between multiple and independent traders based on the above criteria helped to explain many of the complexities found by other workers examining retail patterns. The results of such locational differences were clearly illustrated with the aid of two techniques of pattern analysis. These methods were used to examine both the degree of locational segregation between the two organisational types and to measure differences in their spatial patterns. For the latter task extensions were made to the basic methods of nearest neighbour analysis with some encouraging results.

It was found that locational demands were greatest not between different trades but between retail organisational types.

Further differences could be recognized between multiples and independents when their retail mortality rates were examined. Retail business survival curves were constructed and it was found that rates of survival for both organisational types could be predicted using various probability functions. Within this context some methods of analysis were used successfully from the fields of demography and labour turnover.

Having established the widespread differences between multiples and independents, their development was monitored over a specific urban area. Such a study provided evidence that the growth of multiples was to some extent a factor in the development of the commercial land value market in Kingston upon Hull after 1880. This was due to the emphasis given by these retailers to the locational variable as a competitive parameter. In most cases the initial location of the multiples was within the city centre, so as to be guaranteed the largest market possible. From such central locations the multiples experienced a degree of suburbanization, usually at a much later date than their independently-owned counterparts. The outcome of this process in Hull was the formation of concentrations of multiples in distinct areas at specific distances from the city centre. This may be suggestive of some critical distances between branch shops though this was not specifically tested.

In general terms it does seem that a relationship exists between city size and the rates of the retail suburbanization of food traders. However, no definite conclusions can be reached about crucial city population thresholds from this single case study. Another factor to emerge was the early suburbanization of certain

retail trades within Hull, suggesting that strong centrifugal forces in retailing were not solely associated with increases in private transportation. Similarly, that the 'lingering on' of certain food trades within the C.B.D., in the face of high property values, can to a large extent be attributed to the multiples. It was these organisations that maintained establishments within such central areas when the great majority of food retailers were following the population to the suburbs.

This thesis puts great emphasis on the measurement of retail change and stresses the importance of identifying the various components of such change. It is felt that such an approach is a great advance on previous work that merely measured changes in total shop counts at different time intervals. This more precise approach enables a greater understanding of the mechanisms of retail change. In this study such information was used to construct a simple ecological model of changes in shop ownership. Using grocers as an illustrative example it was found that distinct phases of retail change could be recognized for different time periods. Similarly, that these phases of change correspond to specific geographical areas within the city. These areas could be classified over time in accordance with ecological concepts, in this case retail invasion and succession.

This thesis has approached the study of retail change, not via the usual path of examining shopping centres, but by looking at specific retail trades. As a consequence of this fresh light has been shed on certain aspects of retail geography. However, in pursuing this approach other problems have^{been} raised or reiterated. These may be broadly divided into four major themes, each of which offers a potential field of research.

The first of these themes concerns the need to relate studies

in urban retailing with social area surveys, to bring together the components of the urban system. In this study the inability of population density and population change to adequately account for shop locations suggests that much more attention needs to be given to the influences of socio-economic variables. For example, whilst the relationships between the growth of working-class demand and the expansion of the multiples can be demonstrated at a national level they have not yet been examined within the intra-urban environment. The geographical association between predominantly working-class areas and the location of multiple retailers within the city has not been illustrated.

Secondly, the use of socio-economic data raises the prospect of producing a more comprehensive model of retail change. The relationships between social change and retail change have already been examined for the North American city but not for British cities. It remains to be seen whether such associations between these two factors will be as dramatic as in the U.S.A. This line of research also points the way towards understanding the shifts in retail structure, via the upgrading and downgrading of centres and changes in their socio-economic character.

A third field of possible research that has been highlighted concerns the processes affecting retail mortality. Within the context of this thesis general comments have been made concerning the factors affecting shop closures. However, much more data needs to be collected about the processes of business failure before our knowledge is complete.

Finally, more attention needs to be given to the diffusion of new retail types within the urban hierarchy. In this thesis the inter-urban growth of multiple retailers has only been highlighted and it remains to be seen what can be learned from a more

exhaustive study of such phenomena, especially in relation to the process of retail innovistic change.

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List of Figures

- Fig. 2.1 Hypothetical bid rent curve for a retail firm.
- Fig. 2.2 Continuum of rent paying thresholds for retailers.
- Fig. 3.1 The ratio of multiple to independent food retailers by settlement size.
- Fig. 5.1 The growth and development of Hull up to 1914.
- Fig. 5.2 The location of urban growth zones in Hull.
- Fig. 5.3 Changes in retail structures in Hull.
- Fig. 6.1 The growth of multiple grocers in Hull.
- Fig. 6.2 The growth of independent grocers in Hull.
- Fig. 6.3 Business survival curves for grocers in Hull.
- Fig. 6.4 Business survival curves for grocers in different locations, Hull.
- Fig. 6.5 The growth of independent butchers between 1880 and 1950, Hull.
- Fig. 6.6 The growth of multiple butchers between 1880 and 1950, Hull.
- Fig. 6.7 Business survival curves for butchers in Hull.
- Fig. 6.8 Business survival curves for butchers in different premises, Hull.
- Fig. 6.9 The growth of independent footwear shops in Hull.
- Fig. 6.10 The growth of multiple footwear shops in Hull.
- Fig. 6.11 Business survival curves of footwear retailers in Hull.

- Fig. 6.12 Business survival curves for footwear retailers in different locations, Hull.
- Fig. 6.13 The growth of independent dyers and cleaners in Hull.
- Fig. 6.14 The growth of multiple dyers and cleaners in Hull.
- Fig. 6.15 Business survival curves for dyers and cleaners in Hull.
- Fig. 6.16 Business survival curves for dyers and cleaners in different locations, Hull.
-
- Fig. 7.1 Locational segregation between multiple and independent grocers in Hull.
- Fig. 7.2 Locational segregation between multiple and independent butchers in Hull.
- Fig. 7.3 Locational segregation between multiple and independent footwear retailers, Hull.
- Fig. 7.4 Nearest neighbour values for grocers for 1880 and 1890, Hull.
- Fig. 7.5 Nearest neighbour values for grocers for 1900 and 1910, Hull.
- Fig. 7.6 Nearest neighbour values for grocers for 1920 and 1930, Hull.
- Fig. 7.7 Nearest neighbour values for grocers for 1940 and 1950, Hull.
- Fig. 7.8 Nearest neighbour values for butchers for 1880 and 1890, Hull.
- Fig. 7.9 Nearest neighbour values for butchers for 1900 and 1910, Hull.

- Fig. 7.10 Nearest neighbour values for butchers for 1920 and 1930, Hull.
- Fig. 7.11 Nearest neighbour values for butchers for 1940 and 1950, Hull.
- Fig. 7.12 Nearest neighbour values for footwear shops for 1880 and 1890, Hull.
- Fig. 7.13 Nearest neighbour values for footwear shops for 1900 and 1910, Hull.
- Fig. 7.14 Nearest neighbour values for footwear shops for 1920 and 1930, Hull.
- Fig. 7.15 Nearest neighbour values for footwear shops for 1940 and 1950, Hull.
- Fig. 7.16 Variations in nearest neighbour values for selected multiple retailers in Hull.
-
- Fig. 8.1 Rateable values for commercial properties in 1860, Hull.
- Fig. 8.2 Rateable values for commercial properties in 1880, Hull.
- Fig. 8.3 Indifference curves of multiple retailers operating in Hull.
- Fig. 8.4 Population densities in West Hull.
- Fig. 8.5 Population densities in North Hull.
- Fig. 8.6 Population densities in East Hull.
- Fig. 8.7 Retail grocery provision in 1881, Hull.
- Fig. 8.8 Retail grocery provision in 1901, Hull.
- Fig. 8.9 Retail grocery provision in 1921, Hull.
- Fig. 8.10 Retail grocery provision in 1951, Hull.

- Fig. 8.11 Retail meat provision in 1881, Hull.
- Fig. 8.12 Retail meat provision in 1901, Hull.
- Fig. 8.13 Retail meat provision in 1921, Hull.
- Fig. 8.14 Retail meat provision in 1951, Hull.
- Fig. 8.15 The distribution of multiple and independent grocers in 1900, Hull.
- Fig. 8.16 The distribution of multiple and independent butchers in 1900, Hull.
- Fig. 8.17 The distribution of multiple and independent grocers in 1920, Hull.
- Fig. 8.18 The distribution of multiple and independent butchers in 1920, Hull.
- Fig. 8.19 The distribution of multiple and independent grocers in 1950, Hull.
- Fig. 8.20 The distribution of multiple and independent butchers in 1950, Hull.
- Fig. 8.21 The distribution of multiple and independent footwear retailers in 1900, Hull.
- Fig. 8.22 The distribution of multiple and independent footwear retailers in 1920, Hull.
- Fig. 8.23 The distribution of multiple and independent footwear retailers in 1950, Hull.
-
- Fig. 9.1 Variations in the percentage of grocers with distance from the city centre.
- Fig. 9.2 Variations in the percentage of butchers with distance from the city centre, Hull.
- Fig. 9.3 Changes in shop ownership between 1880 and 1890 for grocers in Hull.

Fig. 9.4 Changes in shop ownership between 1910 and 1920 for grocers in Hull.

Fig. 9.5 Changes in shop ownership between 1920 and 1930 for grocers in Hull.

Fig. 9.5 Changes in shop ownership between 1940 and 1950 for grocers in Hull.

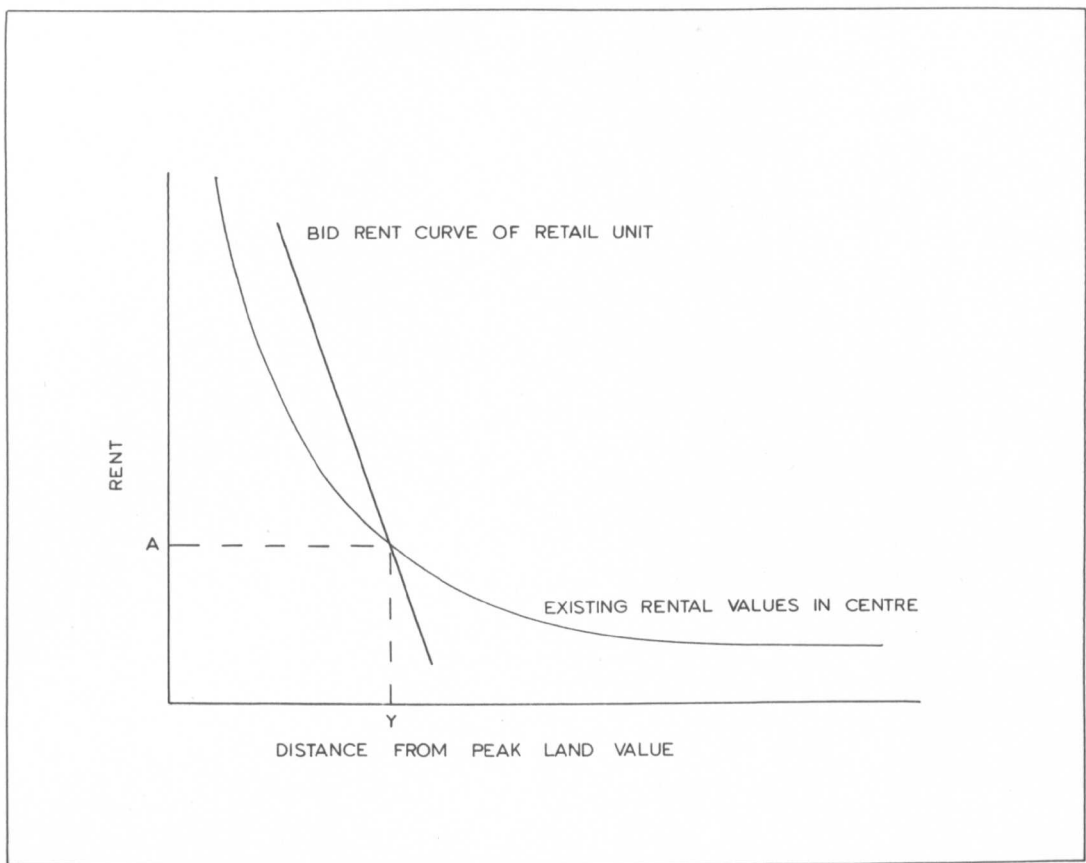


Fig. 2.1 Hypothetical bid rent curve for a retail firm.

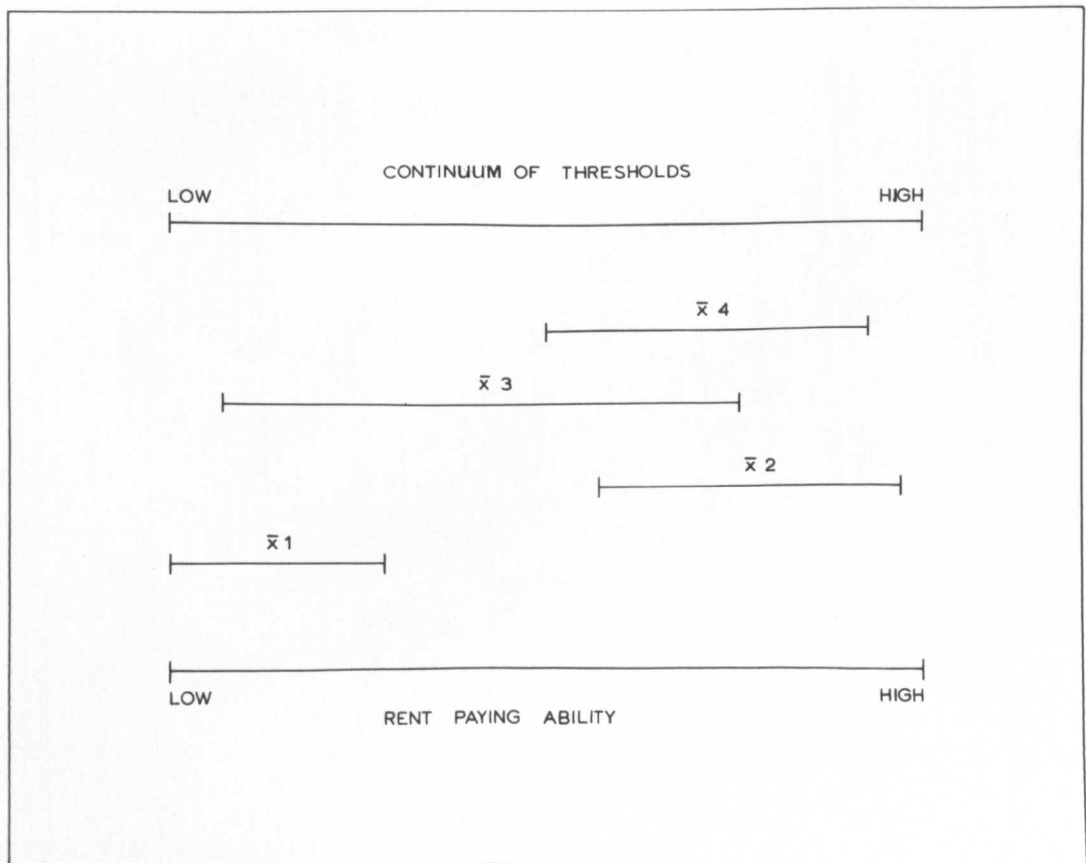


Fig. 2.2 Continuum of rent paying thresholds for retailers.

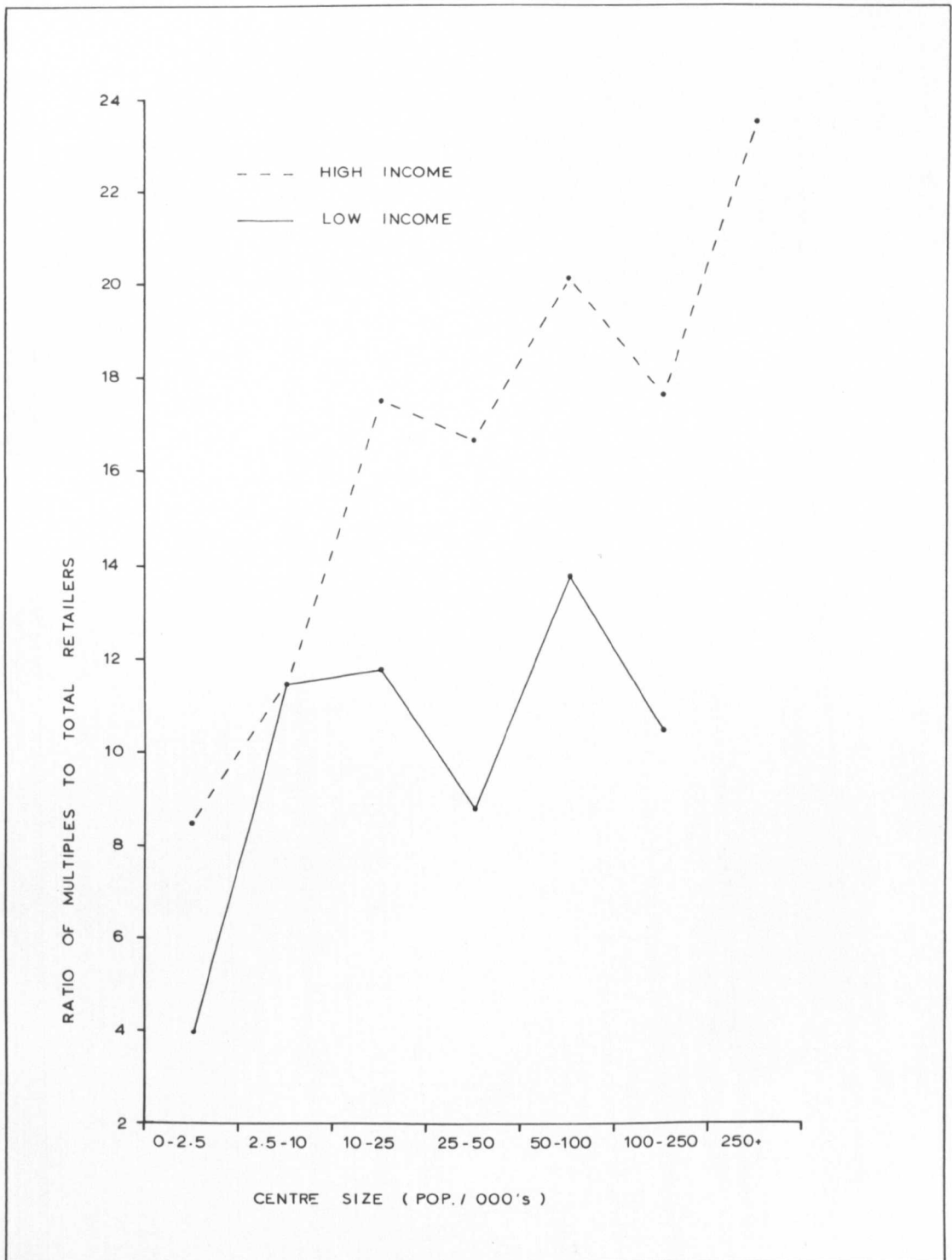


FIGURE 3.1 The ratio of multiple to independent food retailers by settlement size.

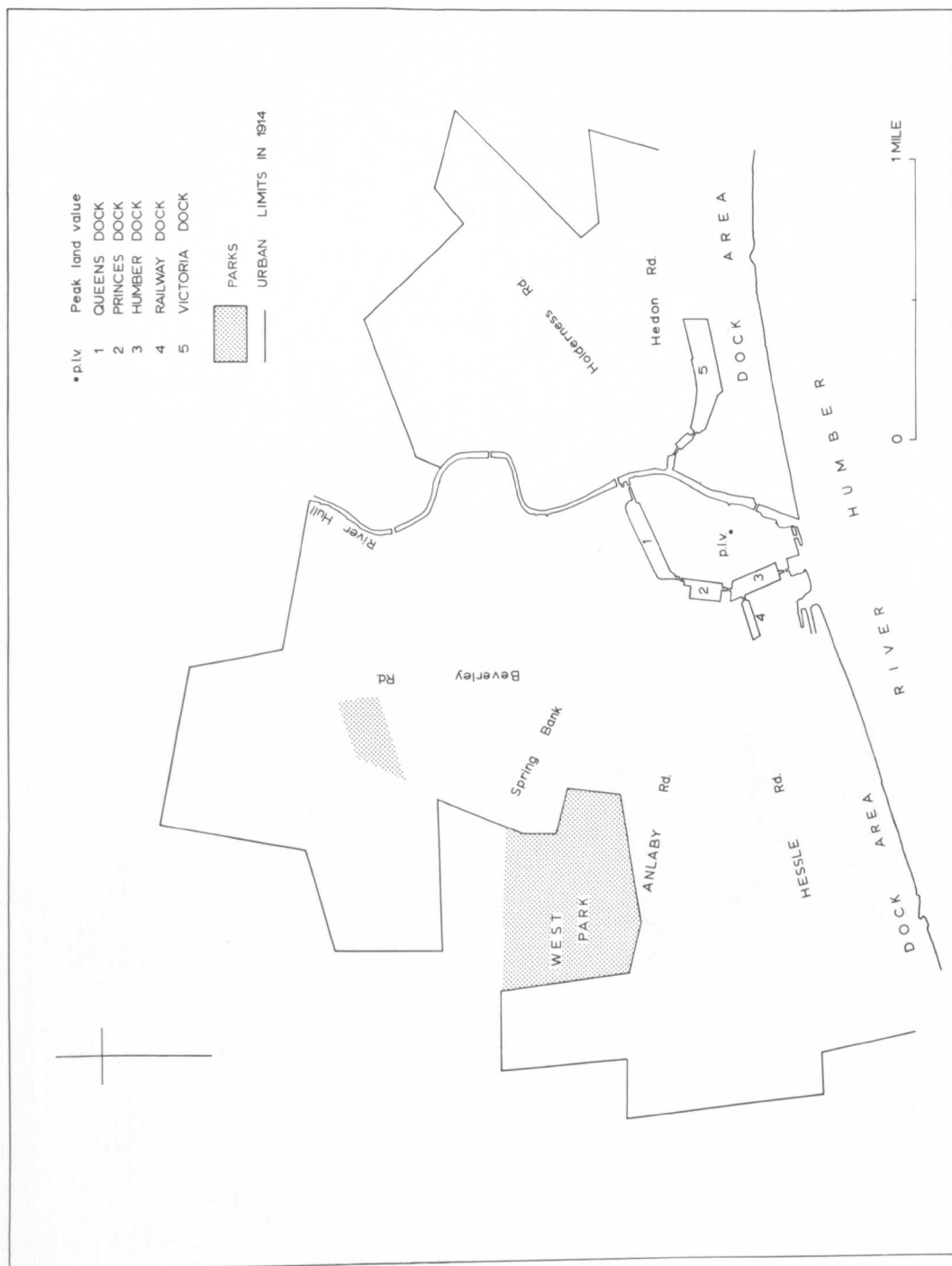


FIGURE 5.1 The growth and development of Hull up to 1914.

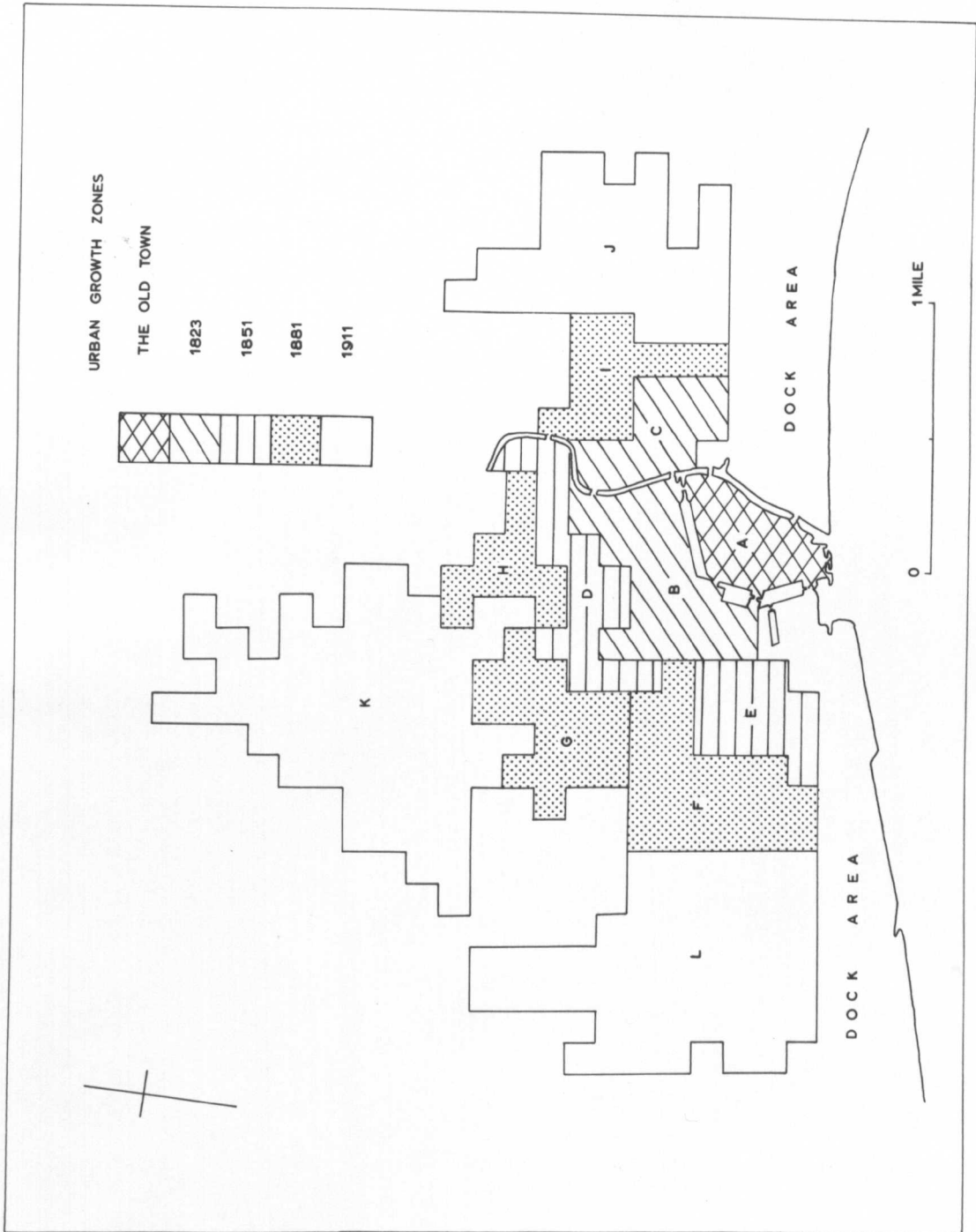


FIGURE 5.2 The location of urban growth zones in Hull.

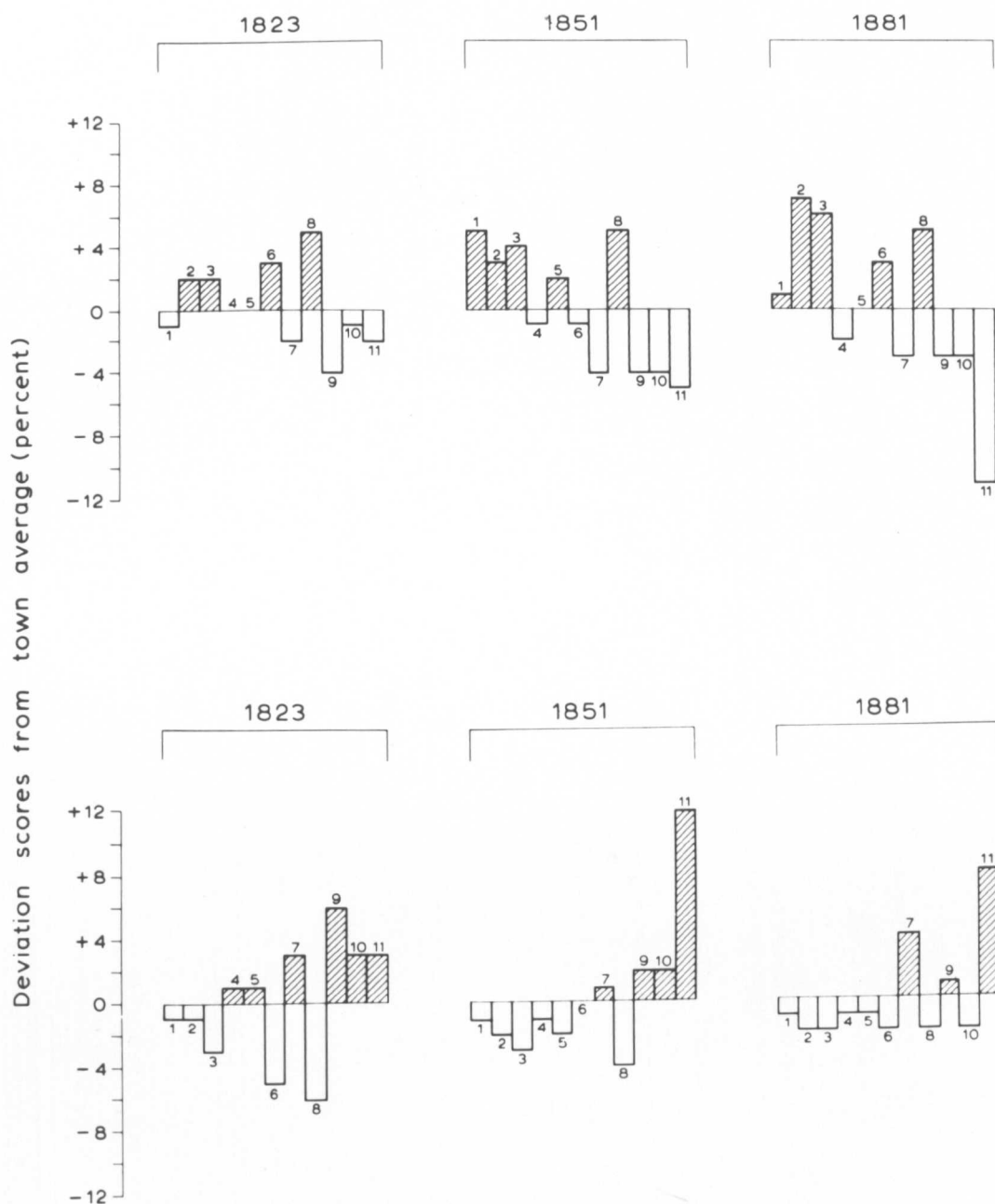


FIGURE 5.3 Changes in retail structures in Hull.

