A geographic study of rural centrality Brampton Cumbria

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A GEOGRAPHIC STUDY OF RURAL CENTRALITY

BRAMPTON CUMBRIA

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ABSTRACT

"A GEOGRAPHIC STUDY OF RURAL CENTRALITY - BRAMPTON, CUMBRIA."

by

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1977

Brampton is a small market town located 9½ miles E.N.E. of Carlisle at the centre of a sub-region referred to as N.E. Cumbria. This position has helped to make it not only an important route centre but also a focus for the surrounding district.

The study examines the present role of Brampton as a small rural service centre, the extent of its influence on the surrounding region, and the amount of dependence of that region on the town. Thus a measurement of the degree of centrality is obtained from which a picture of the region's spatial and behavioural characteristics emerges. In addition, reasons why and how Brampton has developed centrality are also explored.

Enquiry into the nature of services within the region and certain behavioural characteristics of a sample of the population was effected by three personally conducted surveys (two by questionnaires).

The results have enabled not only the scale and provision of services to be analysed, but also the degree of influence and preference for particular centres to be measured. The same information is also used to test several recognised models of centrality; including adaptations of Reilly's 'gravity model' by D.L. Huff, and the ranking of centres based on functional indices devised by W.K.D. Davies. A further technique has been designed which measures the attractiveness of any settlement covered by the surveys. It involves analysing the journeys made by consumers to a centre, and allotting 'weighting' values based on the degree of difficulty.

From the patterns of centrality thus produced, a hierarchy of settlement emerges which is then examined in relation to the classical theories of central place. In conclusion, the study summarises the results of all the analysis and enquiry, and sets the scene for the future development of Brampton in the context of its role as a central place.

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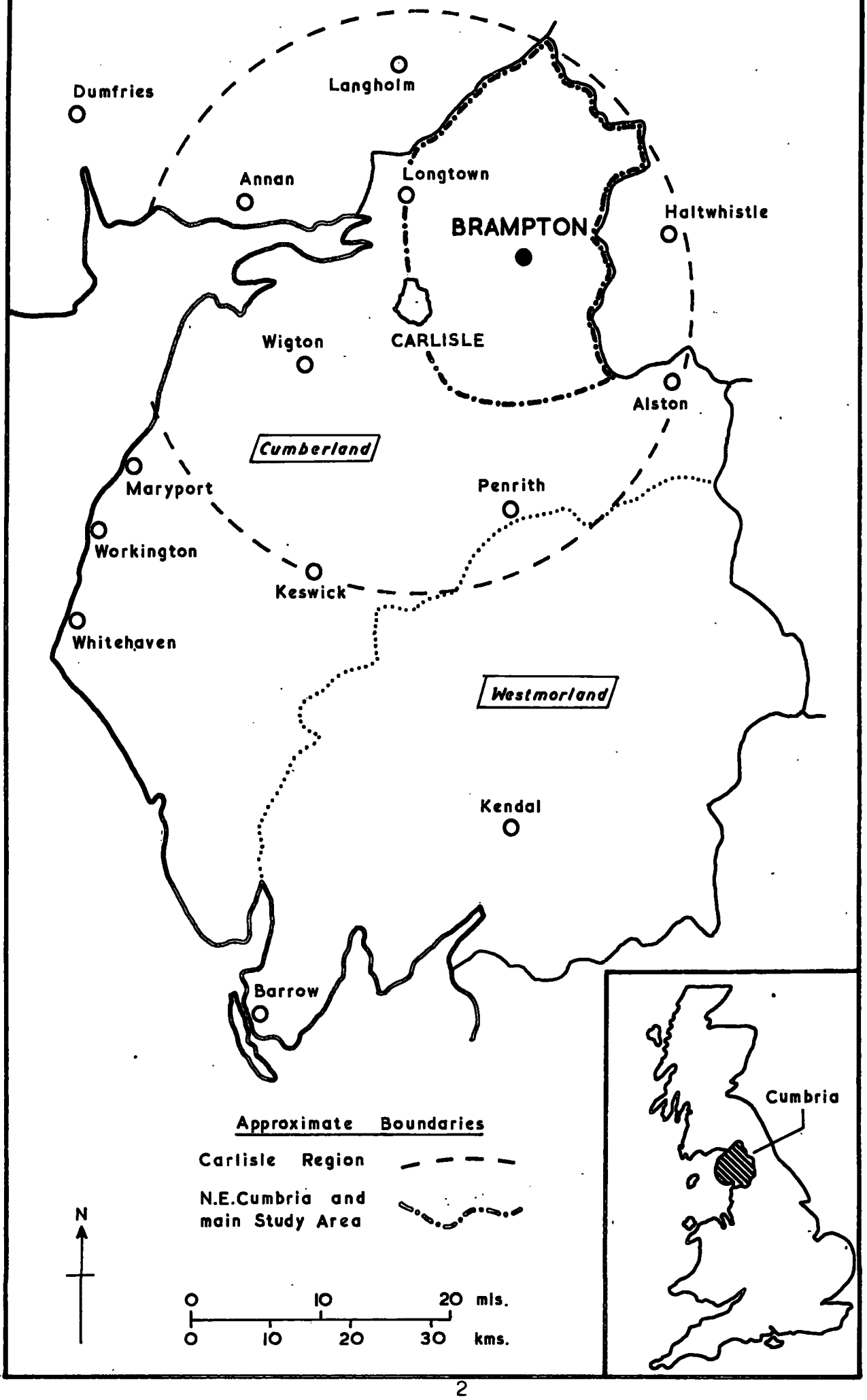
INTRODUCTION

Figure O.1

THE POSITION OF BRAMPTON IN CUMBRIA
showing extent of study area



BRAMPTON (July 1975) looking eastwards from 1000 feet, and showing general features of the Area Plate 1

INTRODUCTION

> "Every town (in some measure) acts as a focus for the surrounding countryside ..... and in acting as a focus, the town functions as a central place". (Carter, 1972, p.69).

> "Brampton, from its situation, lying at the distance of nine miles from Carlisle, and upon a great military road surrounded with common lands ..... is placed in a propitious spot for manufactory and trade; the inhabitants are numerous ..... there is good water, plenty of fuel and provision, and every requisite". (Hutchinson, 1794, Vol.1, p.126).

These two observations, although decades apart and made by a geographer and historian respectively, pinpoint the general theme of this study which is to examine the nature of centrality in part of Cumbria, with special emphasis on the role of Brampton. The town and area were chosen partly because of first-hand knowledge, and partly because of an awareness of some interesting geographic characteristics of a spatial nature which are to be found within the region.

Firstly, an explanation of some regional terms is necessary in order that subsequent references to them may be fully understood. Three areas are regularly mentioned, each within a different context (figure 0.1). The largest of these is the Carlisle region, which can be regarded as an area of approximately 20 miles radius around the city, and over which it would seem to exert a dominant influence. The second region, - North Cumbria, is effectively the county part of the previous region, and therefore excludes part of southern Scotland and a small area of the South Tyne Valley in Northumberland. The territory of this latter region includes most of the lowland contained between the Pennines on the east, the Lake District Fells to the west, and whose southern limit is coincident with the line of the old Cumberland boundary near Penrith. In fact most of the limits were better defined by the pre-1974 administration boundaries of the Penrith, Wigton and Border Rural Districts. Contained with N. Cumbria is the third region (or sub-region) to which most reference is made, - North East Cumbria. Its limits are not as easy to define, but in the main it is that part of the county which lies east of Carlisle and the A.6 and A.7 trunk roads, and northwards from the villages of Kirkoswald and Lazonby. Virtually coincidental with this region, and referred to as the 'Survey Area', is the district over which most of the original field research was carried out. At its centre lies the small market town of Brampton (plate 1), and it is this position that has helped

to make the town not only an important route centre and focus for the surrounding region, but also enabled certain spatial characteristics to develop.

The main aim of this study, therefore, is to examine the present role of Brampton as a small rural service centre, the extent of its influence on the surrounding region, and the amount that region depends on the town. In other words, by measuring the degree of centrality present, a picture of the region's spatial and behavioural characteristics will hopefully emerge. Additionally, reasons why and how Brampton has developed centrality will be explored, and comparisons will be made with other centres to investigate the extent by which it may be either similar or unusual.

Some characteristics of centrality can be seen to emerge from both physical and historical influences. These factors are examined in the first chapter, for not only do they set the scene and provide a perspective of background, they also help to explain how, why, when and where certain patterns of human activity have occurred. A further element that requires exploration is the structure of the population, for it is upon this that the provision of services and therefore the nature of centrality is largely based. Chapter 2 attempts to provide the answers by analysing evidence from a sample survey of the population. In addition, the results are compared with those of published data in order to show that there is a reasonable degree of representation present.

The first part of Chapter 3 analyses the provision of services throughout N.E. Cumbria and the major settlements of N. Cumbria, from the smallest of centres, to Carlisle, the largest. Emphasis is also given to the service provision of Brampton in the context of its role as a rural market town. In the second part of the chapter, a two-fold examination of Brampton's degree of centrality is undertaken. Firstly, the extent of influence of a dozen services within the town is analysed, and secondly, the degree of preference for Brampton (relating to 25 services) from the sample survey of population in the area is measured. This second method not only enables zones of preference to be determined for Brampton, but gives a good picture of the overall pattern of consumer behaviour within the region.

The results are used in Chapter 4 to test recognised models of centrality, from the adaptation of Reilly's 'gravity model' by D.L. Huff (1964), to the ranking of centres based on a functional index devised by W.K.D. Davies (1967). The details of each model are explained in the chapter, and a comparison is made between the

theoretical or expected results, and those obtained from observed data.

The final chapter seeks to identify functional tiers and functional order from the patterns of centrality so determined from the previous chapters. A hierarchy of centres will be seen to emerge which can be examined in relation to the theories of central place as propounded by W. Christaller in 1933, and A. Losch in 1940.

Throughout the study the theme of centrality is constantly reviewed and analysed. Factors which have had favourable or adverse influences on the spatial and behavioural patterns are also examined and explored. The conclusion summarises the main results of all the analysis and enquiry, as well as setting the scene for the future development of Brampton in the context of its role as a central place.

The methods of enquiry used in this study employ various recognised techniques. Apart from a wealth of secondary source material, the majority of primary information was obtained from three personally conducted surveys. The first of these involved a tour of all N.E. Cumbria and some of the main settlements (or their central areas) of N. Cumbria in order to establish details of the provision of services. The information obtained was then cross-checked by reference to the yellow pages of the local telephone directory. Although neither method can be 100% accurate, the results enable correlation of certain tests of centrality to be made with a high degree of authenticity.

The other two surveys consisted of questionnaires. The first (appendix 2.1), was distributed to a representative sample of the population of the area. The results not only enable a picture of population structure to be determined, but also provide all the information on consumer behaviour from which it has been possible to test the various models of centrality in Chapters 3 and 4. The second questionnaire (appendix 3.3) was aimed at a selection of businesses and services in Brampton. It enquired mainly about the range of influence and extent of custom, from which it has been possible to establish a collective picture of the degree of influence Brampton has over the surrounding region.

Whilst several recognised and established techniques of measurement are employed to determine centrality, a further one was designed to measure the attractiveness of any settlement covered by the surveys. It can be argued that the attraction, or pull, which a settlement exerts over the surrounding region in relation to the services it provides, is also a measure of its degree of influence or centrality.

The idea, mainly original, is based on the notion of using 'weighting' values for all journeys made by consumers to any centre for whatever services they require.

Table 0.1 gives the details, where each value from 1 to 10 is related to the degree of difficulty of a journey. For any one centre, the values of all journeys made are totalled and the result is an index of attraction. Therefore, the more journeys that are made to a centre, the higher will be its index of attraction, particularly if some of those journeys cover large distances or are relatively difficult.

'Weighting' Values for Index of Attraction — Table 0.1

Distance in miles	CATEGORY OF DIFFICULTY					
	NIL	A	B	C	D	E
Same place or less than 1	1					
1 - 4		2	3	4	5	6
5 - 10		3	4	5	6	7
11 - 20		5	6	7	8	9
over 20		6	7	8	9	10

This method is used in Chapter 2 for migration and employment, and in Chapter 4 for retail and business services where it is compared with the results using Davies' functional index technique. The two variables used in the table require only a brief explanation. The five categories of difficulty can be expressed either as a time factor (used in the analysis of migration), or to cover variations in the frequency of bus services* adopted in the other fields of investigation. For example :-

Category	Time Factor	Bus Service Frequency
NIL	Upto 1 year	not applicable.
A	1 - 5 years	very frequent, more than 20 per day.
B	6 - 10 years	fairly frequent, 10 - 20 per day.
C	11 - 15 years	infrequent, less than 10 per day.
D	16 - 20 years	very infrequent, less than 10 per week.
E	over 20 years	none at all.

Mileage groupings have been based on the overall pattern of distance between settlements within the region, especially those pertaining to Brampton. There is a significant peak in the number at

*N.B. Full details of bus service frequency are given in Chapter 2 and appendix 2.6

about $4\frac{1}{2}$ miles, and no settlement in the area covered by the survey questionnaire is more than $10\frac{1}{2}$ miles from Brampton. The longest journey recorded within the framework of N. Cumbria is 19 miles, so that people who travel outside the region are covered by the 'over 20' miles category.

In support of much of the data and particularly the methods of analysis, is the variety of illustrative material. Because of the theme and nature of the study, quite a number of results would be less meaningful without a complementary map or diagram. With one exception (figure 6.1), all the maps and diagrams are original. Although secondary source material is naturally used in the construction of several, many 'figures' are based on information collected from the surveys and questionnaires. Similarly, all the photographs, except plate 21, are original, even the aerial views of Brampton and district for which a private aircraft was chartered.

All secondary sources are listed in the Bibliography, and references to quotations from specific items use the 'Harvard System' as illustrated both here and at the beginning of this introduction (Parsons, 1973, p.61). Since there is a wealth of statistical information contained in this study, the more detailed tables are given in the Appendix, whilst less detailed material and occasional summary tables are included in the text.

Throughout the study, an underlying objective is to present the information in a sequential way, backed by appropriate and complementary tables and illustrations. At the same time it is hoped to avoid the problem of having too much visual material that will detract from a fluent assimilation of the study's main theme and content - rural centrality in Cumbria.

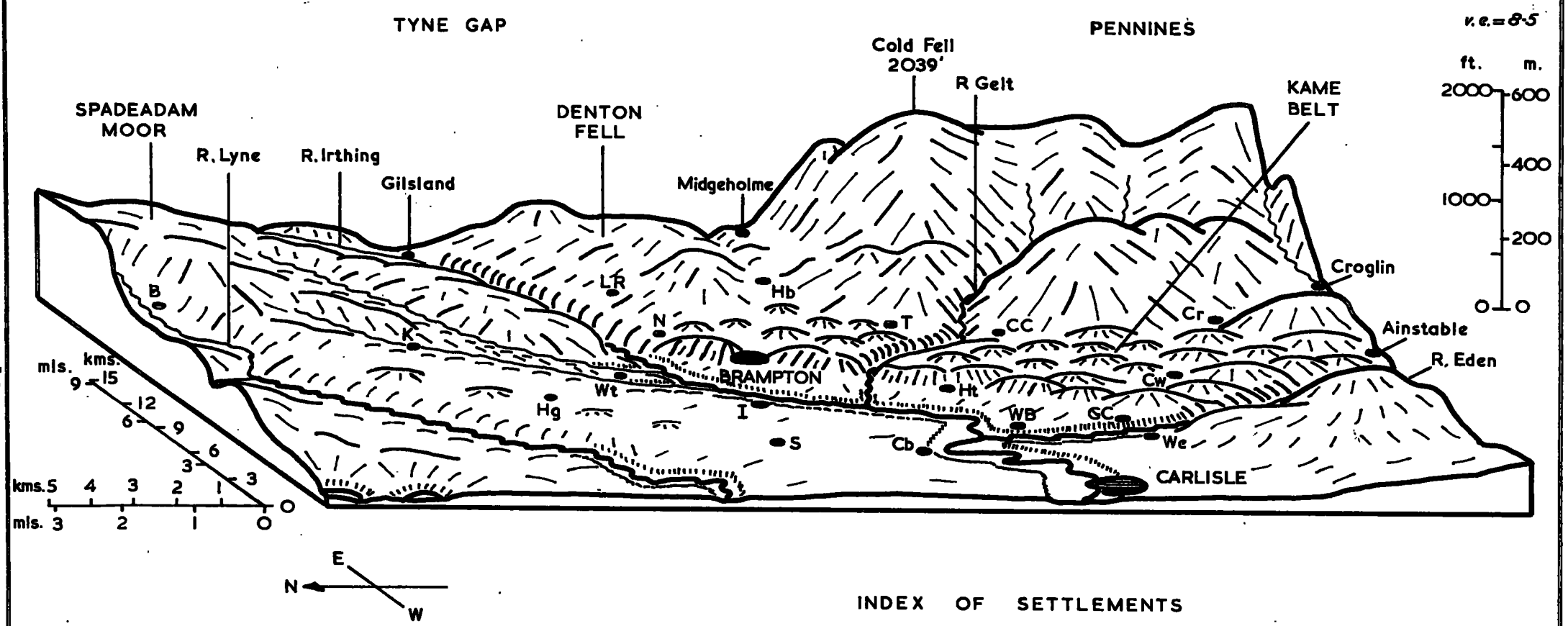
CHAPTER 1

PHYSICAL AND HISTORICAL BACKGROUND

Situation and physical setting, evolution and growth of both the region and Brampton as a market town

BRAMPTON IN ITS REGIONAL SETTING

Figure 1.1



INDEX OF SETTLEMENTS

B	Bewcastle	Hb	Hallbankgate	N	Naworth
Cb	Crosby	Hg	Hethersgill	S	Scaleby
CC	Castle Carrock	Ht	Hayton	T	Talkin
Cr	Cumrew	I	Irthington	WB	Warwick Bridge
Cw	Cumwhitton	K	Kirkcambeck	We	Wetheral
GC	Great Corby	LR	Low Row	Wt	Walton

Compiled from cross sections of 1" O.S. Sheet 76

1.1 PHYSICAL BACKGROUND

The human landscape of N.E. Cumbria, like most other areas of Britain, has been basically influenced by a combination of geographical factors and historical events. Of the former, geology and relief have played a major role in determining the nature and extent of human activity.

Physically the region can be divided into two main areas, separated by a dominant north-south faultline. In the east is the upland region of moors and fells, with the striking edges of the Pennines forming a sub-division to the south-east. To the west lies the flat Carlisle Plain, with rivers like the Eden, Irthing and Lyne meandering across it towards the Solway Firth (figure 1.1). Situated at the foot of the north-west corner of the Pennines in the centre of this region, is Brampton (plate 1). It nestles into the western edge of a belt of low morainic hills that flank and separate the higher fells of the south-east from the flatter landscape of the plain around Carlisle. The town lies $9\frac{1}{2}$ miles E.N.E. of Carlisle and 11 miles S.E. of Longtown, at a point where a medieval north-south route along the foot of the Pennines meets the east-west route through the Tyne Gap from Haltwhistle 11 miles away. It is the greater advantages afforded by this position, over those of other settlements in the immediate area, that has enabled Brampton to become not only an important route centre, but also a focus for the surrounding region.

1.1.1 Geology

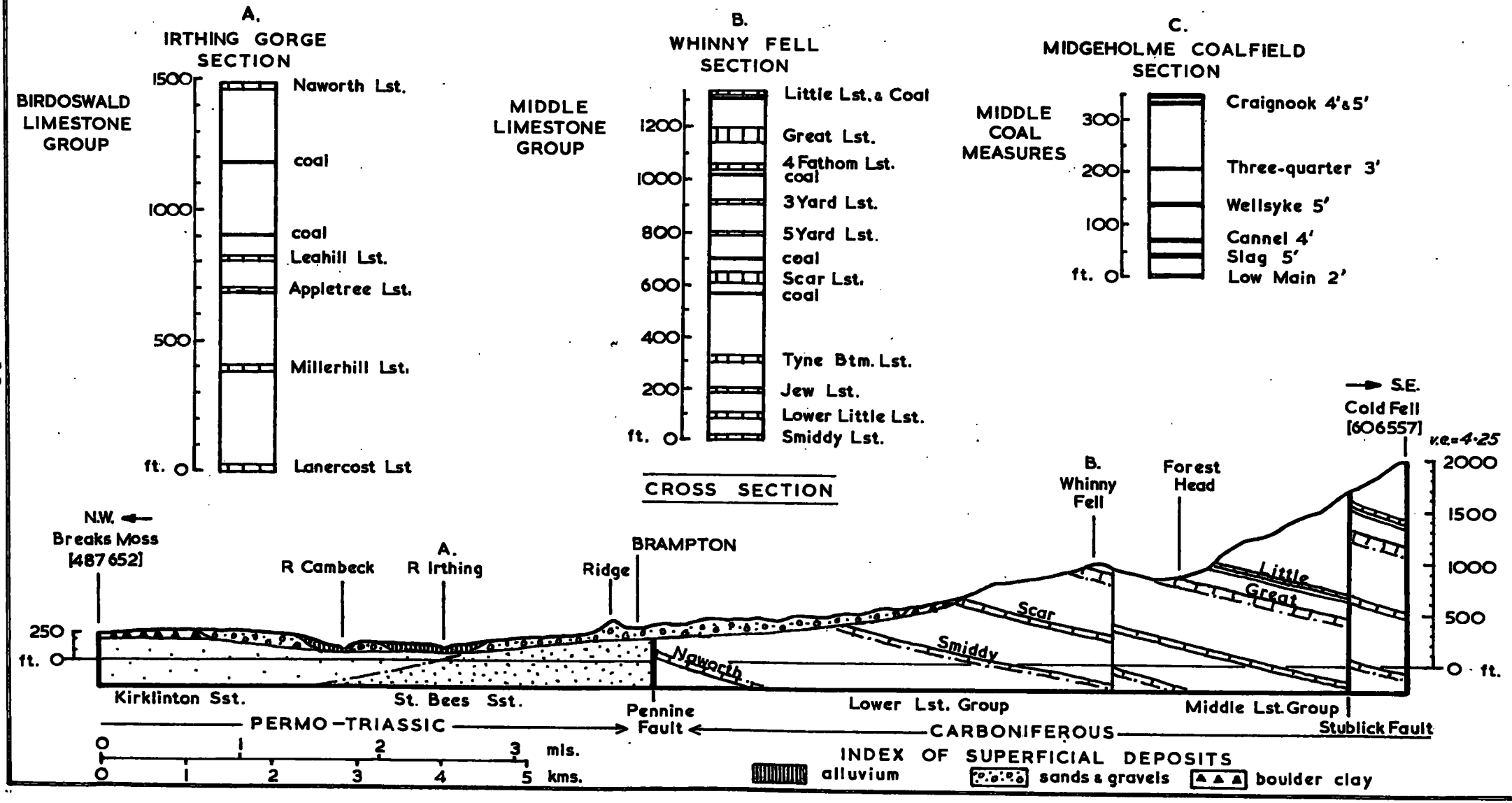
The topography of N.E. Cumbria is fundamentally a product of geological events and deglacial activity. Most of the rocks are of sedimentary origin from the Carboniferous and Permo-Triassic periods, with a superficial layer of drift from the Pleistocene Ice Age covering all but the fells of the Pennines in the south-east. East of Brampton are rocks of Carboniferous age, made up of alternating sequences of sandstones, shales, limestones and occasional coal. Many visible exposures on hill sides and in stream sections enabled Trotter and Hollingworth (1932) to work out the general succession for the area (appendix 1.1).

The oldest beds of this period, represented mainly by sandstones, form the rather monotonous and unbroken upland region of Spadeadam Moor which lies to the north of the river Irthing. South of the river, the younger rocks are punctuated with beds of shale and limestone, helping to give the relief a more striking character, as shown by Denton Fell and Cold Fell (figure 1.1). It is the limestones,

BRAMPTON IN ITS GEOLOGICAL SETTING

Figure 1.2

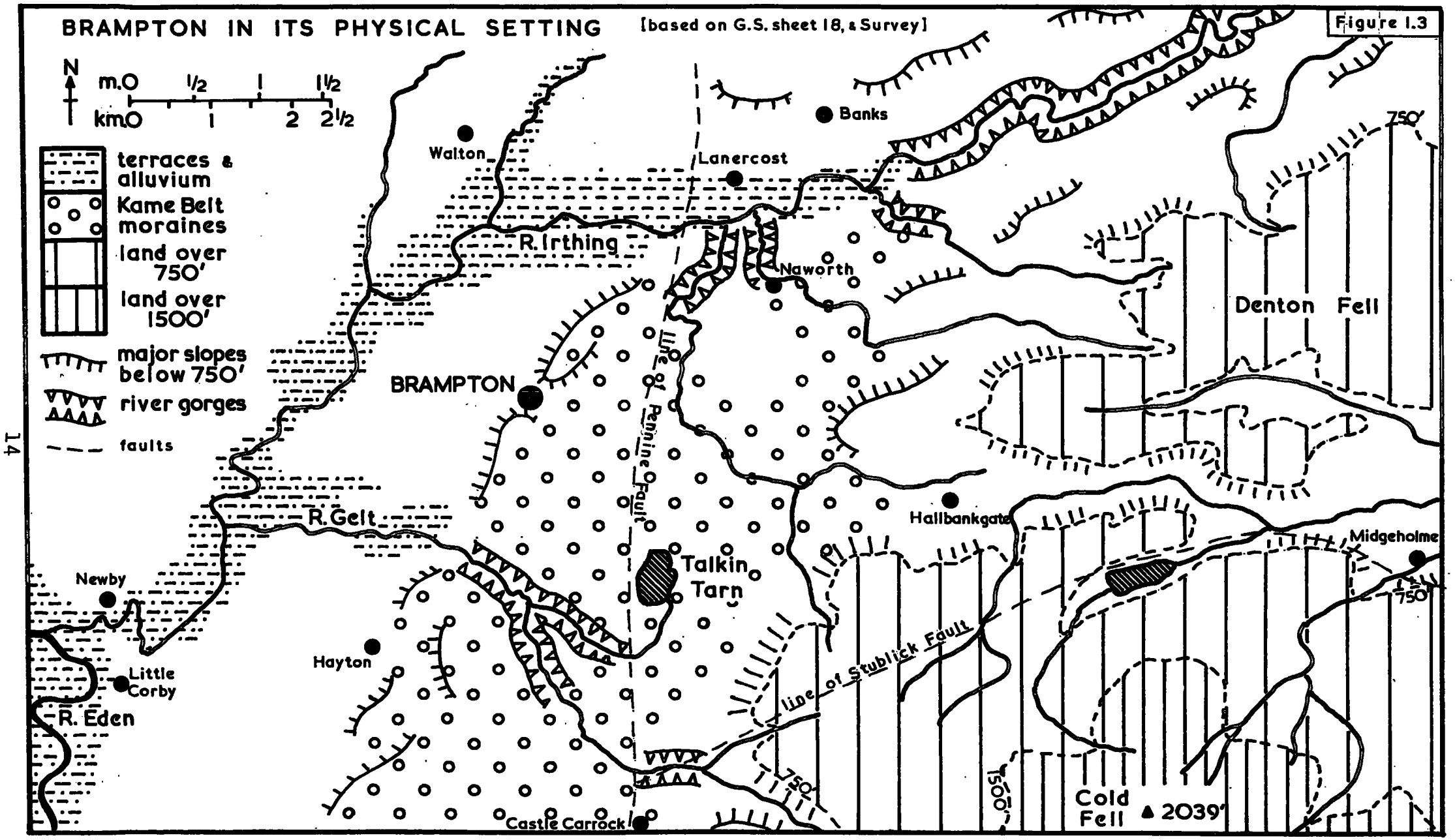
[based on G.S.sheet 18, & Daysh & Watson]



because of their greater resistance to erosion, that have produced many of the pronounced hill slopes and river valleys, thereby influencing some of the human activities of the area. Three limestones of the Birdoswald Group (figure 1.2A) help to form the prominent east-west ridge between Birdoswald and Banks on which the Romans built part of their wall, whilst the river Irthing has cut a deep and inaccessible gorge from rocks of the same group, between Hollows and Wallholme. Many exposures of the Carboniferous strata have been quarried to provide stone for building and limeburning, the chief ones being on the slopes of Cold Fell and Denton Fell where beds such as the Great and Four Fathom limestones outcrop at frequent intervals (figure 1.2B).