The Old Town is represented above, the outer zone below.

The numbers refer to retail trades thus;

- | | | | |
|-----------------|---------------|-------------|---------------|
| 1 Ironmongers | 2 Booksellers | 3 Jewellers | 4 Pawnbrokers |
| 5 Confectioners | 6 Chemists | 7 Milliners | 8 Drapers |
| 9 Butchers | 10 Footwear | 11 Grocers | |

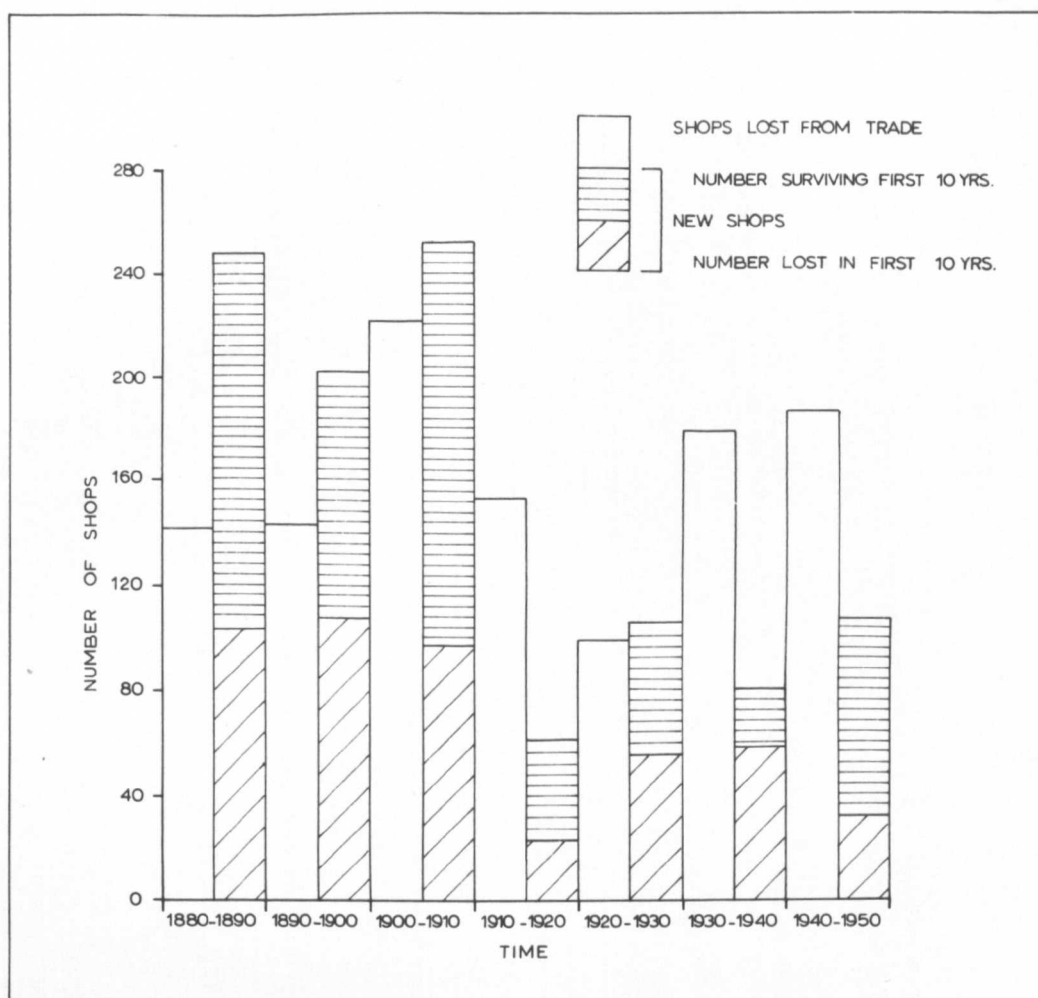


FIGURE 6.2 The growth of independent grocers in Hull.

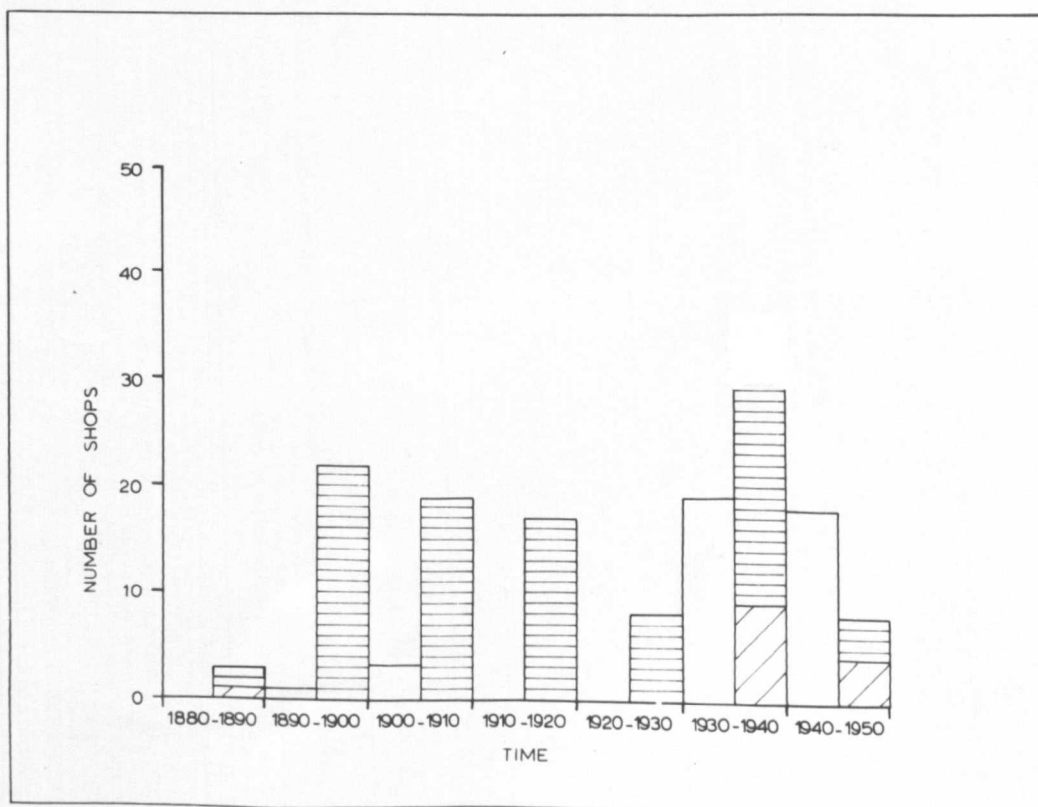


FIGURE 6.1 The growth of multiple grocers in Hull.

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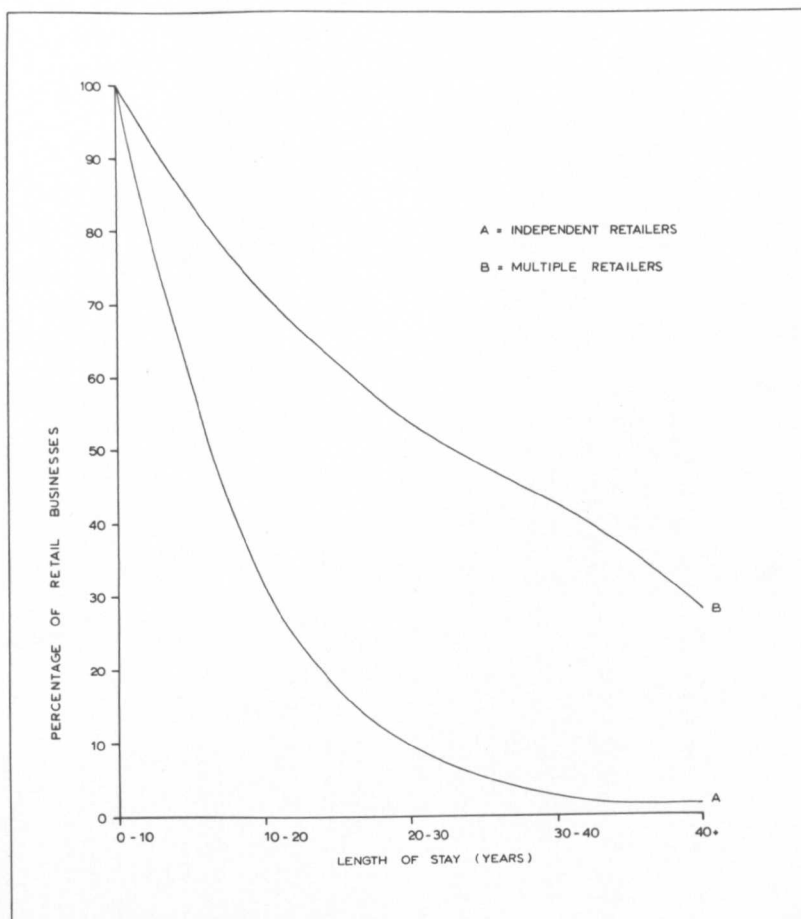


FIGURE 6.3 Business survival curves for grocers in Hull.

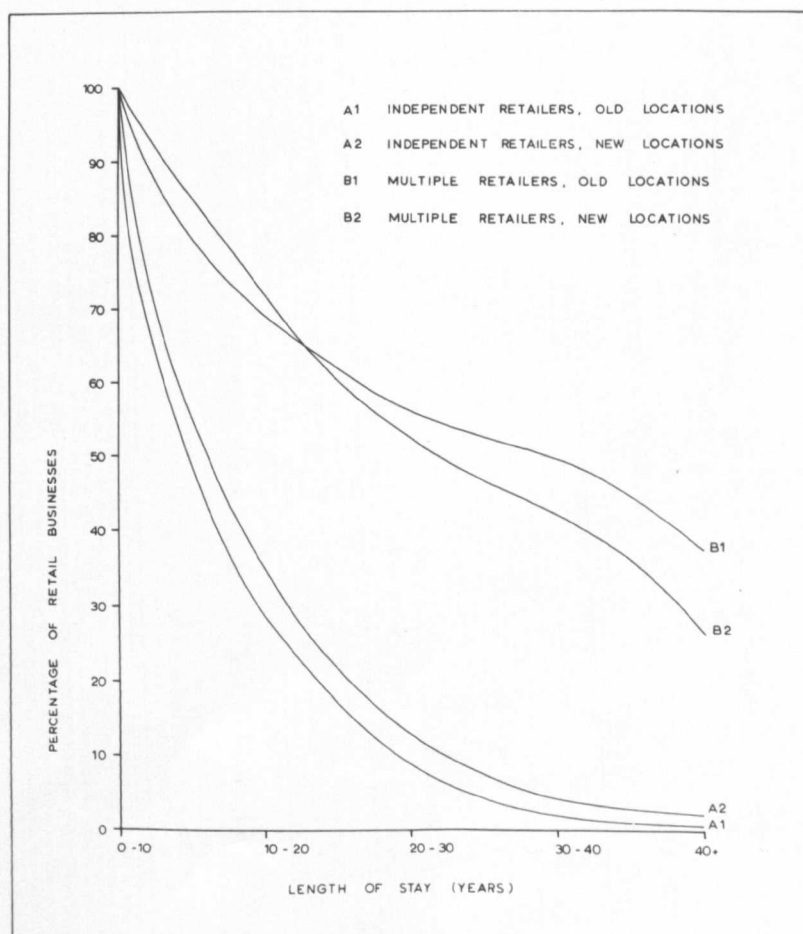


FIGURE 6.4 Business survival curves for grocers in different locations. Hull.

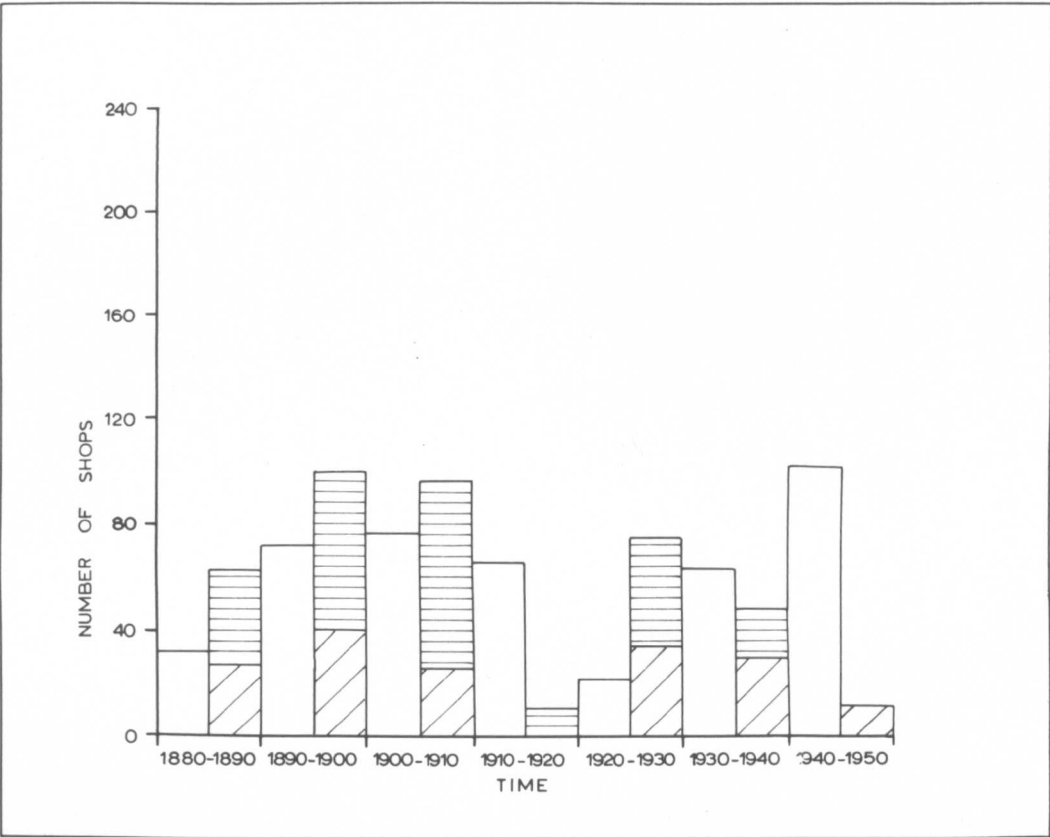


FIGURE 6.5 The growth of independent butchers between 1880 and 1950, Hull. (key as Fig. 6.2)

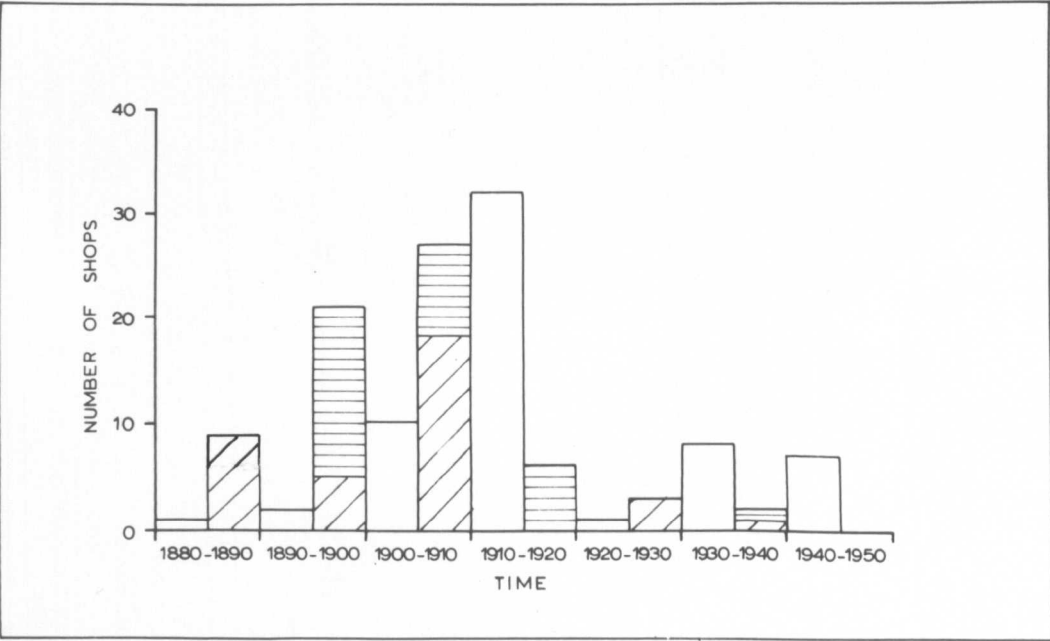


FIGURE 6.6 The growth of multiple butchers between 1880 and 1950, Hull. (key as Fig. 6.2)

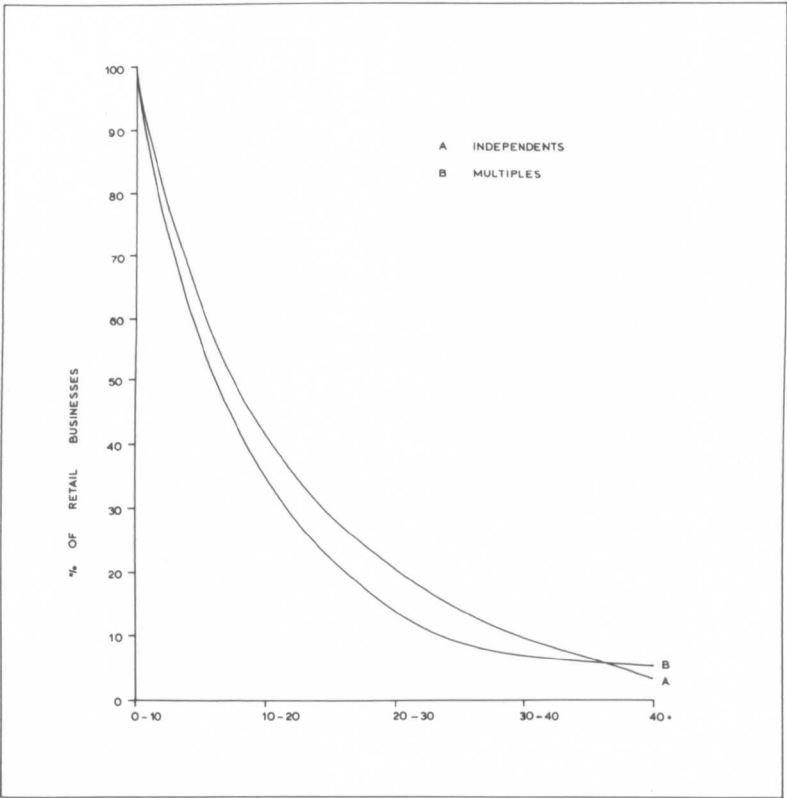


FIGURE 6.7 Business survival curves for butchers in Hull.

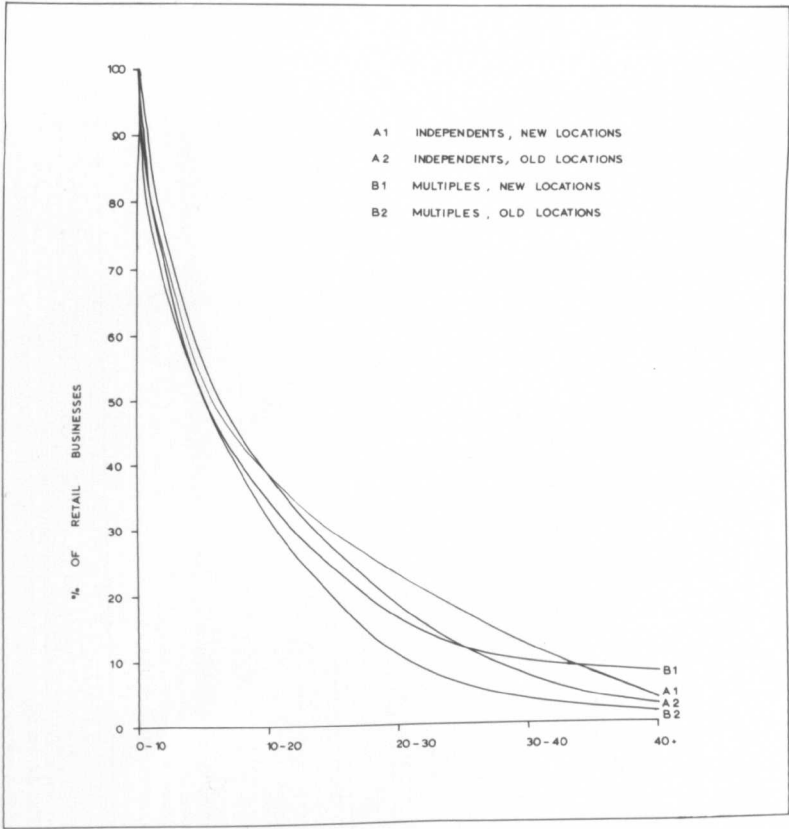


FIGURE 6.8 Business survival curves for butchers in different premises, Hull.

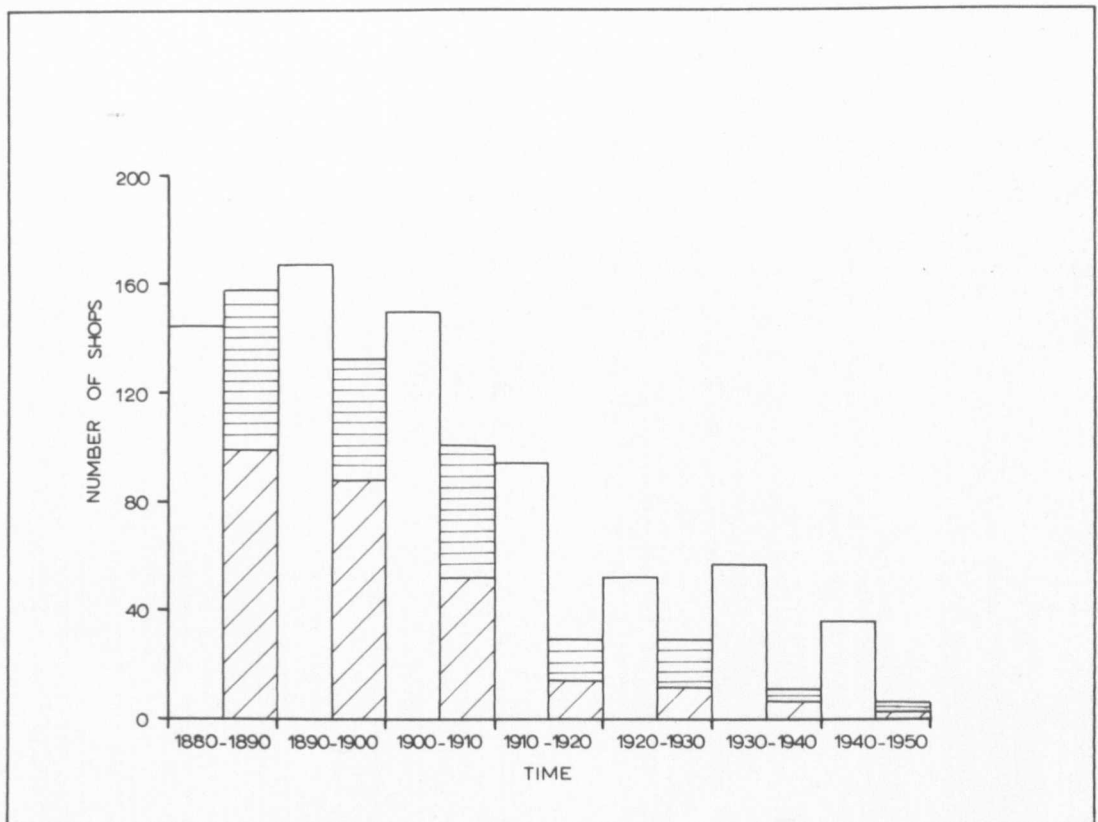


FIGURE 6.9 The growth of independent footwear shops in Hull.

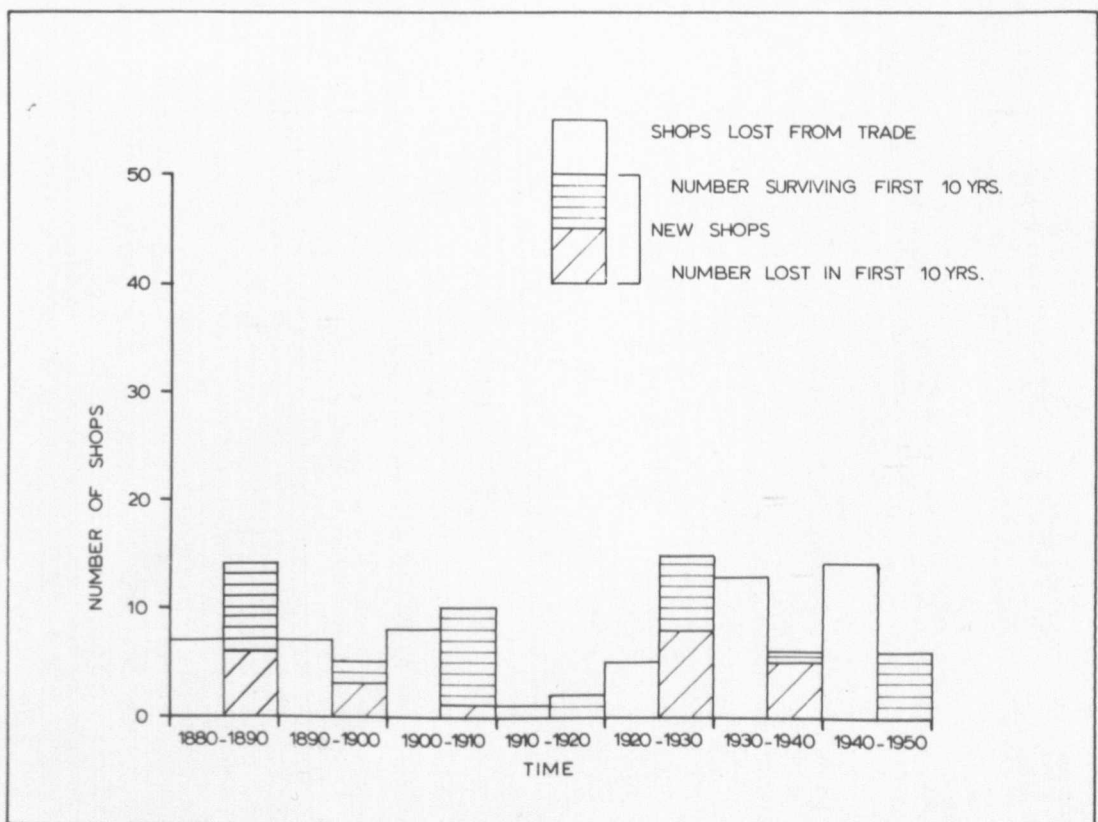


FIGURE 6.10 The growth of multiple footwear shops in Hull.

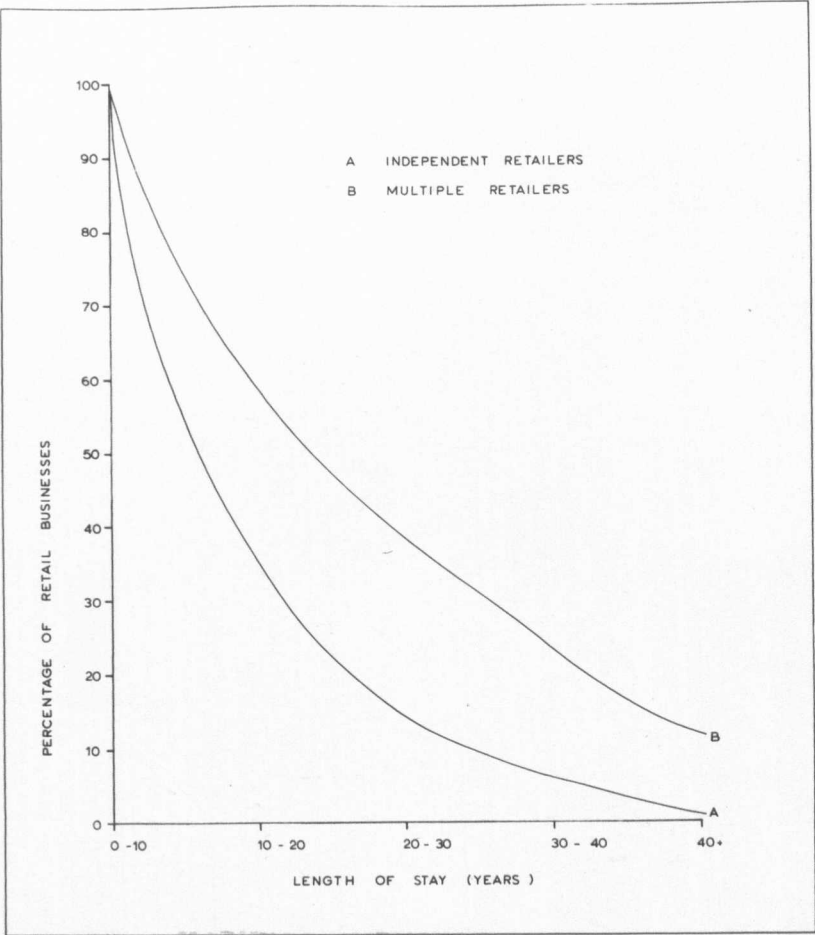


FIGURE 6.11 Business survival curves of footwear retailers in Hull.

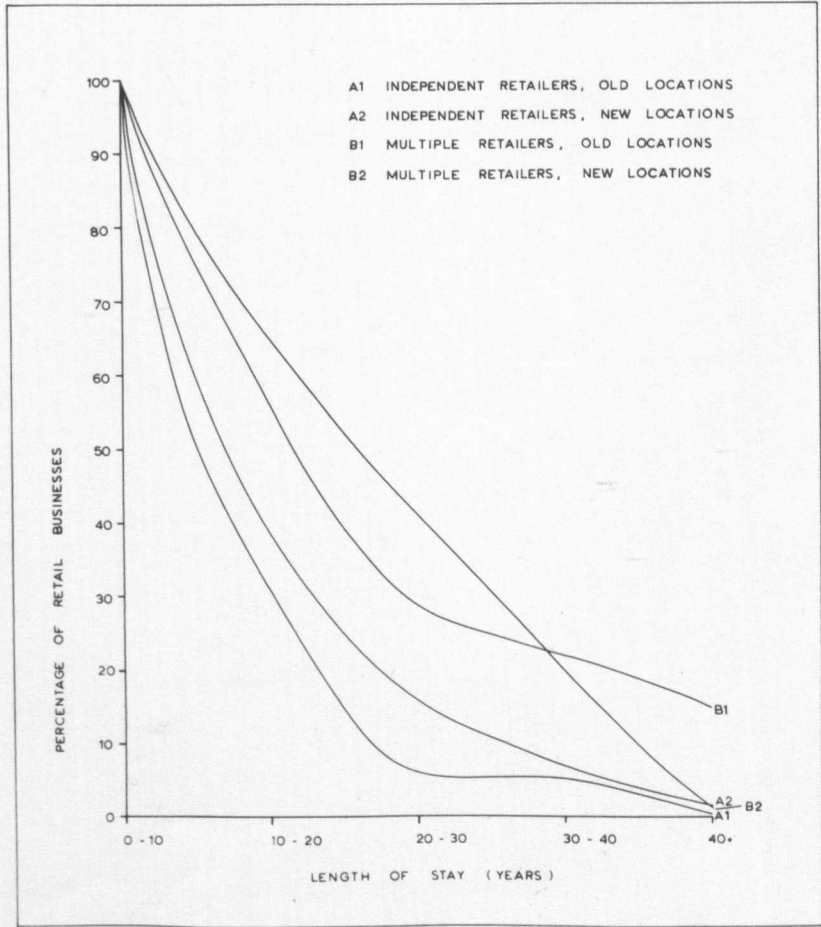


FIGURE 6.12 Business survival curves for footwear retailers in different locations, Hull.

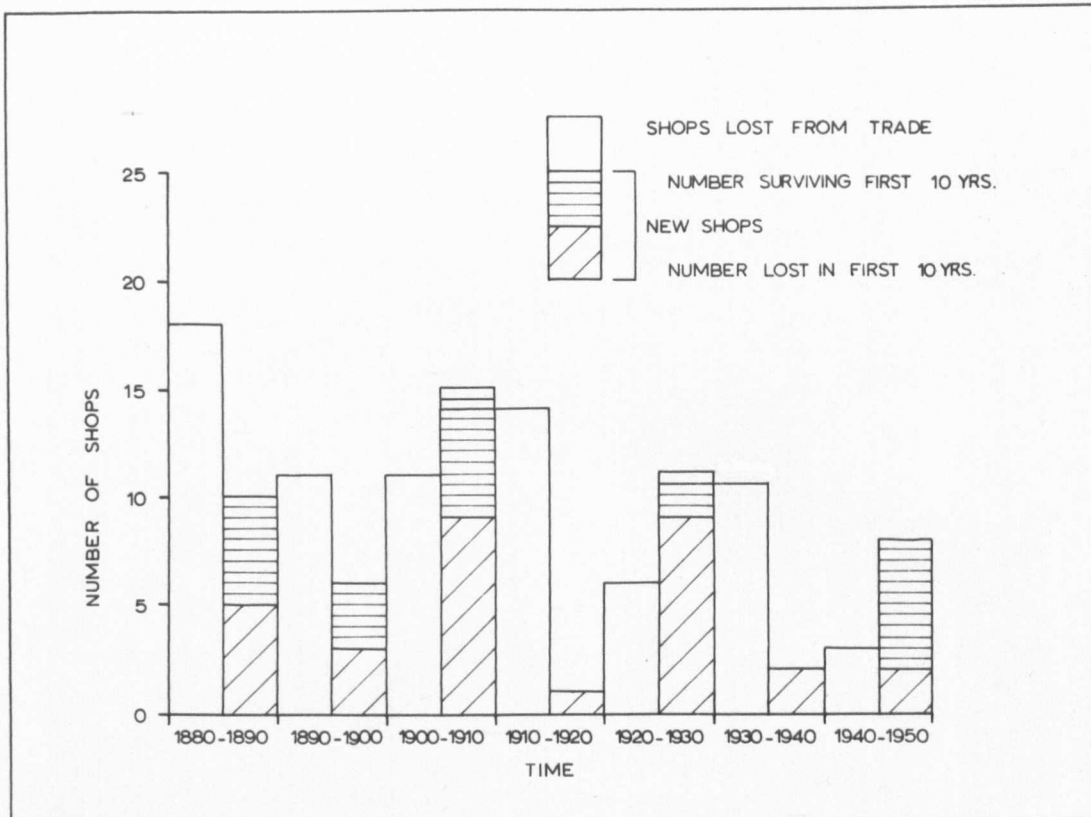


FIGURE 6.13 The growth of independent dyers and cleaners in Hull.

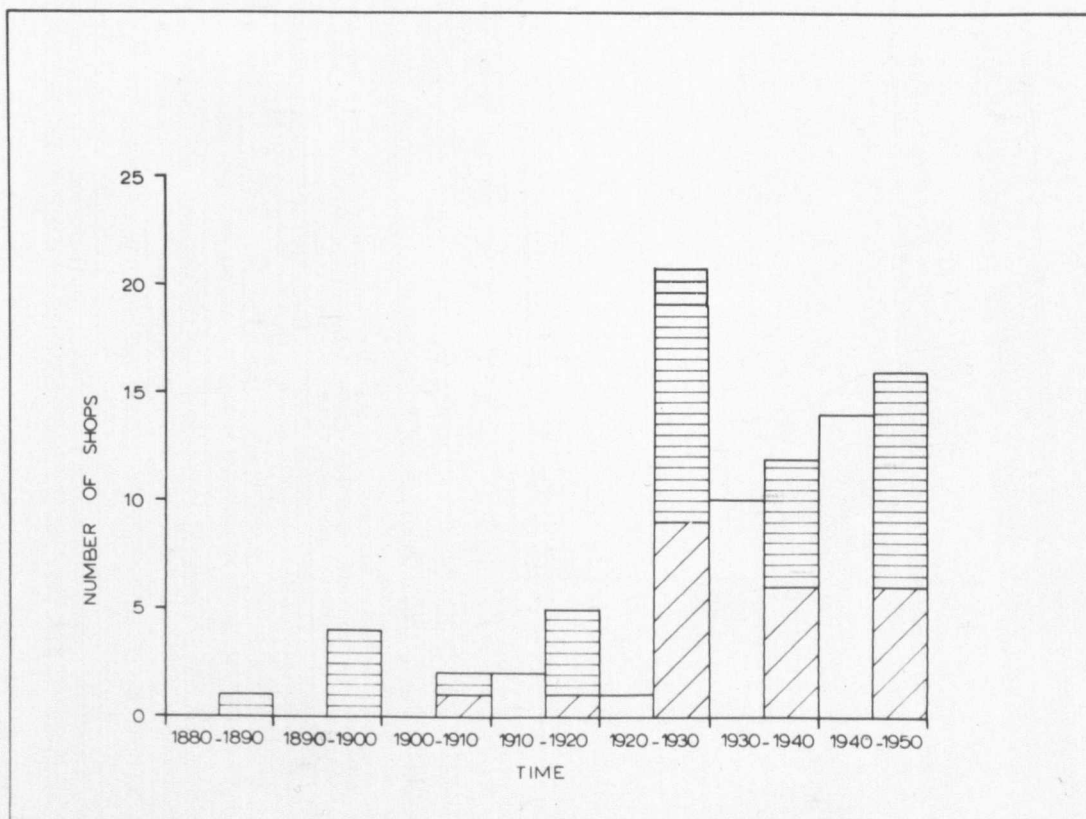


FIGURE 6.14 The growth of multiple dyers and cleaners in Hull.

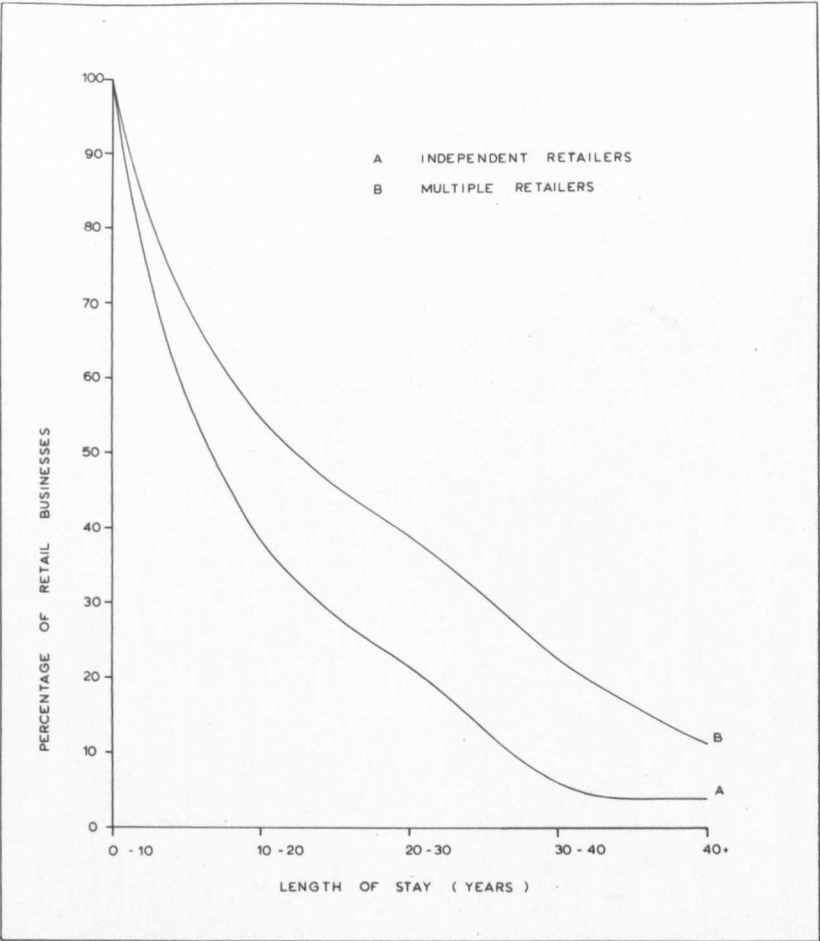


FIGURE 6.15 Business survival curves for dyers and cleaners in Hull.

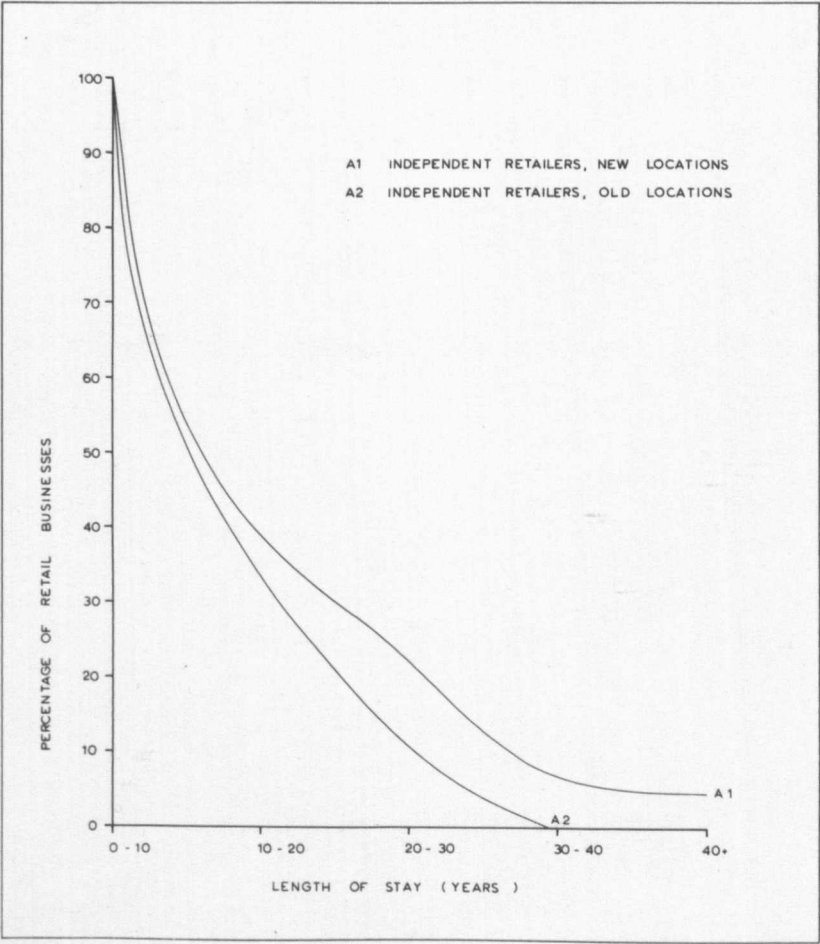


FIGURE 6.16 Business survival curves for dyers and cleaners in different locations, Hull.

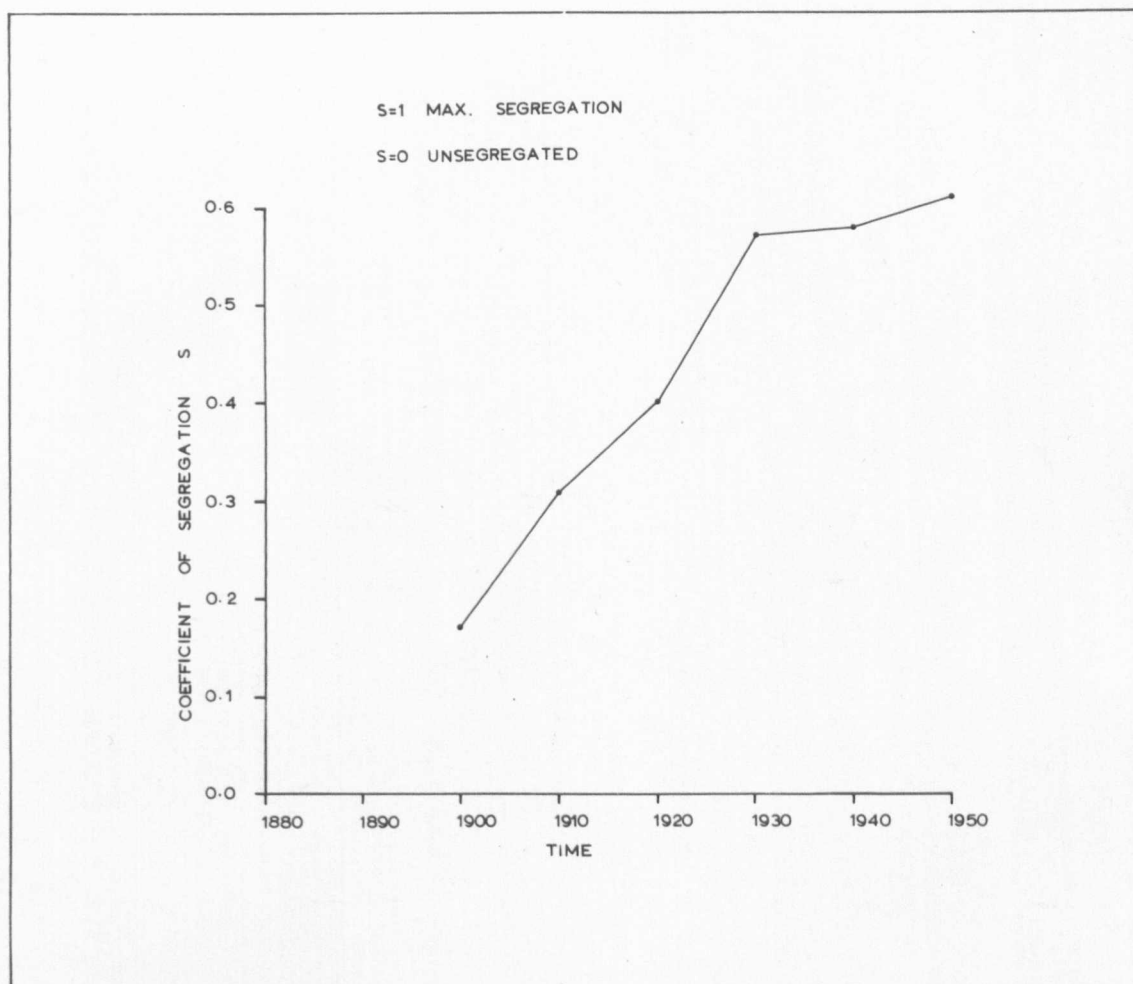


FIGURE 7.1 Locational segregation between multiple and independent grocers in Hull.

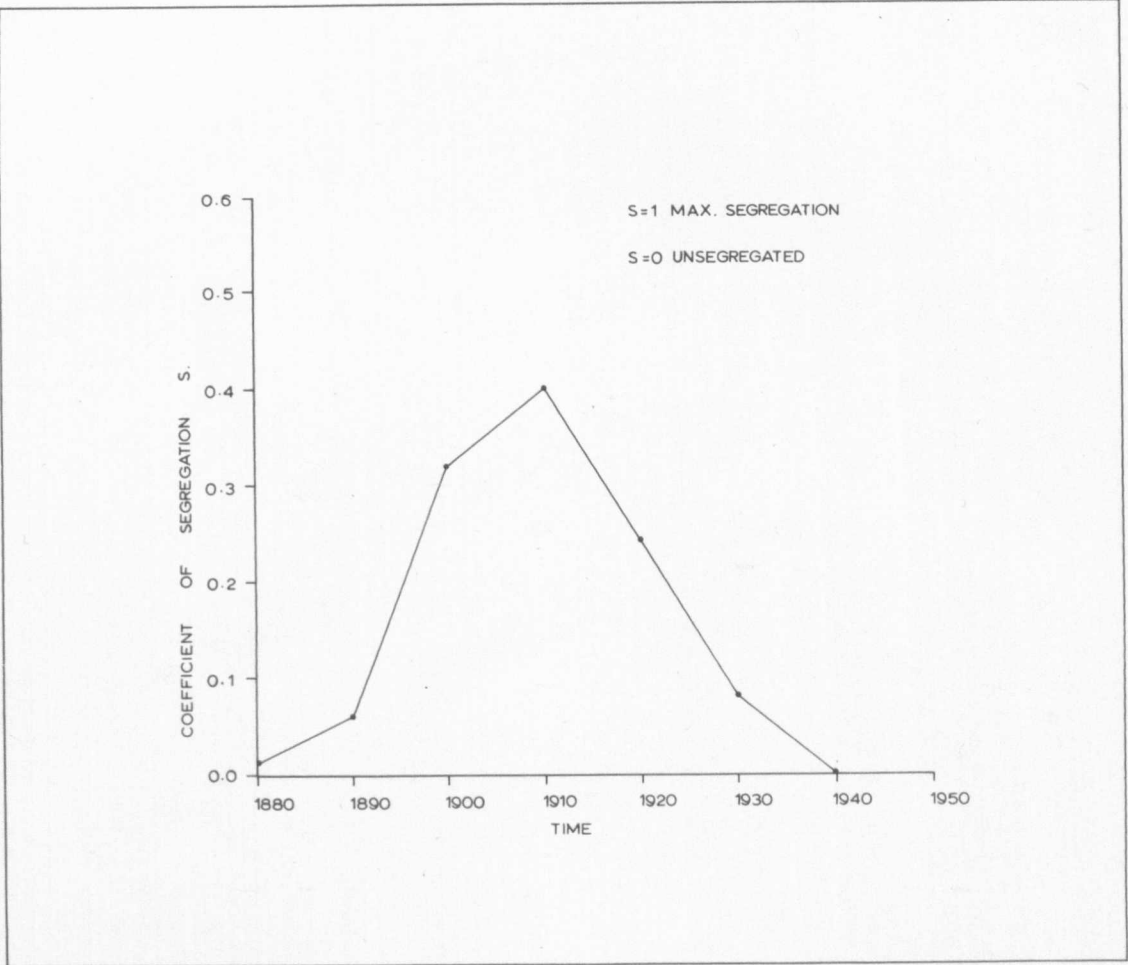


FIGURE 7.2 Locational segregation between multiple and independent butchers in Hull.

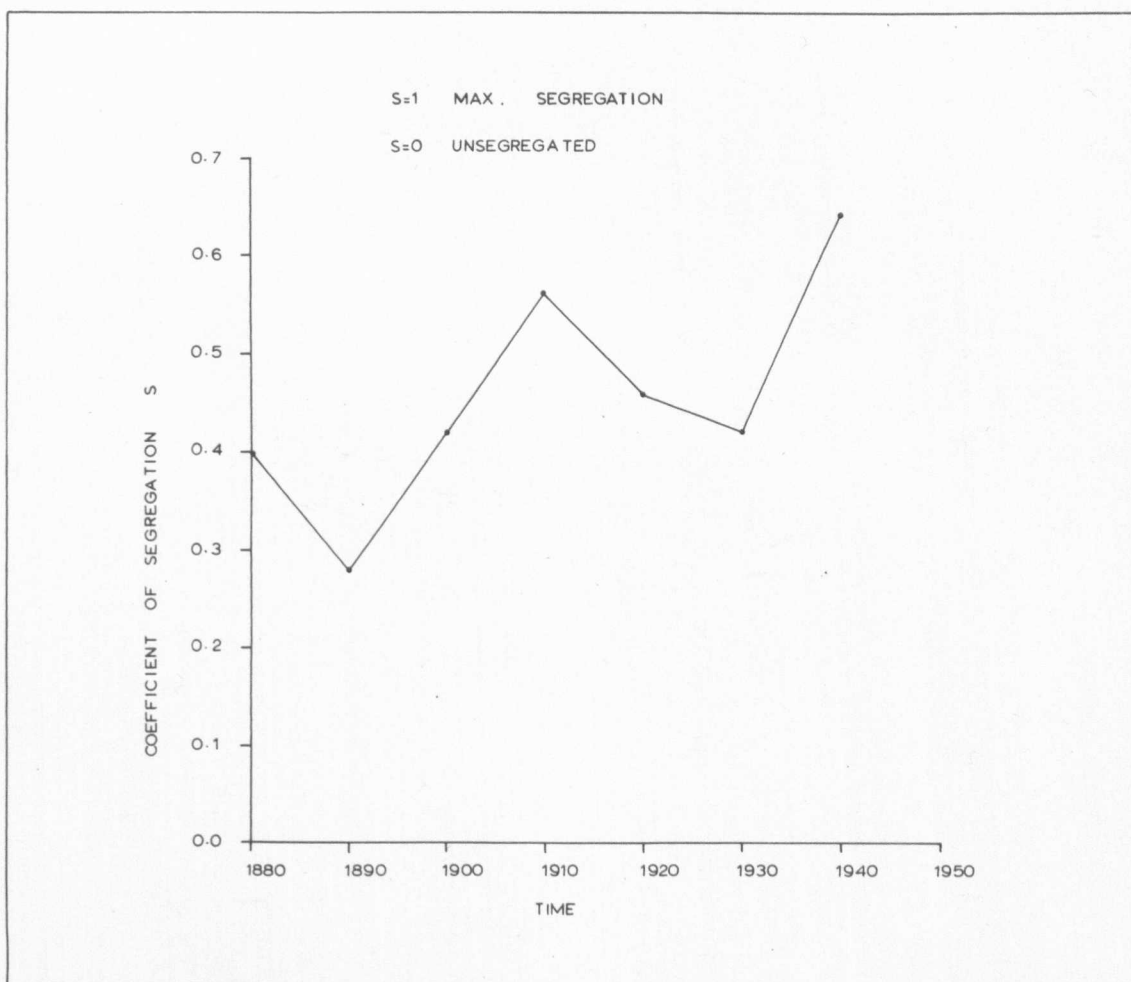


FIGURE 7.3 Locational segregation between multiple and independent footwear retailers, Hull.

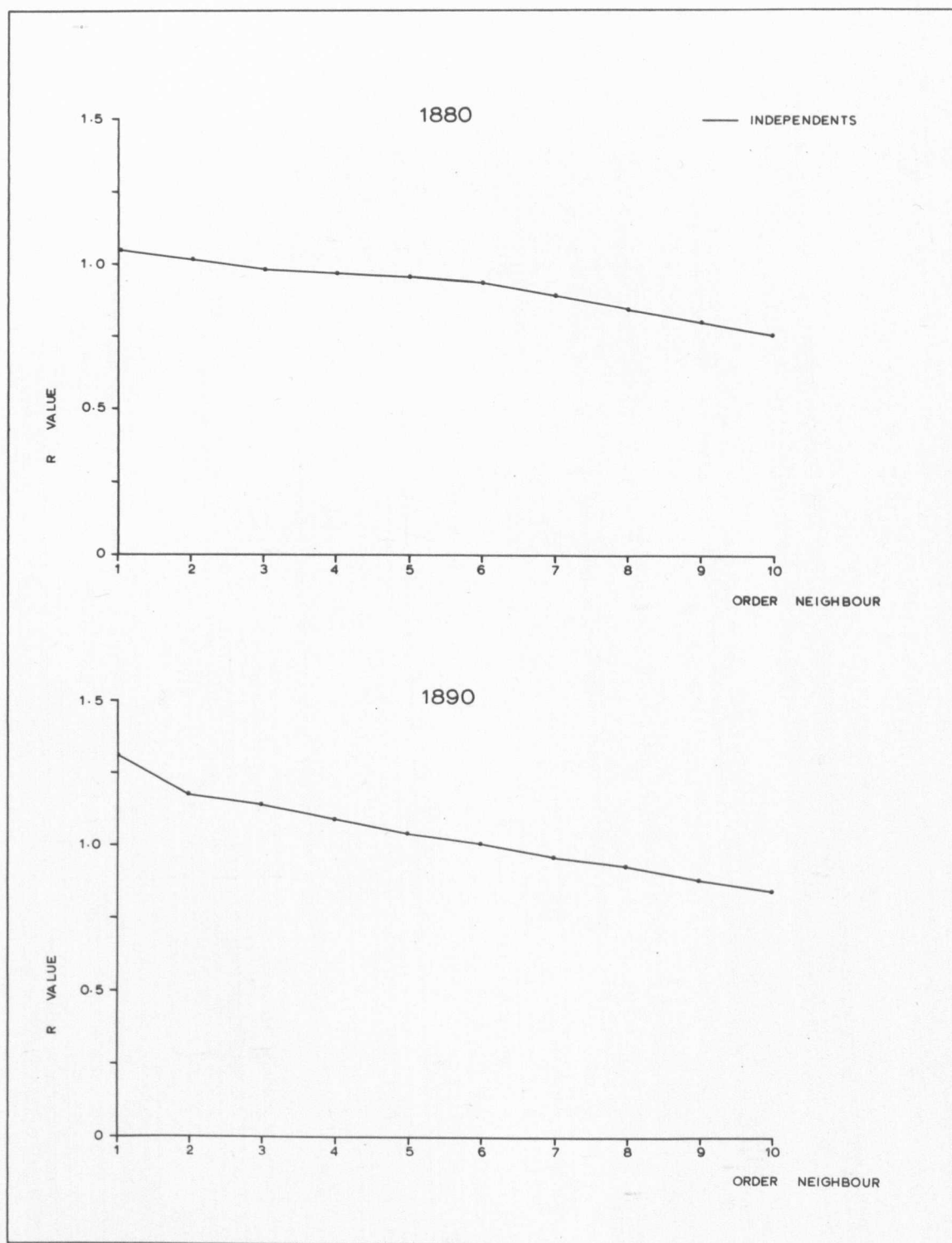


FIGURE 7.4 Nearest neighbour values for grocers for 1880 and 1890, Hull.

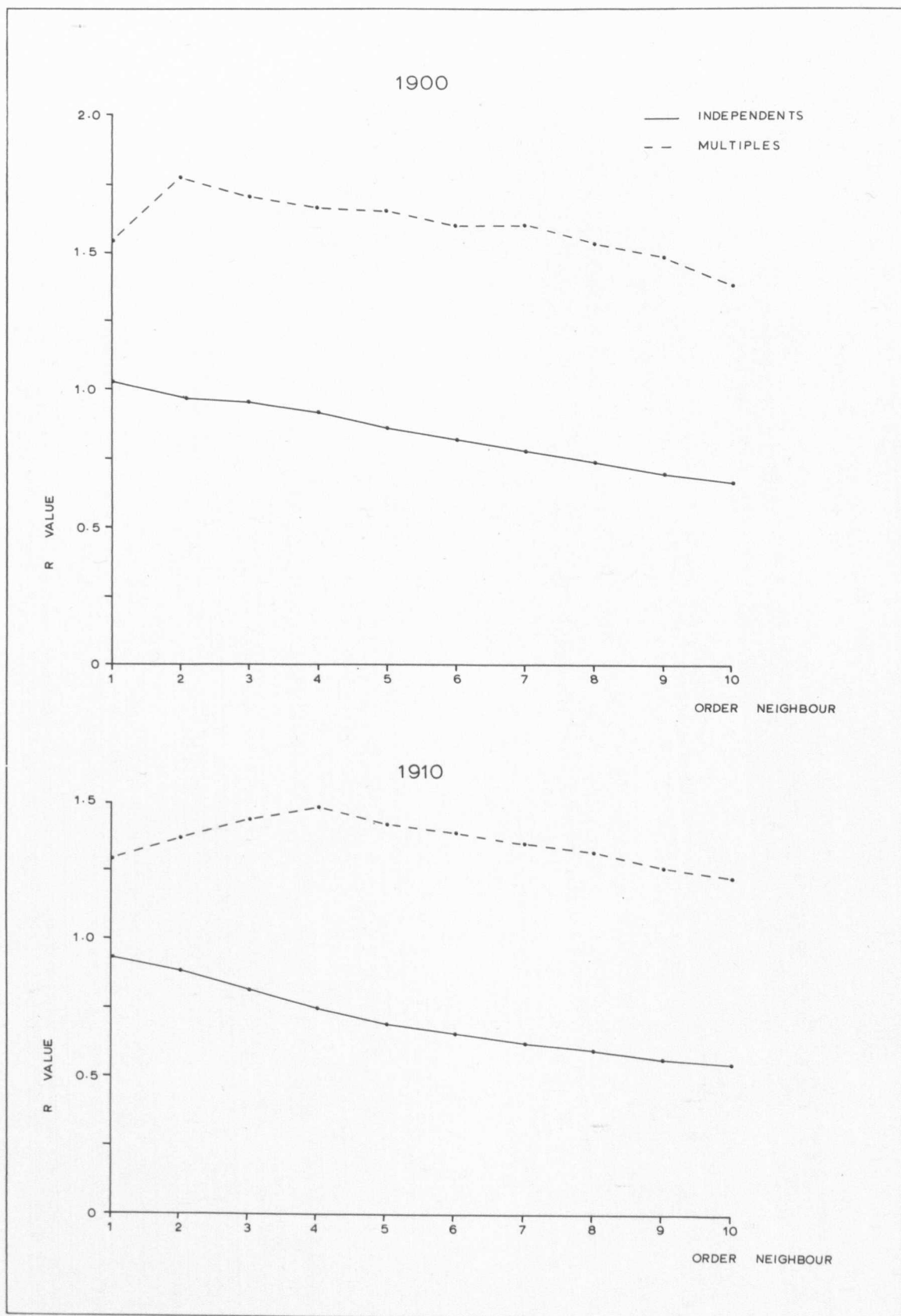


FIGURE 7.5 Nearest neighbour values for grocers for 1900 and 1910, Hull.