Even more influential in the development of the human landscape of the region has been the occurrence along the northern margin of the Pennines at Midgeholme, of a small pocket of upper Carboniferous Coal Measures. Along with a thin but more extensive bed called the Little Limestone Coal, seams such as the Slag, Cannel, Wellsyke and Craignook (figure 1.2C), were extensively worked during the nineteenth century, providing employment and business for many people in the region, and helping to create a wider zone of influence for the chief settlements such as Brampton and Haltwhistle.

Folding, faulting and igneous activity, initiated by earth movements at the end of the Carboniferous period, have all left their mark on the landscape. The first event was the intrusion of a quartz-dolerite sill - the Whin, - and its associated dykes. It is exposed in several localities, such as in Geltsdale, and on Midgeholme Fell where it has been quarried for road metal. Following the intrusion was a prolonged warping of the crust which produced the anticlinal dome of the Bewcastle Fells, the synclinal basin of the Tyne gap, and almost certainly initiated the pre-glacial drainage of the area. The final event was the uplift of the Alston Block section of the Pennines, with faulting on both the western and northern margins. The major line of dislocation which produced the Cross Fell escarpment is the Pennine fault. It has a maximum downthrow to the west of more than 2,500 feet, bringing Triassic sandstones against the varied lithology of the Carboniferous. In the Brampton area the fault is concealed, but further north it reappears as the Red Rock fault, and is partly responsible for producing the western edge of Spadeadam Moor and the Bewcastle Fells. The northern margin of the Pennines is defined by an east - west system of faults, the chief one being the Stublick (figure 1.3). This series has a downthrow of about 1,500 feet to the north, and has been largely


BRAMPTON IN ITS PHYSICAL SETTING
[based on G.S. sheet 18, & Survey]
Figure 1.3
N
m.0 1/2 1 1½
km.0 1 2 2½
terraces & alluvium
Kame Belt moraines
land over 750'
land over 1500'
major slopes below 750'
river gorges
faults
Walton
Banks
Lanercost
R. Irthing
Naworth
Denton Fell
750'
BRAMPTON
line of Pennine Fault
R. Gelt
Hallbankgate
Midgeholme
Talkin Tarn
Newby
Hayton
Little Corby
R. Eden
line of Stublick Fault
Castle Carrock
Cold Fell ▲ 2039'
1500'

responsible for the preservation of the coalfield at Midgeholme, as well as the imposing north face of Cold Fell.

As can be seen from figures 1.1 and 1.3, these faults play an important role, not only in the physical character of the region, but also by influencing the locations of some of the settlements, such as Bewcastle, Midgeholme, Castle Carrock and the smaller scarpfoot villages further south.

To the west of Brampton and the Pennine fault, the landscape produced by the New Red Sandstone rocks of the Permo-Triassic period, is in complete contrast to the eastern area of Carboniferous strata. The plain around Carlisle is underlain by beds of sandstones, occasional limestones and evaporites. Exposures of these beds are rare because of the absence of major structural features and the veneer of glacial drift. One area of outcrop, however, is to be found in the post-glacial gorge of the river Gelt south of Brampton. Here, massive exposures of the St. Bees' Sandstone have been quarried since Roman times, yielding building stone not only for the 'Wall', but also for many houses, farms and churches in the locality.

1.1.2 Glacial Activity

The last major event in geological history which has moulded the landscape of N.E. Cumbria into many of its present proportions, was the Pleistocene Ice Age. Much of the district west and north of the Pennine fells is covered by a wealth and variety of deposits, especially those of deglacial origin. Using the evidence of these deposits and the landforms they produced, Trotter (1929) was able to postulate a pattern of events and correlate a general succession (appendix 1.2). Although, in the light of contemporary knowledge and research, many of his findings and interpretations are open to speculation and question, the general nature and distribution of the landforms are not in dispute.

The majority of lowland deposits appear to have been formed during the advance and retreat of the Main Phase Ice. From boulder clay, drumlin and erratic evidence, it appears that the advance consisted of two ice lobes (one from southern Scotland and the other from the Lake District), which coalesced in the Brampton area and moved eastwards across it. It was the westerly retreat, however, which produced the most interesting and complex set of landforms, referred to by Trotter (1929) and subsequently Smailes (1960) as 'The Brampton Kame Belt'. Over 10 miles long and between 2 to 4 miles wide, the 'Belt' consists of undulating mounds of drift which hug the foot of the Pennine fells from Naworth in the north to Ainstable in the south (figure 1.1). Most of the mounds are

composed of sand with some gravel, whilst several of the hollows are floored by laminated clays. Those that overlie Carboniferous rocks generally have poor drainage or are occupied by lakes, as at Talkin Tarn. Meltwater channels or spillways occur between many of the mounds and several have been utilised as routeways. One of the most striking is occupied by the Brampton to Alston road (B.6292) and the now disused railway line between Hallbankgate and Midgeholme (figure 1.3).

The recession of the Main Phase Ice was probably interrupted by a series of halts, allowing large sandy mounds or kames to accumulate against the ice fronts. Some of the mounds appear to have become elongated into ridges, but only one is well defined. Material which accumulated against the ice front at the final halt stage produced the prominant Brampton Ridge (figure 1.2D and plate 1). It stretches for 3 miles from Boothby to Hayton and marks the westerly limit of the 'Kame Belt' deposits. At a gap halfway along this ridge the present town of Brampton is located; a site whose physical formation has rendered it both economically and historically advantageous (figure 1.3).

1.1.3 Post-Glacial Activity

The post-glacial drainage of the region is as much a tangle to unravel as the deglacial mounds of the 'Kame Belt'. Contemporary thought suggests that some of the pre-glacial drainage of the Carboniferous area may have flowed eastwards, with rivers such as the Irthing and even the Gelt being tributaries of the South Tyne. If this were indeed the case, capture seems almost certain to have occurred on both these rivers, causing them to flow westwards and join the river Eden.

The river Gelt possibly displays some of the better examples of rejuvenation and capture. Its sources, the Old and New Water tributaries, rise high on the Pennine fells just south of Cold Fell. Originally thought to have flowed northwards, according to Smailes (1960), via the high col at 1,250 feet between Cold Fell and Talkin Fell, the Gelt now emerges from the Pennines at Castle Carrock as a strong, westward flowing, youthful river. The next stage of its course is across the 'Kame Belt', where, because of greater load and volume, it is the only river to have carved a deep gorge into the underlying New Red Sandstone, thereby exposing large outcrops at the quarries previously mentioned. Like the gorge of the river Irthing further north, it is this reach of the Gelt that has proved a barrier to communication. Road routes span the river at either

end of the gorge, while the Carlisle to Newcastle railway crosses it with diffuculty on a skew-arch bridge, built last century using stone from the local exposures.

The river Irthing for most of its journey across the Carboniferous strata is confined to an incised valley and gorge, and collects numerous tributaries of a similar nature from both Spadeadam Moor and Denton Fell. Only when its course crosses the line of the Pennine Fault near Lanercost does its character change. The valley quickly assumes a mature profile, with gently sloping sides and a widening flood plain. The floor of this part of the valley, from Lanercost south-westwards, is composed of a series of sand, gravel and alluvial terraces which the river has both created and is now in part destroying. The extent and composition of these deposits (figure 1.2D) in the lower valleys of the Eden, Irthing and Gelt, has not only influenced the nature and quality of farming, but also the sites of several important settlements, such as Lanercost, Walton, Irthington, Newby and Little Corby. Even routeways have been constrained to crossing the rivers where the flood plain is at its narrowest.

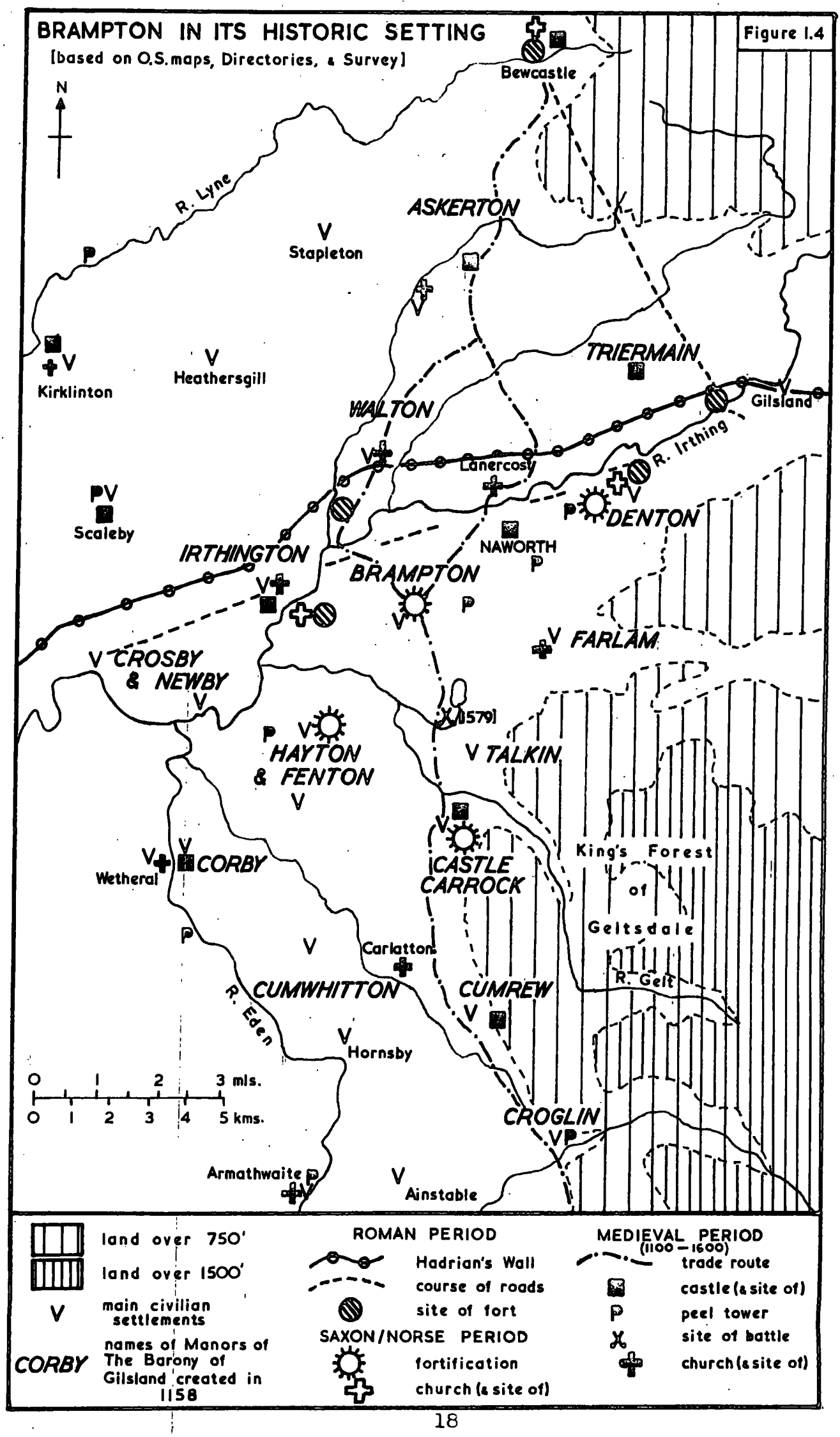
It is apparent therefore, especially from figures 1.1 and 1.3, that the physical assets and constraints of the region have been a major influence upon the characteristics of the human landscape; from locations and sites to activities and functions.

1.2 HISTORICAL BACKGROUND

N.E. Cumbria has had a long and colourful history, being influenced by many of the major military and social events that have effected the English Scene. The region abounds in relics from the Roman Occupation, was mainly colonised by settlers during the Saxon and Norse periods, disrupted by raids from the Picts and Scots, and strongly re-organised by the Normans and their descendants. Economic progress has been exemplified by 18th century changes in farming, 19th century development of the coalfield around Midgeholme and the recent 20th century technological project on Spadeadam Moor. All events have left their mark on the district, and enabled Brampton to emerge as the only market town and important rural centre for the area.

1.2.1 Origins and Colonisation

The present town of Brampton dates back to the 13th century, but the first recorded mention is of the village of Old Brampton in 1169 A.D. when Henry II granted a charter for the founding of a priory


BRAMPTON IN ITS HISTORIC SETTING
[based on O.S. maps, Directories, & Survey]
Figure 1.4
N
Bewcastle
R. Lyne
ASKERTON
Stapleton
Kirklinton
Heathersgill
TRIERMAIN
Gilsland
WALTON
Lanercost
R. Irthing
Scaleby
DENTON
NAWORTH
IRTHINGTON
BRAMPTON
FARLAM
CROSBY & NEWBY
[1579]
HAYTON & FENTON
TALKIN
CASTLE CARROCK
King's Forest of Geltsdale
Wetheral
CORBY
Carlatton
R. Gelt
CUMWHITTON
CUMREW
R. Eden
Hornsby
0 1 2 3 mls.
0 1 2 3 4 5 kms.
CROGLIN
Armathwaite
Ainstable
land over 750'
land over 1500'
main civilian settlements
CORBY names of Manors of The Barony of Gilsland created in 1158
ROMAN PERIOD
Hadrian's Wall
course of roads
site of fort
SAXON/NORSE PERIOD
fortification
church (& site of)
MEDIEVAL PERIOD (1100 – 1600)
trade route
castle (& site of)
peel tower
site of battle
church (& site of)

at Lanercost (plate 2) :-

> "The grant assigned to God and St. Mary Magdelene of Lanercost, and to the regular canons there, the lawn of Lanercost ..... the vill of Walton, the church of that vill, and the churches of Irthington, Brampton, Carlatton and Farlam." (Victoria County History, Cumberland, vol.2, p.152).

Old Brampton seems to have grown up during the early Middle Ages round the site of an old Roman fort, some 1½ miles W.N.W. of the present town (figure 1.4). Like a similar one at Denton further east, it was built by Agricola in 80 A.D. for his fighting troops when he constructed the Stanegate, - the road from Corbridge to his new city of Carlisle (Luguvalium). From its hill position the fort served to guard the point where the road crossed the river Irthing. When Hadrian built the 'Wall' between 122 and 126 A.D. its route lay to the north of the Stanegate. Most of the material for this massive operation, which included forts at Castlesteads and Birdoswald, was obtained from local quarries. These were fairly abundant across the area of Carboniferous rocks, but to the west of Banks exposures of local stone were rare, and it had to be obtained from further afield. One such site was the outcrop of St. Bees' Sandstone in the gorge of the Gelt. The quarries here were an important source of stone for building and repairing the wall and its forts, right up to the time it was abandoned in 383 A.D. A Roman inscription on the face of one exposure of stone, known locally as the "Written Rock of Gelt", bears witness to this. From its translation, Hutchinson (1794, vol.1, p.125) records that the quarries were the workshops of the Second Augustan Legion :-

> "Vexillatus, of the second Augustan Legion, so named on account of its valour during the consulships of Agricola and Maximus, from the workshop of Mercatius, son of Mercatius Fermius."

In the centuries that followed the Roman withdrawal, north-west England was frequently over-run by invading hordes from various directions. The Picts and Scots made swift raids from the north, but never really settled. From place-name elements it would appear that the chief colonisers of north-east Cumbria were the Anglo-Saxons, and the Norse who arrived from Ireland in the 9th and 10th centuries. A few Brittonic and Celtic names, such as Carlisle and

Castle Carrock have survived, but the majority of the larger rural settlements of the area have names ending with 'ton', - Anglo-Saxon for village or enclosure. Examples are Irthington, Walton, Hayton and of course Brampton itself (figure 1.4). According to the English Place Name Society for Cumberland (1952, vol.22), Brampton is probably derived from the Anglo-Saxon 'Burgh-am-ton' meaning a fortified village or enclosure, although Old English for Broom Farm is also suggested (E.P.N.S. 1952, vol.22, p.65). Names of minor settlements, however, often have predominantly Norse endings, such as 'by' (a farm) as in Crosby, Corby and Newby; and 'holme' (island) as in Burtholme and Midgeholme.

It was during the Anglo-Saxon period that Christanity was brought to the district, and the original church at Old Brampton was built. Using the site of the Roman fort, the church served to attract settlements around it particularly during times of strife, although only one cluster - Crooked Holme, survives today.

In 945 A.D. Edmund I gave the city of Carlisle and a large proportion of Cumbria to Malcolm, King of the Scots. For nearly 100 years after the Norman conquest of England, the region remained part of the Kingdom of Strathclyde and did not become English again until the middle of the 12th century. During the last 50 years of this Scottish domination, north-east Cumbria was under the rule of a powerful chieftain called Gille. In 1158 A. D. he was slain by the 'Norman' invaders, and Henry II (who was in Carlisle at the time) created the Barony of Gillesland, subsequently Gilsand :-

> "..... granting all the land which Gille, son of Boet, held on the day he was living and dead, to Hubert de Vallibus (Vaux) and his heirs." (Victoria County History, Cumberland, vol.1, p.306).

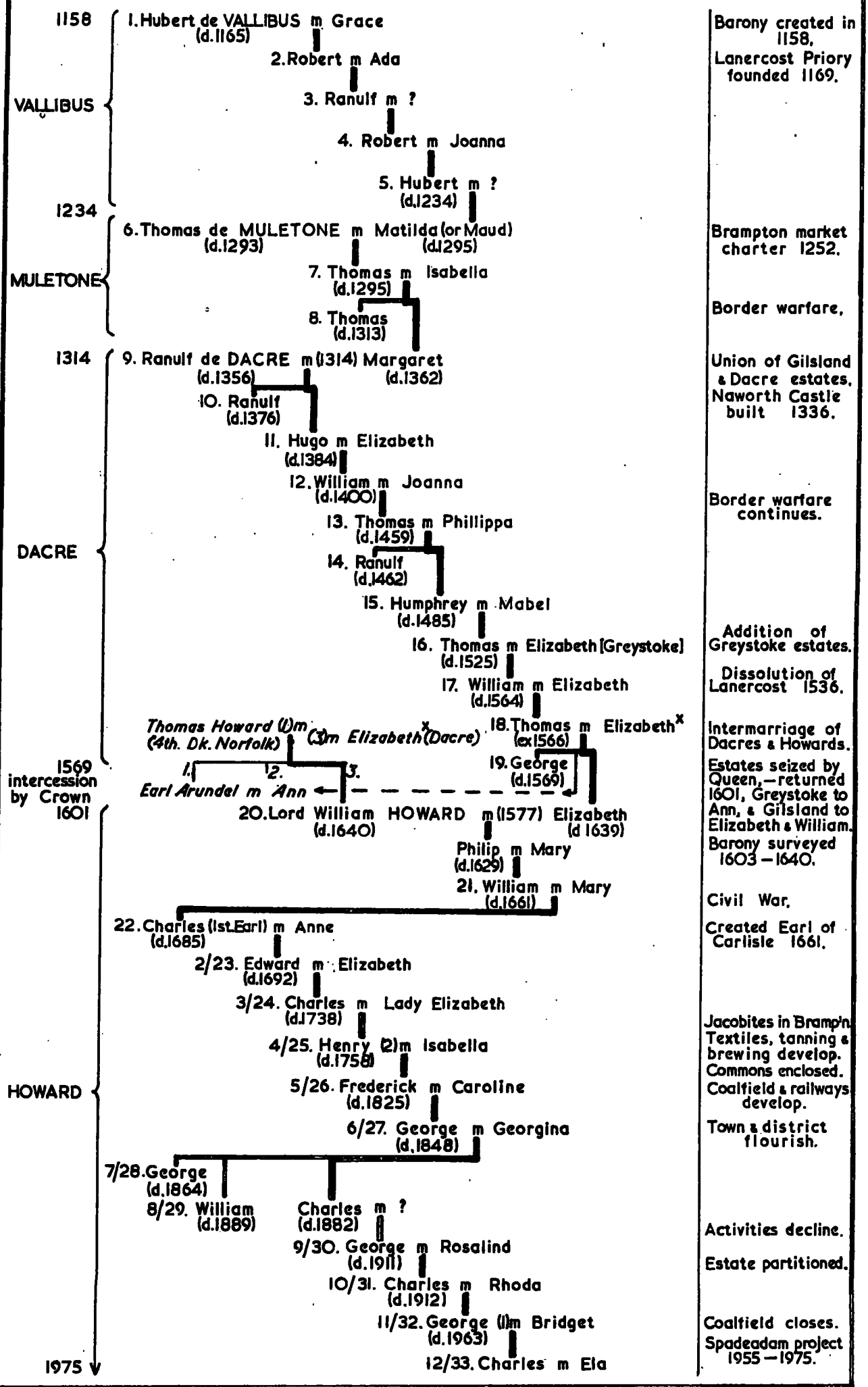
Thus began the baronial system in this area of Cumbria (figure 1.5), which was to play an important part in shaping the character of the region, and aspects of which were to last for nearly 750 years.

1.2.2 Barony of Gilsland - Morphology.

The Barony contained fifteen manors, including Brampton, from Askerton in the north to Croglin in the South (figure 1.4). The extent of each manor varied in size and shape depending on the nature and quality of the landscape, but many probably coincided fairly accurately with the area of present parishes. Since the region was under constant threat of attack from both the Scots and dissident English, many castles and fortifications were built, and the

THE BARONY OF GILSLAND [based on Hutchinson & Ferguson]

Figure 1.5



population removed to sites of greater safety. Several outposts of the Barony were made into defensive sites, such as Bewcastle (Boet's Castle), Scaleby and Armathwaite. Continued Border warfare over the centuries led to the construction of Peel Towers - fortified mansions and farms, many of which still survive to the present, although some (like those at Naworth and Great Corby) have been incorporated into castle structures.

An important chapter in Brampton's evolutuion with regard to its role and function is revealed by a marked charter of 1252 :-

> "To Thomas de Muletone, Maud his wife and their heirs, a weekly market on Tuesdays at their Manor of Brampton, and a yearly fair there on the vigil and feast of the decollation of John the Baptist." (Harper, 1957, p.3).

Muletone (originally Lord of the Manor at Brampton) was the new Lord of Gilsland, having inherited all the titles, land and property of the Barony when he married Maud, the last surviving member of the Vallibus family in 1234 (figure 1.5). This new position therefore, together with the physical and locational advantages of Brampton's site and situation, allowed him to make his old manor the 'capital' of the Barony, thereby setting the seal on its future role and function within the district.

At about the same time a park was created from the flat land around the Old Church. The limits are shown on the Estate Map of 1603 (figure 1.6), and coincide with many field boundaries of today. Whitehead (1906), records that in making the park, Muletone moved the inhabitants to a different site further east - that of the present town. It is very probable that a small settlement already existed at this new location, and the better facilities offered by it were no doubt major factors for the move. As well as an adequate supply of water from two springs and a beck, there was protection from the low ridges of the 'Kame Belt'. Situated at the south-west corner of Brampton Ridge is a cone shaped hill called the 'Mote'. It towers some 200 feet above the present town, and is a prominent land mark for several miles to the north and west (plate 4). At its summit are unexcavated earthworks and a dry ditch, and although there is no evidence to suggest that it was ever a site for an actual castle, its defensive character would almost certainly have been used by Muletone and his successors during the early, turbulent years of baronial rule.

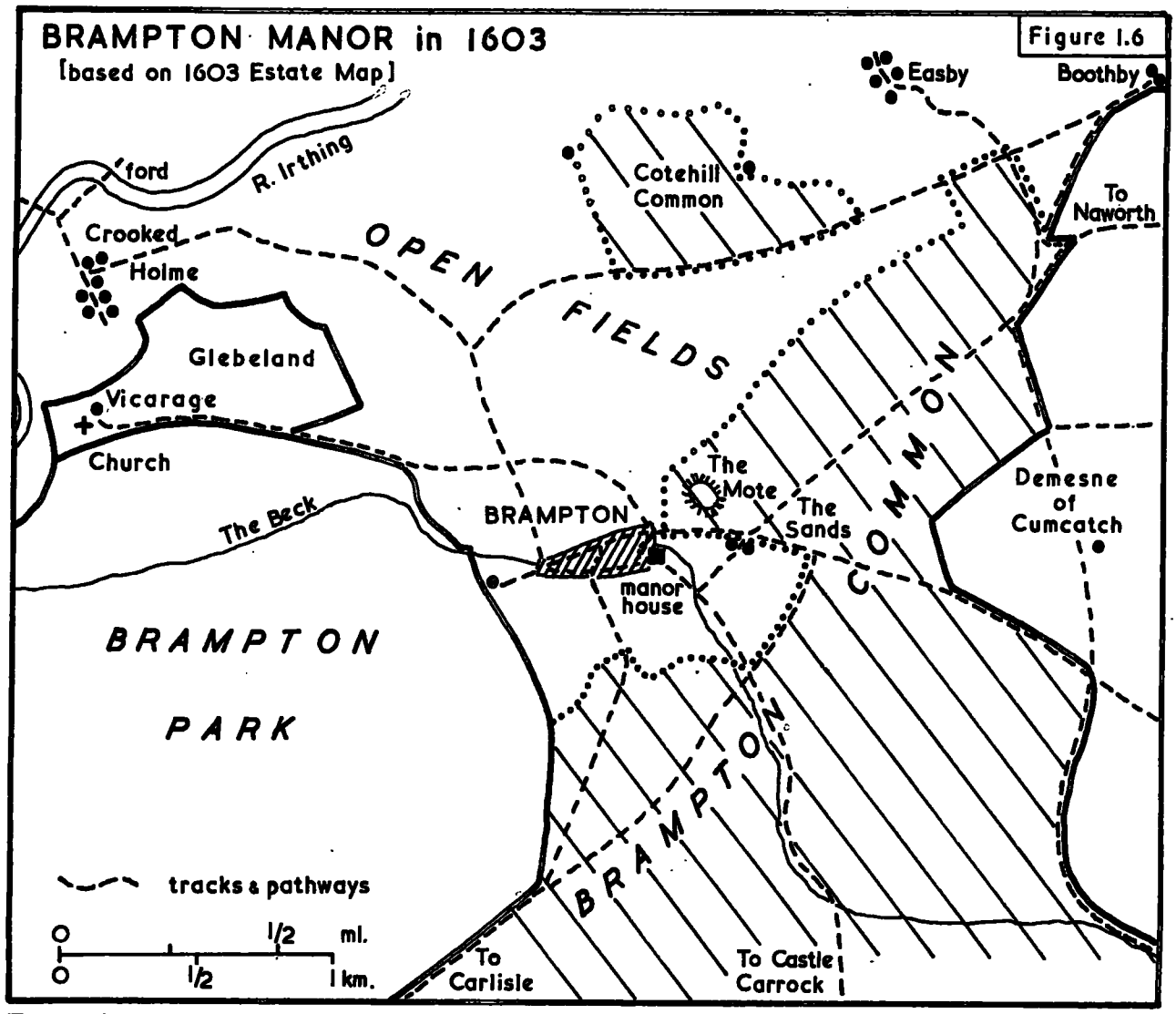
The Barony of Gilsland remained in the Muletone family until 1314, when Margaret, the last of the line, married Ranulf de Dacre

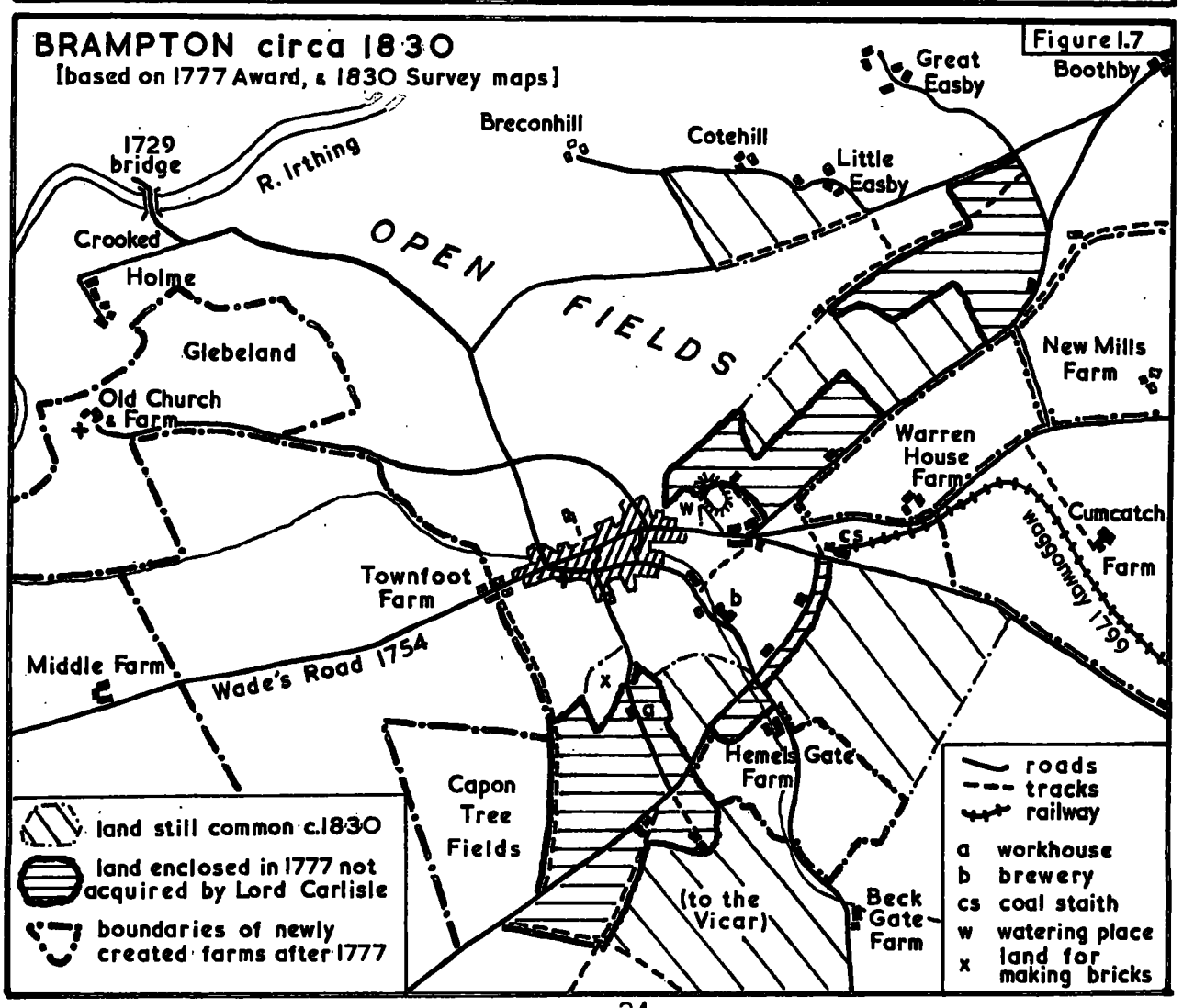
(figure 1.5). The original Dacre home was at Irthington where a motte and bailey castle guarded the important crossing place on the river Irthing, but in 1335 this site was abandoned in favour of a more defensive one at Naworth where a new castle was built around an old Peel Tower (figure 1.4 and plate 3). The Barony changed hands for the last time in 1601 when Lord William Howard, third son of the 4th Duke of Norfolk, became the 20th holder of the title. He should have inherited the position in 1577 when, at the age of 14, he married his step-sister Elizabeth Dacre. However, because of complications arising from intermarriage and political intrigue involving the Howards, Dacres and Mary Queen of Scots, the titles and estates were impounded and withheld by Queen Elizabeth I for about 30 years. They were finally redeemed in 1601, and on payment of £10,000 Lord William was 'restored in blood'. In the marriage settlements the Dacre lands had been divided between the surviving heiresses. Greystoke went to Ann, whilst her younger sister Elizabeth received Gilsland. (figure 1.5).

The arrival of Lord William at Naworth in 1601 was an important turning point in the evolution of the area. 'Belted Will' as he was more popularly known (because of a large studded belt he wore in battle) was not only a fine soldier, but also a man of action around his estates. According to Whitehead (1906, p.35) "..... he was a wonderful man of business." He is still regarded as a local hero, having had railway engines and public houses named after him. On taking possession of the Barony, he immediately instituted a survey of the estates which had fallen into disorder through warfare and neglect, and in 1605 obtained a new market charter for Brampton from James I. From the results of his surveys, Lord William produced a map (figure 1.6), a field book, and annual household books in which every improvement to the estate was duly recorded. Unfortunately the records and work he started were not continued by his immediate successors, otherwise Bishop Nicholson writing about Brampton in 1704 may not have referred to "..... the appalling condition of the buildings as unbefitting a mercate town." (Harper, 1957, p.9).

1.2.3 Brampton In The 18th Century

Although still 'Capital' of the Barony, Brampton does not appear to have awakened as a market town until well through the 18th century. The arrival of 'Bonnie Prince Charlie' in the town in 1745 on his southwards march to Preston, undoubtedly sparked off new developments. General Wade, in charge of the English army, should have cut off the

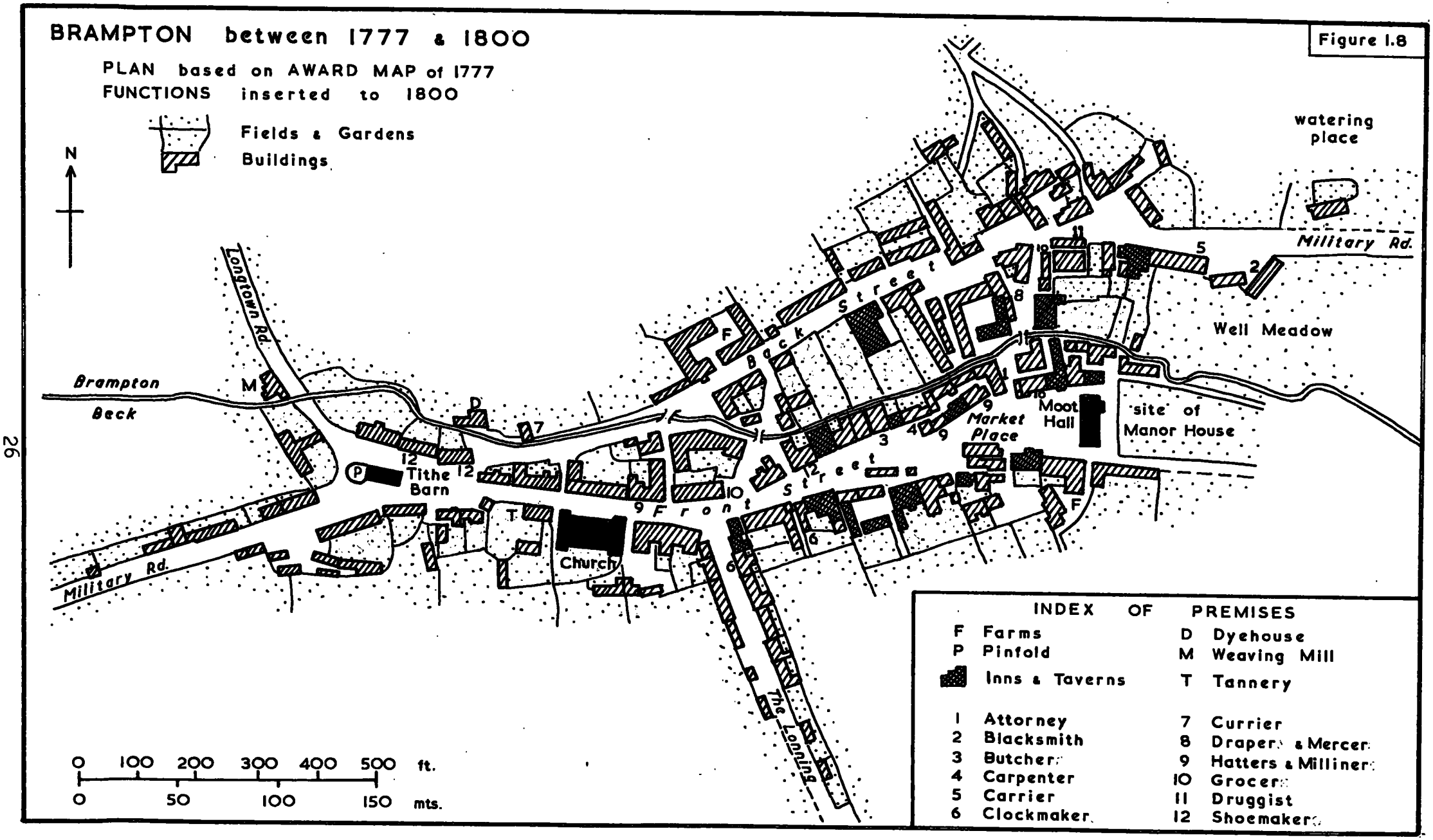

BRAMPTON MANOR in 1603
[based on 1603 Estate Map]
Figure 1.6
Easby
Boothby
ford
R. Irthing
Cotehill Common
To Naworth
Crooked Holme
OPEN FIELDS
COMMON
Glebeland
Vicarage
Church
The Mote
The Sands
Demesne of Cumcatch
The Beck
BRAMPTON
manor house
BRAMPTON PARK
BRAMPTON
tracks & pathways
1/2 ml.
1/2 1 km.
To Carlisle
To Castle Carrock


BRAMPTON circa 1830
[based on 1777 Award, & 1830 Survey maps]
Figure 1.7
Great Easby
Boothby
1729 bridge
R. Irthing
Breconhill
Cotehill
Little Easby
Crooked Holme
OPEN FIELDS
Glebeland
Old Church & Farm
New Mills Farm
Warren House Farm
Cumcatch Farm
waggonway 1799
Townfoot Farm
Middle Farm
Wade's Road 1754
Capon Tree Fields
Hemels Gate Farm
(to the Vicar)
Beck Gate Farm
land still common c.1830
land enclosed in 1777 not acquired by Lord Carlisle
boundaries of newly created farms after 1777
roads
tracks
railway
a workhouse
b brewery
cs coal staith
w watering place
x land for making bricks

Jacobites advance through Cumbria, but his westerly progress from Hexham was impeded by the very poor state of the roads and tracks. He was therefore given the task of surveying the area for a new road between Newcastle and Carlisle, and having it constructed. Completed in 1754, and known locally as Wade's Road, it avoided the old routes to Carlisle by cutting straight through manorial park-land (figure 1.7, plates1 & 7). Although primarily intended as a military road, it soon became an established trade route allowing Brampton to develop as a commercial and market centre.

This dawn of a new era was given greater impetus by the Enclosure Awards that enfranchised about 10,000 acres of commonland in the area between 1772 and 1811. The award for Brampton was passed in 1777, when out of a manorial area of 5,550 acres, some 1,762 were common. Common fields had become established after the spread of Norman influence in the 12th century, and the Scottish 'run-rig' system of open fields, in which farmers had scattered ownership or tenure of the arable land, also prevailed in this part of Cumbria. At Brampton the arable open fields lay on the flatter land north of the town, while the mounds of the 'Kame Belt' to the east and south were occupied by the commons (figure 1.6).

After 1777 the land was progressively carved up, and farms were established in some of the newly enclosed areas, including the Park (figure 1.7). The area of open fields, however, still retained much of its piecemeal character of scattered ownership for many years later, and even the nature of farming was slow to change. Bailey and Culley, in surveying the County for the Board of Agriculture in 1794, were highly critical of the low standards of farming they encountered. They considered that wheat was generally sown too thick and too early, turnips not enough, and there was overgrazing of the remaining common land by un-enlightened breeders. Even Hutchinson (1794, p.126) on a visit to the town was struck by the fact that Brampton "..... upon the great military road is surrounded by common lands carrying a multitude of sheep." Bailey and Culley (1794) attributed the slow development of agriculture in the region to the fact that farms were generally small and tenancies insecure. After the enclosure awards much land was 'held' from the Lords of the Manor under 'customary tenure'; - a type of lease under which the holders were subject to fines, rents and the performance of certain duties. Another obstacle was undoubtedly the individual expense of purchasing part of the common land, which, until the national Enclosure Award of 1801, could cost as much as £2,000 per


BRAMPTON between 1777 & 1800
PLAN based on AWARD MAP of 1777
FUNCTIONS inserted to 1800
Figure 1.8
Fields & Gardens
Buildings
N
watering place
Military Rd.
Well Meadow
Longtown Rd.
Brampton Beck
Back Street
Market Place
Moot Hall
site of Manor House
Tithe Barn
Front Street
Church
Military Rd.
The Lonning
0 100 200 300 400 500 ft.
0 50 100 150 mts.
INDEX OF PREMISES
F Farms
P Pinfold
Inns & Taverns
D Dyehouse
M Weaving Mill
T Tannery
1 Attorney
2 Blacksmith
3 Butchers
4 Carpenter
5 Carrier
6 Clockmaker
7 Currier
8 Drapers & Mercers
9 Hatters & Milliners
10 Grocers
11 Druggist
12 Shoemakers

application.

The second half of the 18th century also brought about a growth of industrial activities. In 1747 a textile industry had been established in Carlisle, and along with other settlements in the county, such as Wigton and Warwick Bridge, Brampton soon became an important outpost in the manufacture of checks and ginghams. By the end of the century the town could also boast a tannery with 30 workers, a brewery (established in 1785), as well as the textile mill in which 60 weavers were employed. The census for 1801 records as many as 136 people engaged in manufacturing (though in what proportions is not stated), but only 44 in agriculture.

In support of these important activities, Brampton also had its share of cottage industries, and by the end of the 18th century most trades and businesses appear to have been represented (appendix 1.6). Some of the homebased crafts (such as hand-loom weavers) owed their livelihood to the presence of the textile mill, whilst the tannery and brewery had their respective allied trades in the form of skinners, saddlers, shoemakers, coopers and publicans. Other occupations, like blacksmiths, joiners and stone-masons, developed in towns like Brampton because of the increasing demand for that type of work. Hutchinson (1794, p.126) described the scene clearly when he noted that Brampton :-

> "..... is in a propitious spot for manufactory and trade, ... there is a good supply of water, plenty of fuel and provision ..... the inhabitants are numerous and in want of employment."

The first accurate picture of the layout of Brampton is obtained from a map of 1777 (figure 1.8), and comparing it with successive publications, the centre has changed little in 200 years (plates 7 & 8). The central feature was an east-west elongated market place running into Front Street, with shops, taverns and houses on both sides. The direction was no doubt governed by the east-west course of Brampton Beck which flowed openly behind the northern row of buildings (plate 5). To the north of the beck was a second throughfare - Back Street (now called Main Street and the route of the A69 trunk road), which appears to have been mainly residential, although it may have contained a couple of farms. Linking Back Street with the Market Place were High and Low Cross Streets, each with narrow bridges where they spanned the beck. At the eastern end of the Market Place, in front of the site of the old Manor House, was the Moot or Town Hall - a two storied rectangular building with shops on the ground floor.

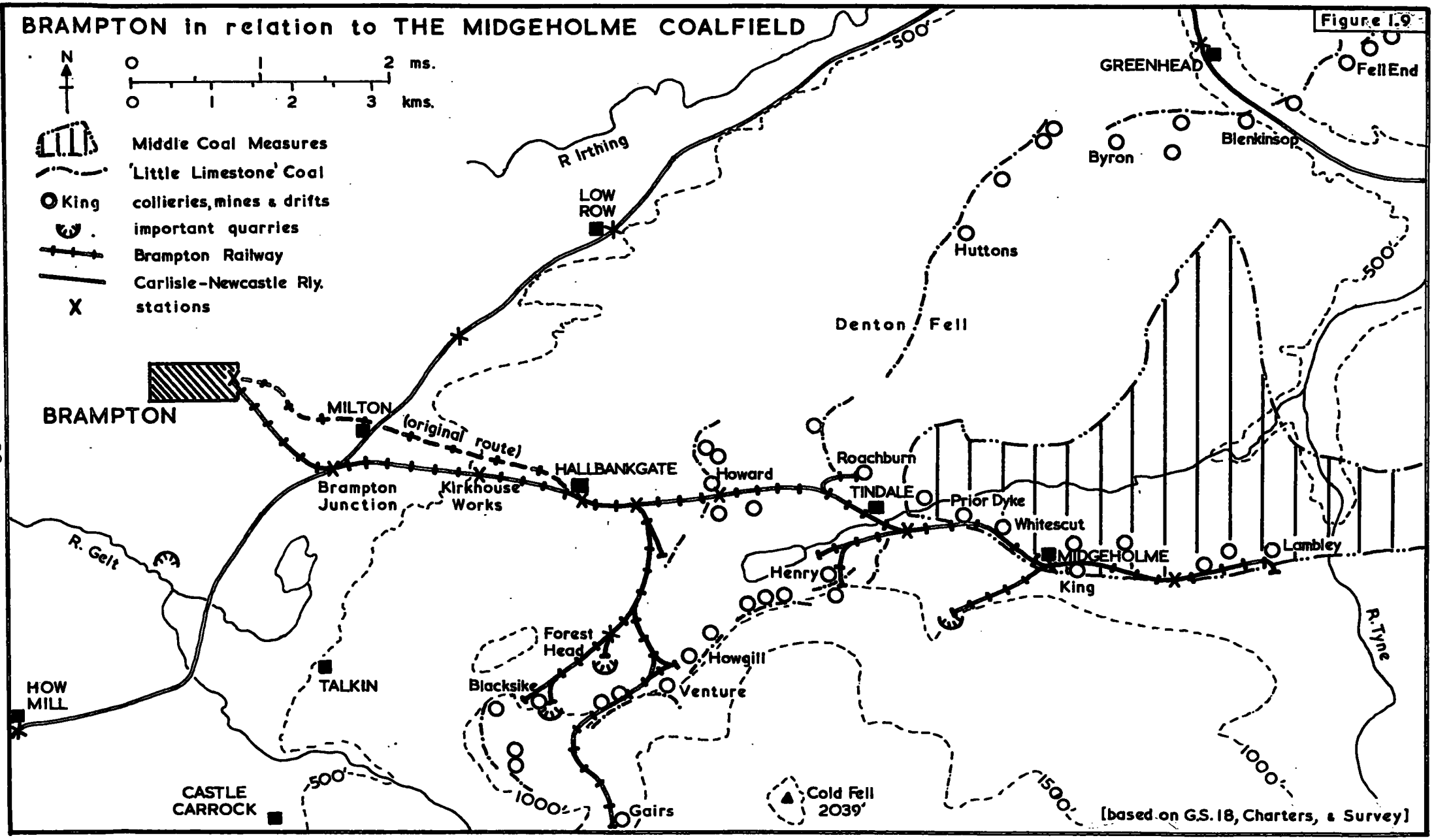
This was replaced in 1817 by the present octagonal structure, built by Frederick (the fifth Earl of Carlisle) to serve both as a council meeting hall, and a butter and eggs market (plate 9). On the south side of Front Street stood an old building housing the hospital and grammar school. This was removed in 1788 to make way for the new church. At the western end of the town, where Main Street and Longtown Road met, stood the Tithe Barn and Pinfold. The barn was subsequently converted into a National School in 1816 (plate 10).

In 1794 most of the buildings "..... were clustered round the market place in a mean and irregular fashion" (Hutchinson 1794, p.126), so that any new industrial activity was often forced to develop on the outskirts of the town. The tannery occupied a building near the new church at the western end of Front Street, textiles developed in premises at the foot of Longtown Road, whilst the brewery was constructed at the eastern end of the town on a site where there was a sufficient supply of water from the beck (figure 1.7).

One of the principal commercial activities indicative of the flourishing status of Brampton during the last years of the 18th century was the twice weekly market. Held in the square every Tuesday and Saturday, dues were let by the Earl of Carlisle for £14 a year, while stallholders paid 2d. a day for the use of a booth. The Earl also collected tolls on all grain, fruit and root crops sold in the market, but in 1795 because of diminishing trade he acceded to a request to have the tolls abolished. The market was plentifully supplied with all types of meat (beef at 3d. per lb.) poultry, salmon and trout (also at 3d. per lb.), eggs, butter and cheese. In addition to the provision market, there were four large annual fairs for sheep and cattle. These were held on the Sands (where Muletone held the original fairs in the 13th century) and attracted custom from many farms and villages in the region (plate 6).

1.2.4 Coalfield and Railway Development

Another area that was starting to flourish at this time was the coalfield. According to the household books of Lord William Howard, coal had been mined in the Midgeholme district from the 16th century; the earliest known working being at Roachburn in 1522. In 1628 there is reference to workings at Midgeholme, and by 1736 several other pits and adits had been opened producing about 840 tons of coal a week (appendix 1.9). Further areas on the fellsides were progressively developed and by 1801, weekly production had


BRAMPTON in relation to THE MIDGEHOLME COALFIELD
Figure 1.9
N
0 1 2 ms.
0 1 2 3 kms.
Middle Coal Measures
'Little Limestone' Coal
King collieries, mines & drifts
important quarries
Brampton Railway
Carlisle-Newcastle Rly.
stations
R Irthing
LOW ROW
GREENHEAD
Fell End
Byron
Blenkinsop
Huttons
Denton Fell
500'
BRAMPTON
MILTON
(original route)
HALLBANKGATE
Brampton Junction
Kirkhouse Works
Howard
Roachburn
TINDALE
Prior Dyke
Whitescut
MIDGEHOLME
Lambley
King
Henry
R. Gelt
R. Tyne
Forest Head
Howgill
Venture
Blacksike
TALKIN
HOW MILL
CASTLE CARROCK
1000'
Gairs
Cold Fell 2039'
1500'
[based on G.S. 18, Charters, & Survey]

risen to over 8,000 tons. Most of the collieries were owned and run by the Earls of Carlisle, and in 1775 the first railway, using horse-drawn wagons, was built at Tindale Fell pit. Other wooden wagonways were soon constructed and in 1799 the line was extended westwards to a new coal staith on the edge of the Sands at Brampton (figure 1.7). Not only did this link the town with its industrial hinterland, it also provided the townspeople with cheaper coal and encouraged trade.