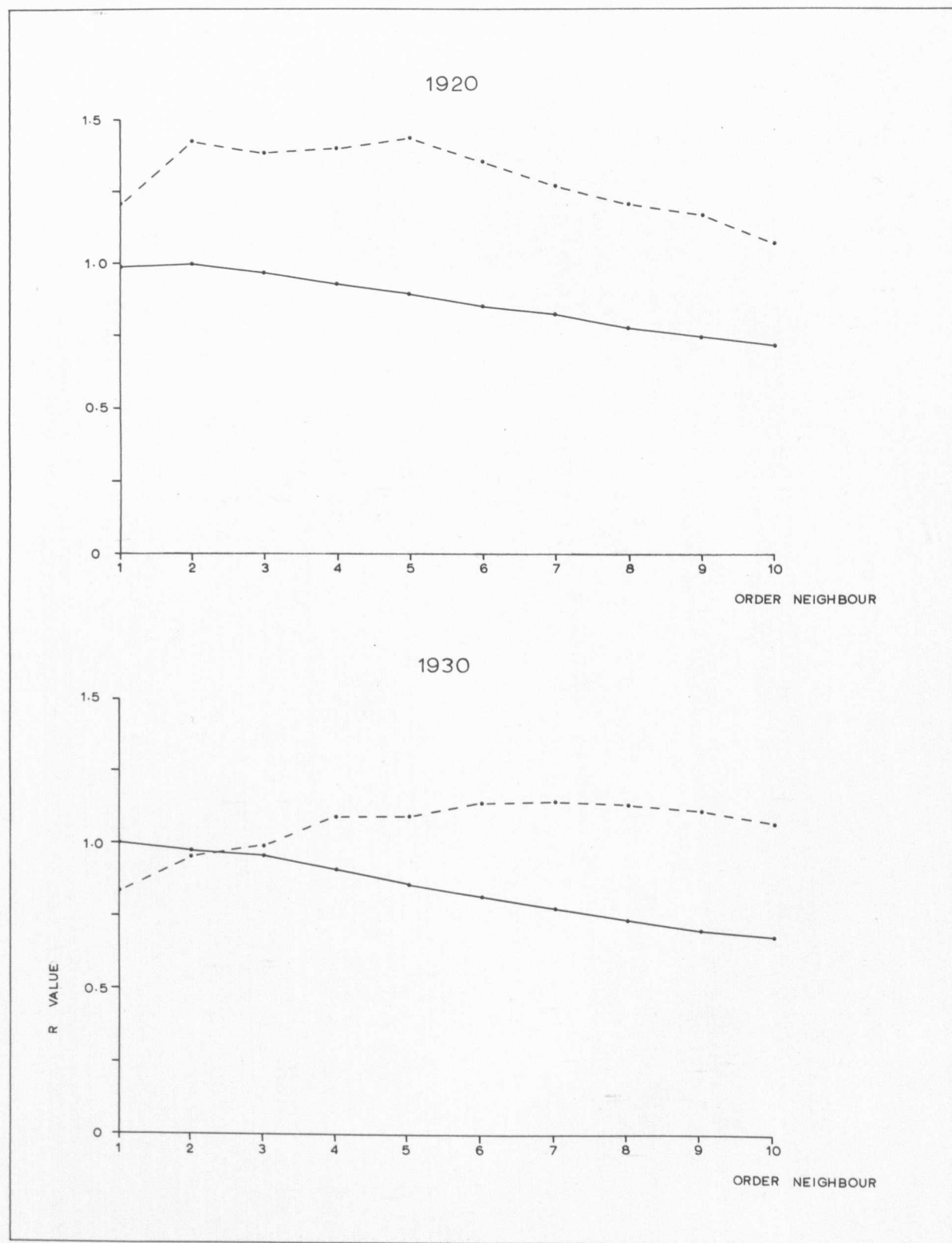


FIGURE 7.6 Nearest neighbour values for grocers for 1920 and 1930, Hull.

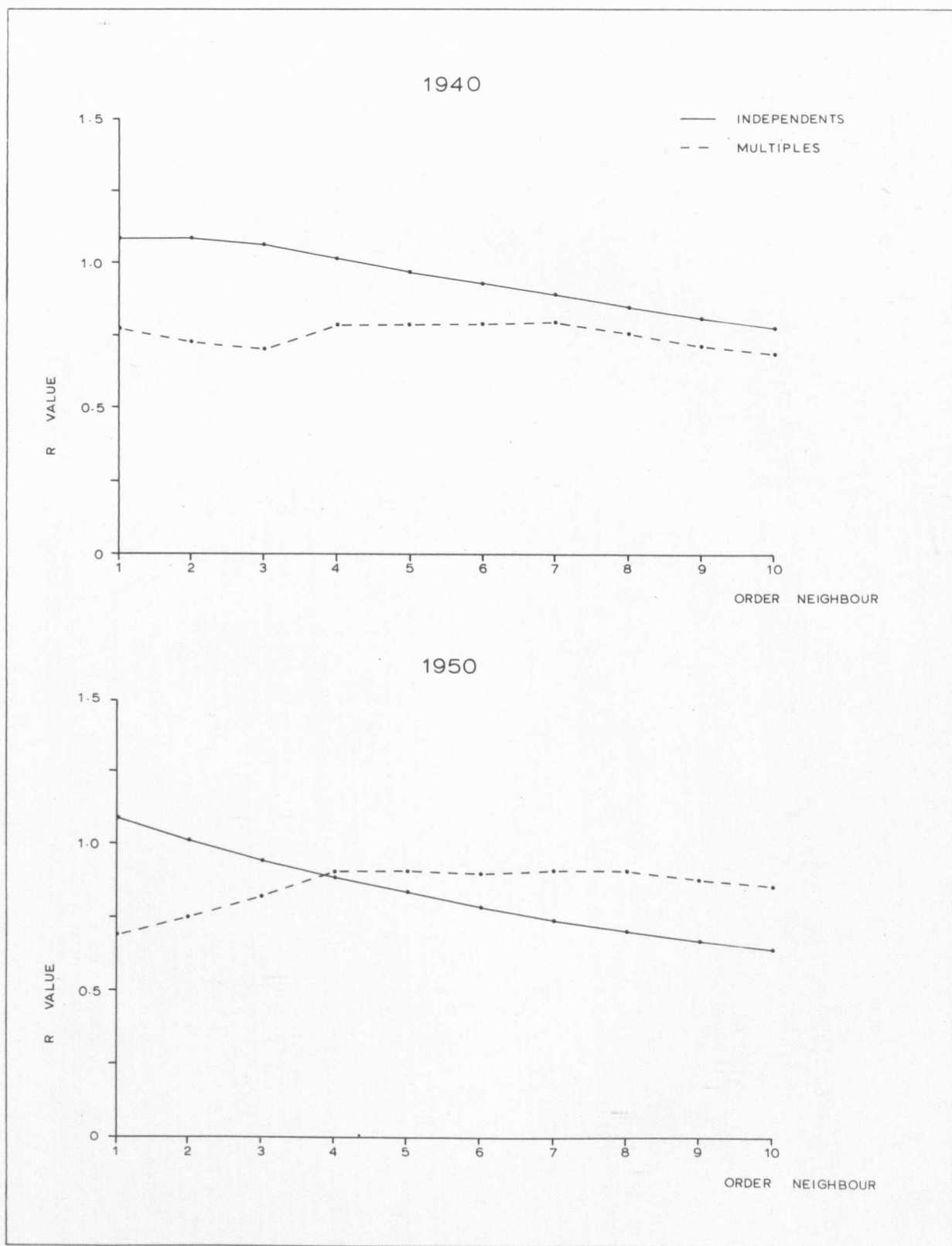


FIGURE 7.7 Nearest neighbour values for grocers for 1940 and 1950, Hull.

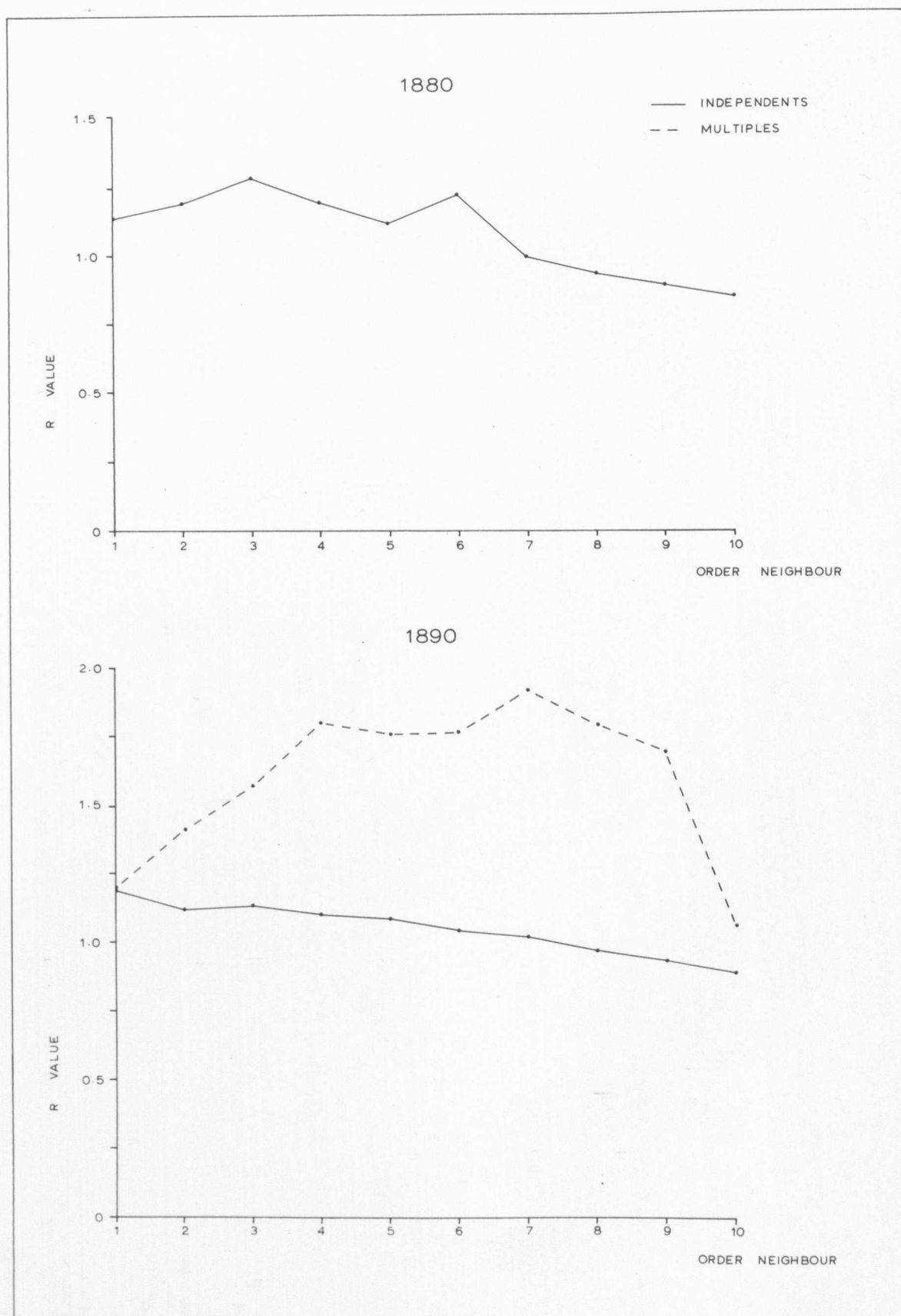


FIGURE 7.8 Nearest neighbour values for butchers in 1880 and 1890, Hull.

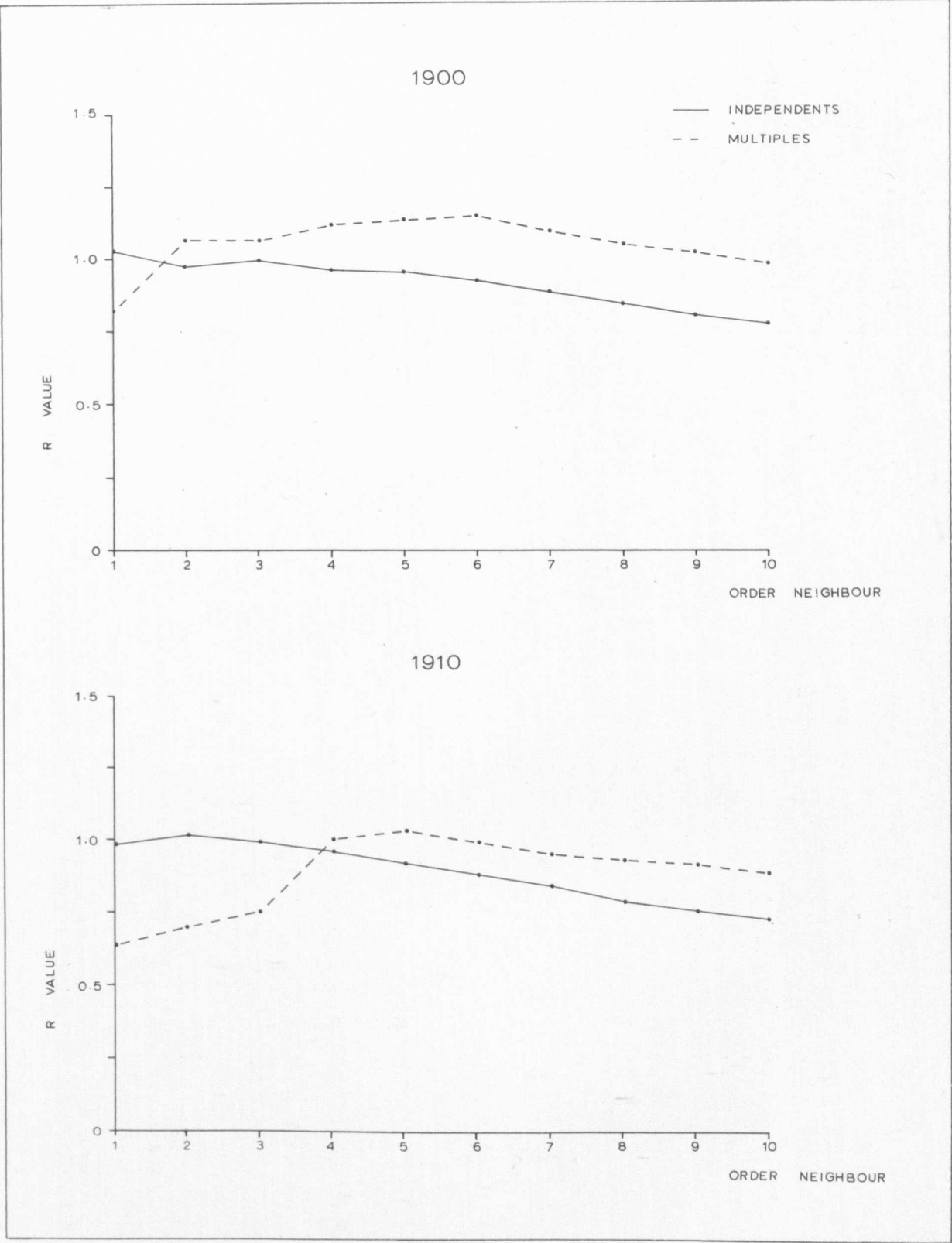


FIGURE 7.9 Nearest neighbour values for butchers in 1900 and 1910, Hull.

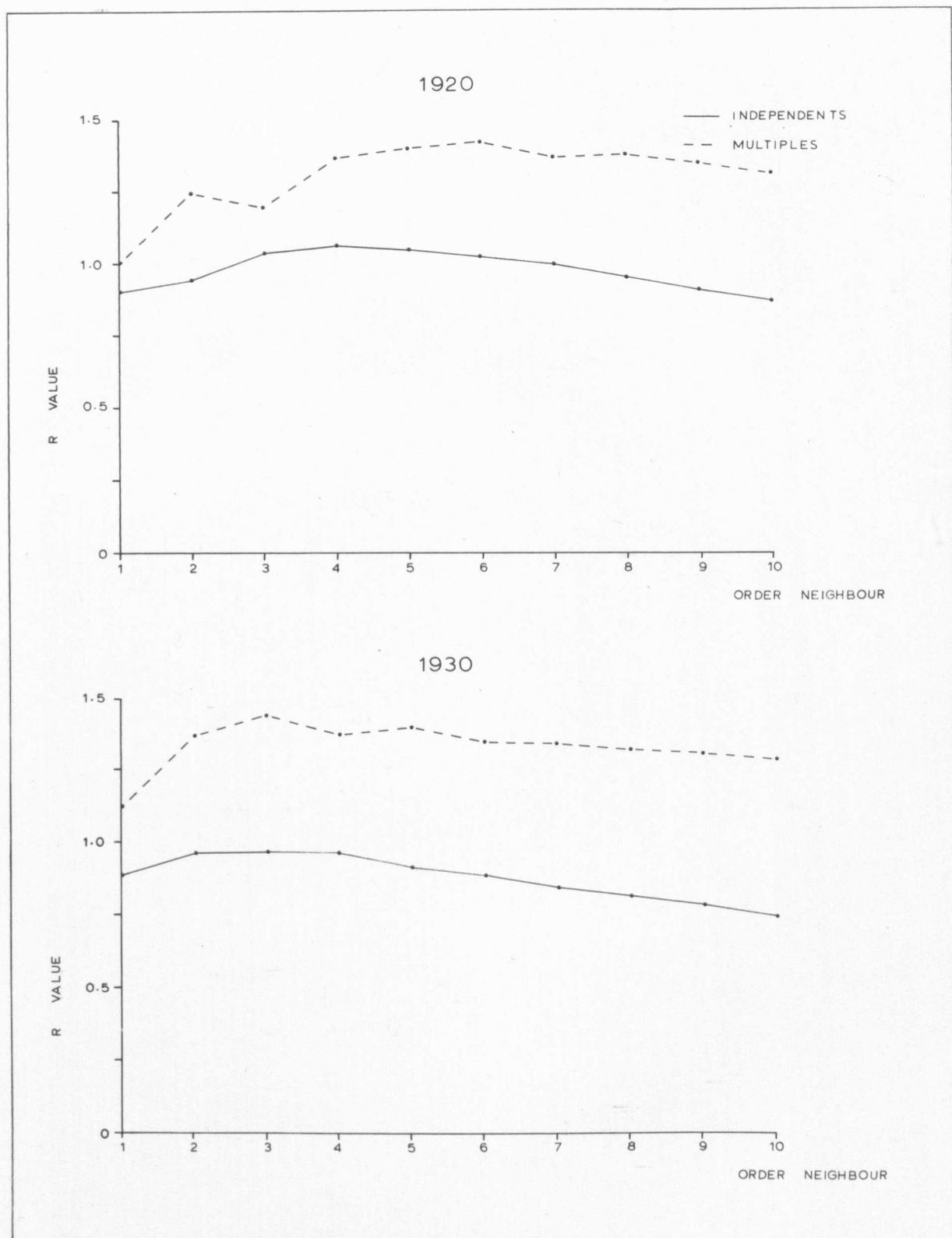


FIGURE 7.10 Nearest neighbour values for butchers in 1920 and 1930, Hull.

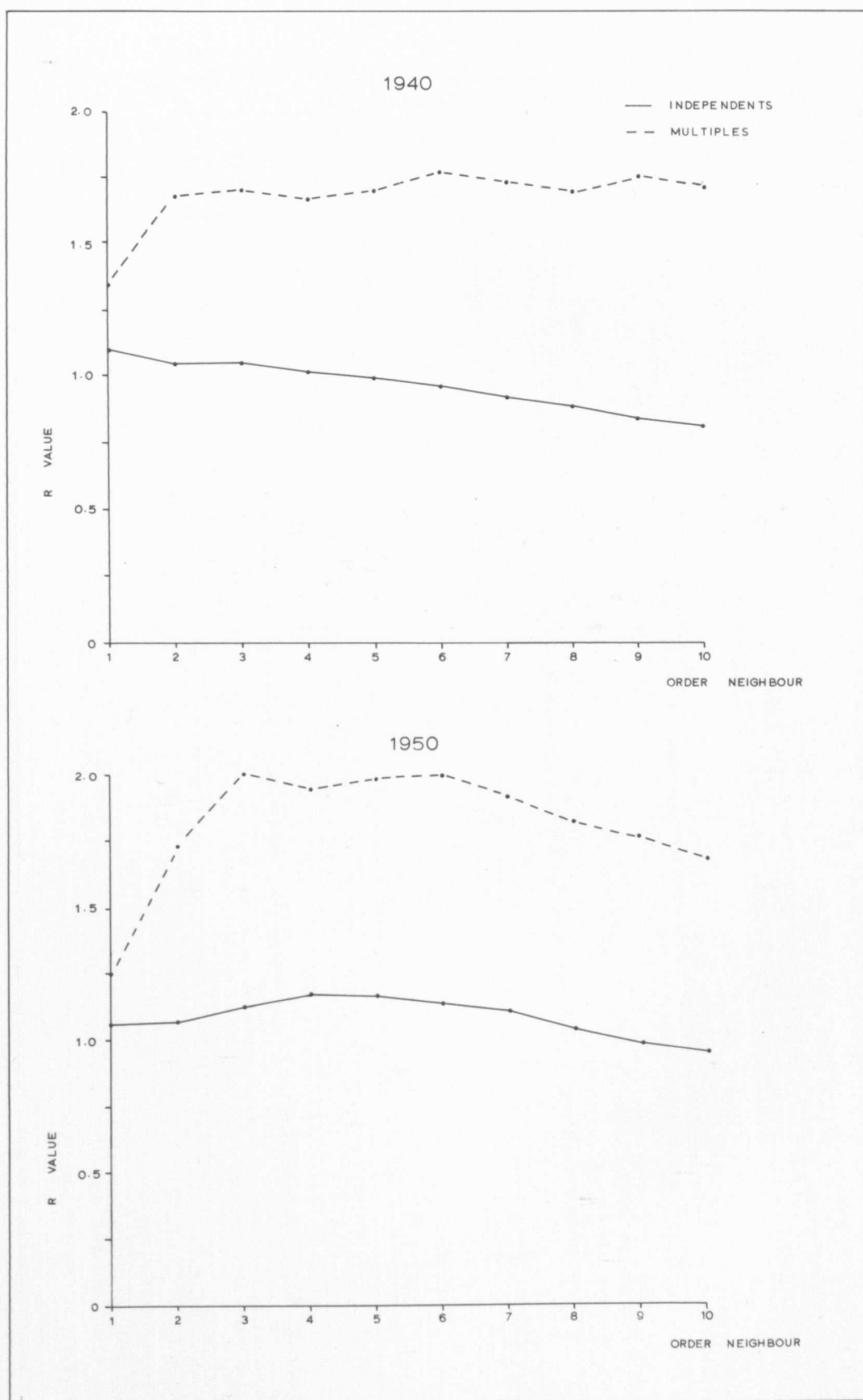


FIGURE 7.11 Nearest neighbour values for butchers for 1940 and 1950, Hull.

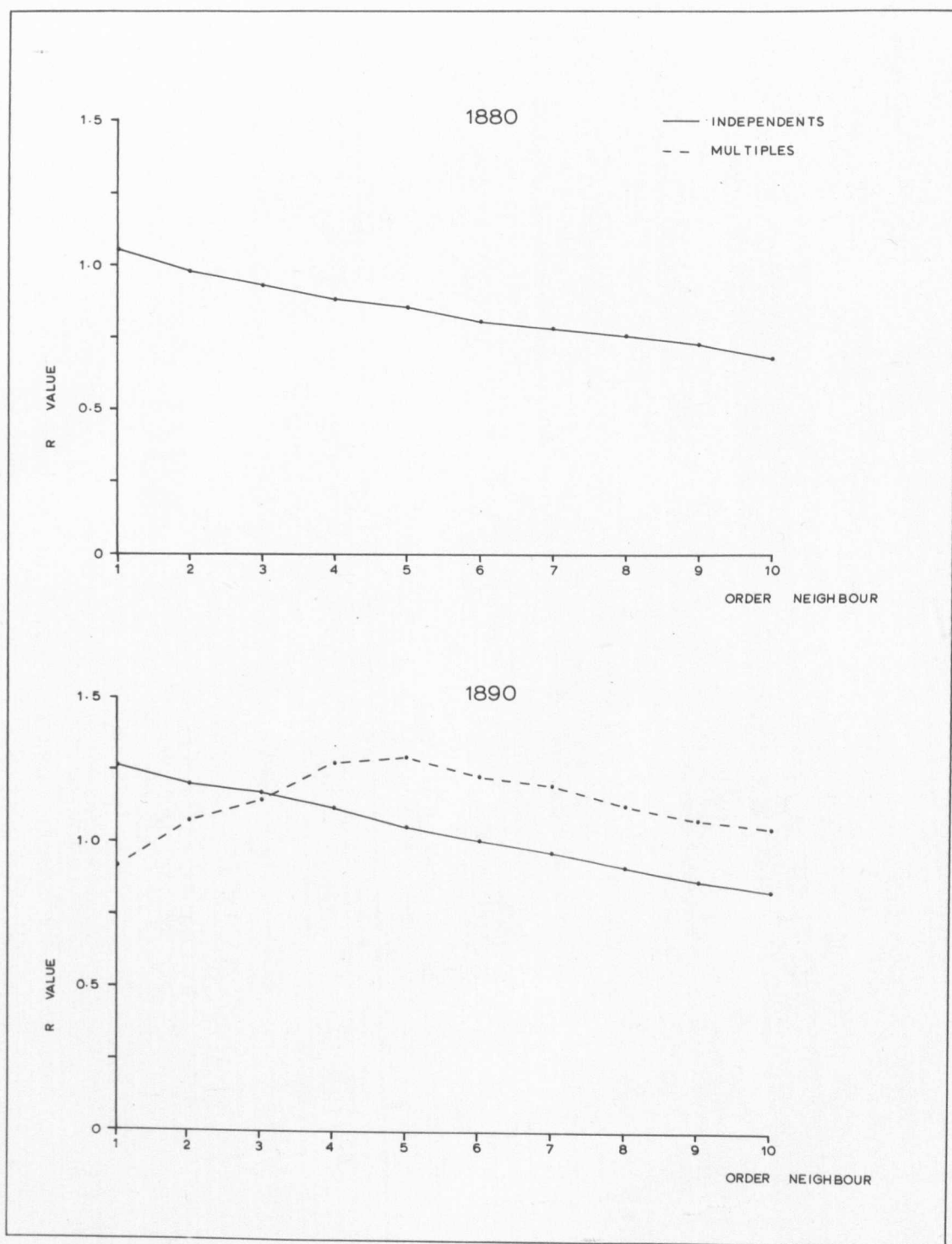


FIGURE 7.12 Nearest neighbour values for footwear shops for 1880 and 1890, Hull.

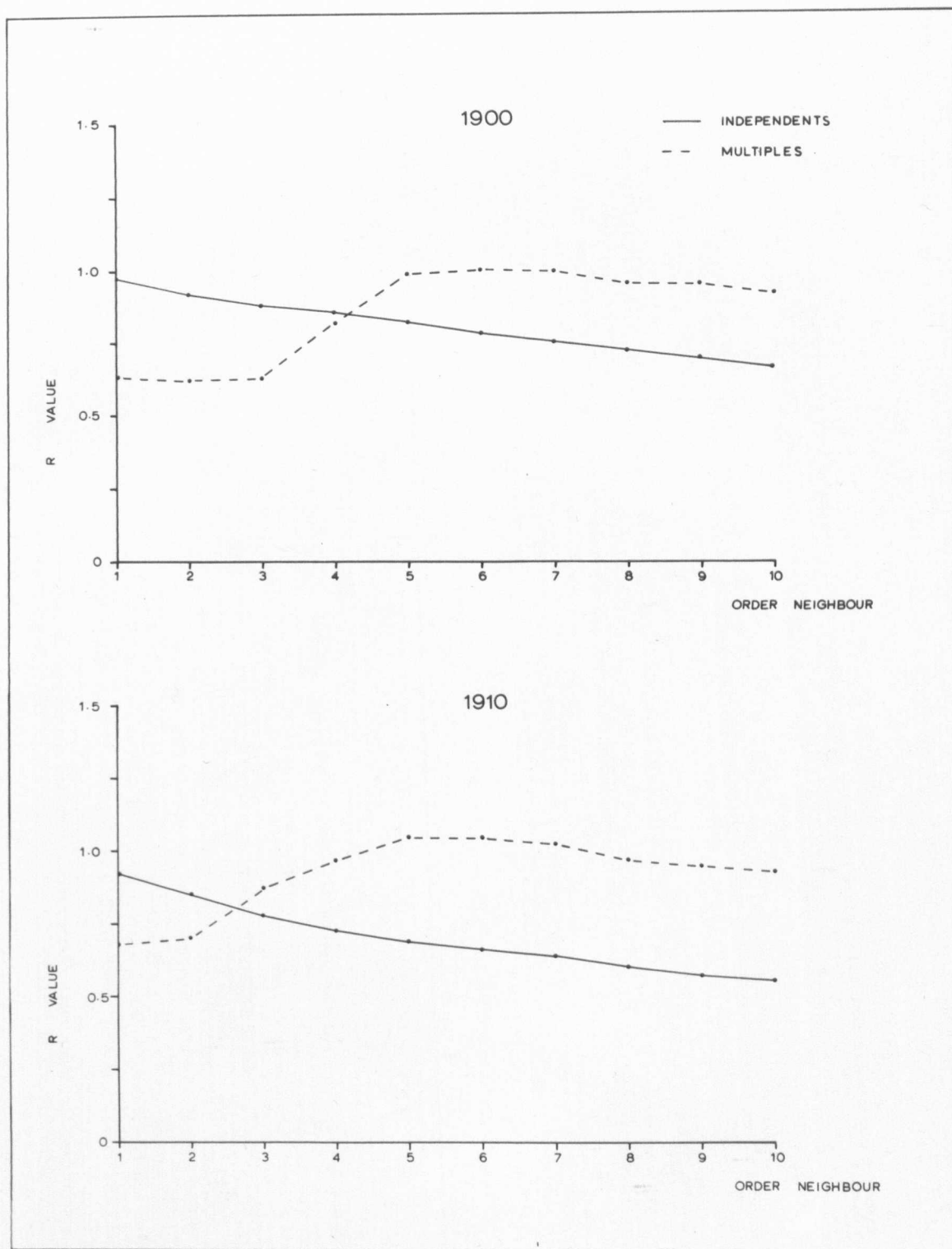


FIGURE 7.13 Nearest neighbour values for footwear shops for 1900 and 1910, Hull.