After 1800 the coalfield continued to prosper, and by the first quarter of the century nearly 200 men were employed in the various workings of both the middle Coal Measures and the Little Limestone seam. Space does not permit more than a brief glimpse at this most interesting area, or its era of influence in the growth and development of N.E. Cumbria, but fuller details are given by Trotter and Hollingworth (1932), Dyer (1969) and Charters (1971). The extent of the workings is shown in figure 1.9, in appendix 1.8 and illustrated in plates 11, 12 & 13.

The earlier pits of the coalfield were located in the district between Tindale and Midgeholme, but by 1810 many new workings had been opened on the fellsides south-west of Tindale. In 1829 the district around Forest Head was very active, and further pits had been sunk east of Midgeholme towards Lambley. Many of the workings, particularly of the Little Limestone coal were adits or drift mines, and were given names like William, Morpeth, Howard, George and Henry, - identifiable with certain members of the Howard family by whose grace they were worked.

In conjunction with the pits, quarrying was also an important activity, particularly amongst the limestones and shales at Forest Head. Veins of iron ore, lead, copper and zinc were mined from the fellsides near Tindale in sufficient quantity as to allow the construction of a spelter plant in 1847, but it only lasted about 50 years by which time the minerals had been worked out. Coal was a much more viable commodity, and though output fluctuated, production continued at several pits well into the 20th century. The peak of output appears to have been reached about 1810, when 585,000 tons (278,615 loads) were mined from the drifts alone. In 1819, the figure had fallen to 418,000 tons and was only 73,000 tons in 1829 (appendix 1.9).

Six years later (in 1835) the pits were leased to James Thompson who had been appointed the Earl of Carlisle's colliery manager and

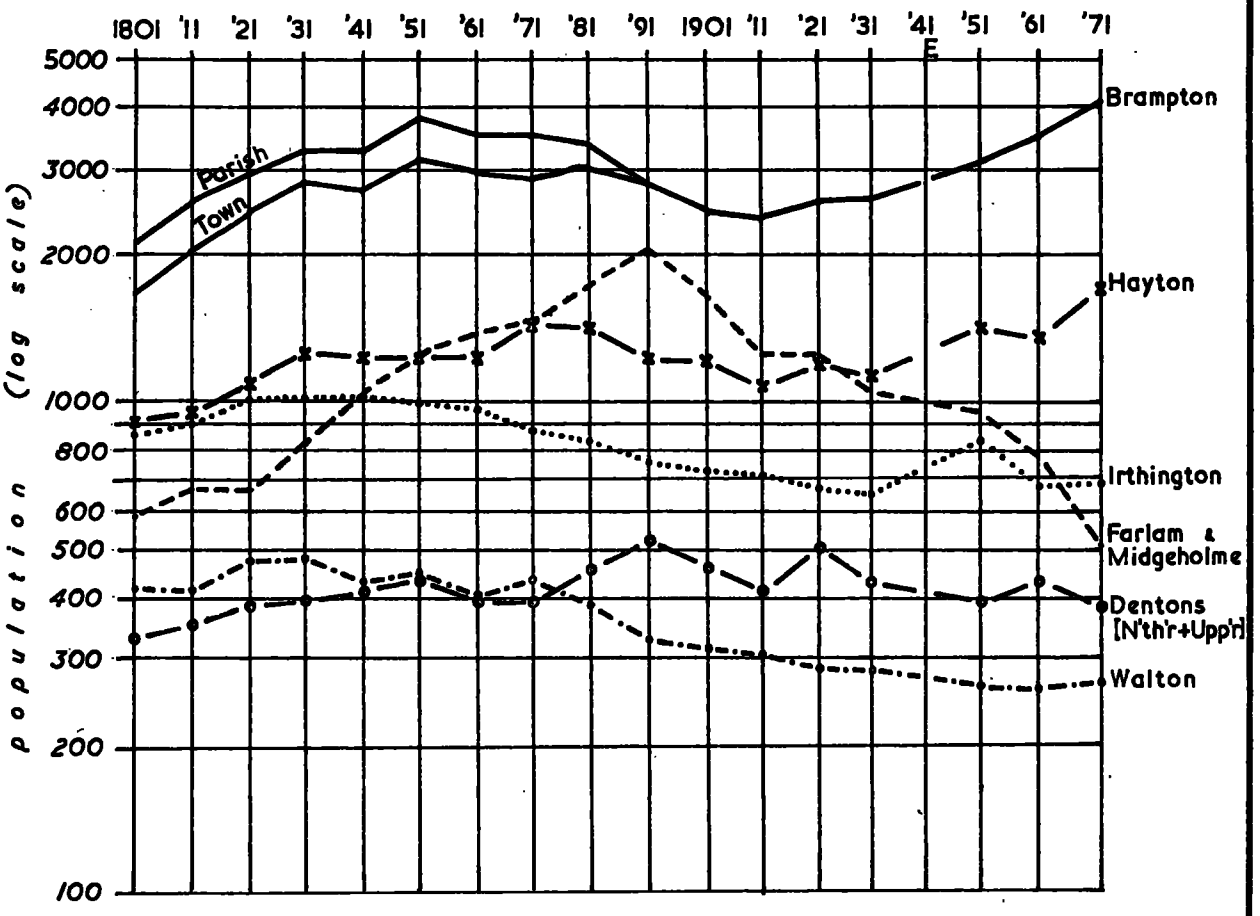
agent in 1819. With a high degree of business efficiency he re-organised and improved the workings of the pits and developed better communications in the area. Not only did he extend the railways to most of the main workings of the district (figure 1.9), he also provided carriages - called 'Dandies', - for the convenience of his workers and their families who wished to travel to Brampton on market days. A foundry and engineering workshops at Kirkhouse were extended and improved (later building locomotives), and in 1837 Thompson purchased Stephenson's 'Rocket' which he used on the railways until 1844. By this time there were over 14 miles of track linking Brampton with the various pits of the area.

The district was further awakened by the opening of the Newcastle and Carlisle Railway in 1838. The original plan, submitted in 1825 and modified several times, intended that the route westwards from Gilsland should follow the Irthing Valley and approach Carlisle from the north. Many engineering difficulties were encountered and objections from landowners raised before the line was eventually constructed along its existing route to the south of Naworth and Brampton. On the advice of Stephenson, part of Thompson's railway to the town was re-routed from Hallbankgate (plate 15) so that it crossed the new public line near Milton at a point now occupied by Brampton Junction. This station then became the main outlet point for all coal and limestone produced in the Midgeholme area, and it continued to provide such a service until the closure of the Brampton Railway in 1952 (plate 14). The re-routing also necessitated the building of an inclined plane between Hallbankgate and Kirkhouse, as well as a re-alignment of the station at Brampton. Although $1\frac{1}{2}$ miles from the new main line, townspeople were conveyed to and from it by a horse drawn 'dandy'. The horses were later replaced by a steam locomotive and the line continued to provide a goods service until 1912, although the passenger one was withdrawn in 1890 for safety reasons.

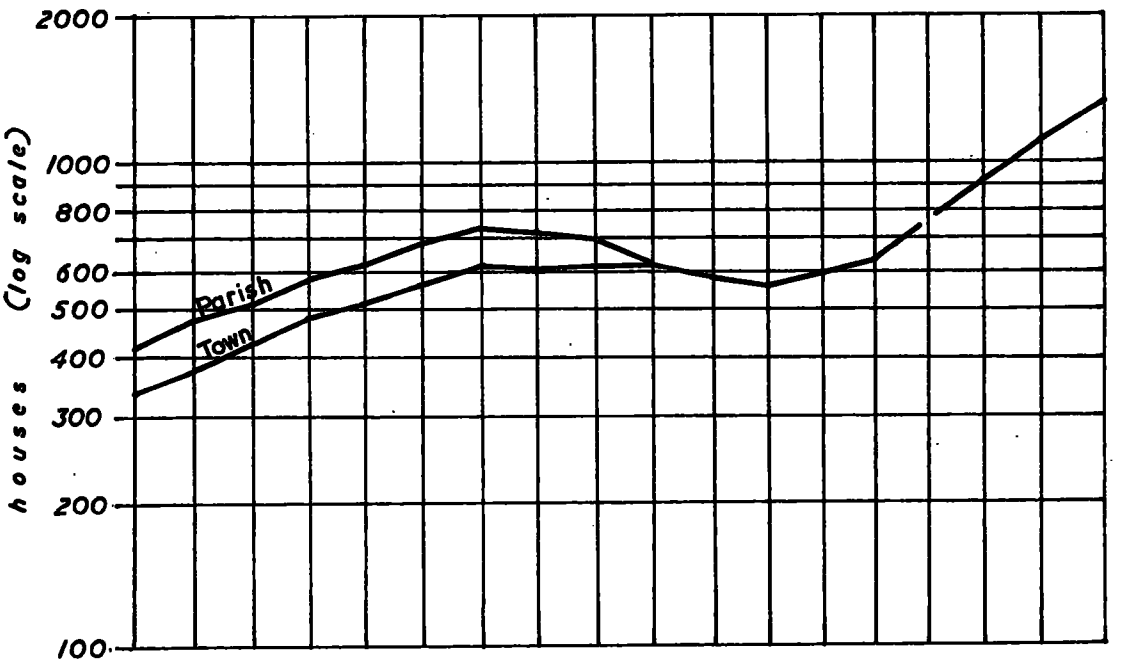
When Thompson died in 1851, he left a prosperous community with eight collieries in full working order and 850 men and boys fully employed, either in the mines or on the railways. Most of these workers lived with their families in the numerous stone-built cottages that had sprung up all over the area, either by the pits, near the quarries or alongside the railway. The more important clusters had grown into villages, such as Hallbankgate (plate 15), Tindale (plate 11) and Midgeholme (plate 13), whilst outposts could be found at Forest Head and Howgill (plate 12). All of them were

Figure 1.10

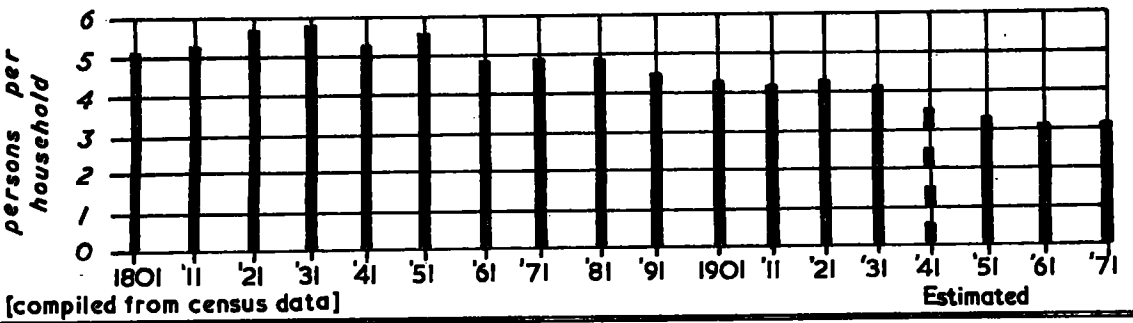
A. POPULATION OF SELECTED PARISHES 1801 — 1971



B. INHABITED HOUSES IN BRAMPTON 1801 — 1971



C HOUSEHOLD SIZE (AVERAGE) IN BRAMPTON 1801 — 1971



[compiled from census data]

linked by rail to Brampton, whose industrial and commercial activities continued to provide the main focal point and market centre for the area.

1.2.5 Brampton & District in the 19th Century

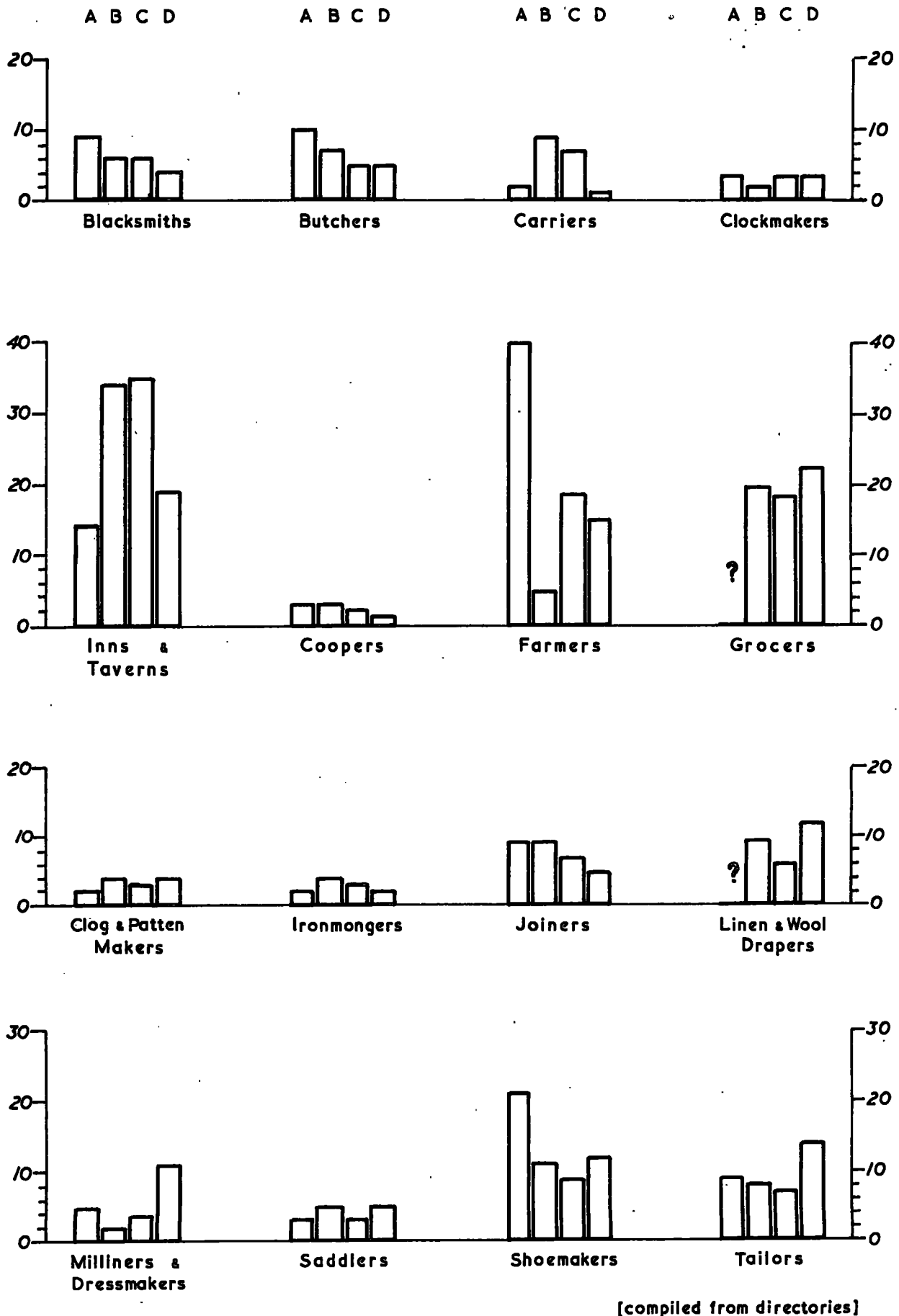
The growth of human activity in the town and its region during the first half of the 19th century was accompanied by a miniature population explosion (appendix 1.3). Details of population before the 19th century are irregular and incomplete, but with the introduction of the official census in 1801, the picture becomes clearer. As can be seen from the accompanying diagram (figure 1.10A), the populations of all parishes rose in the first 50 years, the most marked ones being in Farlam and Brampton parishes. Brampton's town population rose from 1,603 at the beginning of the century to a peak of 3,189 by 1851 (an increase of 99%), whilst that of the parish (which included the separate townships of Naworth and Easby) jumped by 80% from 2,125 to 3,825. Farlam parish had the greatest increase over the same period, from 592 to 1,259 (113%), and this continued to rise to a peak of 2,069 in 1891, whilst most others in the region were declining. The trends shown by the graphs reflect the degree of involvement in the economic activities of the area. The main workforce for the collieries and railways lived in the parishes of Farlam, Hayton and Nether Denton, while Irthington and Walton parishes supported mainly agricultural workers. The sharp decrease in Farlam's population after 1891 (40% in 20 years), and a smaller fall at the Denton's, can be attributed to the closure of several collieries and subsequent contraction of activity on the railway. In fact, by 1971, all the increase of Farlam and Midgeholme's population had been eroded. The decline of Brampton's population after 1851 was partly a result of the initial migration of workers to the coalfield area, and subsequently to the decline of trade within the town itself. It remained below 3,000 until after the second world war and only passed its previous peak in 1971.

Although the population of Brampton parish dropped by over 1,300 in the second half of the 19th century (34%), it appears to have had only a slight effect on the number of trades and businesses in the town (figure 1.11 and appendix 1.6). Certain trades, like blacksmiths and joiners, display a gradual decrease between 1794 and 1884, whilst those allied to textiles, such as drapers and tailors, suddenly show an increase by the latter date. Differences in classification between the various directories make correlation and analysis difficult and it is possible that the figures given,

Figure 1.11

GRAPHS OF SELECTED TRADES AT BRAMPTON
In 1794, 1829, 1851 and 1884

COLUMNS A—1794. B—1829. C—1851. D—1884.



[compiled from directories]

especially in the earlier years, are not accurate (eg. 40 farmers for 1794 and only 5 for 1829). However, the details do show the wide range of services and functions with which the town was endowed.

The occupations of Brampton people in 1851 (appendix 1.5) must also be treated with some reservations, since many men and women at that time had more than one job of work, often two or three. Agriculture supported some 200 people from the parish, whilst the collieries and railway employed 62 workers, most of whom lived at Naworth. The largest employment of labour appears to have been in textiles with 420 people (mainly weavers) supporting an extra 150 in the tailoring, dressmaking and hatmaking trades. 66 leather workers (most shoemakers) were probably reliant on the tannery, and 26 innkeepers served to keep two breweries in business.

The new brewery, which had been built by 1829 alongside the beck at the foot of Longtown Road (figure 1.12A), played an important part in the growth of inns and taverns during the middle part of the century. Details from the various directories reveal that the number of licensed premises or beer houses grew from 12 in 1790 to 35 in 1851. They subsequently decreased to 14 in 1903 after many had been closed by the justices (figure 1.11 & appendix 1.7). Over the middle period of the century (if the directories are correct) nearly every building on the north side of Front Street was a beer house or tavern (plate 17).

Like many other market towns in the country, Brampton was not alone in possessing two breweries and a large number of public houses, although compared with the 27 for Wigton in 1829, Brampton's 34 seems high, especially since Wigton had two-thirds more population. The importance of the market and the fairs on the Sands were in some measure responsible for the high number, whilst the bi-annual hirings at Whitsuntide and Martinmas would also make a contribution. The two post houses, - the Howard Arms and the Scotch Arms, catered for the growing number of travellers between Carlisle and Newcastle, as well as for local custom. During the middle of the century a great deal of trade was completed in the taverns, and many farmers and shopkeepers regarded them as 'quarters' for business, sealing their transactions over a drink. This is no doubt why many tradesmen were also publicans, and their premises both shops and beer houses.

The reduction in the number of public houses during the latter part of the 19th century was partially a result of the changing

pattern of trade. The growth of industrial towns such as Carlisle and Newcastle, and the better communications between them, had led to a fall in demand for products of the 'cottage' trades. This in turn led to a decline in the importance of the market and the loss of the fairs from the Sands. The other important factor was the campaign for total abstinence, which in 1881 received the unwavering support of Rosalind, the future Countess of Carlisle, and later Lord Carlisle himself. She proved to be such a strong and powerful advocate that many inns were eventually forced to close because of the lack of custom.

The second half of the 19th century saw other changes in the life and activities of Brampton and district. In 1851 new schools were built near the Mote (figure 1.12A) to replace the overcroweded National School on the site of the old tithe barn. This was then converted into a magistrates court and in 1902 a police station was added (plate 10). In 1877 a new workhouse was constructed in Union Lane, and the Parish Church in Front Street was rebuilt in 1884, by which time the town could also boast two banks (Carlisle and District, and the Cumberland Union). On the debit side, as well as the reduction of trade previously mentioned, a serious fire in 1874 destroyed a new tweed mill at the eastern end of Brampton. Although it was rebuilt a few years later and used as a wool store, weaving was never resumed. The old brewery ceased operations in the early years of the 20th century, by which time no mention is made of the tannery in the directories for the area.

1.2.6 Early 20th Century Fortunes

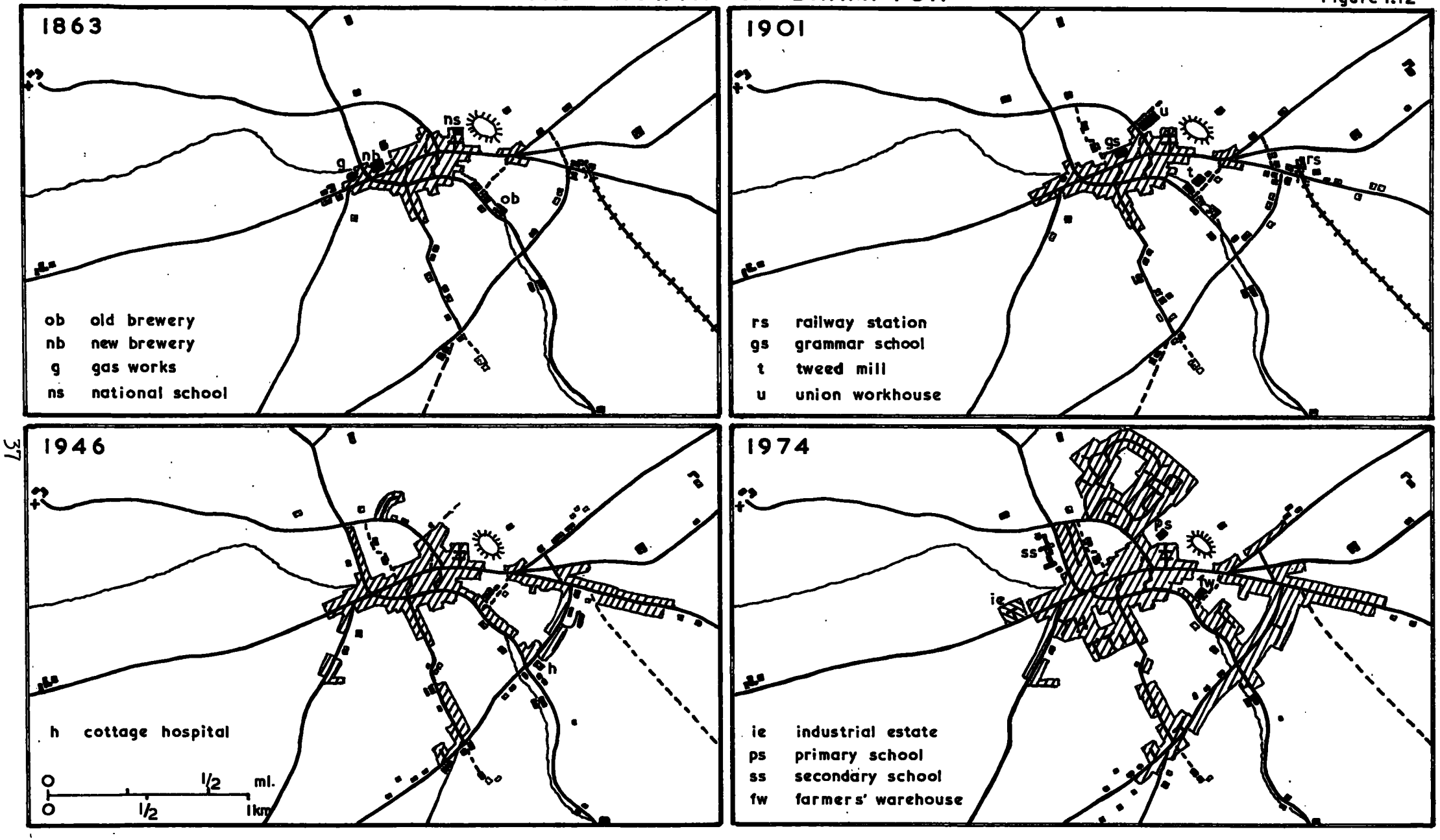
This economic recession continued into the 20th century particularly at the coalfield. Most of the coal had been won earlier in the 19th century, and by 1900 many pits had closed, either from declining yields or more commonly from flooding problems. The collieries and drifts at Blacksike (1872), King Pit Midgeholme (1893) (plate 13), and Howard and Campbell (1896), were all examples of this slump, which also affected activity on the railway. By 1901 coal output was confined to several drifts at Bishops Hill and a new colliery at Roachburn, then employing 278 workers. In 1908 a flooding disaster put most of Roachburn out of action, and as a consequence, the lease on the coalfield was surrendered and Thompson and Sons was dissolved. Although a new firm, the Naworth Coal Company, took over the reins later in 1908, the future for both collieries and railway looked bleak.

Other important changes occurred around the turn of the century,

[based on 6" & 25" O.S. maps]

THE GROWTH OF BRAMPTON

Figure 1.12



when land and property belonging to the Earl of Carlisle were sold or leased. These included areas of Gelt Woods, the four farms in the Old Park, and 13½ acres of land at Brampton for allotments, as well as the market place, Moot Hall, the Mote and Sands. In 1884, according to Bulmer, the township had been largely owned by the Earl of Carlisle, but 23 years later Whitehead (1907, p.45) reported that ".....most of the people are no longer encumbered by rents, taxes and tolls, and are free to use the town as their own".

One reason for these moves could be attributed to the introduction of a high rate of death duties in the budget of 1893, and when the 9th and 10th Earls died within 9 months of each other in 1911 and 1912 (figure 1.5), even more property had to be relinquished. The Naworth estate was subsequently reduced to a mere 500 acres from what had been several thousands when Lord William Howard surveyed it in 1603. Consequent upon this contraction was the decline of power that the Earls of Carlisle and their ancestors had possessed for over 750 years. The last embers of Baronial rule that had lingered longer in this part of Cumbria than most other areas of Britain were finally extinguished.

Apart from the recession at the beginning of the 20th century, the first 50 years brought about renewed growth and development in the economic life of Brampton and district, but on a more gradual scale than had been witnessed during the first half of the 19th century. The population rose by 25% from 2,494 in 1901 to 3,130 in 1951 (although it had dropped to 2,392 in 1911), whilst the number of inhabited houses increased by 60% (583 to 941) over the same period. The changes in housing that occurred after the turn of the century are exemplified both by the graph in figure 1.10B, and by comparing the maps in figures 1.7 and 1.12 which show the growth of Brampton between 1830 and 1946. Therefore most of the 80% increase in housing between 1801 and 1901, must have occurred within the central area of the town, for the maps show only a small increase in the number of buildings away from the centre during that period.

Complementary to the growth of housing has been the decrease in household size, particularly since the beginning of the 20th century (figure 1.10C). A ratio of 5 persons per household was sustained throughout most of 19th century and it only started to decrease after 1881. It then dropped fairly steadily until it reached 3.3 persons per household in 1951. This was primarily due to a lower population, but also to improving standards and the greater freedom to extend and build away from the town centre which the lifting of 'baronial

constraints' permitted. Even by 1951 the population had not reached its former peak (of 1851) but it had nearly twice as many houses in which to live. The map for 1946 (figure 1.12C) shows the expansion that had taken place. Although most of it was linear along existing routeways with virtually no infilling, the contrast with earlier maps is evident.

Even more significant though, is the direction of this expansion, - nearly all to the east and south of the town on land that had originally been part of Brampton Common. Building incursions into the Old Park and open fields were non-existent before 1901 (because, although leased, most of the land was still owned by the Howard family), and even by 1946 there had been little progress in that direction.

There was some progress, however, in the coalfield and on its associated railway. As well as trying to create a sound and profitable enterprise, in 1909 the new lessees - the Naworth Coal Company, also hoped to explore new coal reserves, as well as reopening some old workings. In the 16 years of their existence, the firm opened four new pits, including Gairs (1909-1936), which was situated several miles from the main coalfield area on the remote and bleak fellside in Geltsdale (figure 1.9). Lime and limestone from the quarries at Forest Head also proved valuable commodities, and demand for all three products was especially heavy during the First World War.

The railway also prospered during this period, and sections of track were either built or renewed to serve the new pits, in addition to the aquisition of new staff, locomotives and rolling stock. At the same time the 'Dandy' branch between Brampton and its junction with the main Carlisle to Newcastle line was revitalised by the North Eastern Railway Company, to whom it was separately leased. After relaying the track and installing new buildings and equipment, the passenger service was reopened in 1913, - a welcome return after a lapse of 23 years. Although the war produced an initial increase in both passenger and goods traffic, usage soon dwindled, partly due to the growing rivalry of motor bus services between the town and the junction. When the L.N.E.R. Company was formed in 1923, the lease was terminated, and the ultimate happened. All services to the town were withdrawn never again to be resumed. Consequently Brampton was left without a railway of its own and the branch line reverted to nature.

This same year, 1923, witnessed financial difficulties with the Naworth Coal Company, and a year later they were forced into voluntary

liquidation. This left all the pits closed, the railway idle, 100 men and lads unemployed and a gloomy prospect for all their dependants at Hallbankgate and the surrounding settlements. Fortunately, salvation came six months later with the formation of yet another company - Naworth Collieries Ltd, run by Charles Roberts (related to the Howard Family by marriage). This company managed to overcome many of the problems previously encountered and proved to be successful all through its lifetime. Its demise came in 1947 when it was compulsorily taken over by the National Coal Board. During this era there was a return to prosperity with the resumption of many old coal and limestone workings, the opening of new ones, and revitalisation of the railway to serve them. This phase of industrial expansion produced a new works at Kirkhouse making bricks and tiles from shale quarried at Forest Head, and the birth of a new quarry on the fellside at Midgeholme, from which dolerite or 'whinstone' was extracted (figure 1.9). Although some of the new mines (mainly drifts) lasted no more than three or four years, there was sufficient activity in the district to keep between 300 and 400 workers employed.

With the advent of Nationalisation in 1947, however, activity declined to a new low. By 1951, five pits had been closed, the quarrying of limestone and whinstone had stopped and the transport of lime and shale from Forest Head had switched to road. As a 'last ditch' stand, the N.C.B. reconstructed and re-opened King Pit at Midgeholme after 57 years of dereliction, but they did not re-open the short section of railway line necessary to serve it (plate 13). In consequence of these events the Brampton Railway finally passed to posterity in 1953, after 154 eventful years of service in the life of the area. King Pit survived the railway by only two years, when, because of the age old trouble of water seepage, it was finally closed and 200 men had to seek employment elsewhere.

1.2.7 Post World War II Development

Fortunately for some people, alternative employment was available within the region in 1955. A growing proportion of work could be found on the bleak semi-forested uplands of Spadeadam Moor (10 miles north-east of Brampton), where the Ministry of Aviation was starting the construction of a Rocket Research Station (plate 21). The site was carefully chosen because of its proximity to large quantities of water, access to good routeways, and its remote situation from areas of high population density. The establishment took five years to build and equip, employing upwards of 500 workers,

initially in the construction trade, but latterly from the engineering and technological professions.

This new venture and the gradual influx of workers and their families from other areas of the country, caused a re-awakening of activity, not only in Brampton, but in the whole of north-east Cumbria. Because of its facilities, potential and accessibility to Spadeadam, the town was selected as the main settlement for housing the workers and their families, and two new estates were built for this purpose (plate 22). Some natural growth in the form of council housing and a few new businesses had occurred in Brampton prior to 1955, but the general character of many of the roads and older buildings, particularly in the town centre, still had a 19th century flavour to them. It took about 10 years for the impact of Spadeadam to be realised, and another 10 during which the impetus of change gained momentum. The results were to be found in most areas of human activity. In addition to the two estates built specifically for Spadeadam families, new private and council dwellings (many designed especially for senior citizens) were built thoughout Brampton, some on land cleared of slum property and others on new developments to the south and east of the town centre (plate 22). Other settlements in the region, such as Hayton, Irthington and Corby Hill, also benefitted and gained new housing (plate 16). In the two decades since the Spadeadam project first commenced, the population of Brampton rose by almost a third (figure 1.10), the number of houses by about 40% and the built-up area approximately doubled (figure 1.12D).

Trade revived as the new population (many of them from the midlands and the south) brought fresh demands into a community that had fallen into relative stagnation. The weekly market was re-established, new shops and businesses appeared, and many old ones became re-vitalised either by changes of management or by structural face-lifts (plate 18). Finally in 1971, a small trading estate with three factories was built on farming land next to Town Foot Farm (figure 1.12D) (plate 22), - the first major incursion into the Old Park since Wade's road of 1754.

Once again, Brampton became a busy thriving market town and service centre, but unfortunately the Spadeadam project was not to last. Varying political decisions and financial constraints produced waves of inactivity that eventually led to the complete closure of the Research Station in 1971, and deprived the district of a major source of employment.

In some respects, the legacy of development, initiated by Spadeadam and its people, has helped the region to adjust less

painfully to its changed character than might otherwise have been the case. Many houses in Brampton, vacated by Spadeadam personnel over the last ten years, are now occupied by a more varied type of regional commuter, and the town, like some of its neighbours, is developing its role as a dormitory type of settlement. Even old cottages, particularly some in the mining and railway district, have been transformed into modern habitable dwellings for weekend or retirement purposes, such as at Forest Head and Banks.

Improved road communications have helped this transition, though not all the planned alterations have been carried out. Brampton in 1976 was still without a by-pass, (first muted before the second world war), and the main A69 trunk road continued to snake its way through the old part of the town along the route Wade constructed 220 years previously, - obviously carrying infinitely more traffic than was ever intended (plate 8). The Carlisle to Newcastle railway too has suffered from the constraints of the economic climate, losing most of the facilities and amenities it once possessed. By 1976 only occasional passenger trains stopped at Brampton Junction, the only station open between Carlisle and Haltwhistle on the main route to Newcastle. Gone are the branch lines, goods sidings and station personnel (plate 14). It lies derelict and abandoned, a prey to nature, which is slowly shrouding all evidence of its former importance.

1.2.8 Summary

Although Brampton has seen many changes throughout its history, perhaps none more striking than during the present post-war era, the town and its surroundings have managed to retain many of the features that exemplify these different phases of growth and development. Decisions by politicians and planners will continue to alter the face of the landscape, and modify or even obliterate some of the characteristics of the past. What cannot be changed, however, is the town's position and site, and the fortuitous decision of Thomas de Muletone over 700 years ago to make his Manor the capital of the Barony of Gilsland and to obtain a charter enabling it to become the market centre of the region.

CHAPTER 2

DEMOGRAPHIC CHARACTERISTICS

2.0 INTRODUCTION

All settlements have a part to play in the life of a region, and in general, the larger the settlement, the more important the part. The historical evidence of Brampton's role as a market town within N.E. Cumbria is well established, but the degree to which it can be regarded as a centre depends on various criteria.

The term 'centrality' has, over the last few decades, been used to explain the extent or degree by which any settlement fits into the mesh of a central place hierarchy. Implicit in the concept is the understanding that a settlement is only a centre if it provides a function or service for the surrounding area, however large or small. The most appropriate explanation would seem to be the one given by Berry (1967, P.3), who defines centrality as a focal point, at which a cluster of retail and service establishments are located for the convenience of consumers. The quantity, type and variety of these services will naturally vary from place to place within a region, since they are a reflection, not so much of the size of the population, but more of its demands.

Fundamentally, it is man and his basic needs that lie at the root of most studies in human geography, especially those concerned with functions and services. Over the centuries, these same requirements have been important factors in determining where, and in what proportions man has made himself a home, - in other words, the establishment of a pattern and hierarchy of settlement. Even with increasing changes from either social, professional or cultural influences, he still finds himself 'attracted', whether by choice or necessity, to living in a particular place. As long as there is reasonable provision of, or access to, the essential services of life, and his demands are met, he will be satisfied.

The providers of such services are, by definition, the central places of the settlement hierarchy. Whilst it may be logical to suggest that a town will have a greater number and wider range of services than those of a smaller centre, such as a village, and not as many as a city, it is the scale and structure of these facilities which is important, and from which the degree of centrality can eventually be measured.

Although there appears to be an empirical relationship between the size of a settlement and the number and type of services it possesses, it is more often due to the range and latitude of peoples' needs than any other factor. This demand, as referred to by Scot (1970, P.15) "..... varies with the income, occupation, age and sex

structure of the population". Therefore before analysing and measuring the nature and provision of services in N.E. Cumbria and their role in the assessment of centrality, it is necessary to examine the foundations upon which they are based. An outline of the number of people present in the region, their location, and the extent of some of their demographic characteristics is an important precursor to any subsequent analysis concerning their habits and customs.

2.1 METHODOLOGY

In order to achieve the best possible information on the population of Brampton and its region, a questionnaire (appendix 2.1), based on population structure and shopping or business customs was circulated to households throughout the area. This was achieved by asking 320 pupils from three year groups at the comprehensive school in Brampton, to take the form home and invite their parents to complete and return it. 140 households, involving 668 people actually participated. This method was chosen as preferable to any other for the following reasons :-

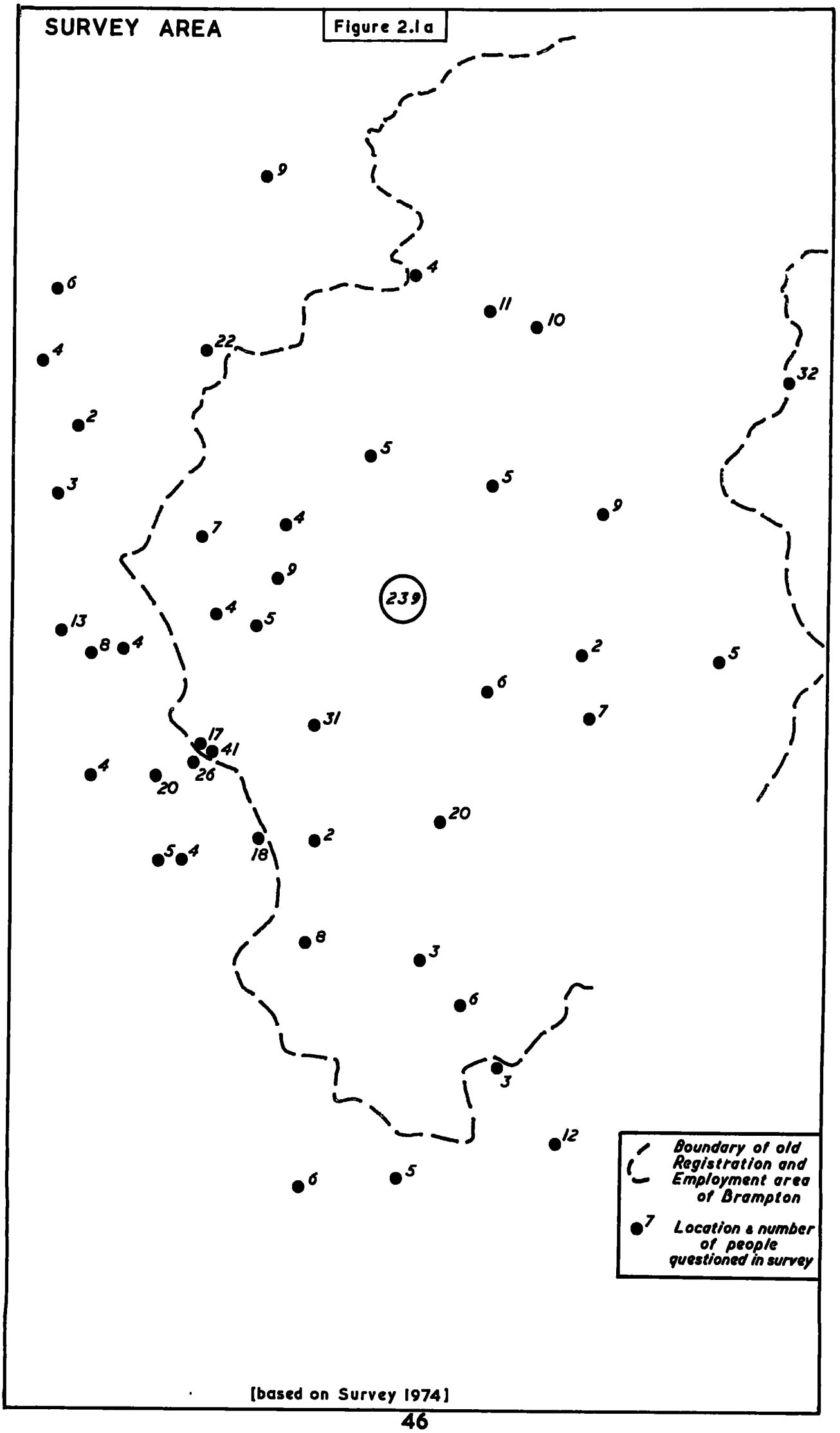
a) It could be seen that the questionnaire would hope to reach :-
   i) a random sample of the total population of the area,
   ii) a socio-economic cross-section of the population,
   iii) a representative cross-section of the different communities within the area, i.e. town, village, farm.

b) Since the school's catchment area was known to be only slightly larger than the Old Brampton Registration and Employment Area, selected published data for the latter could be compared with the results of the survey.

Such comparisons are shown in the analysis of population structure detailed in the next few pages, and the results help to justify the method adopted. The only disadvantage has been the disproportionate representation of age groups, and this will be examined later in the chapter.

2.2 POPULATION - NUMBERS AND DISTRIBUTION

The most recently published figures are given by the 1971 Census of Cumberland (appendix 1.3), and show that the Parish of Brampton had 4,033 inhabitants, whilst those of the surrounding sixteen parishes in the old Registration Area had a further 4,979 people. Adding these figures to the population of the extra areas covered by the survey questionnaire (such as the parishes of Ainstable, Hethersgill, Stapleton, part of Wetheral and part of Stanwix Rural), gives a grand total of 11,890 people, of which Brampton's share is 34%.



[based on Survey 1974]

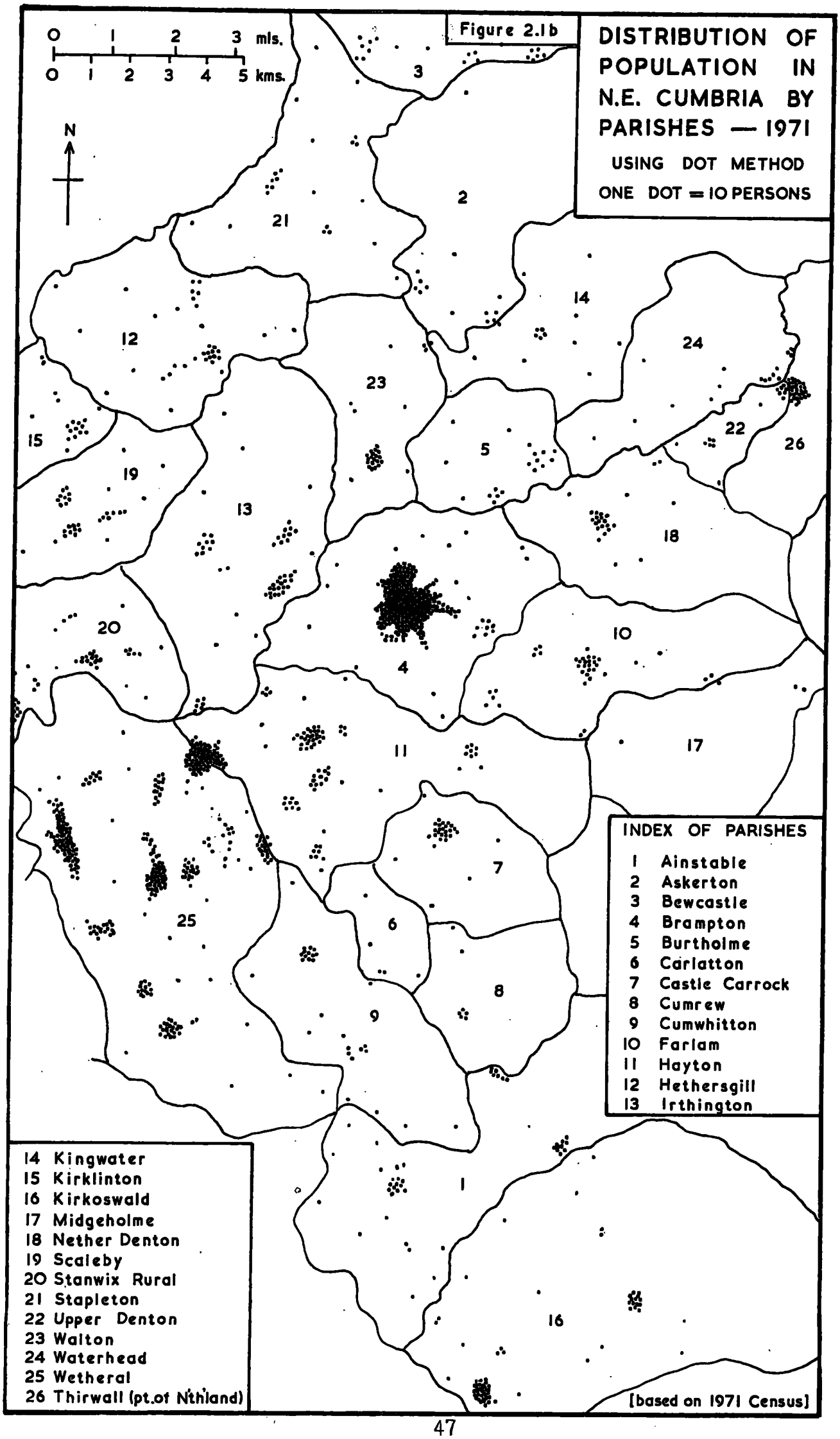


Figure 2.1b
DISTRIBUTION OF POPULATION IN N.E. CUMBRIA BY PARISHES — 1971
USING DOT METHOD
ONE DOT = 10 PERSONS
0 1 2 3 mls.
0 1 2 3 4 5 kms.
N
INDEX OF PARISHES
1 Ainstable
2 Askerton
3 Bewcastle
4 Brampton
5 Burtholme
6 Carlatton
7 Castle Carrock
8 Cumrew
9 Cumwhitton
10 Farlam
11 Hayton
12 Hethersgill
13 Irthington
14 Kingwater
15 Kirklinton
16 Kirkoswald
17 Midgeholme
18 Nether Denton
19 Scaleby
20 Stanwix Rural
21 Stapleton
22 Upper Denton
23 Walton
24 Waterhead
25 Wetheral
26 Thirwall (pt.of Nthland)
[based on 1971 Census]

The accompanying map (figure 2.1b) shows the distribution of this population, as well as the location of the more important communities in the region, - Brampton being the most dominant.

Population of Selected Parishes in Survey Area — Table 2.1

Parish	1971 Census		Population Surveyed		
	Number	as % of total (11,890)	Number	as % of total (668)	as % of Parish
	(A)	(B)	(C)	(D)	(E)
Brampton	4,033	34.0	239	35.8	5.9
Ainstable	425	3.6	20	3.0	4.7
Castle Carrock	298	2.5	20	3.0	6.7
Farlam	433	3.7	20	3.0	4.5
Hayton	1,700	14.3	91	13.6	5.4
Hethersgill	344	2.9	28	4.2	8.1
Irthington	685	5.8	29	4.3	4.2
Wetheral (part)	913	7.7	48	7.2	5.3
Nether Denton	253	2.1	9	1.3	3.6
Upper Denton with Thirwall	593	5.0	32	4.8	5.4
Total in Survey Area	11,890		668		5.6

The population concentrations at Brampton, Warwick Bridge and to a lesser extent at Gilsland, are also reflected in the results of the questionnaire. It was circulated to 320 households, and although returns were received from only 140 families, producing a 5.6% sample, there was still a satisfactory representation of a cross-section of the population in the region. Of the 668 people involved, 429 lived in the outer parishes of the survey area, and 239 (or 36%) in Brampton. This compares very favourably with the actual 34% referred to above, and emphasises the degree of primacy which Brampton possesses in relation to the rest of the region. Similar favourable comparisons can be found amongst the other parishes, such as Hayton, and Upper Denton with Thirwall, where the percentage differences are less than 1.

The numbers and locations of the questioned population are shown in figure 2.1a (the overlay to figure 2.1b), and illustrate the random nature of their distribution. Similarly, the degree of representation in the ten selected parishes (table 2.1) shows the comparability of the questionnaire results with those of published census data.

The comparability of column D with B illustrates that the

distribution of people questioned in the survey is, in most cases, within 1% of their true proportions. In column E, the deviation from the mean of 5.6 is also a reflection of the number questioned with respect to their parish size. Here it is interesting to note that the sample from Nether Denton was much lower than the mean, whilst those from Hethersgill and Castle Carrock were higher. This may have been due to the fact that, either the latter two parishes had more children at the school in Brampton, or that the people have been more diligent in returning the questionnaire. What is perhaps significant, is the similarity to the mean of the samples from the larger parishes, such as Hayton, part of Wetheral and Brampton itself.

2.3 RANK SIZE AND HIERARCHY

Whilst the parish figures, referred to above, give a good impression of population and its distribution, they do not take account of the size of individual settlements. A problem therefore arose in how to assess the population of separate communities where only a parish or enumeration district figure was given. The solution has been to take 80% of the parish figure * and divide it proportionately amongst the known settlements, based on the visual evidence of a first hand survey of the region. The results, although not guaranteed accurate, do have consistancy and are shown in appendix 2.2. From them a picture of the general settlement hierarchy is established and the position of individual places within it can easily be seen. Within North Cumbria, Carlisle and Penrith remain the same with 71,582 and 11,306 people respectively, but the population of Wigton is reduced to 3,904, and Brampton's becomes 3,226. Another problem concerns the agglomeration of settlement at Warwick Bridge. Warwick Bridge itself is part of one enumeration district of the Parish of Wetheral, whilst its two neighbours, Corby Hill and Little Corby belong to Hayton Parish. The three places are all linked to each other and separate figures would have been inappropriate, therefore by the same method, a composite total of 958 was obtained, and the agglomeration will henceforward be referred to as Warwick Bridge.