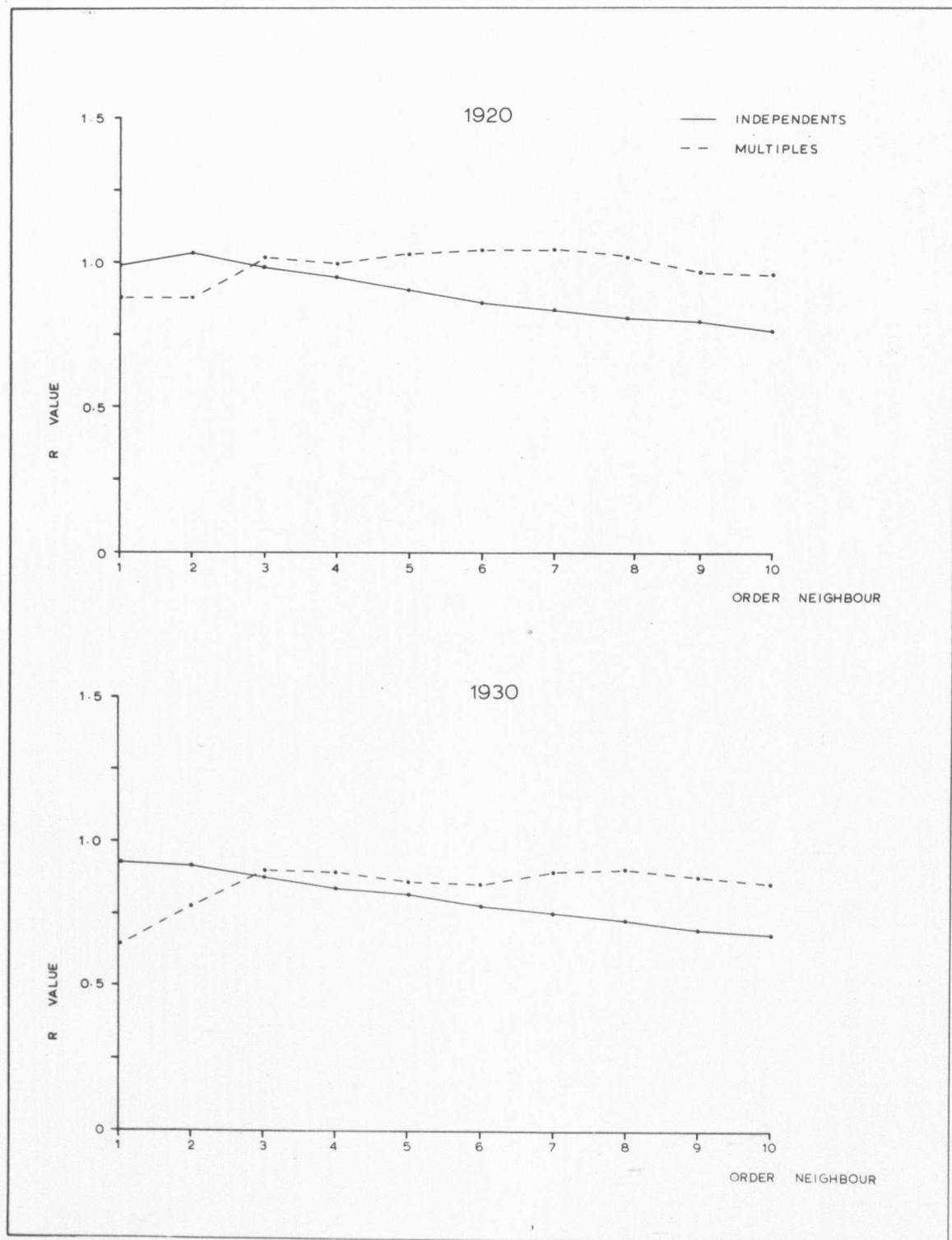


FIGURE 7.14 Nearest neighbour values for footwear shops for 1920 and 1930, Hull.

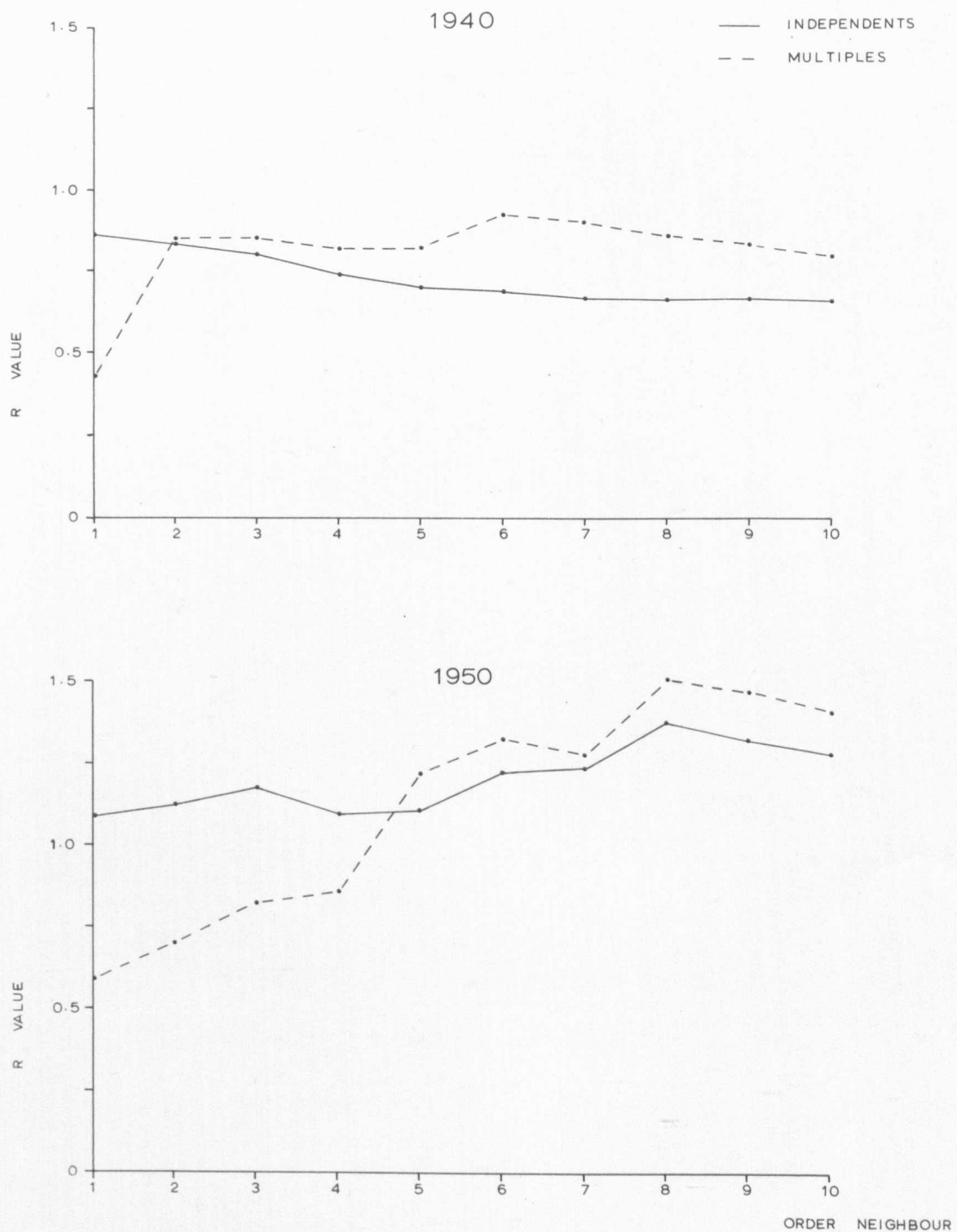


FIGURE 7.15 Nearest neighbour values for footwear shops for 1940 and 1950, Hull.

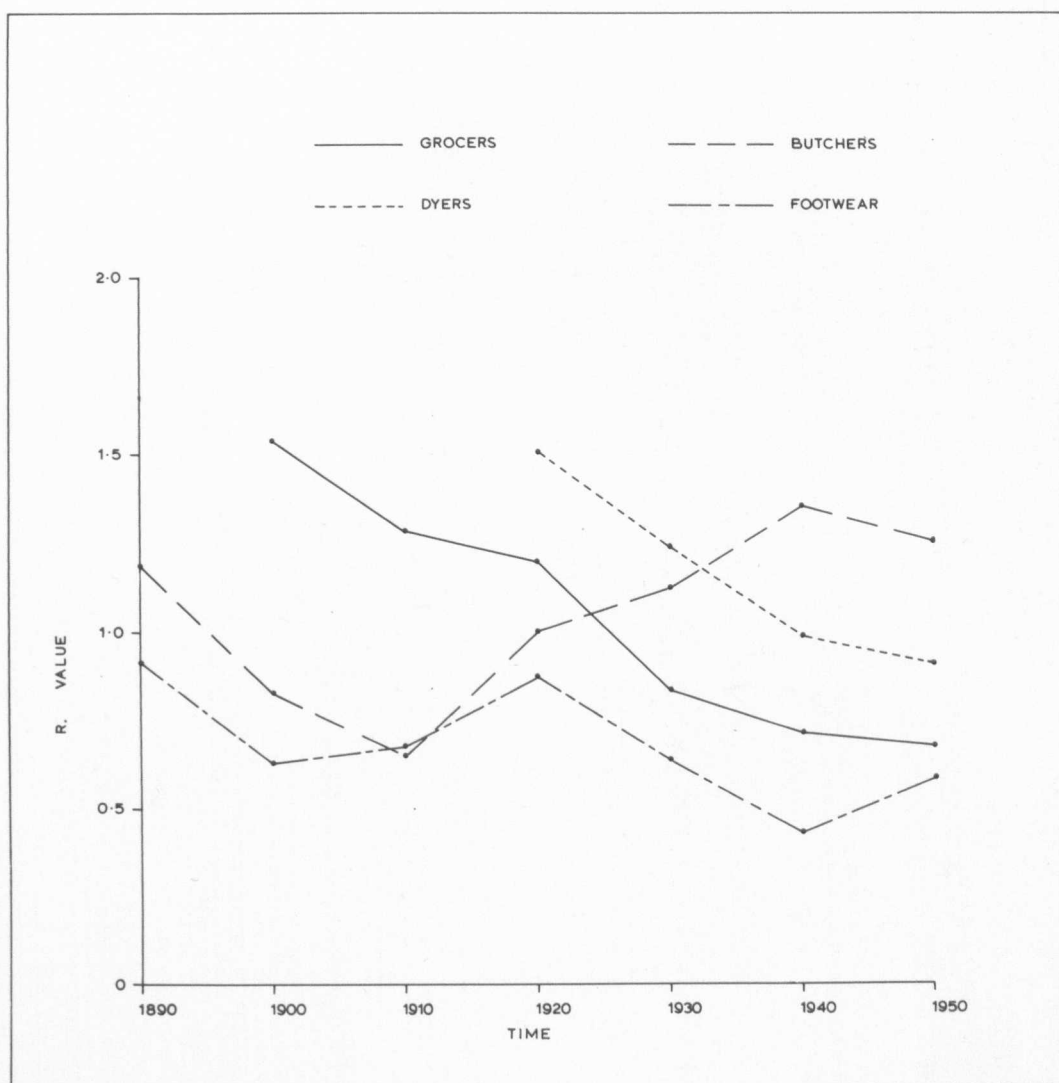


FIGURE 7.16 Variations in nearest neighbour values for selected multiple retailers in Hull.

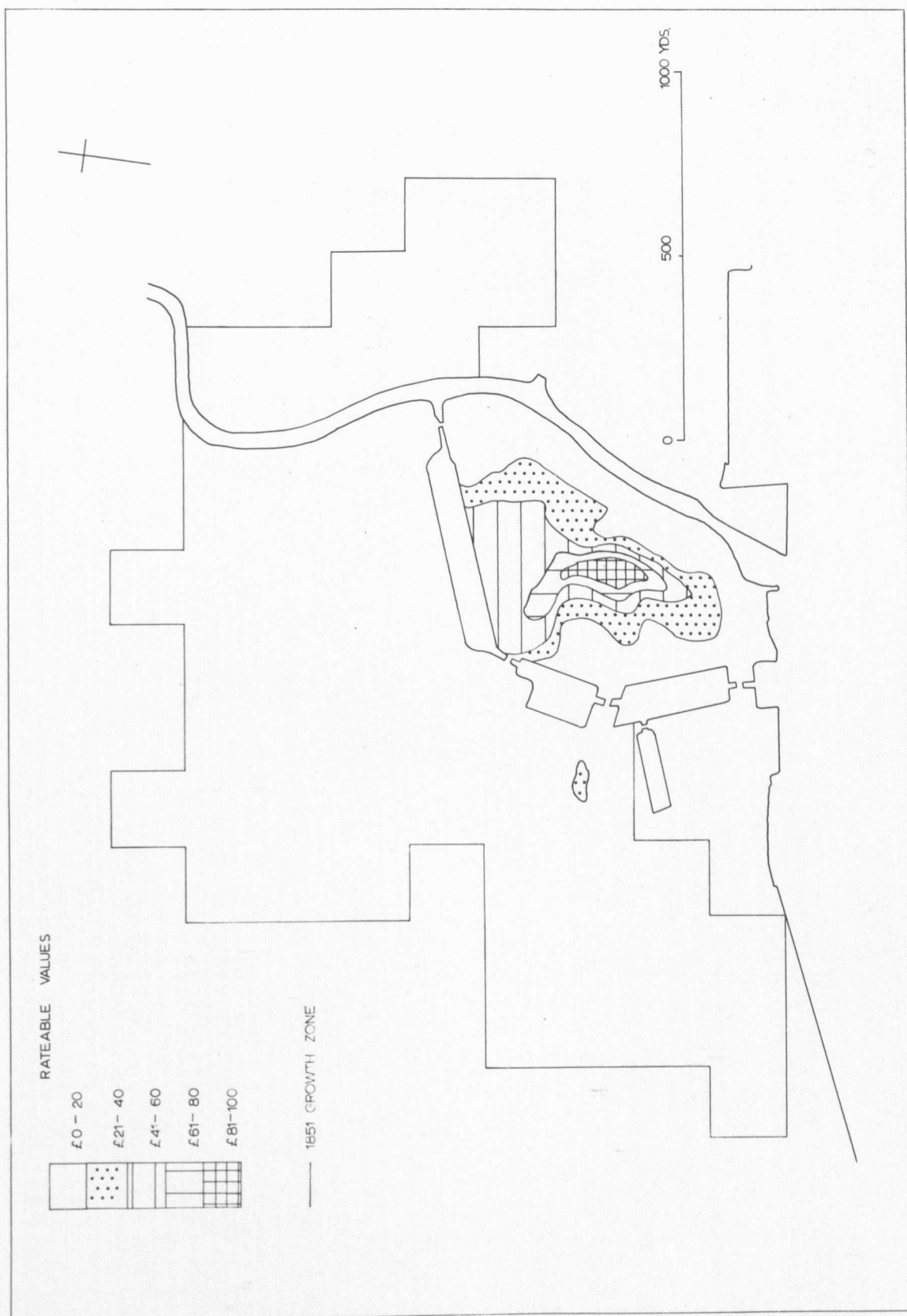


FIGURE 8.1 Rateable values for commercial properties in 1860, Hull.

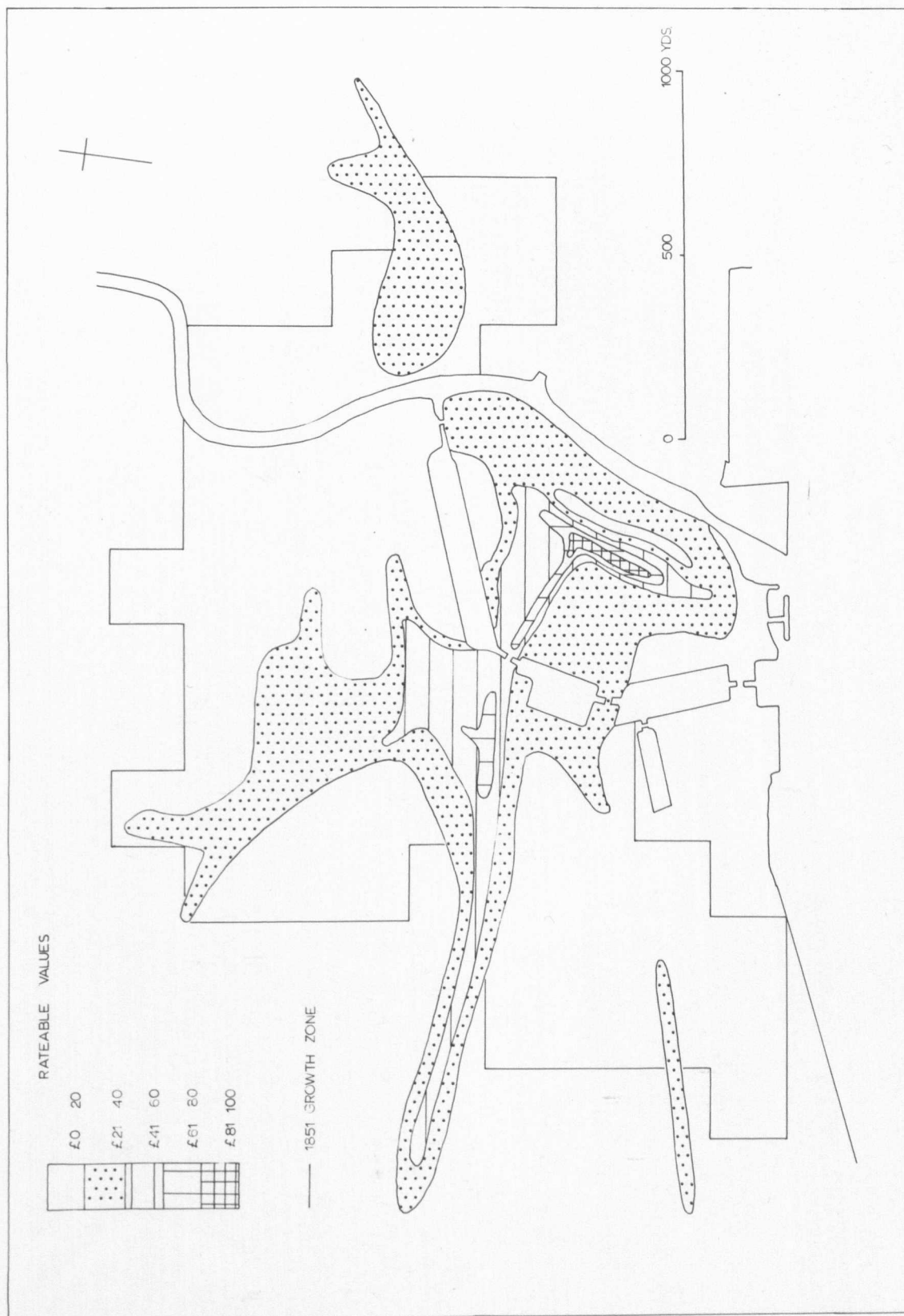


FIGURE 8.2 Rateable values for commercial properties in 1880, Hull.

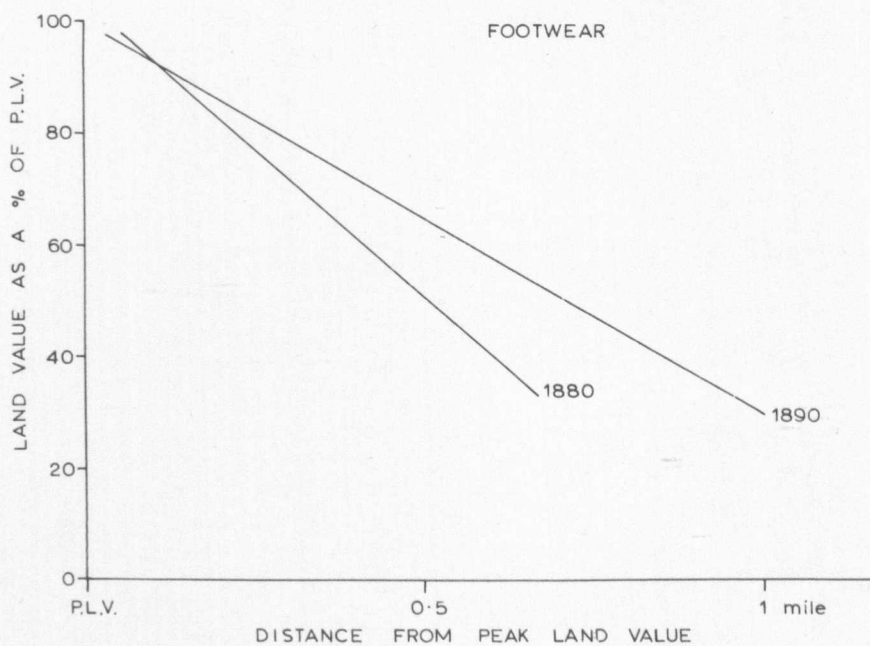
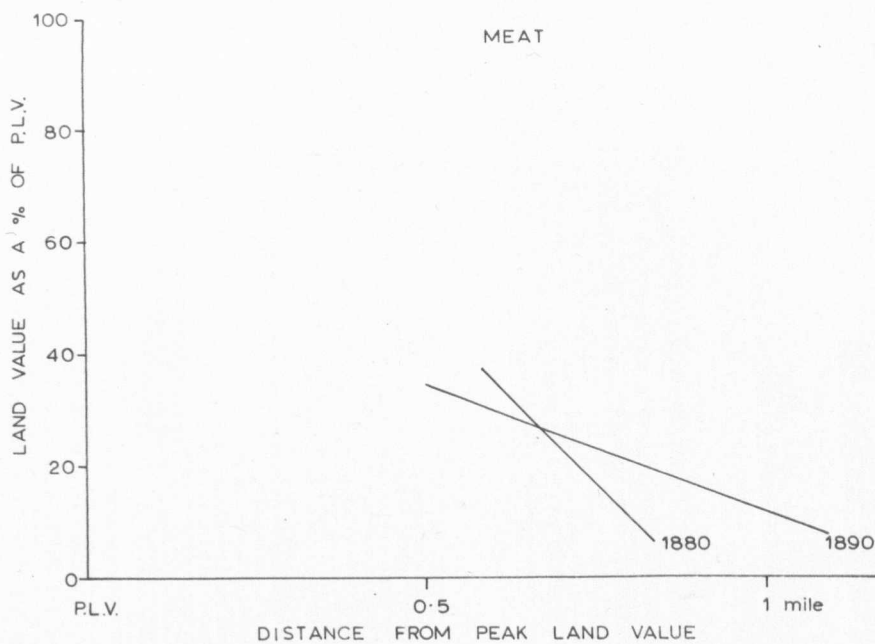


FIGURE 8.3 Indifference curves of multiple retailers operating in Hull.

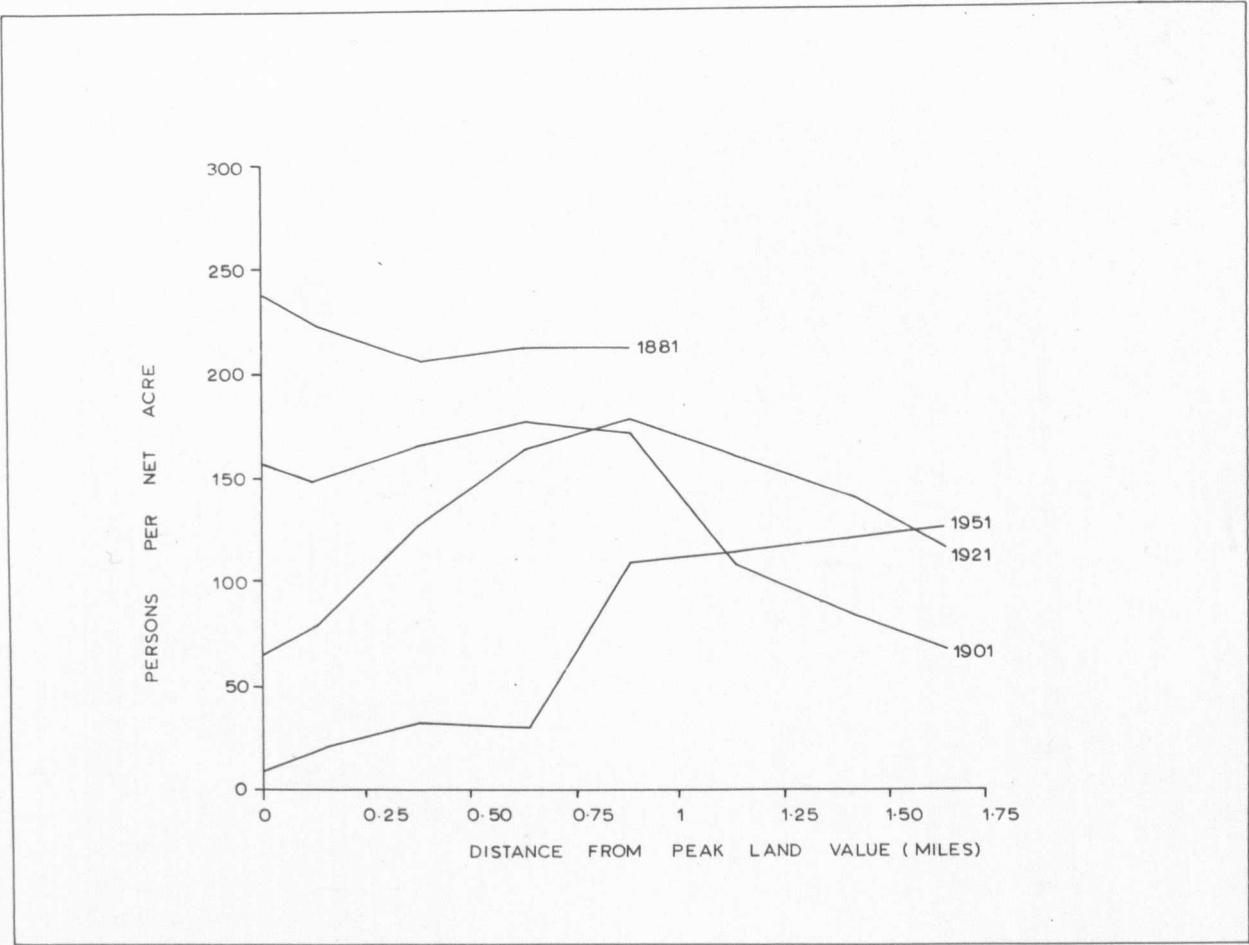


FIGURE 8.4 Population densities in West Hull.

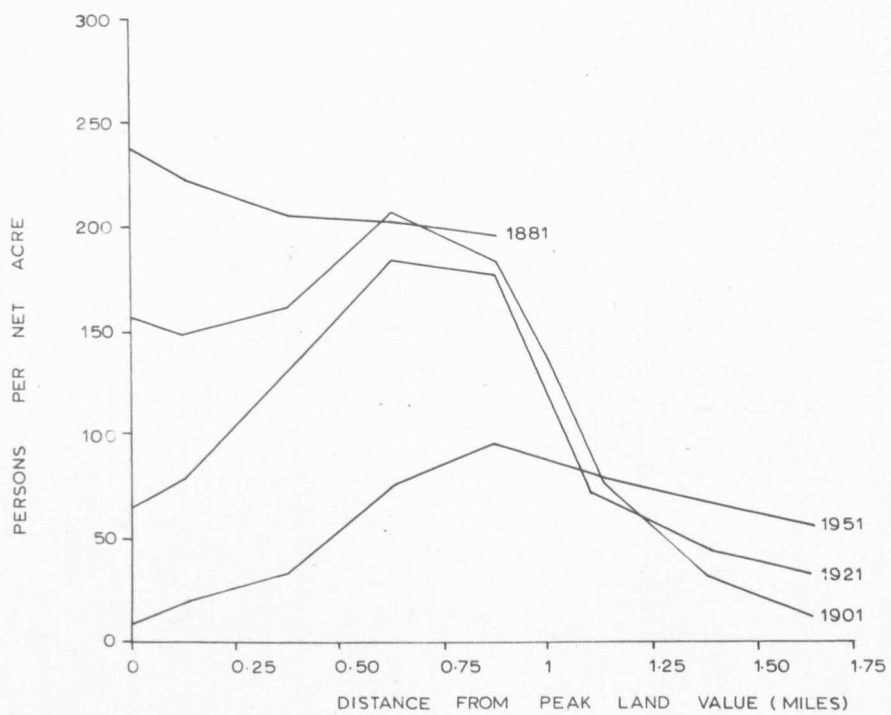


FIGURE 8.5 Population densities in North Hull.