Nationally, Brampton's rank as a town lies between 850th and 900th place. According to Everson and Fitzgerald(1969, P.65), there were 932 urban settlements with populations greater than 2,000, and 850 greater than 4,000. Regionally, however, the town lies in fifth position behind Carlisle the primate city, whose zone of

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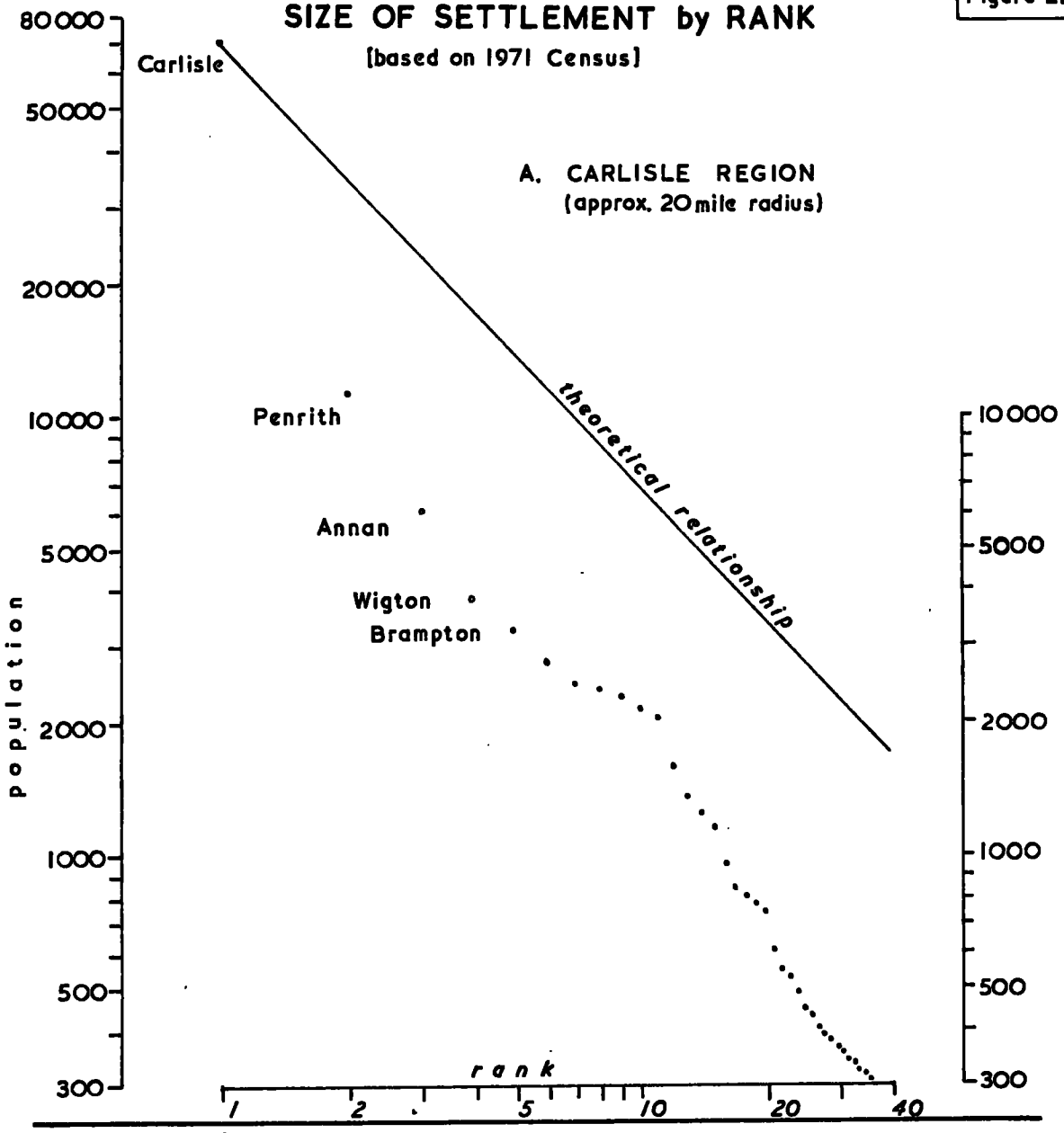
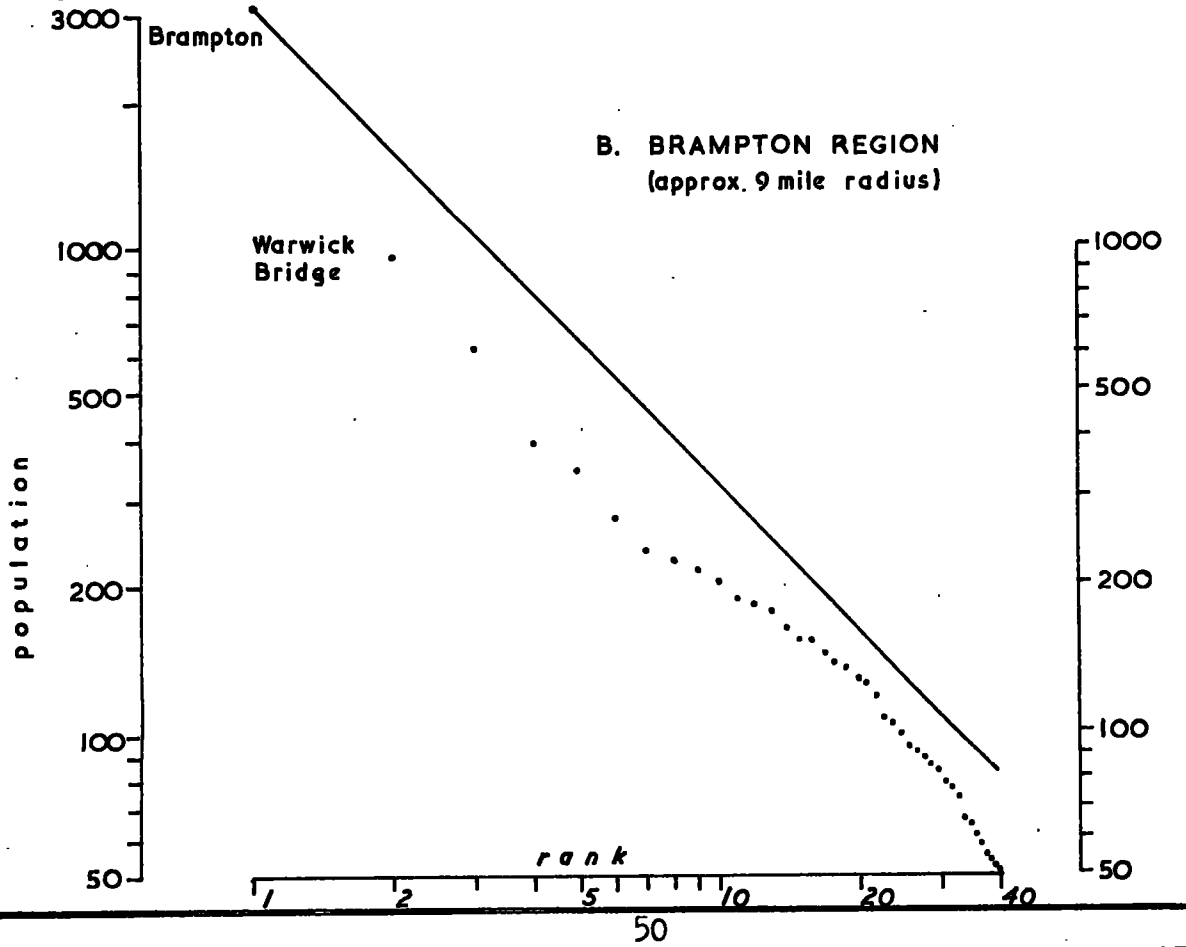
* N.B. Based on the percentage of Urban Population in Britain.

Figure 2.2

SIZE OF SETTLEMENT by RANK

[based on 1971 Census]





influence and tributary area can be seen to extend over the majority of the Solway Lowlands, including part of southern Scotland. Within this region of approximately 20 miles radius, are 36 settlements whose population is greater than 300. Penrith, the second largest town, lies 18 miles south of Carisle, whilst Annan, a similar distance to the north west, is in third place. A graph of the rank order is shown in figure 2.2A. The second graph (figure 2.2B) shows the rank order for settlements in N.E. Cumbria, with Brampton as the prime centre. Here there are 40 settlements with more than 50 people, and the resultant graph shows a better rank-size relationship than for the larger region based on Carlisle. This is primarily due to the greater uniformity of both physical and human landscapes within the Brampton district, as compared with the larger region in which national boundaries and physical barriers are adverse factors.

One test of the degree of primacy is to measure the relationships between settlements using the 'rank-size' rule propounded by Zipf (Everson and Fitzgerald, 1969, P.67). According to the rule, the 'n'th settlement of any series should have $\frac{1}{n}$ of the population of the primate city, or conversely, the primate city should be 'n' times the size of the 'n'th settlement.

(i.e. $Pn = \frac{P1}{n}$ or $P1 = n \times Pn$).

Applied to the Carlisle region, the results from the sample (table 2.2), show that the minor settlements actually have fewer people than the rule, or that Carlisle is, on average, four times larger than its subordinate towns and villages would suggest. Similarly with Brampton and its region, although the differences are not as accentuated.

Actual v Theoretical Rank Size of Settlements — Table 2.2

Region \ Rank	1st.	5th.	10th.	15th.	20th.
Carlisle	Carlisle	Brampton	Silloth	East Riggs	Houghton
Actual Size	71,582	3,226	2,130	1,164	762
Size of 'n'th		14,300	7,152	4,772	3,576
Size of 1st	(17,532)	16,130	21,300	15,240	17,460
N.E. Cumbria	Brampton	Hayton	Walton	Low Crosby	Ainstable
Actual Size	3,226	344	189	153	124
Size of 'n'th		645	323	215	161
Size of 1st	(2,096)	1,720	1,890	2,295	2,480

The important point that emerges from these results, is that both Carlisle and Brampton display a higher degree of primacy than their tributary areas would theoretically suggest, and as such, they must therefore play a greater role in the life of their respective regions than would normally be the case.

Comparable settlements in the same population range and with similar regional characteristics to Brampton, can be found in Tadcaster (3,362), Wetherby (3,343), Malton (3,357), Sedgefield (3,684), and Wigton (3,904). All are important market towns on strategic routes and within 15 miles of the primate settlement of the region. The first three are subordinate to York, Sedgefield to Stockton, and Wigton to Carlisle. It is interesting to observe that both Wigton and Brampton with similar populations, are equidistant in opposite directions from their primate city, and that both appear to have retained and developed similar roles of centrality within their own districts.

2.4 AGE STRUCTURE

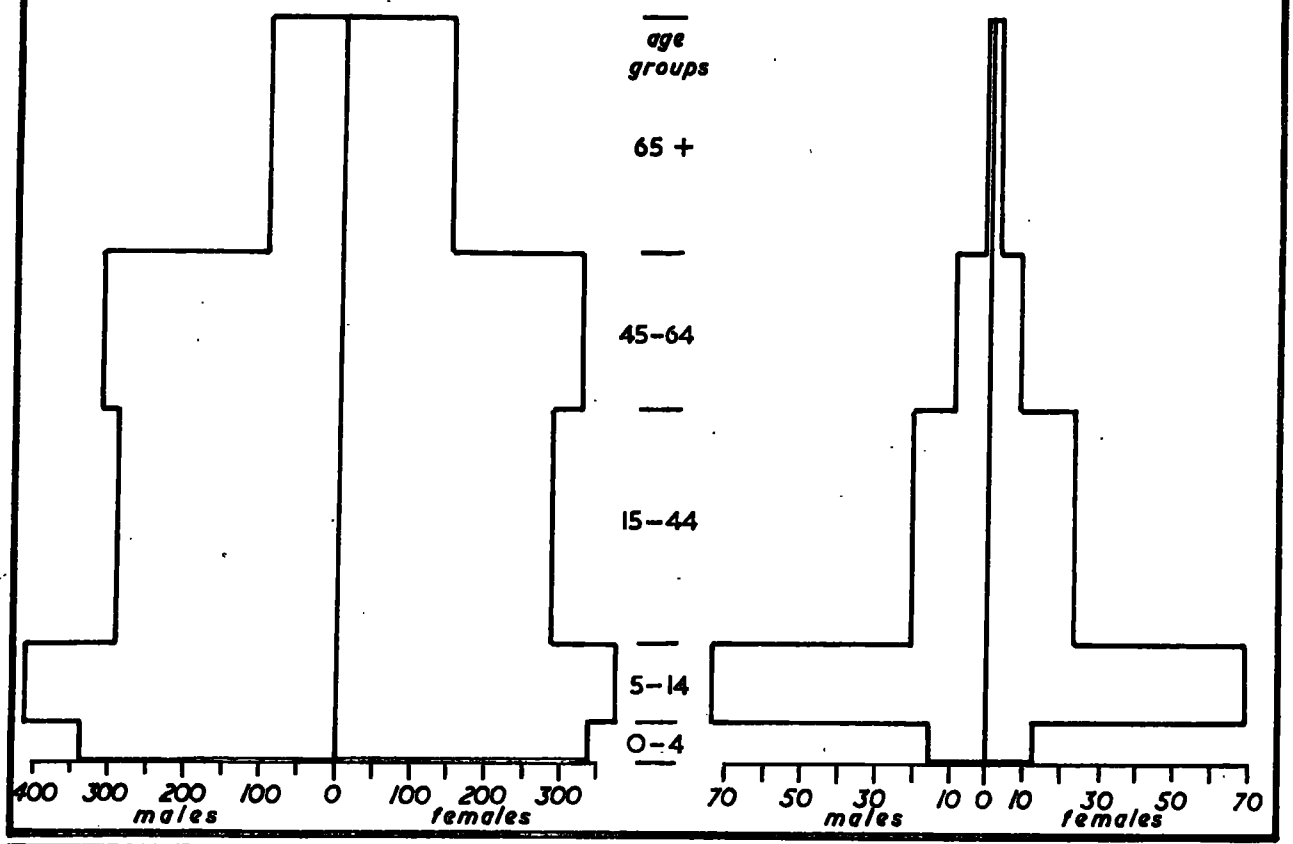
The one aspect of population analysis that does show a difference between the results of the questionnaire and those of published data, is in the age structure (appendix 2.3). The accompanying diagram (figure 2.3) indicates that for the Brampton Employment Area in 1971, approximately 7% of the population were below school age, 16% between 5 and 14 years, 62% in the working age group and 15% were senior citizens. This latter figure is higher than both the county average of 13.3% and the national proportion of 11.5%, and therefore reflects the greater number of older people which are to be found in rural areas as compared to urban centres.

The returns from the questionnaire are weighted in favour of the younger age groups (school age in particular), and therefore little value can be placed on the results except to show how the figures differ. Out of 668 people involved, 333 or 50% were in the working age group, only 3% were senior citizens, whilst as many as 43% could be classed in the school age group.

The fact that more younger and fewer elderly people were questioned is somewhat compensated for in other respects. People over retirement age are generally more settled, less mobile and have a lower economic potential than their younger counterparts. Therefore in analysing the migratory, circulatory and occupational characteristics of the population, it is members of the working age group (and particularly the younger element), that are able to supply the most satisfactory information.

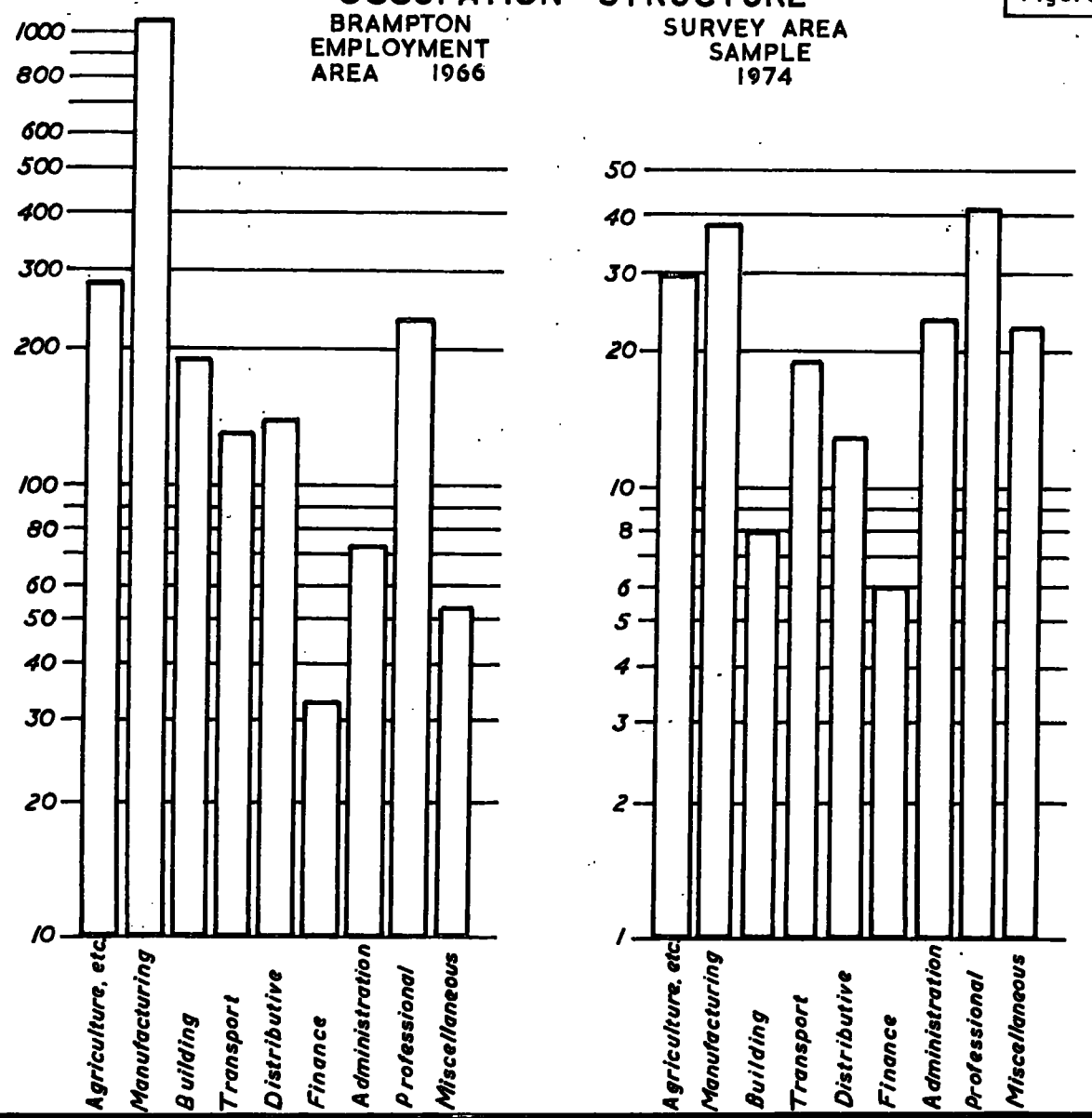
AGE STRUCTURE

Figure 2.3



OCCUPATION STRUCTURE

Figure 2.4



2.5 MIGRATION

When people change their place of residence, it is usually governed by one of four reasons, either occupation, housing, marriage or retirement. Some people never change their habitation, whilst others are constrained because of circumstances to change to a less favourable place. The majority who do have a choice of movement, however limited, usually select a place which provides them with, or access to, the functions and services they require. Therefore the attractiveness of a particular settlement is one element which demonstrates its degree of centrality.

In analysing the migratory trends of the population in the survey area,answers to three questions in that particular section of the questionnaire (appendix 2.1) produced a varied and interesting set of results. It was only possible to gain information of migration into a centre, but, as certain results showed, some movement was from within the survey area and this certainly helped to establish an internal pattern. The factors used in measuring the index of centrality were based on the two variables, time and distance, and 'weightings' between 1 and 10 were duly accorded. Any household who had moved only a short distance, or within a short period of time, was ascribed a small weighting, whilst those families who had moved a large distance, or several years ago, were given greater weightings. Although reasons for moving play a very importance part in migration, they could not be given comparable weightings, because they are virtually impossible to measure in mathematical terms.

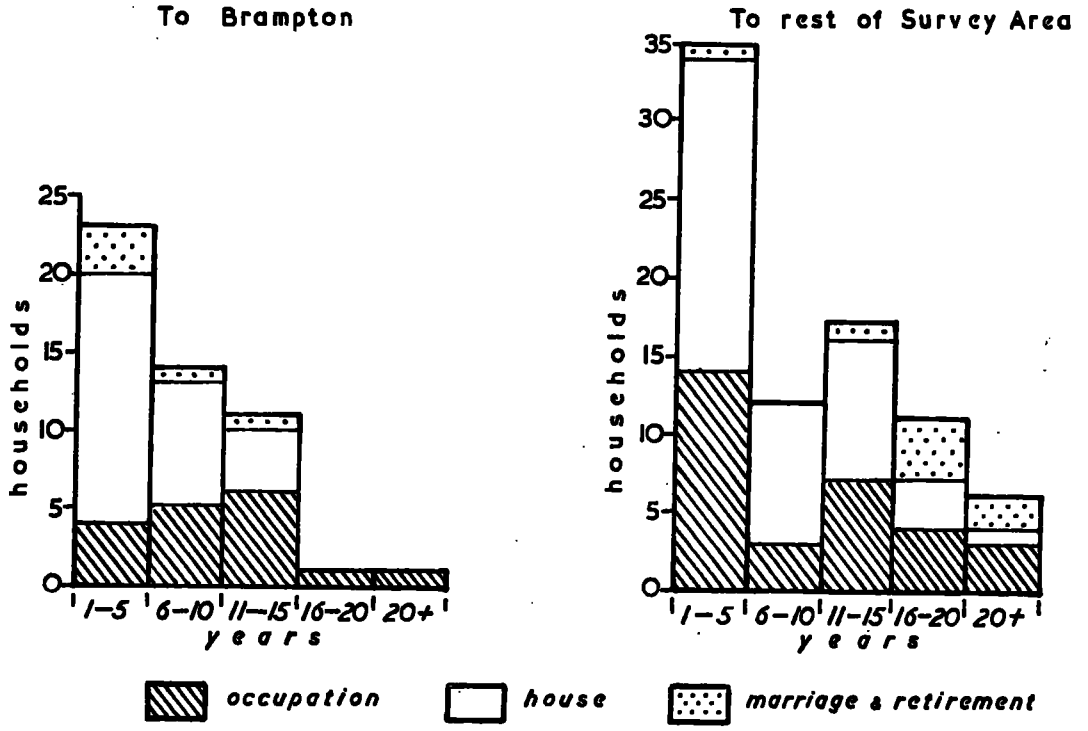
The mileage groupings are based on the overall pattern of distances between settlements within the region. All migration from more than 20 miles away has been grouped together since it can be regarded as external to the region. Time groupings have been based more arithmetically but with regard to certain events within the area. The first group (1-5 year period) covers both the closure of Spadeadam, and the development of new industry and housing within the area, whilst the last group (20 years or more) predates the establishment of the rocket research station, and much of the post-war housing.

The analysis of the results is given in appendices 2.4 and 2.5, and in the accompanying diagram (figure 2.5). Most of the 140 families questioned had moved house some time within the last 20 years, with the largest group, 57 or 41%, doing so within the last five. Only nine families had never moved, and none of these was in Brampton. Of the reasons given for moving, 50% gave a change of house, followed by a change of occupation with 34%. When related to time, it can be seen

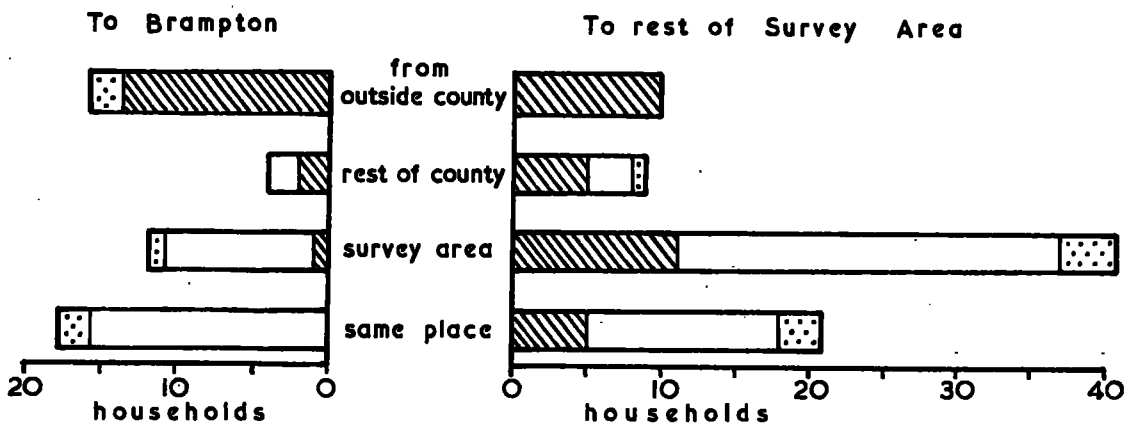
HOUSEHOLD MIGRATION

Figure 2.5

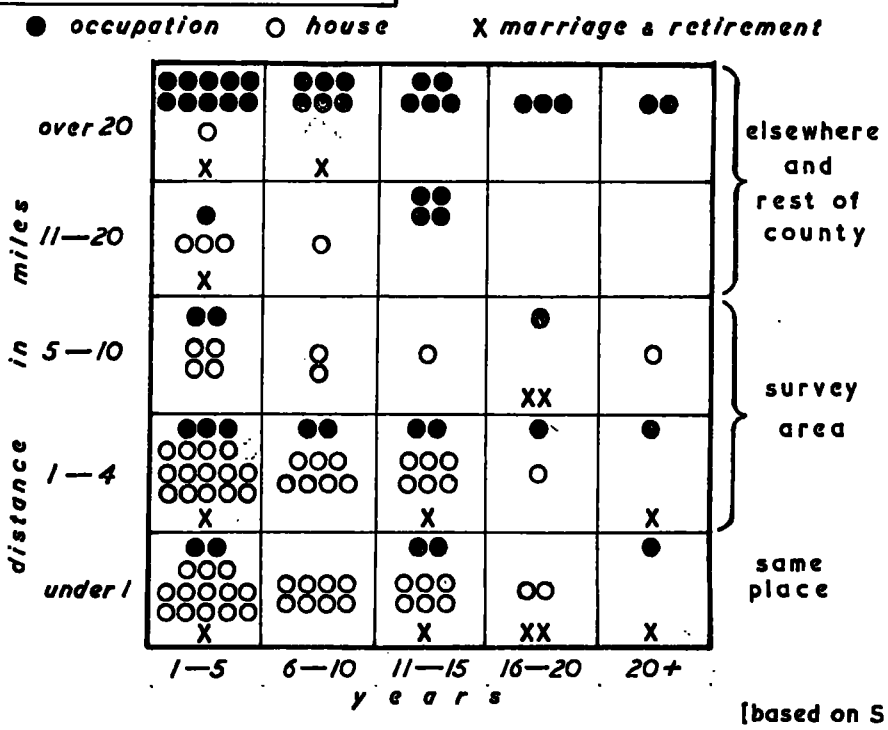
A. TIME & REASON SINCE MOVING



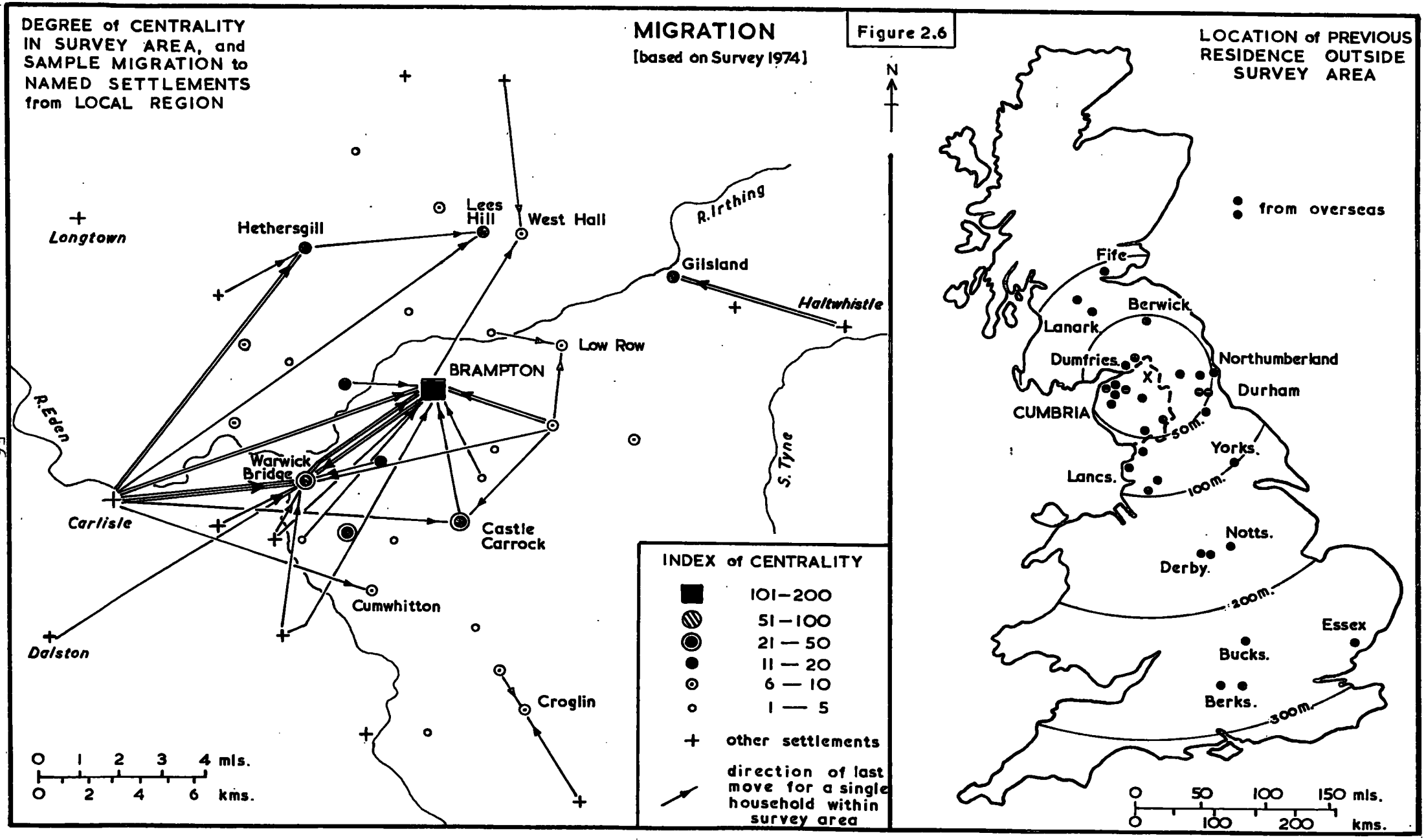
B. SOURCE & REASON



C. BY TIME & DISTANCE & REASON



[based on Survey 1974]