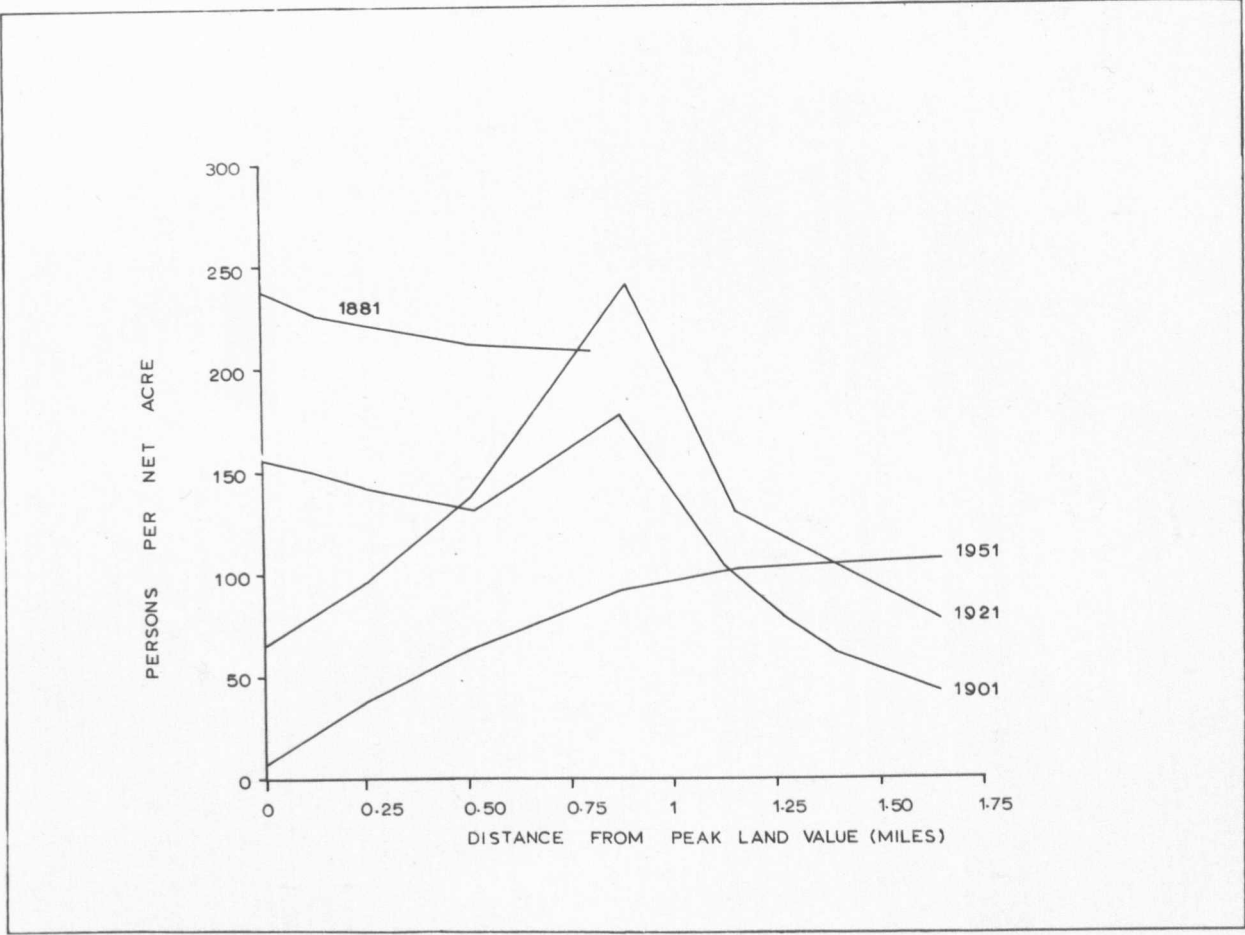


FIGURE 8.6 Population densities in East Hull.

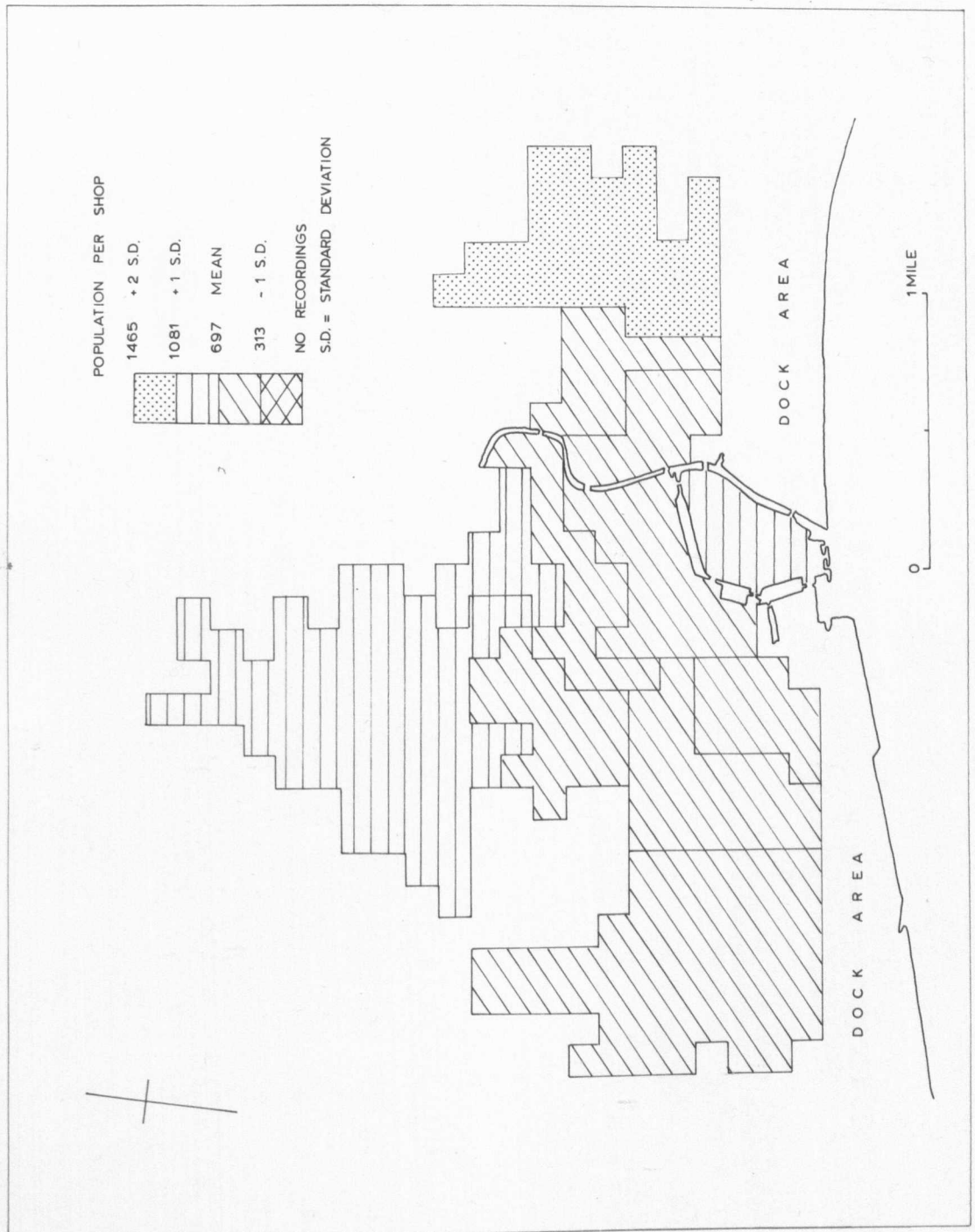


FIGURE 8.7 Retail grocery provision in 1881, Hull.

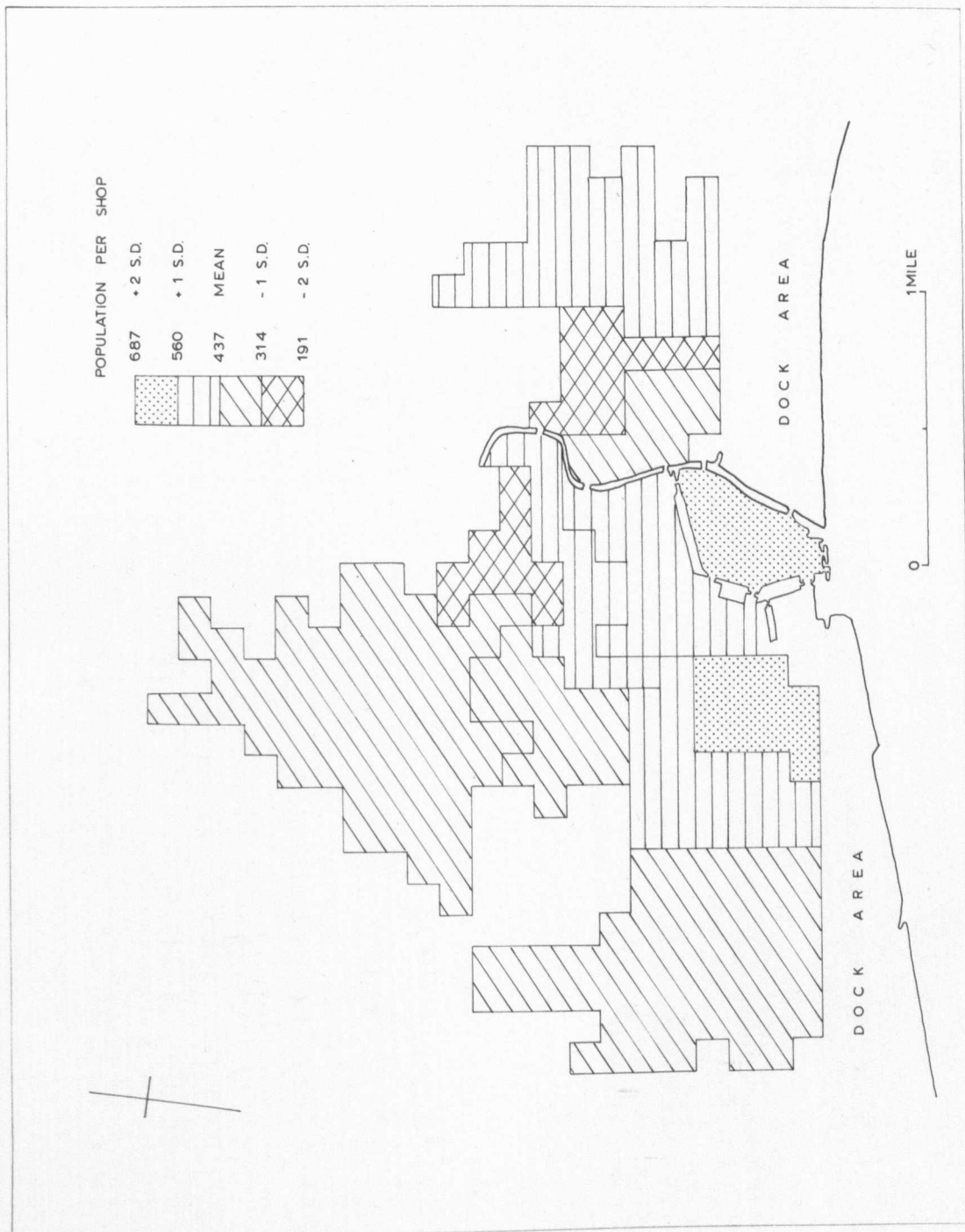


FIGURE 8.8 Retail grocery provision in 1901, Hull.

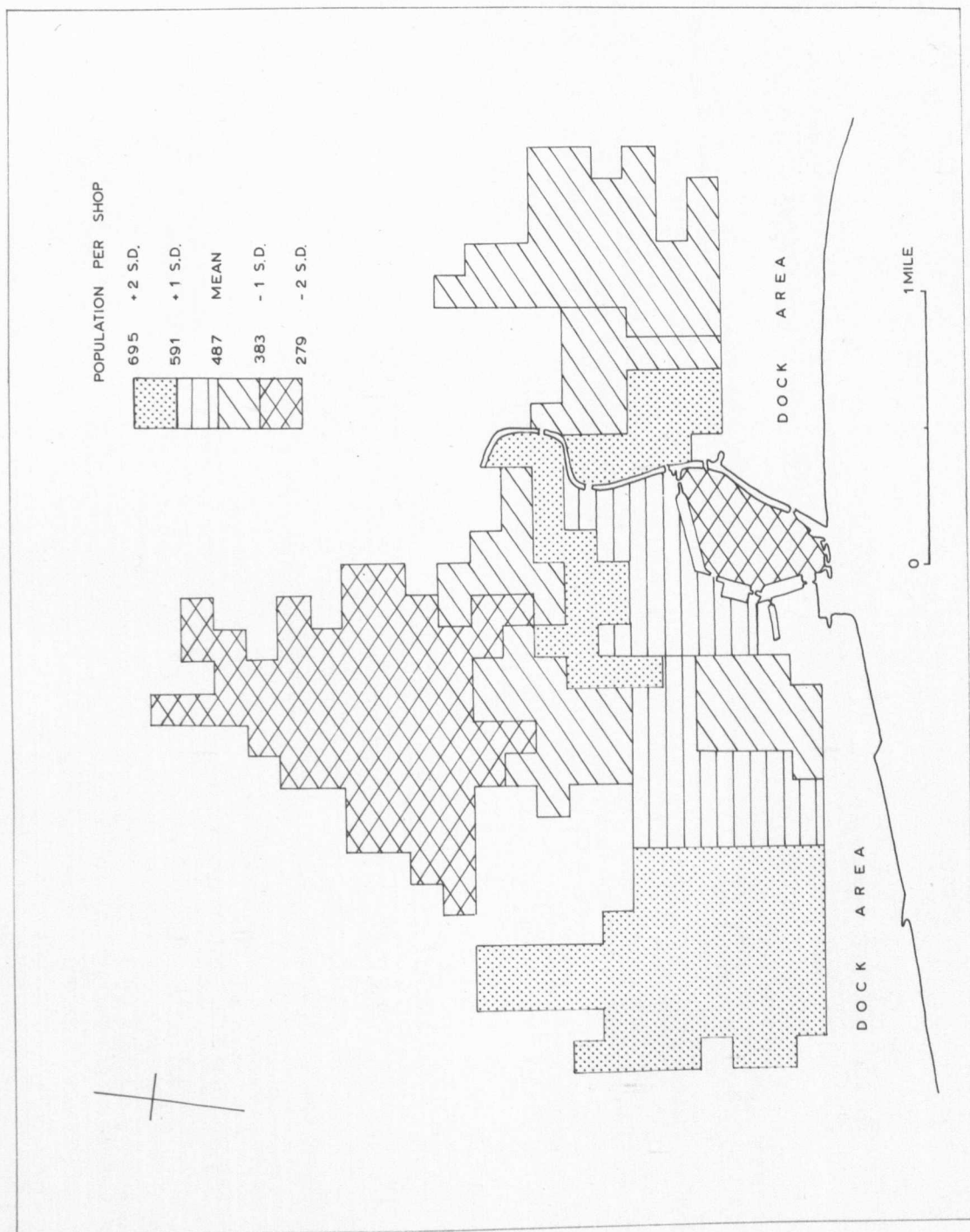


FIGURE 8.9 Retail grocery provision in 1921, Hull.

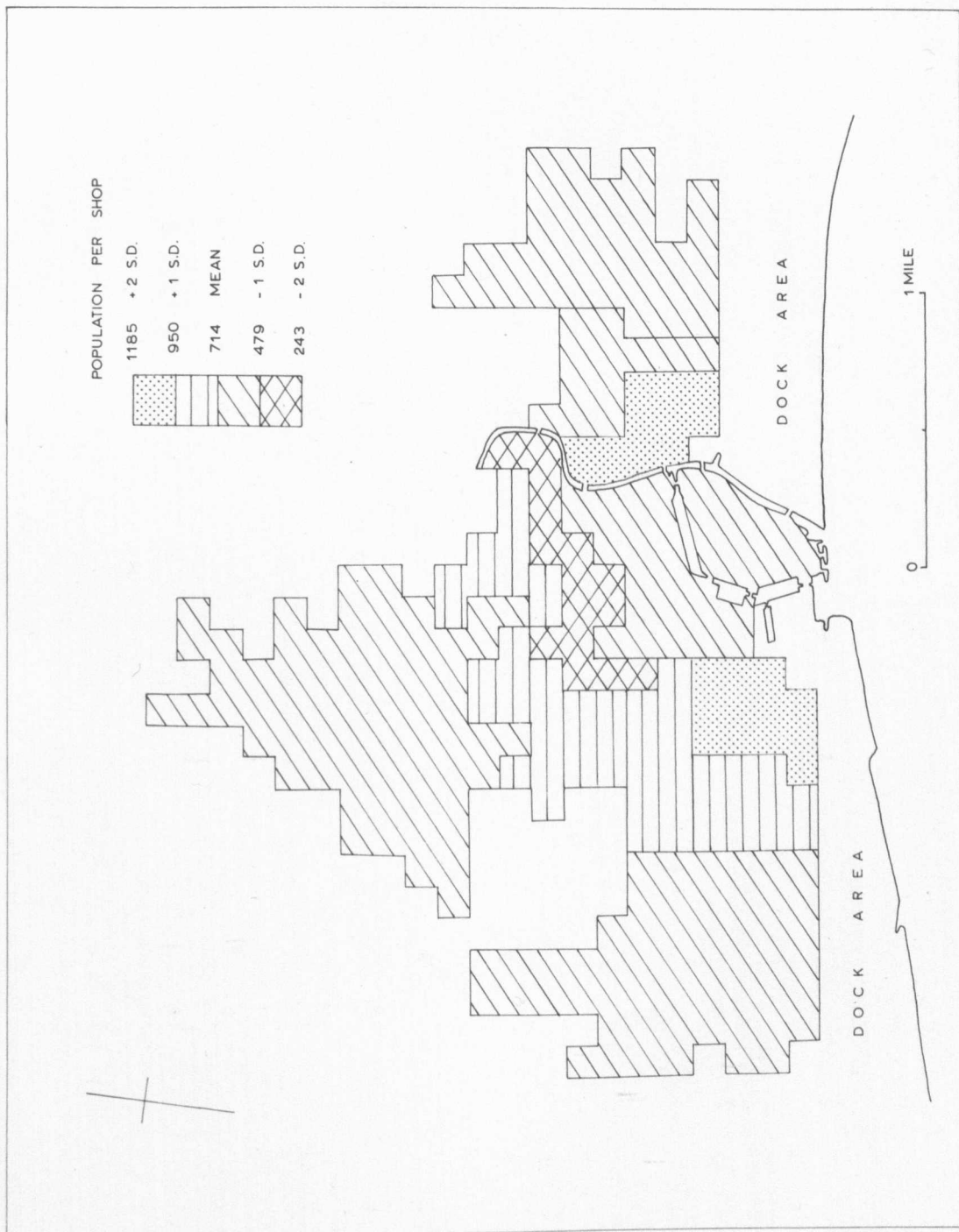


FIGURE 8.10 Retail grocery provision in 1951, Hull.

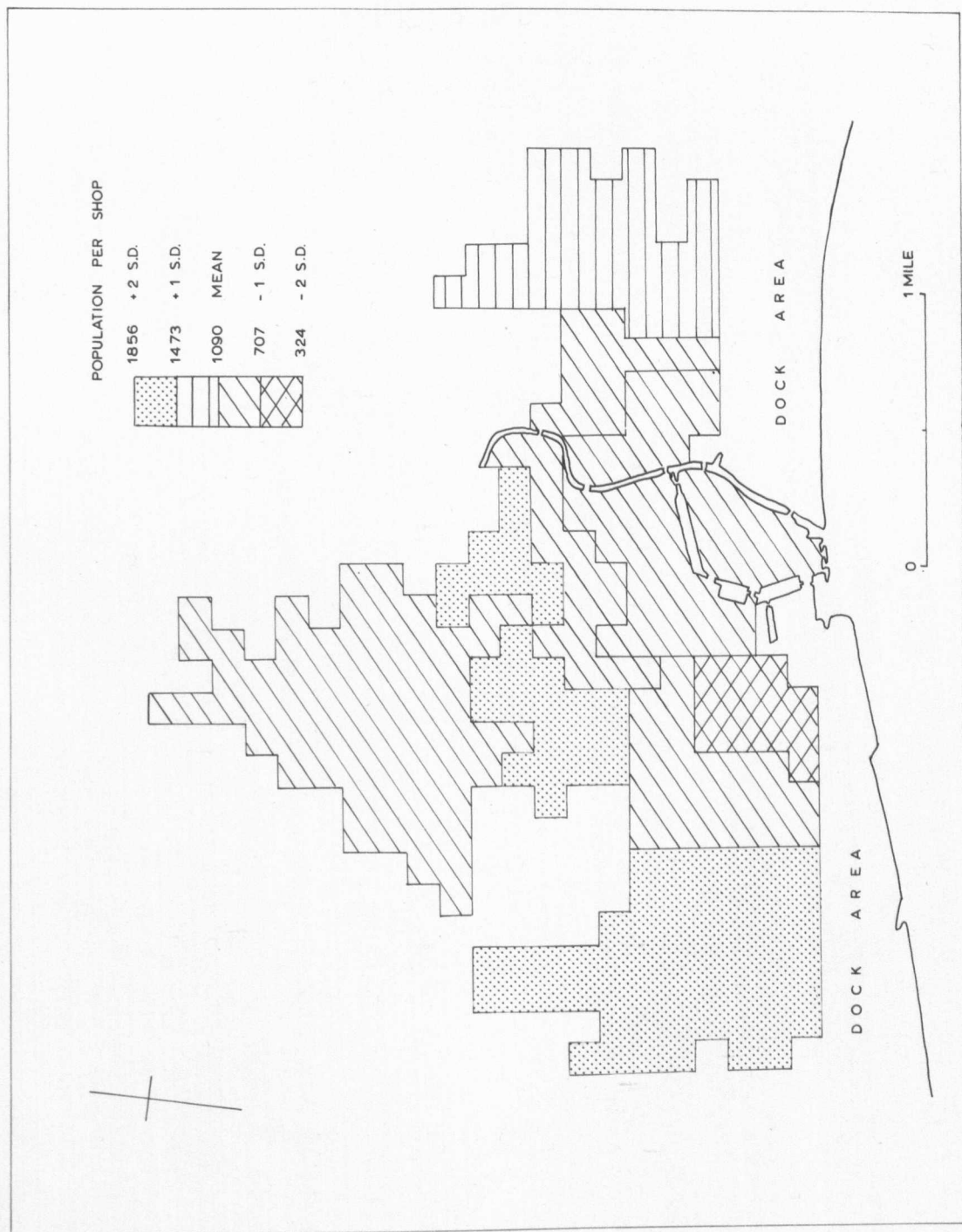


FIGURE 8.11 Retail meat provision in 1881, Hull.

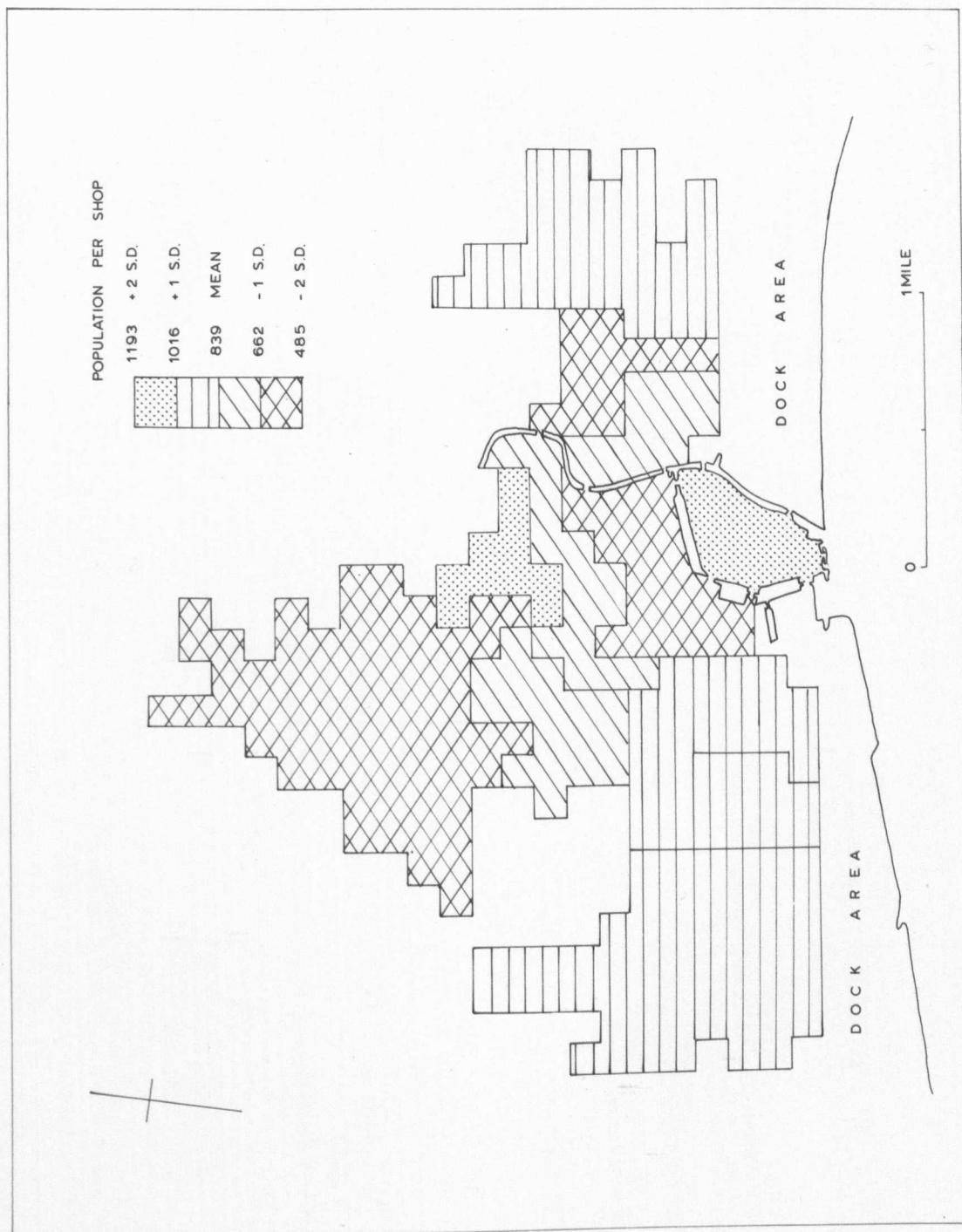


FIGURE 8.12 Retail meat provision in 1901, Hull.

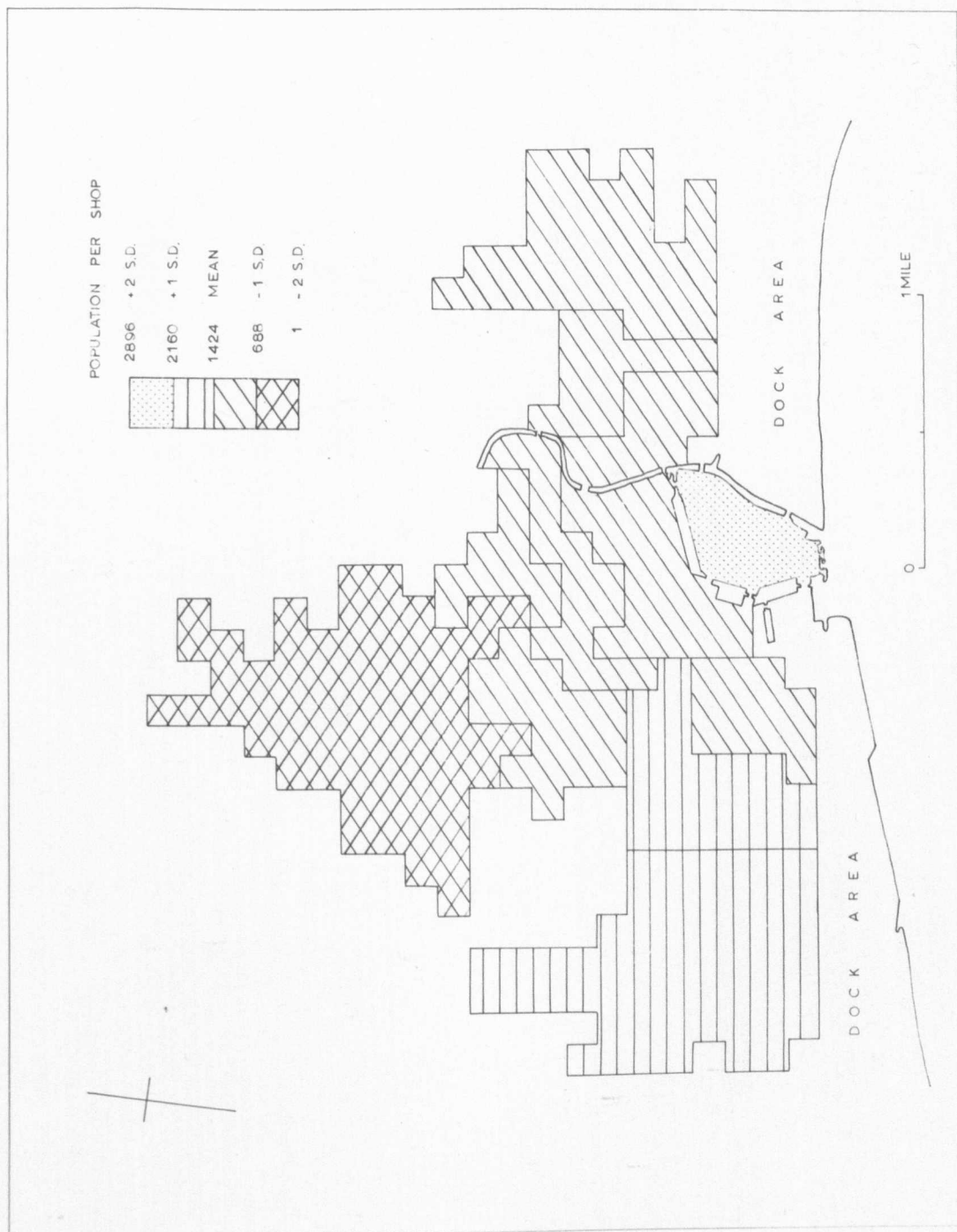


FIGURE 8.13 Retail meat provision in 1921, Hull.

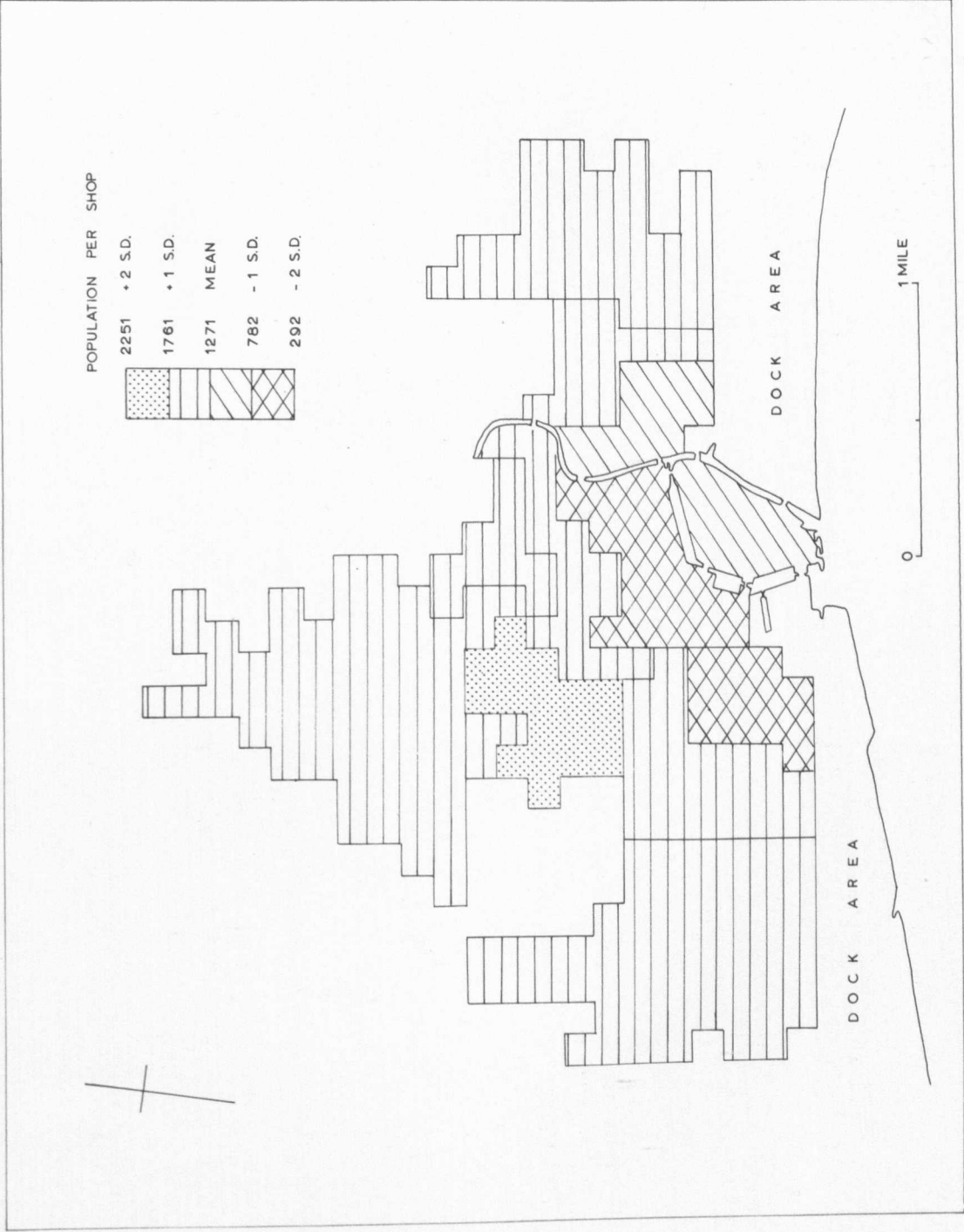


FIGURE 8.14 Retail meat provision in 1951, Hull.

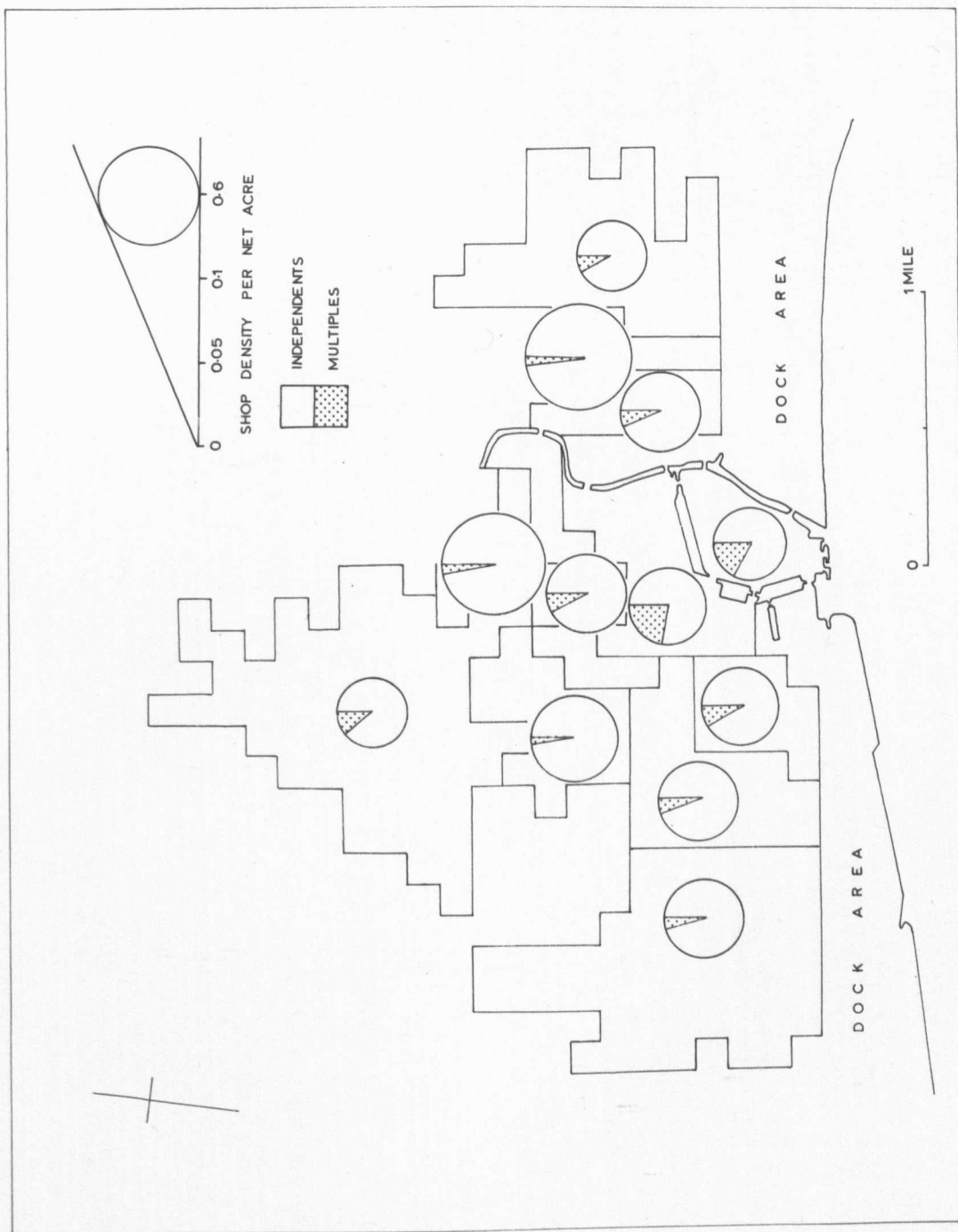


FIGURE 8.15 The distribution of multiple and independent grocers in 1900, Hull.

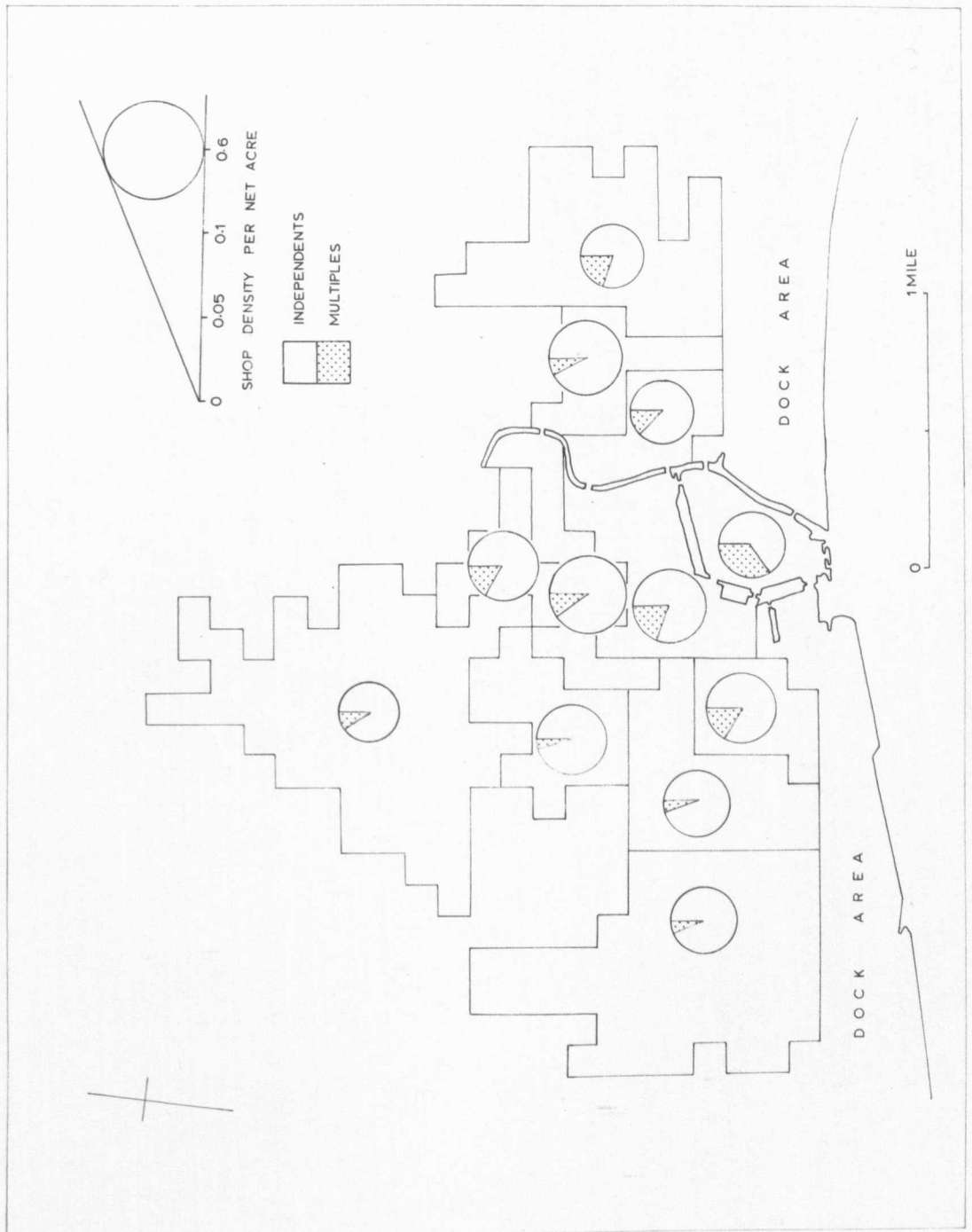


FIGURE 8.16 The distribution of multiple and independent butchers in 1900, Hull.

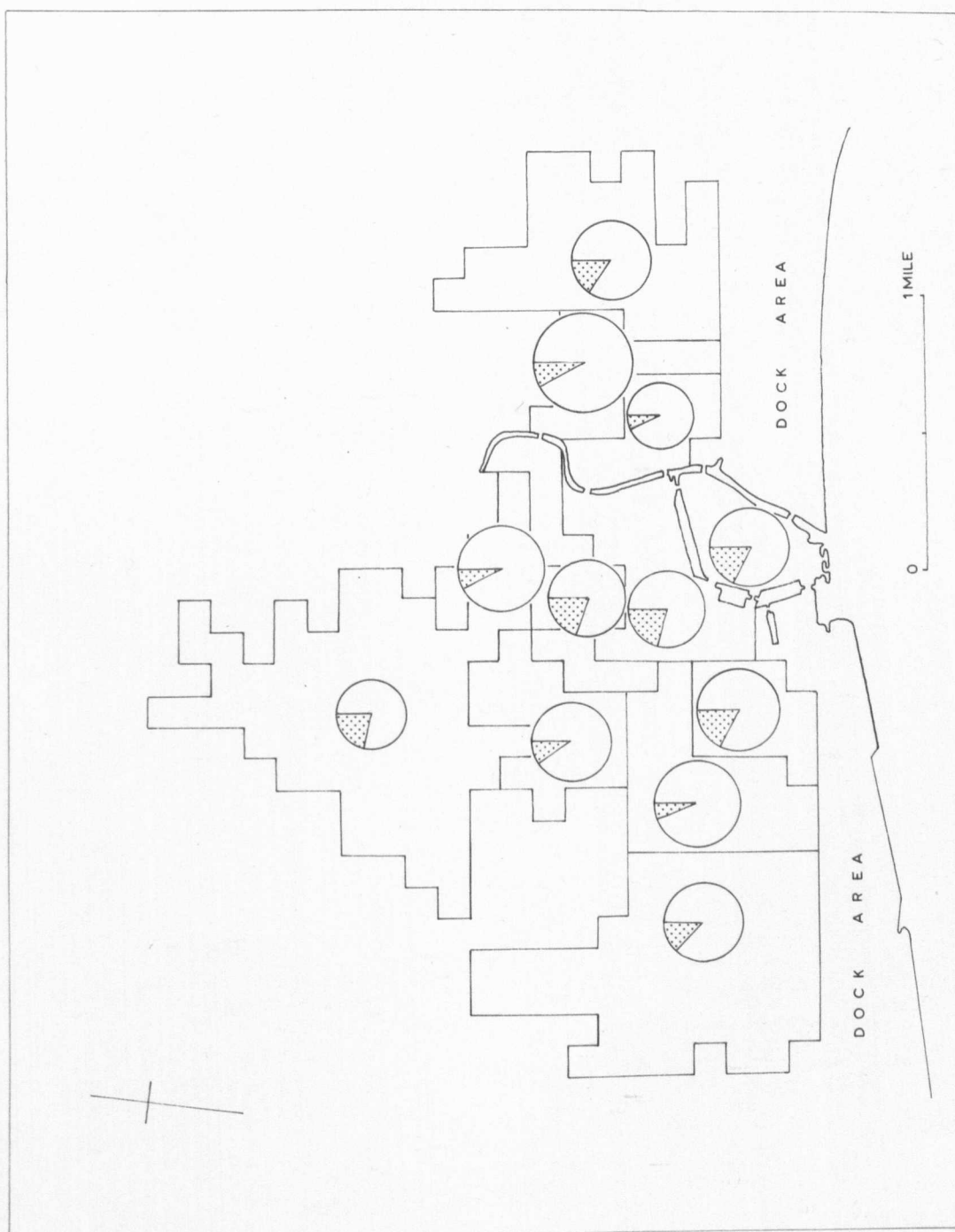


FIGURE 8.17 The distribution of multiple and independent grocers in 1920, Hull. (key as Fig. 8.16)

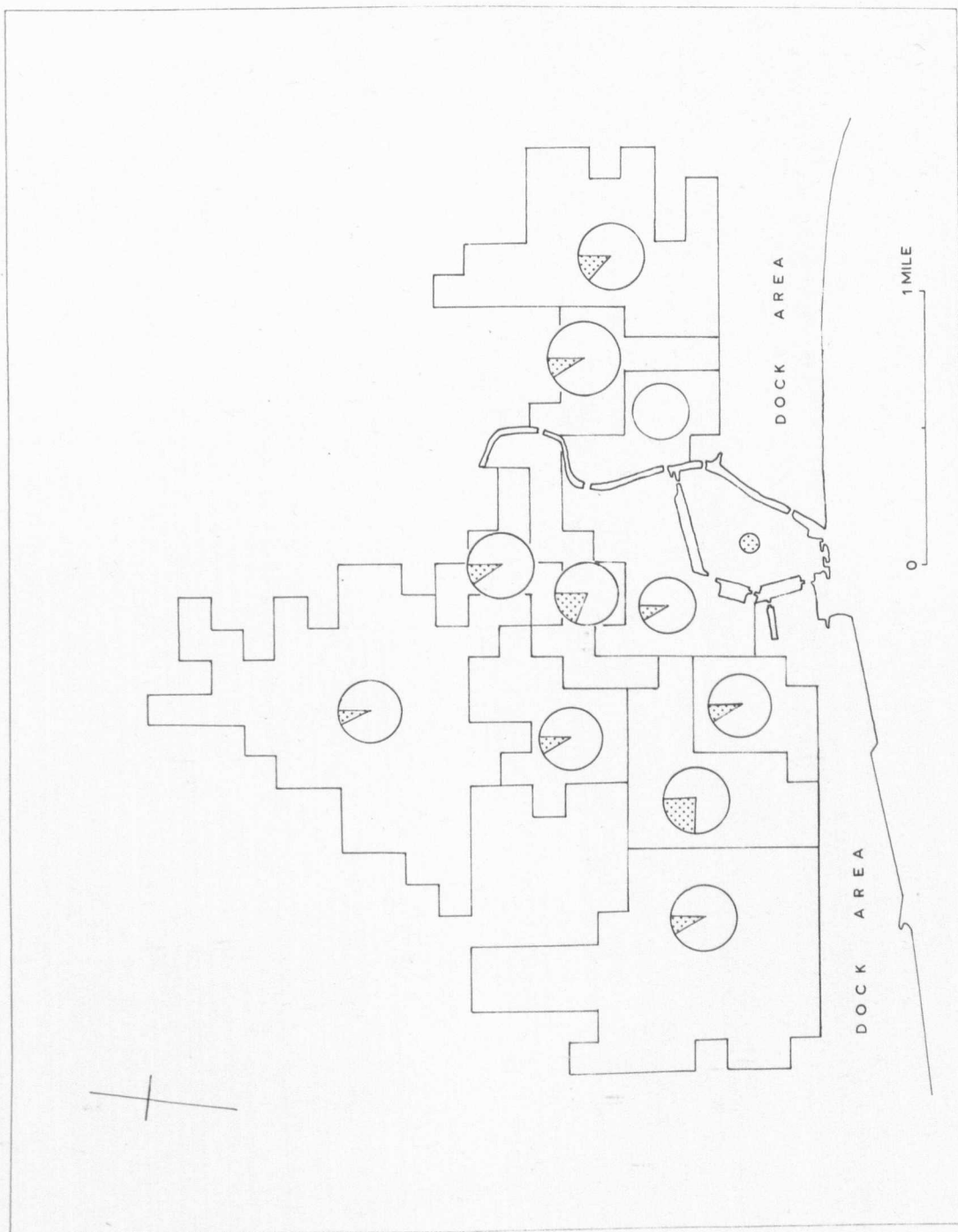


FIGURE 8.18 The distribution of multiple and independent butchers in 1920, Hull. (key as Fig. 8.16)

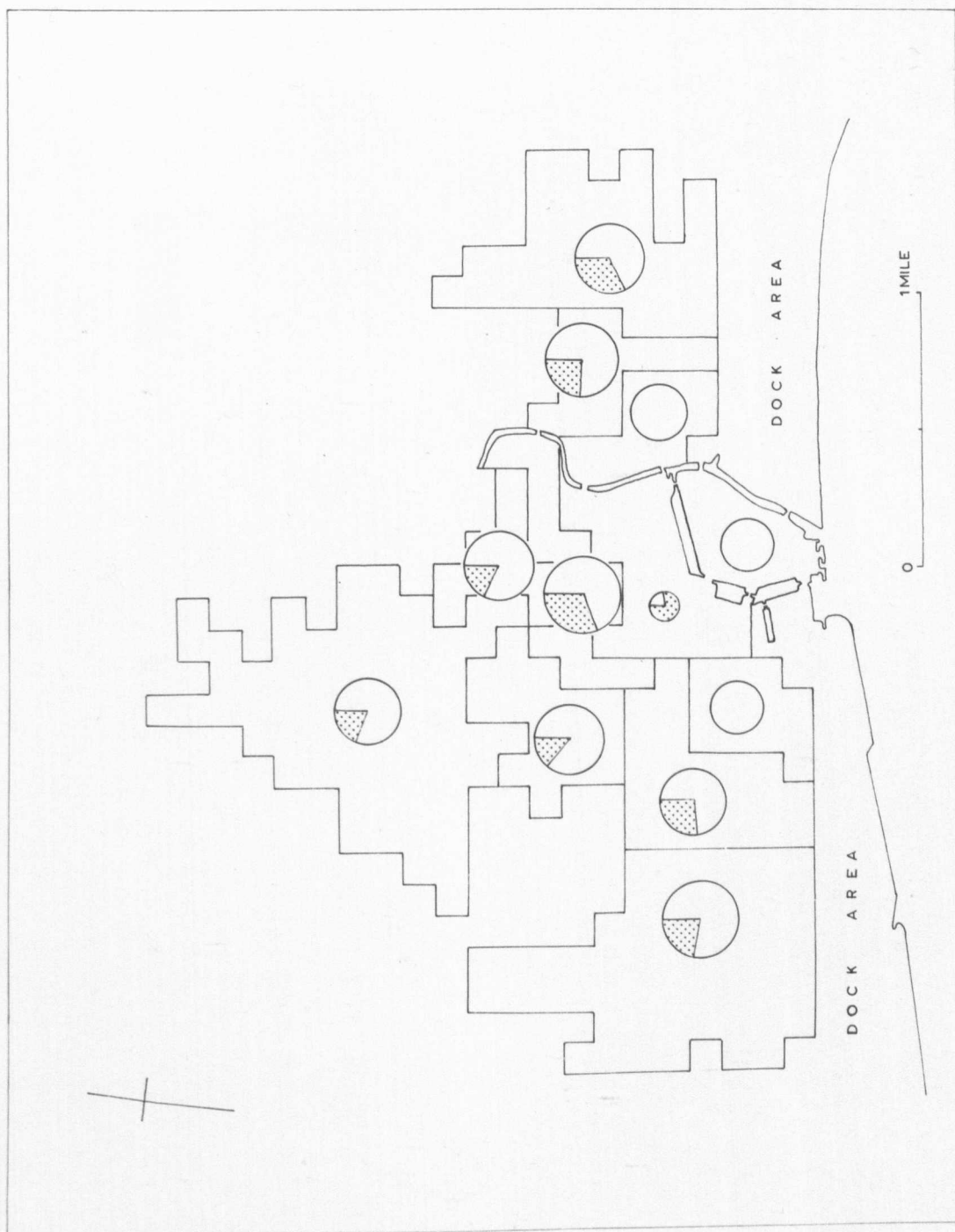


FIGURE 8.19 The distribution of multiple and independent grocers in 1950, Hull. (key as Fig. 8.16)

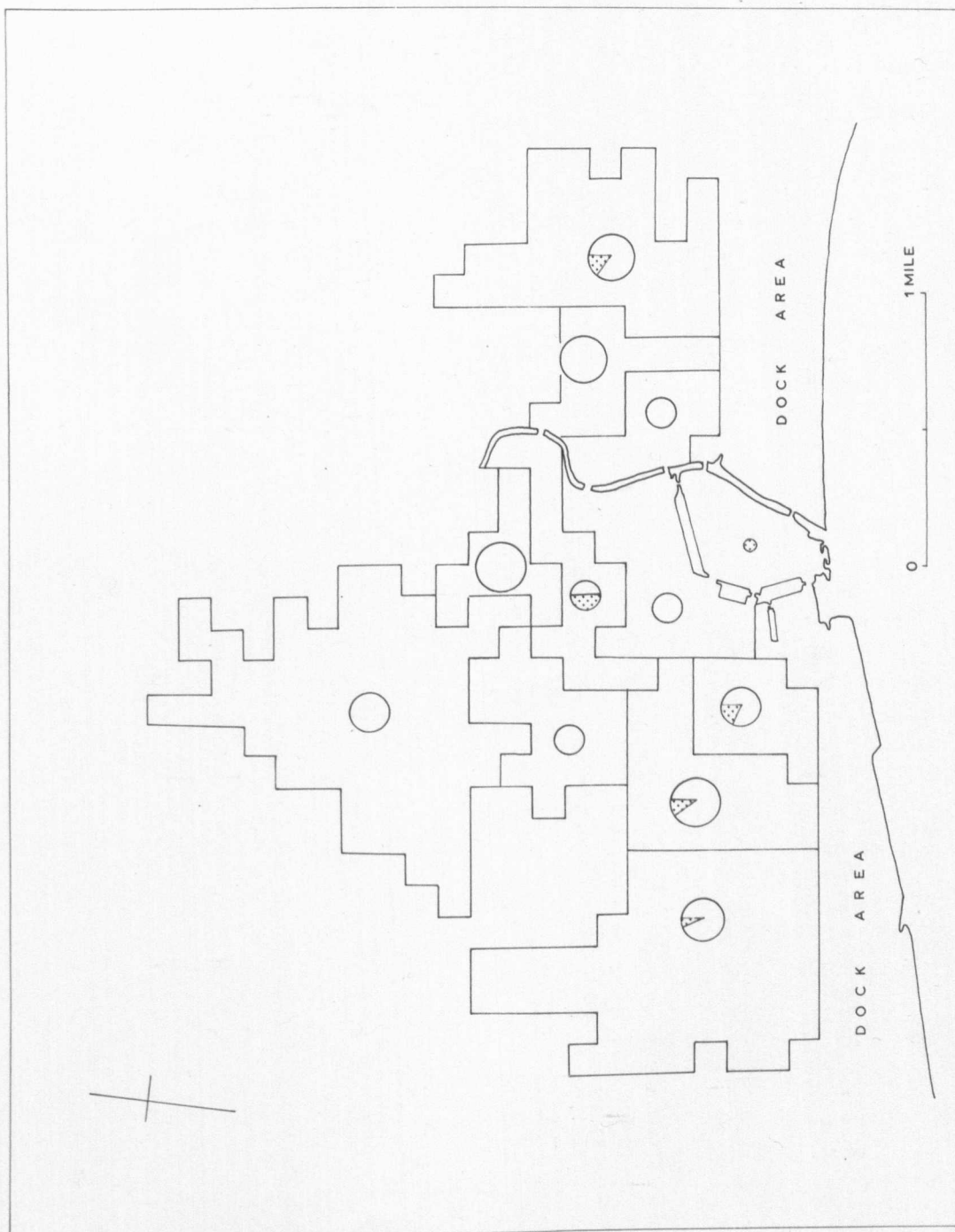


FIGURE 8.20 The distribution of multiple and independent butchers in 1950, Hull. (key as Fig. 8.16)

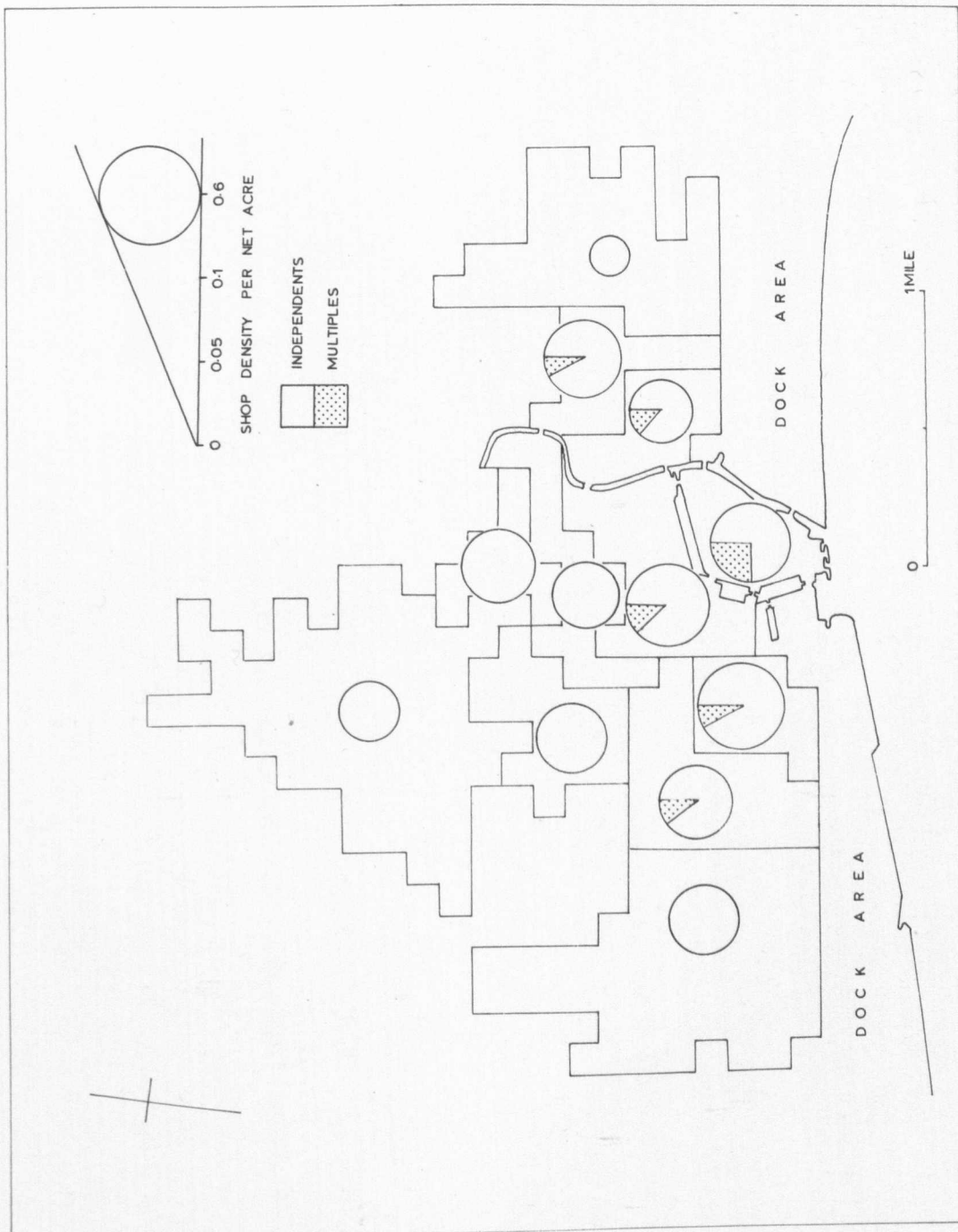


FIGURE 8.21 The distribution of multiple and independent footwear retailers in 1900, Hull.