DEGREE of CENTRALITY IN SURVEY AREA, and SAMPLE MIGRATION to NAMED SETTLEMENTS from LOCAL REGION
MIGRATION
[based on Survey 1974]
Figure 2.6
LOCATION of PREVIOUS RESIDENCE OUTSIDE SURVEY AREA
N
Longtown
Hethersgill
Lees Hill
West Hall
R. Irthing
Gilsland
Haltwhistle
Low Row
BRAMPTON
R. Eden
Warwick Bridge
Carlisle
Castle Carrock
S. Tyne
Cumwhitton
Dalston
Croglin
INDEX of CENTRALITY
101–200
51–100
21 — 50
11 — 20
6 — 10
1 — 5
other settlements
direction of last move for a single household within survey area
0 1 2 3 4 mls.
0 2 4 6 kms.
from overseas
Fife
Berwick
Lanark
Dumfries
Northumberland
Durham
CUMBRIA
50m.
Yorks.
Lancs.
100m.
Notts.
Derby.
200m.
Essex
Bucks.
Berks.
300m.
0 50 100 150 mls.
0 100 200 kms.

that a change of house has been more important within the last 5 years, whilst jobs were relatively and progressively more important over the preceding years. In the last five year period, of the 58 families that moved, 36 were for house reasons, and only 18 because of a change of occupation, whilst over 15 years ago the proportions are reversed. This is attributable partly to the greater supply of new and better houses on the market, and partly to the greater ease with which moving house can be accomplished in the present decade compared to the era before 1959.

The third part of the question on migration asked for the location of the households' previous residence, and the results proved to be very interesting. Out of 140 households, 39 or 28% had moved from within the same settlement (or for specific purposes less than 1 mile), and 18 of these were in Brampton itself. One answer gave next door as the previous residence! The majority of these 39 families gave a change of house as their reason, but the 5 who said occupation were in fact all farmers, suggesting that a house went with the new job. The highest group of families, 53 or 38%, had moved from places within the survey area (29% within five miles and the remaining 9% within 10 miles), and again the chief reason was for a change of house. The third largest group, 29 or 21%, had moved into the area from outside a 20 mile radius, the majority being attracted to Brampton rather than the other settlements. These families, however, as might be logically expected, gave a change of occupation as the chief reason for moving, with only 1 for a change of house and 2 for retirement. This illustates one of the main trends in the pattern of migration, namely that a change of occupation becomes more of a reason as distance increases.

A study of the accompanying map (figure 2.6) reveals the actual location of the previous residence for a sample of the 97 internal (survey area) migrants, and all the 34 external ones. Of the latter group, 15 or 44% came from within a 50 mile radius of the area (8 moving from the rest of Cumbria). A further 10 resided up to 100 miles away, 7 upto 300 miles and 2 came from overseas. Families from the furthest locations all moved to Brampton, whilst for the rest of the survey area, the greatest distance moved appears to have been from York to Hallbankgate.

The first map shows a sample of movement within the survey area for distances up to 10 miles. Only a representative selection is shown otherwise the number of direction lines would have been confusing. From both the map and the details in appendix 2.5,

several points emerge. There has been a diffusion of movement throughout the area, not always to the same place or in the same direction. People have moved out of Carlisle to at least six places, and Brampton and Warwick Bridge have both attracted as well as lost families to a variety of other settlements within the area. In the tally of net gains or losses, it is not surprising that Brampton and Warwick Bridge (being the largest settlements in the area), have larger gains than other places, but also in contention are Castle Carrock, Hayton and Heads Nook. All these settlements can boast new housing of both the private and council variety. At the opposite end of the scale however, comes Hallbankgate with a net loss of six, reflecting perhaps the decline of its importance as a railway and mining community ever since those occupations ceased to exist.

Migration Index of Centrality — Table 2.3

Settlement	Index	Settlement	Index	Settlement	Index
Brampton	196	Aglionby	7	Laversdale	5
Warwick Bridge	32	Croglin	7	Farlam	4
Castle Carrock	27	Cumwhitton	7	Great Corby	4
Heads Nook	22	Kirkcambeck	7	Walby	3
Gilsland	19	Low Row	7	Wetheral	3
Hethersgill	19	Newbiggin	7	Armathwaite	2
Hayton	12	Scaleby Hill	7	Ainstable	1
Irthington	11	Tindale	7	Cumrew	1
Lees Hill	11	Greenhead	6	Faugh	1
Warwick	11	Hallbankgate	6	Kirklinton	1
Crosby	9	Smithfield	6	Roweltown	1
West Hall	8	Lanercost	5	Walton	1

In compiling the index of centrality for migration, the results (table 2.3) show that Brampton, with 196, is well above its nearest rivals of Warwick Bridge, Castle Carrock and Heads Nook, which have indices of 32, 27, and 22 respectively. This is somewhat in accord with the picture of net gains previously mentioned. As might be expected, the larger settlements have higher indices than the smaller ones with a couple of exceptions. A small community such as Lees Hill scores 11, whilst Walton, with four times the population only scores 1. Not surprising perhaps is Hallbankgate's figure of 6, but some of the anomalies must be attributed to the very small representative sample of people questioned in these villages. Nevertheless, the results

do tend to reflect the general size of the settlements, and in particular the accentuated primacy of Brampton.

2.6 CIRCULATION

The degree of circulation of the population in any area is governed by a number of inter-related factors. Firstly there is the age factor, from which it can be deduced that elderly people are usually less mobile than younger ones. Secondly, the financial status of a family often determines not only car ownership, but also the distances which they can afford to travel for whatever purpose. A third factor is the attractiveness of a particular place, whether it be for employment, shopping or recreation. Finally, but not least, is the degree of provision of public transport, upon which everyone, at some time or other is reliant.

About thirty years ago, at the end of the World War II, few families could afford to own a car and be independant of public transport, but in the present decade the position has been reversed and those households without a car are now in a minority. This has arisen as the direct result of a higher standard of both income and living conditions. Whilst this may infer that people are more mobile today than thirty years ago, it also means that they are less reliant on public transport, and as a consequence the frequency and extent of such services has naturally contracted. In the case of the railways, this service has ceased completely in many areas of the country and within N.E. Cumbria it has contracted to such a extent that is is almost non-existent. Out of the original 10 stations on the main line between Carlisle and Haltwhistle, only one, Brampton Junction, is still open. Even the sporadic frequency of the service and the scant number of passengers who use the station, make it something of a 'white elephant.'

The bus companies too have felt it necessary to contract and reduce the number or frequency of services. However, because of the greater flexibility of bus transport compared to rail, the operations of such a service still perform a vital role in the life of N.E. Cumbria, especially for work people, school children and shoppers on market days.

Complementary with the growth of circulation has been the gradual reduction in the number and type of retail and business services provided by the smaller settlements. Before the age of public transport and the motor bus in particular, each village was able to provide its population with a small but important range of essential functions, whilst the nearest town usually had a wealth of services and was able

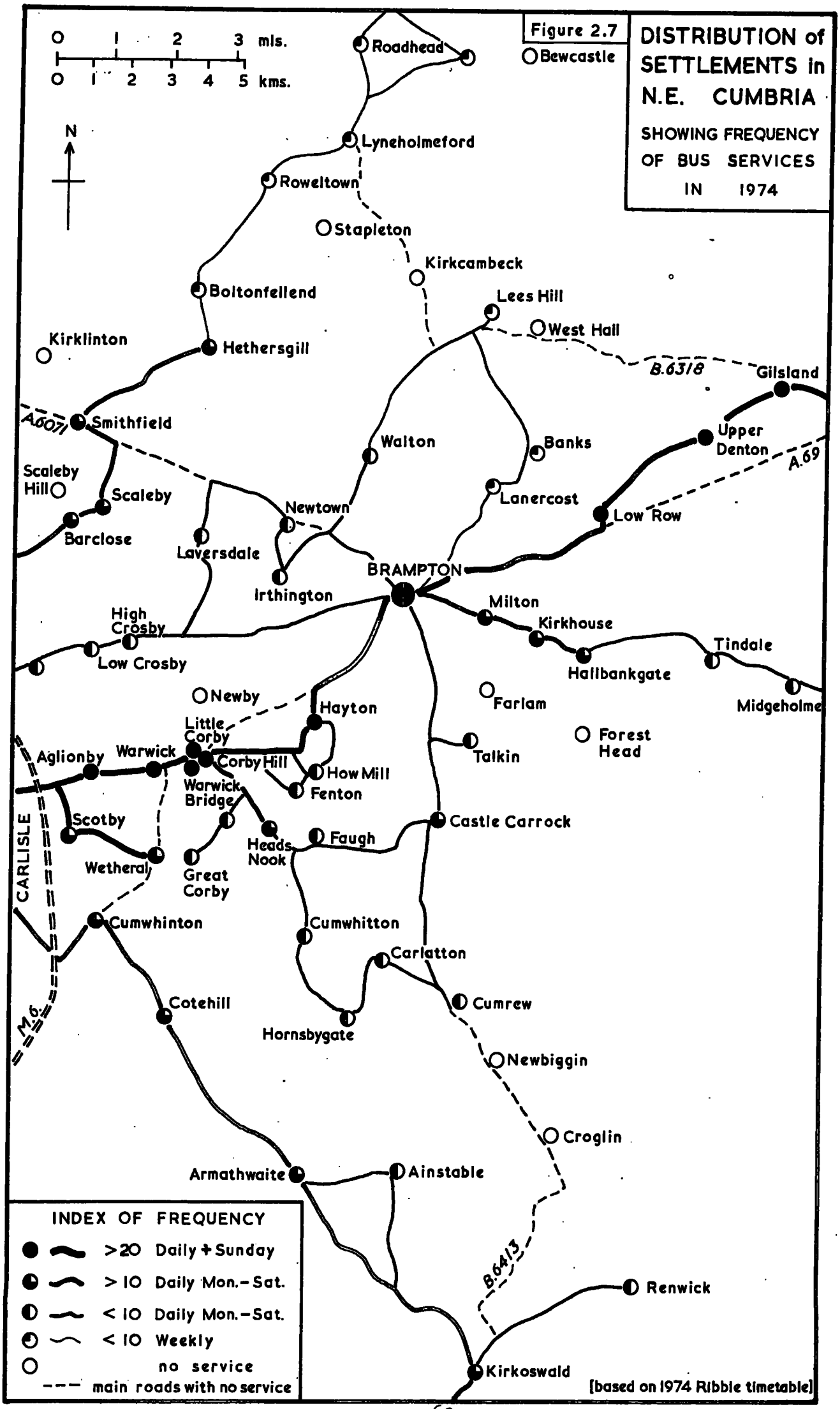


Figure 2.7
DISTRIBUTION of SETTLEMENTS in N.E. CUMBRIA
SHOWING FREQUENCY OF BUS SERVICES IN 1974
0 1 2 3 mls.
0 1 2 3 4 5 kms.
N
Bewcastle
Roadhead
Lyneholmeford
Roweltown
Stapleton
Kirkcambeck
Boltonfellend
Lees Hill
West Hall
Kirklinton
Hethersgill
B.6318
Gilsland
A6071
Smithfield
Walton
Banks
Upper Denton
A.69
Scaleby Hill
Scaleby
Newtown
Lanercost
Low Row
Barclose
Laversdale
BRAMPTON
Irthington
Milton
High Crosby
Kirkhouse
Tindale
Low Crosby
Hallbankgate
Midgeholme
Newby
Hayton
Farlam
Little Corby
Forest Head
Aglionby
Warwick
Corby Hill
How Mill
Talkin
Warwick Bridge
Fenton
Scotby
Castle Carrock
Heads Nook
Faugh
CARLISLE
Wetheral
Great Corby
Cumwhinton
Cumwhitton
Carlatton
Cotehill
Cumrew
M6
Hornsbygate
Newbiggin
Croglin
Armathwaite
Ainstable
B.6413
Renwick
Kirkoswald
INDEX OF FREQUENCY
>20 Daily + Sunday
> 10 Daily Mon.-Sat.
< 10 Daily Mon.-Sat.
< 10 Weekly
no service
main roads with no service
[based on 1974 Ribble timetable]

to provide not only for its own inhabitants, but for those of the surrounding area as well. The position has now changed, so that villages have very few services, small towns cater for most essentials, but the wealth and range of services are only provided by the larger centres or cities. In consequence of this change some people find it difficult to have their demands met by their own settlement, and are forced to seek them elsewhere. This is comparatively easy for families with their own independant method of transport, but often difficult and ardous for those without. Therefore reliance on public transport is all important, and since the rail services in N.E. Cumbria are negligible, it falls to the bus companies to provide such a service. F.H.W. Green stated as long ago as 1950 that "..... by a process of trial and error, the bus operators have discovered where the majority of people wished to make their journeys". (Geographical Journal, N.116, p.65).

Since 1950, there has been even more contraction of bus services throughout rural England, but the premise still holds true. In trying to cater for the needs of the population of N.E. Cumbria, the Ribble and United Bus Companies operate seven services, all from Carlisle. (Details in appendix 2.6). As can be seen from figure 2.7, the routes on which these services operate take into account most of the settlements in the area, leaving only a handful of the population without any provision. The degree of this provision however, various from route to route and from day to day.

In analysing the number of journeys it was found that both routes and settlements could be graded into five categories. The first of these, category A, was mainly along the A69 trunk road between Carlisle and Haltwhistle, and took account of such places as Warwick Bridge, Hayton, Brampton and Gilsland. With more than 30 daily services, and in parts more than 50, it was the only route with a Sunday operation. Category B services could be described as frequent daily with more than 10, serving settlements such as Hethersgill, Hallbankgate, Castle Carrock and Heads Nook. The exceptions in this category are Scotby and Wetheral, which have over 40 daily services, but none on Sundays. Out of a total of 63 settlements in the region, 23 or 36.5% are accounted for by these first two categories, and therefore their provision can be regarded as adequate. A further 21 settlements, most of them minor, come into the C category, and with less than 10 daily services their provision is not only infrequent but also barely adequate. Ainstable, Cumwhitton, Irthington and Walton are some of the villages concerned, whilst Roadhead, Lees Hill and Banks are examples of category D Services. The operations here are very infrequent, with

services only on a market day or Saturday. The remaining settlements (eleven in all), such as Kirkcambeck and Croglin, are placed in the E category since they have no service whatsoever.

Bus Service Frequency and Accessibility — Table 2.4

Settlement	Number of Service Operations	Average Daily Frequency	Category	Settlements in area	
				Number Accessible	% of 63 total
Brampton	4	60	A	32	50
Warwick Bridge	3	57	A	24	38
Hayton	2	46	A	14	22
Hallbankgate	1	12	B	11	17
Castle Carrock	1	10	B	11	17
Hethersgill	1	10	B	8	13
Cumrew	1	3	C	11	17
Irthington	1	7	C	10	16
Walton	1	4	C	10	16
Great Corby	1	7	C	8	13
Lees Hill	1	(Wed)2	D	10	16
Roadhead	1	(M&S)2	D	8	13

It must be emphasised here that a measure of circulation based on bus services is only true and acceptable for the direction of the operated routes and the settlements along them. For instance, Carlisle is accessible by bus from 52 settlements along all seven operated routeways, whilst Brampton is accessible from only 32 villages and hamlets within the region along four service routes. Similarly someone living in Hethersgill would find it extremely awkward getting to Brampton by bus as no direct service links them, whilst anyone living in Walton and needing to travel to Castle Carrock would have similar problems.

As can be seen from table 2.4, Brampton is an important centre in N.E. Cumbria, having four of the seven operated services, a frequency of 60 daily journeys and accessible from 32 (or 50%) of the settlements in the area. The next in rank is Warwick Bridge, whilst further down the list come the more isolated hamlets, such as Cumrew with one infrequent daily service of 3 journeys, and Lees Hill with 2 journeys only on a Wednesday.

To a large extent therefore, Carruthers (1957, p.372) provided an appropriate summary when he stated "..... that bus traffic is

especially useful as a means of giving some indication of the nodality of any centre". Although his methods of assessment are not specifically used in this study, the frequency of bus services in N.E. Cumbria is a valuable factor in displaying the degree of centrality with regard to certain criteria. One of these is in the field of employment, for without essential bus services many people would not be able to live where they do and pursue an occupation elsewhere. One of the attractions of a small rural settlement is not necessarily the employment it provides, but often the degree of accessibility to places which offer greater opportunities for work.

2.7 EMPLOYMENT

Employment in N.E. Cumbria shows a growing variation in the types of occupation available. Although still a strong farming area, there are signs of diversification amongst the secondary and tertiary sectors, especially since the closure of both the collieries around Midgeholme and the rocket research station at Spadeadam.

Proportions of Active to Total Population — Table 2.5

Area & Date of Source	Total Pop'n	15-64 age group		Active Population		
		Number	as % of total	Number	as % of total	as % of age group
Employment Area 1966	8,707	5,224	60	2,191	25	42
Survey Area Sample 1974	668	333	50	202	30	60

The last official data is provided by the Brampton Advisory Report for 1966, and is therefore rather out of date. However it shows that out of a total population of 8,707 for the Brampton Employment Area, 5,224 were in the working age group. Of these, 2,191 were actively employed, accounting for 25% of the total population or 42% of the age group.

The details, given in appendix 2.7, show that the highest proportion, 48%, were engaged in manufacture. This is largely accounted for by the numbers of engineers and technicians employed at Spadeadam. In addition, reliance of the region on farming is borne out by the majority of the 280 placed in category 1 (agriculture, mining and quarrying). Under the circumstances therefore, it is not surprising to find that the proportions displayed by these two categories are well above the national average. Conversely, there are two employment groups which show figures below the national average, - these are in administration with public services, and

miscellaneous. In N.E. Cumbria, because of the rural nature of the region, there are bound to be smaller numbers employed in shops and offices compared to urban and industrial areas located in other parts of the country.

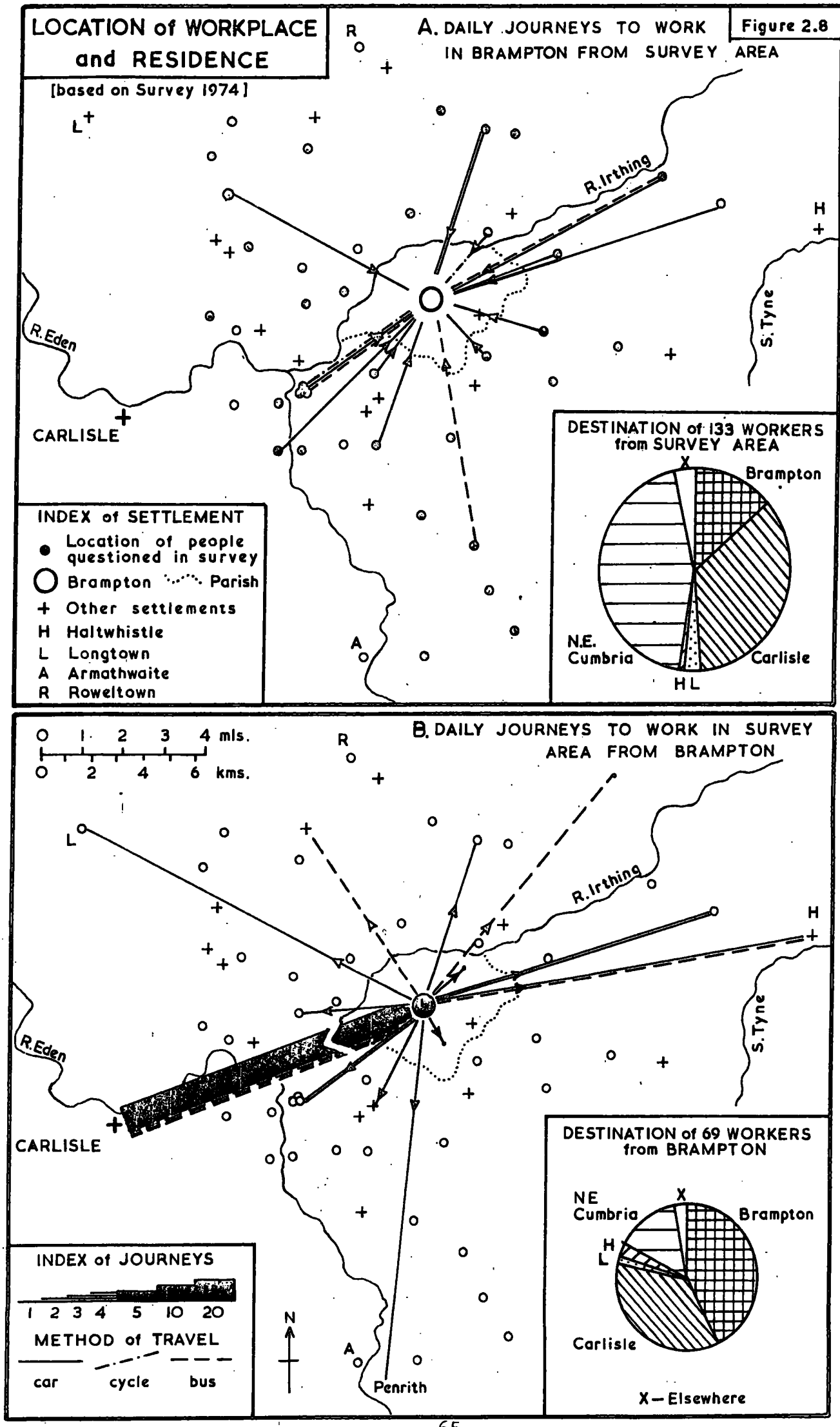
In comparing the details obtained from the questionnaire of 1974 with the figures from the 1966 Brampton Advisory Report, it must be remembered that not only is there a ten year gap, but that the survey covers a wider area, and also that Spadeadam had closed down in the interim period. This latter fact is immediately reflected by the smaller proportion of people employed in manufacturing and construction. The results (table 2.5), show that out of the sample of 668 people, some 333 (or 50%) fell into the working age group, and out of these 202 were in active employment. This is 30% of the total or 60% of the age group, - both ratios being higher than the official statistics for 1966, mainly because of the greater number of people in this age group that were questioned in the survey.

The results of this survey are given in appendix 2.7. Out of 202 active persons, some 71% were male and 29% female which compares favourably with the 76% and 24% respectively from the official figures of 1966. The largest group of workers, 41 or 20%, were engaged in professional activities, ranging from 25 in teaching, to 3 in nursing and 1 each in architecture and surveying. In second place, with 38, came those in manufacture, where a wide range of activities such as engineering, printing and textiles were represented. All those employed in agriculture were male (23 being listed as farmers), whilst the miscellaneous category, with 23 persons (or 11%), had a dominance of females, mainly as caterers or cleaners.

The totals for each category, both from the survey and the 1966 Advisory Report are illustrated in figure 2.6. Naturally there are differences between the two sets of figures, but they both demonstrate the range of activities in which people are employed, as well as the occupational cross-section represented by the sample questioned in the survey.