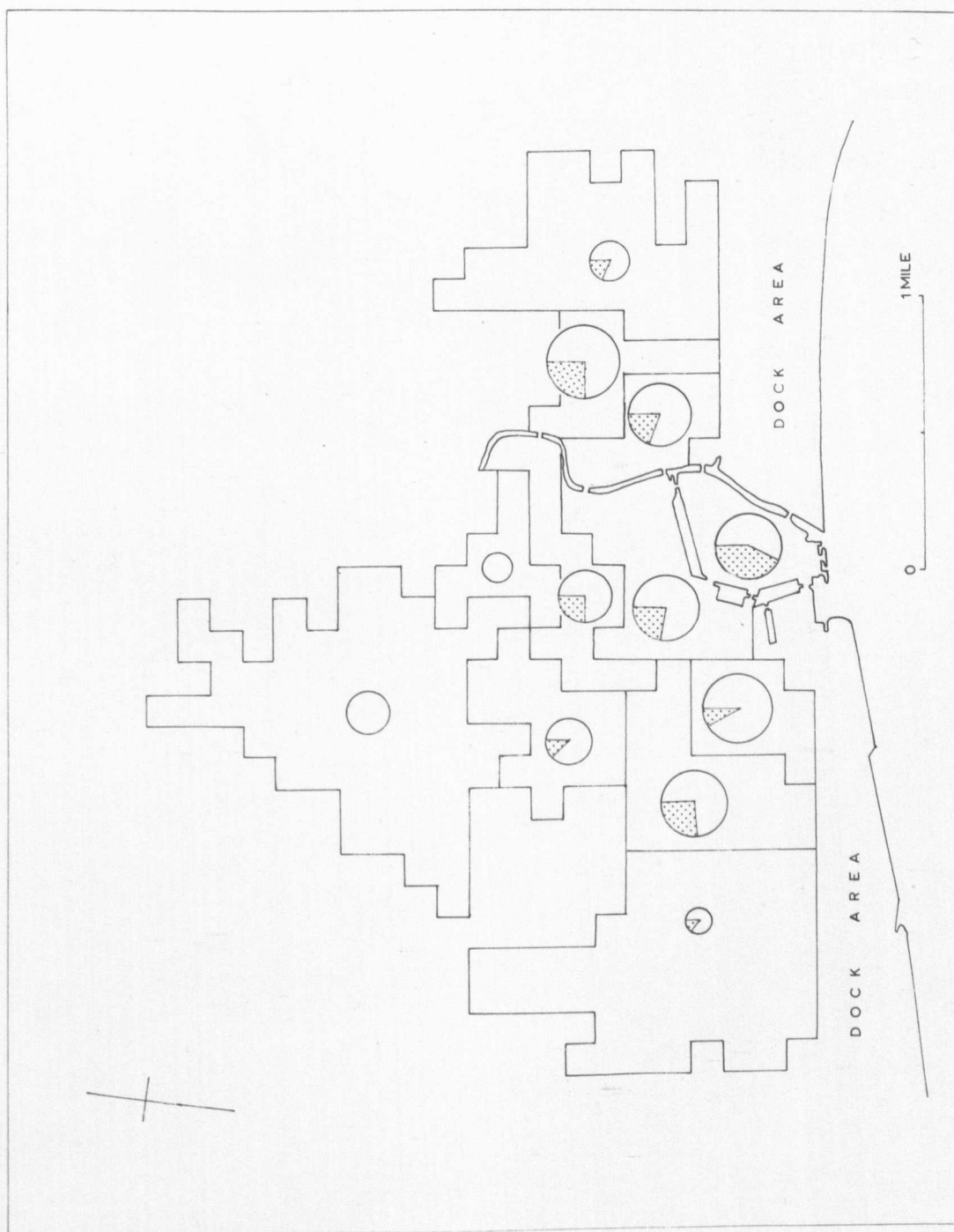


FIGURE 8.22 The distribution of multiple and independent footwear retailers in 1920, Hull. (key as Fig. 8.21)

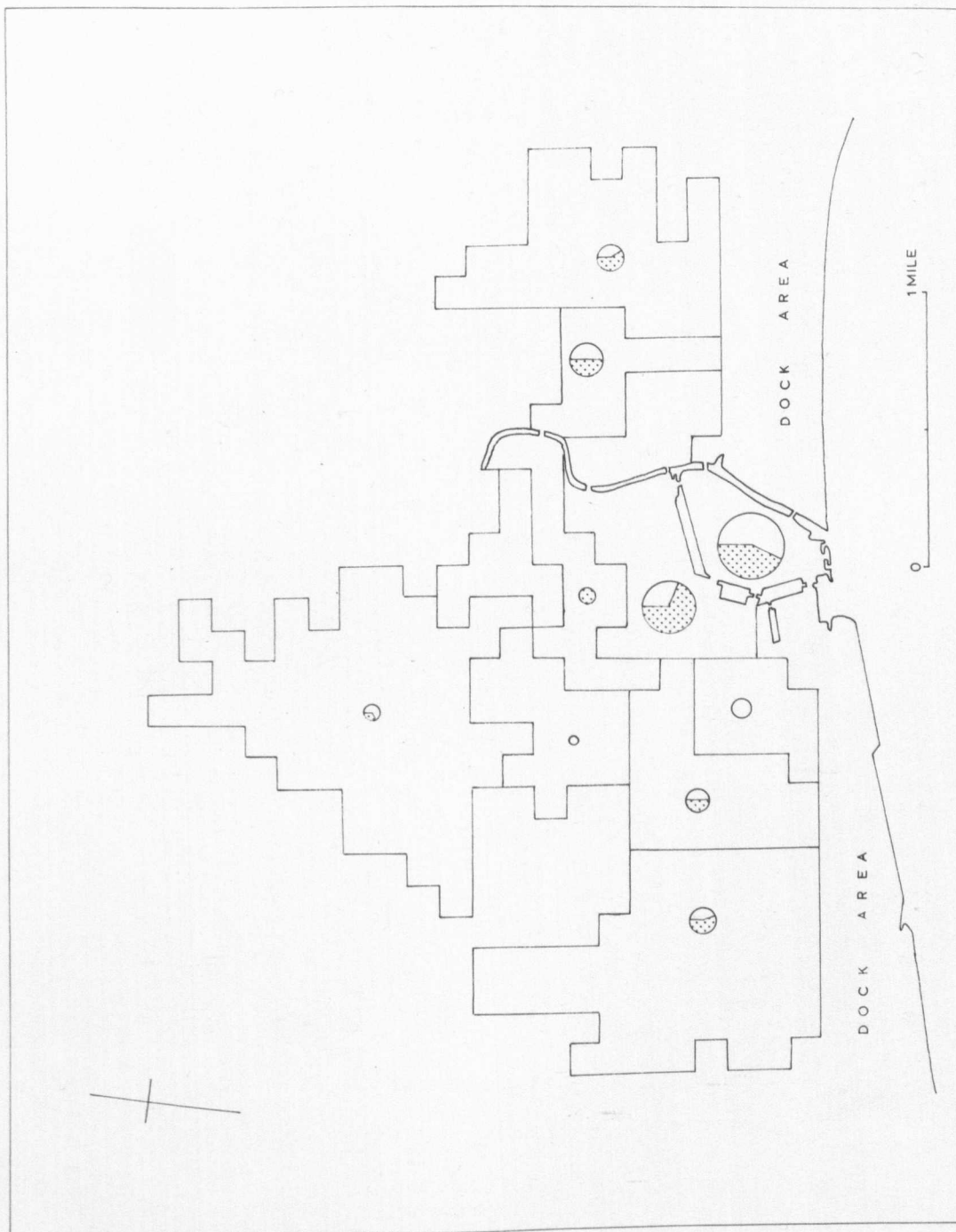


FIGURE 8.23 The distribution of multiple and independent footwear retailers in 1950, Hull.
(key as Fig. 8.21)

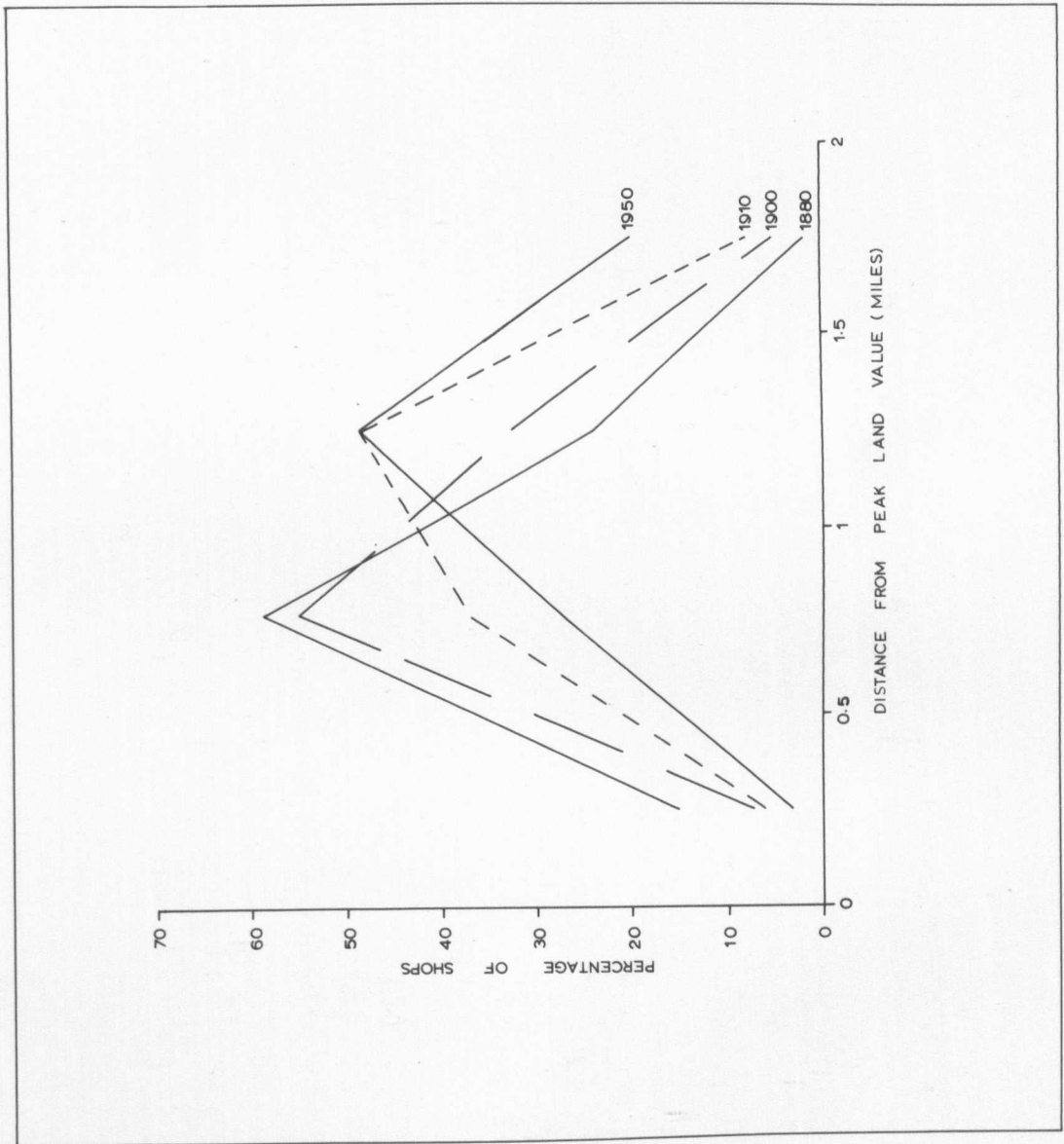


FIGURE 9.1 Variations in the percentage of grocers with distance from the city centre, Hull.

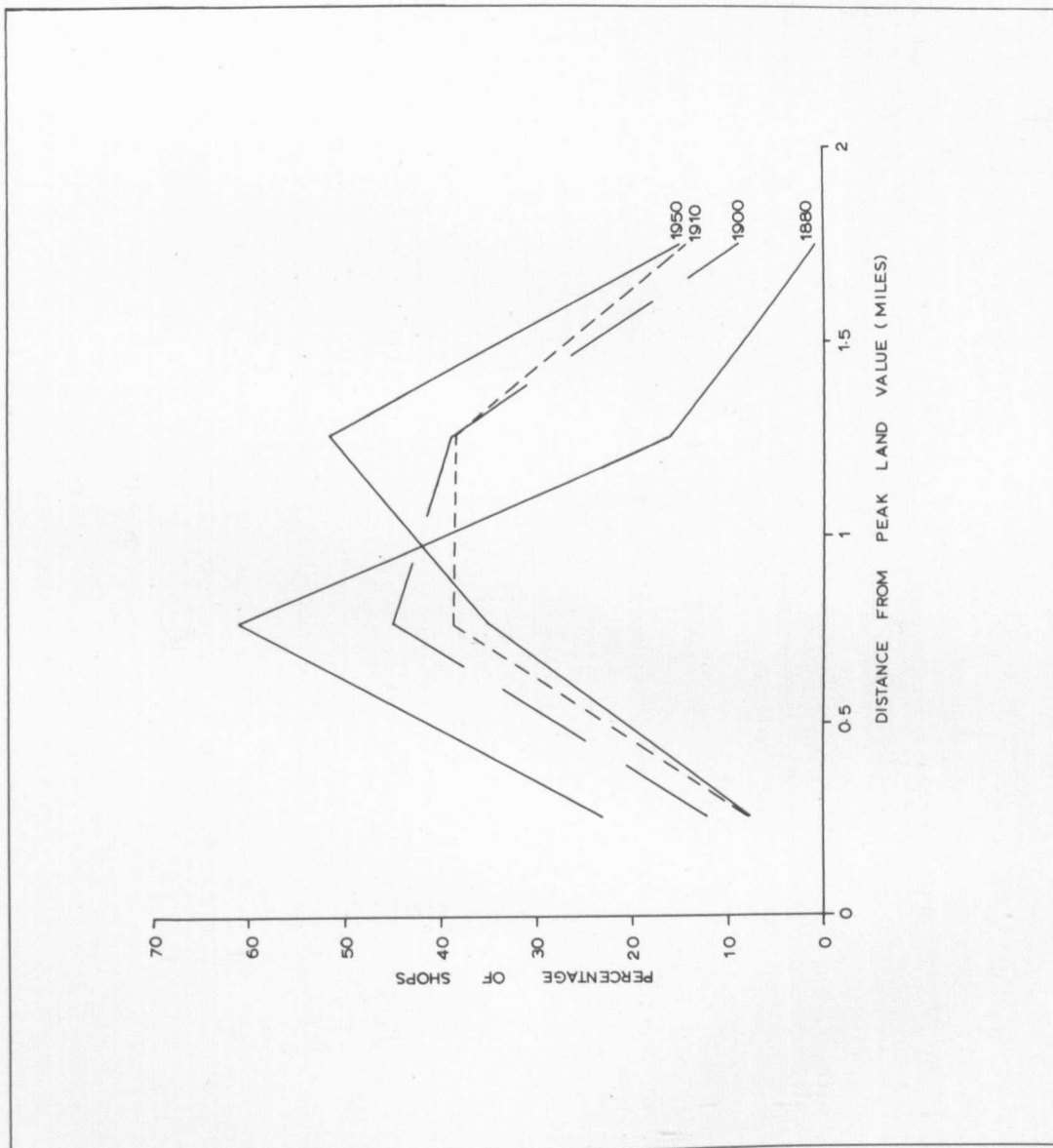


FIGURE 9.2 Variations in the percentage of butchers with distance from the city centre, Hull.

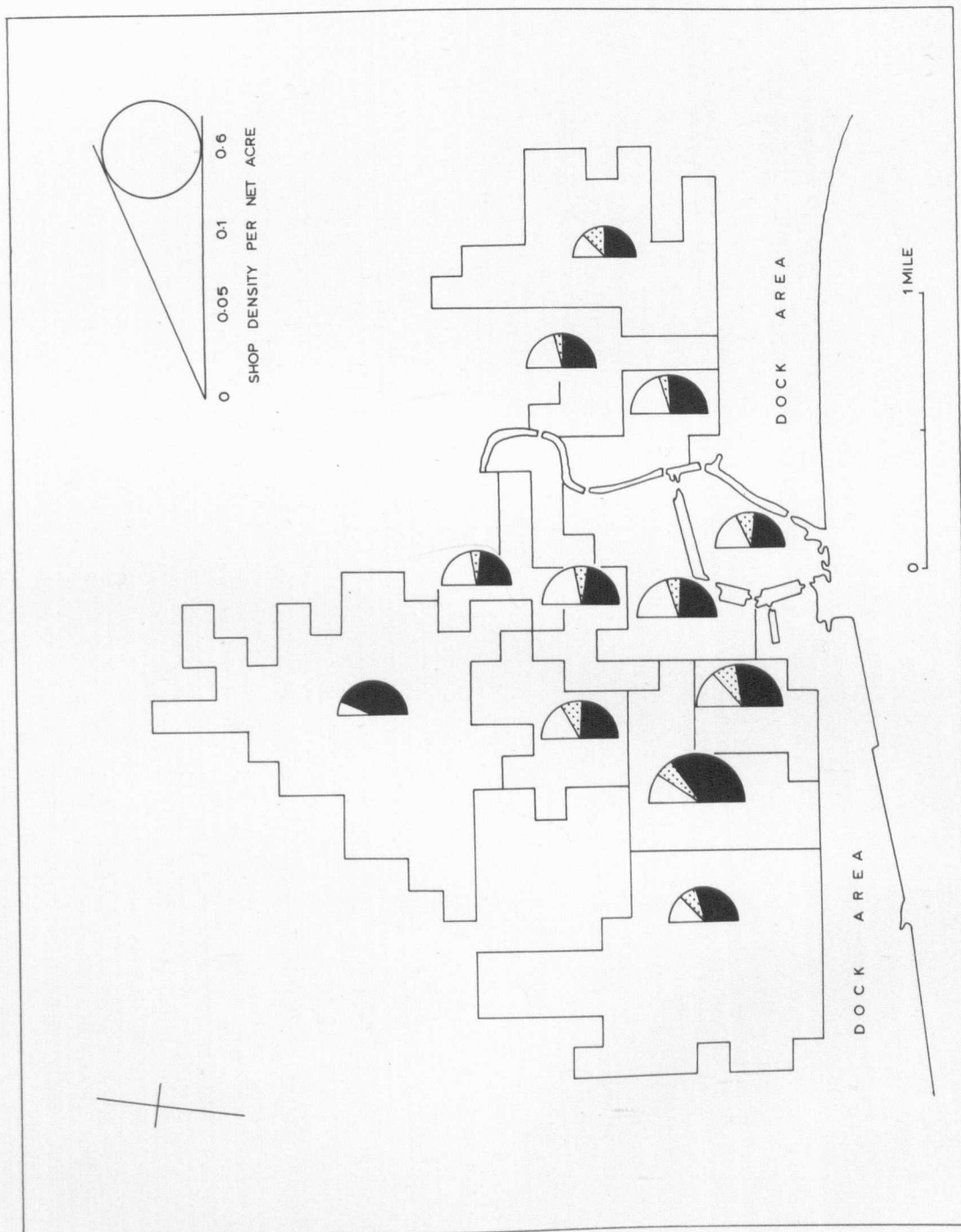


FIGURE 9.3 Changes in shop ownership between 1880 and 1890 for grocers in Hull.

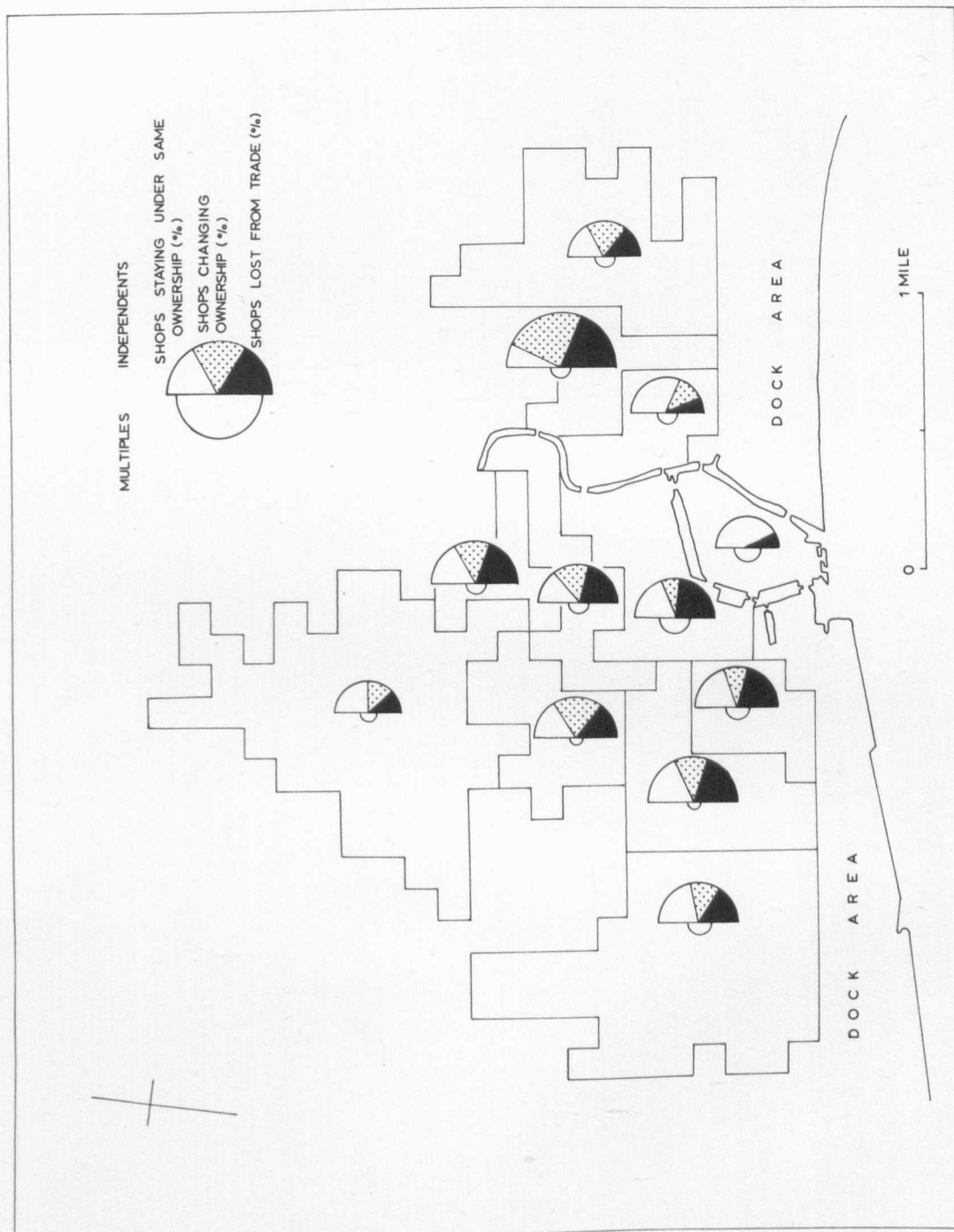


FIGURE 9.4 Changes in shop ownership between 1910 and 1920 for grocers in Hull. (key as Fig. 9.3)

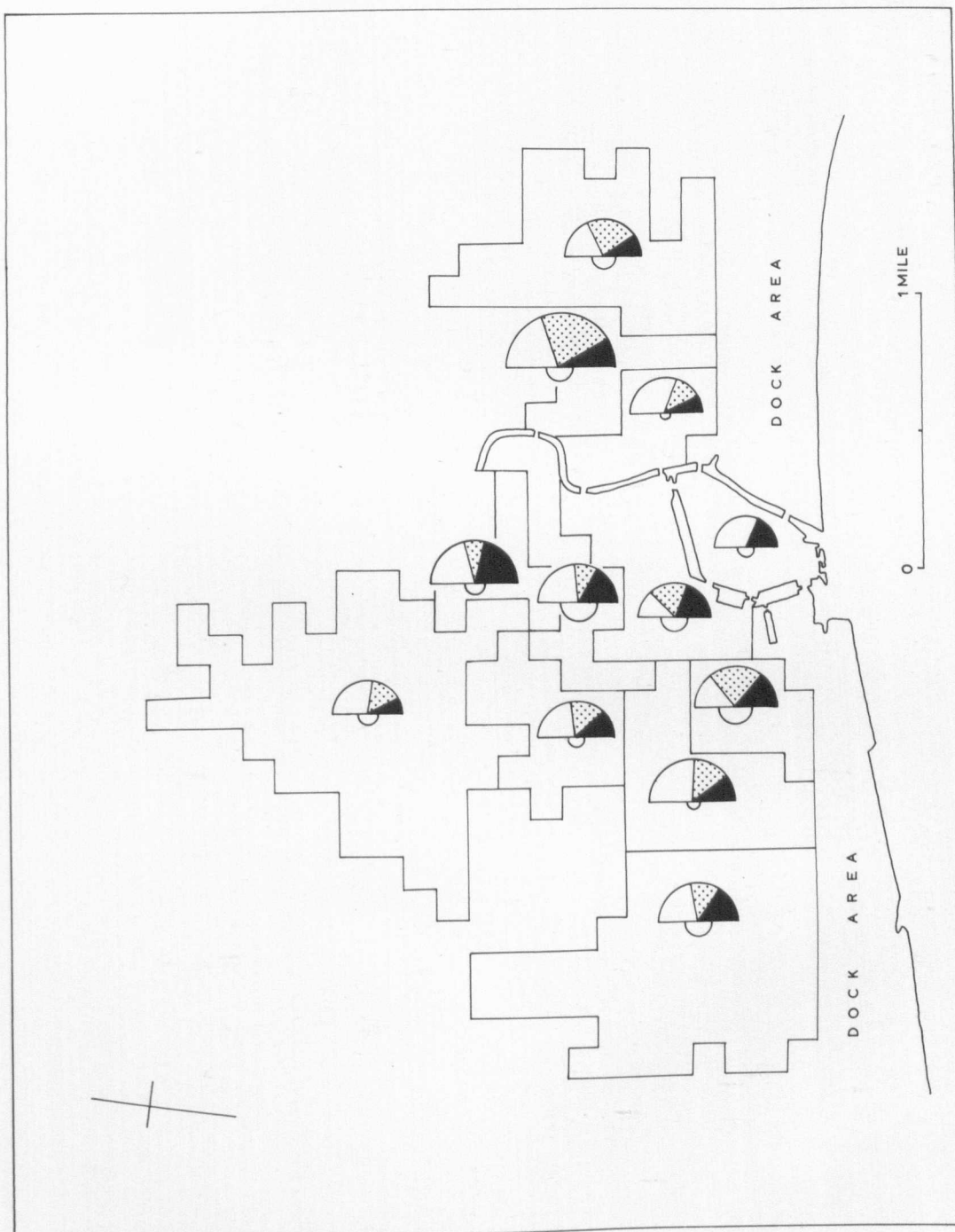


FIGURE 9.5 Changes in shop ownership between 1920 and 1930 for grocers in Hull. (key as Figs. 9.3 and 9.4)

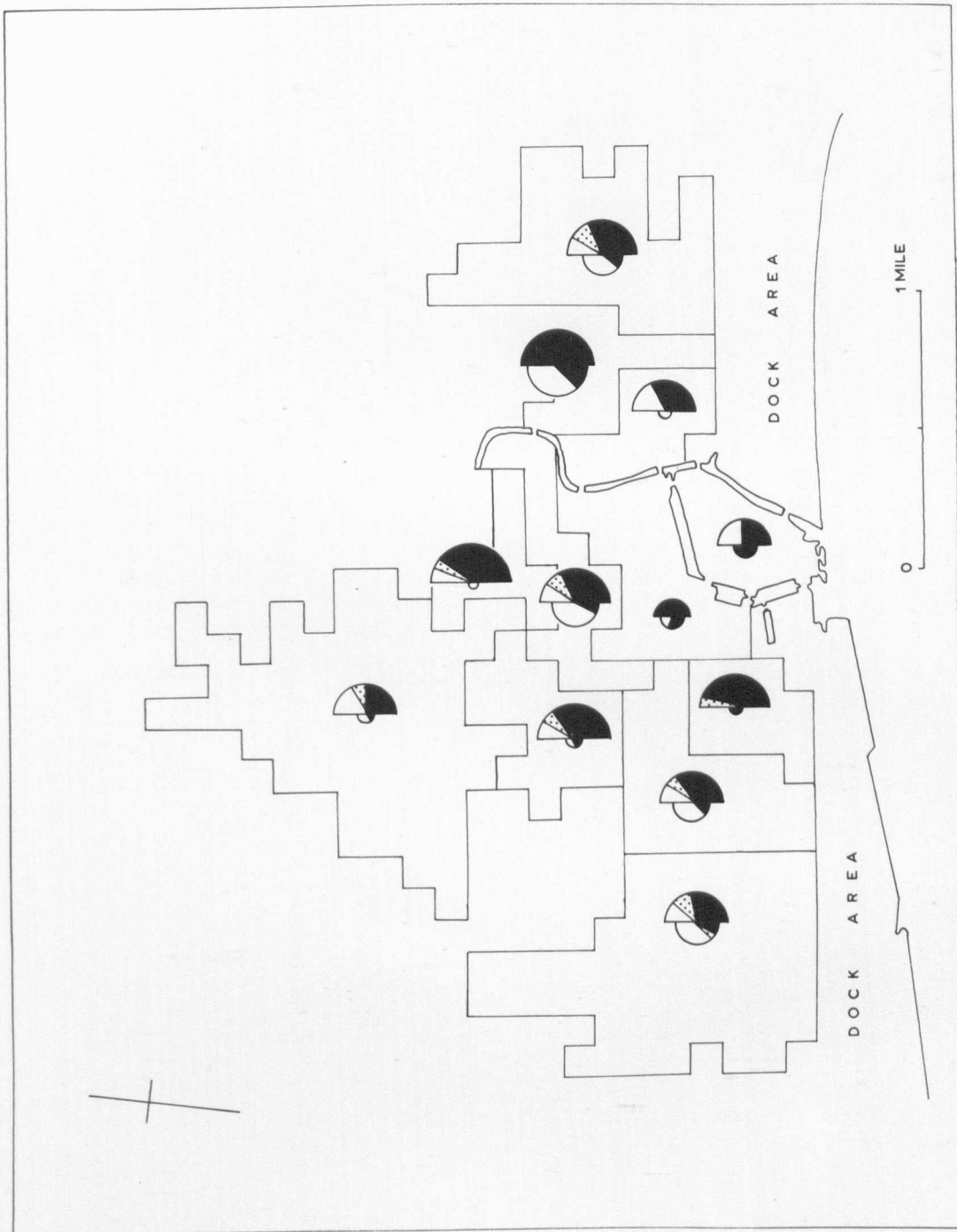


FIGURE 9.6 Changes in shop ownership between 1940 and 1950 for grocers in Hull. (key as Figs. 9.3 and 9.4)