2.8 LOCATION OF WORKPLACE AND RESIDENCE

Although the occupations of people in N.E. Cumbria are useful on their own, they become more meaningful when related to the location of workplace and residence. Unfortunately official data only shows the general trend within the whole of the old Border Rural District (of which the area of N.E. Cumbria under review is only a part), and is therefore of little value for comparison. However, the results from the answers to the questionnaire have proved interesting and


LOCATION of WORKPLACE and RESIDENCE
[based on Survey 1974]
A. DAILY JOURNEYS TO WORK IN BRAMPTON FROM SURVEY AREA
Figure 2.8
R.Irthing
R.Eden
S.Tyne
CARLISLE
L
R
A
H
INDEX of SETTLEMENT
Location of people questioned in survey
Brampton
Parish
Other settlements
H Haltwhistle
L Longtown
A Armathwaite
R Roweltown
DESTINATION of 133 WORKERS from SURVEY AREA
Brampton
N.E. Cumbria
Carlisle
H L
X
B. DAILY JOURNEYS TO WORK IN SURVEY AREA FROM BRAMPTON
0 1 2 3 4 mls.
0 2 4 6 kms.
INDEX of JOURNEYS
1 2 3 4 5 10 20
METHOD of TRAVEL
car
cycle
bus
N
Penrith
DESTINATION of 69 WORKERS from BRAMPTON
NE Cumbria
Brampton
Carlisle
X — Elsewhere

valuable, and are illustrated in the accompanying diagram (figure 2.8), as well as being given in detail in appendix 2.8.

The analysis shows that for 69 Brampton-based people, 29 or 42% work in the town or immediate environs, whilst a slightly lower proportion, 25 or 36%, are employed in Carlisle. 19% work in the rest of the local region and only 3% elsewhere. With regard to the 133 people living in the rest of the survey area, approximately the same proportion, 35%, work in Carlisle, but only 13% find employment in Brampton. Nearly 30% work in the same location as their place of residence (a large proportion of these being in farming), 19% in the rest of the local area, and 4% elsewhere.

The first map (figure 2.8A) shows the daily journeys to work in Brampton from the surrounding region, and displays the dispersion of home locations involved. The inset pie graph translates the figures for the 133 people concerned into a more meaningful diagram since it was impossible to show every destination on the map. The second map (figure 2.8B) shows the daily journeys to work outside Brampton of people living in the town, and illustrates the importance of Carlisle in the functional role of the whole region. Again, the inset pie graph reflects the location and dispersion of employment of Brampton people in a complementary way.

Both maps illustrate the fact that many of the journeys between home and work are related to the major routeways, especially the A69 Haltwhistle to Carlisle, and the A6071 Longtown to Brampton. The distances travelled in other directions are generally much shorter and with a lower proportion of commuters. As one might expect, the method of travel is chiefly by car, even to Carlisle, although there is a very frequent bus service along most routeways. Of the 134 commuters, only 15 use a bus, 8 use cycles or motorcycles and the rest, 111 or 83%, use a car. The remaining 68 people work in the same place as they reside, and the majority of them walk.

Although these figures are only representative of the people questioned in the survey, they do however, give an indication of what must be regarded as a general trend. Details from ten years ago would, no doubt, have shown a different picture, with many more people commuting to Spadeadam whilst over twenty years ago there would have been indications of the residual activity in the coalfield area. The results, once again, confirm Brampton's role in the life of the region, and show that in the field of employment, the town is not only able to attract many of its own residents, but also some of those living in the surrounding area.

The index of centrality based on employment uses the table prescribed in the introduction (figure 0.1), where the two variables are distance and frequency of bus service. Although most workers travelling any distance use cars, the availability of public transport is the only reliable factor that can be used. The results (table 2.6 and appendix 2.9), show that within the main survey area, Brampton emerges in first place with an index of 92, followed by Warwick Bridge with 14, and Hethersgill 9. At the other end of the scale are settlements such as Croglin with 2 and Hallbankgate with 1. Certain anomalies from this aspect of the survey are perhaps not as unusual as might appear at first sight. Lanercost, with an index of 9, has a dairy and National Trust Abbey as well as farms, whilst Hayton, a much larger, but mainly dormitory settlement, only has an index of 1. This is because it has no trades that employ outside labour, other than farming.

Employment Index of Centrality — Table 2.6

Settlement	Index	Settlement	Index	Settlement	Index
Carlisle	265	How Mill	8	Low Row	2
Brampton	92	Crosby	7	Walby	2
Longtown	28	Lazonby	7	Ainstable	1
Penrith	27	Kirkoswald	6	Carlatton	1
Warwick Bridge	14	Lees Hill	5	Cumwhitton	1
Haltwhistle	13	Castle Carrock	4	Hallbankgate	1
Scotby	11	West Hall	3	Hayton	1
Hethersgill	9	Croglin	2	Kirkcambeck	1
Lanercost	9	Heads Nook	2	Laversdale	1
Gilsland	8	Irthington	2	Roweltown	1
Greenhead	8	Kirklinton	2	Walton	1

Carlisle, with an index of 265, is obviously the largest employer of labour in the region. Although this figure represents only a fraction of the total attraction (since the city is on the periphery of the survey area), it nevertheless serves as a useful guide, especially when compared with the indices of attraction for retail and other services which are examined in Chapter 4.

CHAPTER 3

FUNCTIONS, SERVICES AND AREAS OF INFLUENCE

3.0 INTRODUCTION

One of the chief problems facing the population of a mainly rural area is the provision of adequate functions and services. According to Brush and Bracey (1955, p.561) :-

"the centrality of a settlement can be ascertained by one of two methods, either

i) the assessment of the businesses and services existing, or

ii) the measurement of the area dependent on the centre for goods and services, i.e. fields or zones of influence".

Since these two criteria are inter-related, an analysis of both would give an even better result. Therefore an examination of the retail and business services of N.E. Cumbria is the next stage to be considered.

3.1 FUNCTIONS AND SERVICES

As well as being the largest employer of labour within the region, Carlisle is also the primary centre for all other types of activity, from retail and business services to entertainment, education and administration. In consequence, its fields of influence are large, capturing the population requirements of most of north Cumbria and a proportion of southern Scotland as well. Therefore the goods and services it provides are not only for its own inhabitants, but also for the larger population of this tributary area or region.

According to Berry (1967), the maximum distance that consumers are willing to travel for a particular service is known as the range or economic reach, whilst the level at which a service can be profitably provided is called the threshold. The goods and services provided by Carlisle contain a mixture of types, from the low threshold short range goods mainly for its own population, to the high threshold long range commodities for both its own consumers and those of the tributary area.

At the other end of the settlement hierarchy are the hamlets, with small populations and few, if any, services. Any goods provided by these will inevitably have very limited economic reaches and therefore their thresholds will be low, and ranges small. Between these two limits in the hierarchy are towns and villages providing middle order levels of service outlets.

Within Carlisle's regional influence, the next level of provision is supplied by Penrith, followed by Annan, Wigton and Brampton all at a third level. At progressively lower levels are villages, such as Dalston and Lazonby, and within the Brampton survey area, Warwick Bridge and Gilsland. Examination of the spatial location and central-place patterns that these centres generate will be studied in the

final chapter. It is, however, significant to note at this stage that such lower-order settlements do exist within the region, because by doing so they help to resolve the fundamental problem of supplying an adequate set of services to meet the needs of the scattered rural population.

3.1.1 Classification and Methodology

In order to provide the best possible information on which measurements of centrality could be assessed, a survey of all the functions and services in the settlements of N.E. Cumbria was carried out. In addition, some of the outlying larger towns of the region such as Penrith, Haltwhistle and Wigton, were also examined so that comparisons could be made with centres from within the survey area. Details for the main towns are given in appendix 3.1 and for the survey area in appendix 3.2. Although the questionnaire only concerns 25 specific items of retail and business services, it was felt necessary to show the breadth and range of goods and services offered by surveying most of those provided within each town or its centre.

As far as the smaller towns were concerned (i.e. Wigton, Brampton, Longtown and Haltwhistle), nearly all the functions and services are concentrated within the central area, since the settlements are not large enough to possess secondary or suburban business centres. In the case of Carlisle and Penrith, however, only those functions occurring within the central area or C.B.D. were surveyed. Although this would not give a total picture of all the services, consumers from the outlying tributary areas are mainly attracted to those in the C.B.D., with few people, if any, needing to visit the suburban centres.

At this stage, it is interesting to observe that all the main functions and services of the smaller towns could be found together, thereby forming a nucleus or central area within the settlement. In all cases the limits were well defined and in accord with the older medieval or pre-twentieth century development areas, particularly so in Brampton (figure 3.3), therefore the task of recording the number and variety of services was fairly straight forward. In Carlisle and Penrith, however, the exercise was less comprehensive, since many trades and professions do not exist in the central area. They are located in the surrounding zones where rent and rates are lower and access presumably better. This leaves the central area devoted almost solely to shopping and commercial enterprises.

Carlisle displays all the facets of urban structure (idealised by the various theories on the subject), possessing a C.B.D., a transition zone of warehouses and high density old housing, an industrial zone, and

several sectors of 20th century housing towards the periphery. Contained within these outer residential areas are the secondary shopping centres and new industrial estates. Penrith's structure has similar zones and sectors to those of Carlisle but they are not as well developed, particularly with the zone of transition around the C.B.D., which is rather amorphous. Wigton, Brampton, Longtown and Haltwhistle all display similar features of urban structure but of a lower order. The central areas are small, usually concentrated around an old market place or along one main street, and immediately surrounded by a mixture of 19th and 20th century residential development. No true zones or sectors are distinguishable and there is an absence of a definite area of transition, although pockets do occur from time to time as a prelude to infilling or urban renewal.

Two interesting points emerge from this examination. Not only does each town display a different level of maturity, but collectively they help to show the sequence of urban development and evolution. From a random sample of settlements this would not necessarily be manifest, but in N. Cumbria the choice is limited. Therefore it is all the more fortunate that it has occurred, particularly since all the towns concerned are the leading members of the settlement hierarchy for the region.

3.1.2 Problems Outlined and Resolved

In surveying the functions and services of the region, certain factors had to be taken into consideration and small problems resolved. The main factors were :-

a) consideration and choice of functional units, outlets and establishments,

b) classification of such units and establishments, and

c) representation of high and low threshold commodities or services.

With regard to the first set of these factors, Carter (1972) comments on the differences that can be obtained in the analysis of a survey of retail and business services, depending on the method used. A functional unit, strictly speaking, is a particular item or commodity, i.e. a tin of beans or a loaf of bread. The outlet is where this item can be purchased, and the establishment is the shop or business that provides that outlet. Because of the complexity that would arise should every single item be considered, a functional unit has been used to define a group or class of similar items, e.g. groceries or confectionery, especially since many establishments usually cater for a particular group of commodities.

This still leaves certain problems to be considered, as Scott (1970) outlines with regard to the classification of shops and outlets. The growth of multiple stores and the relative decline of single outlet businesses has accentuated the problem. A supermarket may retail more than 5,000 different items grouped into approximately six main classes, whilst national stores such as Boots and W.H. Smith, no longer concentrate solely on the products by which they were established, but have developed other ranges of goods such as audio and records, gifts and fancy goods.

One of the inter-related problems was resolved by deciding to list both the number of establishments and number of functional outlets, but to use the latter rather than the former in the tests for centrality (Chapter 4). As an example, take three shops :- 1) a supermarket,* 2) a grocer and greengrocer, 3) a butcher. Here there are 3 different establishments (a multiple, a double and a single), but 6 functional units, and (since the supermarket has all 6) a total of 9 outlets.

In many cases where an establishment retails more than one class of goods, it has been classified under the dominant type; e.g. a shop which sells mainly books and stationary but only a few gifts and fancy goods, has been classed under the first heading. The exception in this example being W.H. Smith, which like Boots, has been regarded as a multiple and classified under five separate functional units. On the other hand some shops have no specific dominance with one class of goods, and are therefore listed as double or triple establishments, such as those which sell newspapers, tobacco and confectionery, - the most common of the three-fold outlets. Certain units in the retail services have been combined under similar headings, e.g. furniture with carpets, and electrical goods with domestic appliances. In the case of ladies and gentlemen's clothes however, it was deemed necessary to itemise them separately since there were more single outlets of each than combined ones, whereas the reverse was true of shoes.

The final problem concerned choice, - which services and functional units to include and which to omit from the final list. After consultation of published material on this subject (in particular Everson and Fitzgerald 1969 and 1972), a compromise was reached in which 70 functions or services were enumerated for the six towns, and 30 for the smaller settlements. Those for the towns were classified into four main groups, namely :-

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* N.B. selling groceries, greengroceries, meat, bread and cakes, confectionery, and beer, wine and spirits.

a) Retail, comprising 36 units (11 food, 4 apparel and 21 household),
b) Trades, comprising 14 units,
c) Professional, comprising 10 units, and
d) Community, comprising 10 units and including specialist services such as fire and police.

The selection of the 30 services for the villages and hamlets was largely based on the 25 items listed in the questionnaire, which in turn were governed by the diversity of people's basic needs. To these were added five other services normally found in many villages, such as schools, places of worship and public houses. Certain services selected themselves because of their essential character (e.g. groceries, clothes, furniture, post office and doctor), but in other cases it was important to choose a sample of both high and low threshold commodities in order that adequate representation should be available for the various tests of centrality.

To ease the task of enumerating the various outlets, establishments in the retail section were classified into four types, namely single, double, triple and multiple. The one apparent anomaly in the choice of outlets is the inclusion of a general store as a functional unit rather than as a single or even multiple establishment. Although it usually retails a variety of commodities (mainly food) in much the same way as a supermarket, it does so at a much lower level without any range or breadth of goods. Therefore to classify it in the same group as a multiple type of grocer/butcher/baker would be both a misrepresentation and an injustice. Its inclusion is necessary however, because it plays a very important part in the life of a village community, especially where it is often the only retail service outlet for several miles around.

3.1.3 Analysis of Main Towns

The full details of functions and services for the towns of the region are given in appendix 3.1. An abstract is shown in table 3.1 where the retail figures are displayed alongside floorspace data published by the Northern Economic Development Council for 1967. Whilst there are bound to be some discrepancies between the two sets of figures, the fact that there is a good measure of similarity shows that the survey has achieved one of its primary aims, - recording the numbers of functions and services as fully as possible.

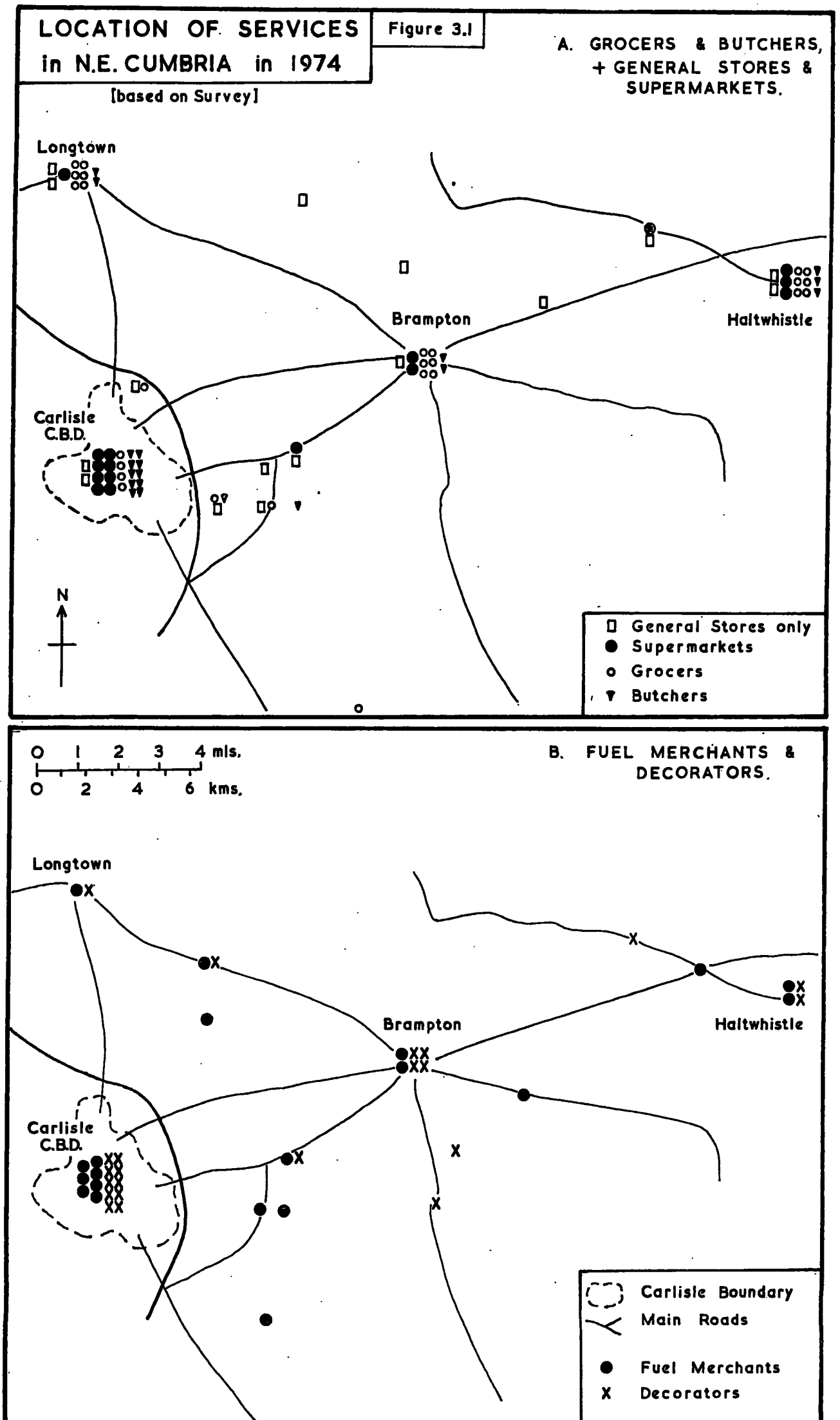
As can be seen from the survey, Carlisle possesses within its C.B.D. almost all the functional units required of a regional centre. There are 314 retail establishments with 469 outlets covering a range of 36 low and high threshold commodities. In addition there are 89

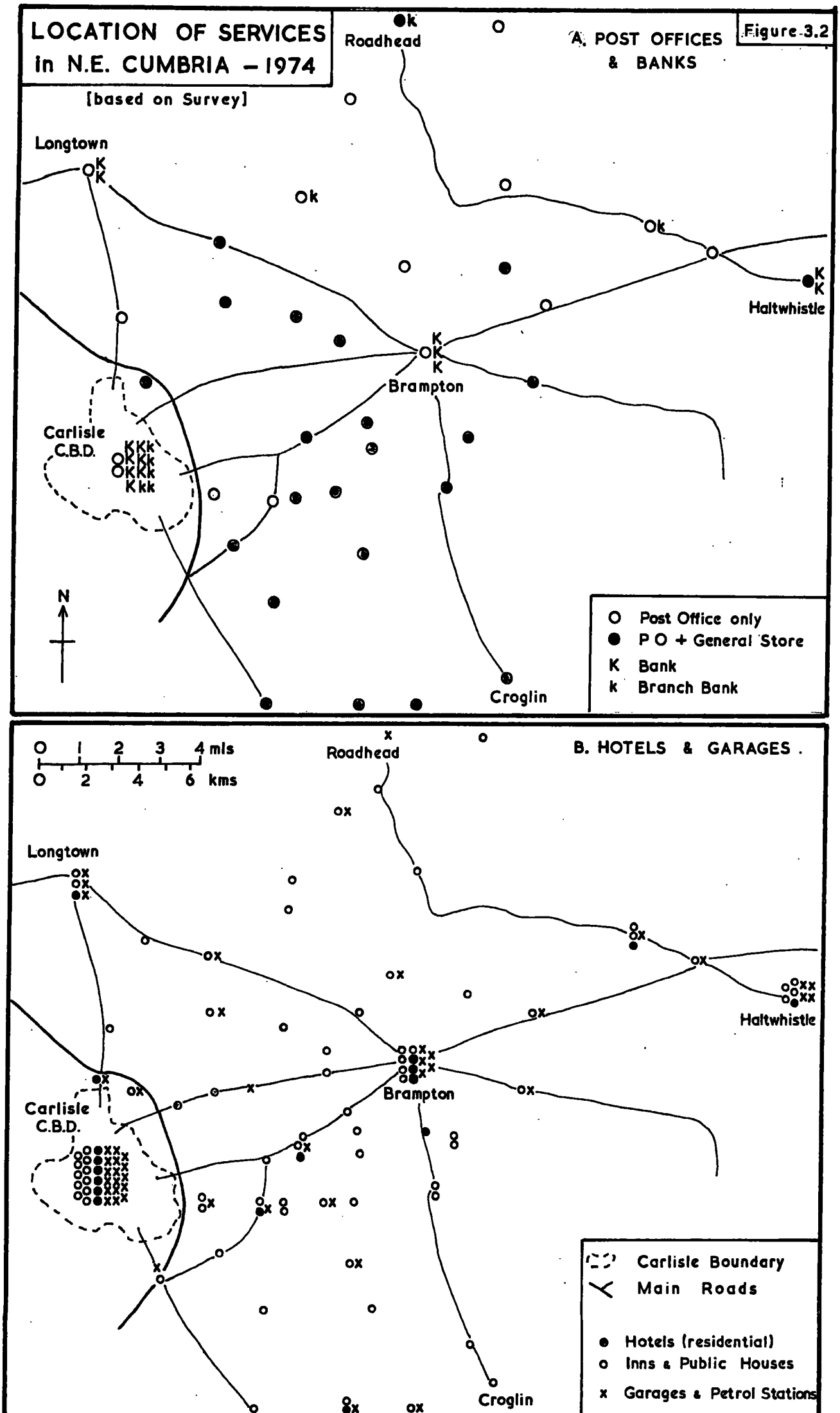
trade and 66 professional services, although many more are to be found within the other zones of the city. Penrith emerges in second place, with 274 establishments covering 370 outlets, followed by three lower-order settlements of Wigton, Brampton and Haltwhistle. Although having a much lower number of retail, trade and professional outlets than the primate city, they still display a fairly wide and comprehensive range of services, emphasising the roles that they play within their own respective districts. Longtown is in last place in the hierarchy of towns with only half the number of retail and trade establishments that Brampton possesses. Its overall economic reach therefore, must be at a distinctly lower level than those of the other centres.

Abstract of Floorspace and Functional Outlets — Table 3.1

MAIN TOWNS OF NORTH CUMBRIA	N.E.D.C. (1967) Retail Floorspace (sq.ft.)	SURVEY 1974						
		Retail Estab.	Retail Out-lets	Trade E&O.	Prof. E&O.	Comm. E&O.	Total Estab.	Total Out-lets
Carlisle C.B.D.	782,000	314	469	89	66	16	485	640
%	50	45	44	30	47	19	40	40
Penrith C.B.D.	366,000	168	264	70	26	10	274	370
%	23	25	25	24	18	12	23	24
Wigton	125,000	70	96	49	16	18	153	179
%	8	10	9	16	11	21	13	11
Brampton	112,000	58	82	42	10	15	125	149
%	7	8	8	14	7	18	10	9
Haltwhistle	106,000	54	109	27	13	13	107	162
%	7	8	10	9	9	15	9	10
Longtown	75,000	28	49	21	10	12	71	92
%	5	4	5	7	7	14	6	6
Totals	1,566,000	692	1,069	298	141	84	1,215	1,592

As might be expected, there is a higher proportion of both single and specialist shops in the larger towns compared to the smaller centres. Although Brampton and Wigton have a few establishments in this category, such as antiques, wool and toys, they do not possess the range that can be found in Carlisle or even Penrith, where milliners, furriers, jewellers and even tobacconists exist on their own. Nor are


LOCATION OF SERVICES
in N.E. CUMBRIA in 1974
[based on Survey]
Figure 3.1
A. GROCERS & BUTCHERS, + GENERAL STORES & SUPERMARKETS.
Longtown
Brampton
Haltwhistle
Carlisle C.B.D.
N
General Stores only
Supermarkets
Grocers
Butchers
0 1 2 3 4 mls.
0 2 4 6 kms.
B. FUEL MERCHANTS & DECORATORS.
Longtown
Brampton
Haltwhistle
Carlisle C.B.D.
Carlisle Boundary
Main Roads
Fuel Merchants
Decorators


LOCATION OF SERVICES
in N.E. CUMBRIA – 1974
[based on Survey]
A. POST OFFICES & BANKS
Figure 3.2
Roadhead
Longtown
Haltwhistle
Brampton
Carlisle C.B.D.
Croglin
N
O Post Office only
P O + General Store
K Bank
k Branch Bank
0 1 2 3 4 mls
0 2 4 6 kms
B. HOTELS & GARAGES.
Carlisle Boundary
Main Roads
Hotels (residential)
Inns & Public Houses
Garages & Petrol Stations

there the same number of department stores or multiples at which a whole variety of outlets can be found within the one establishment. In Carlisle over 84% of the 314 retail establishments come into the single category, helping to emphasise the degree of specialisation which a large urban and regional centre possesses. Brampton and Wigton have approximately 75% each, Haltwhistle 58%, whilst Longtown's proportion of single establishments is only 50%. To some extent these figures reflect the economic reach of a community and therefore the range and threshold of individual services. A specialist shop can only survive as a single establishment if its threshold is high enough to sustain a large volume of business. Since this volume is usually dependent on the market area, only the larger centres will be able to provide this type of service. In the smaller centres such specialisation may have to share an establishment with another unit in order to survive, e.g. Brampton's sports and toys share one shop.

3.1.4 Analysis of the rest of N.E. Cumbria

Outside the main towns, the nature and distribution of services in N.E. Cumbria is varied. One would expect many of the villages to provide a small selection of low threshold services which are in constant demand. Whilst this is generally the case, the distribution and frequency with which they occur gives a more random pattern than might be at first expected. As can be seen from the accompanying map (figure 3.1A), there is a dearth of butchers and grocers outside the main towns. One of the reasons can be ascribed to the increase of travelling shops which now tour most of the outlying communities, and which, in many cases, have taken over the role of the village grocer and butcher. Another reason is probably the growth of super and mini-markets in the main settlements, coupled with the greater mobility of the majority of the population. This certainly enhances the role the towns play in the retail life of the region, and at the same time gives their services an increased economic reach at the expense of those in the smaller settlements. In contrast to the low numbers of grocers and butchers, is the greater incidence of fuel merchants and decorators, the large provision of post offices (with and without a general store), and the widespread distribution of public houses and garages (figures 3.1B and 3.2). Most villages can boast the last three types of services (appendix 3.2), and in several cases, inns and garages are located outside the centres of settlement along a main road or at a convenient junction.

These particular services have been chosen as illustrations because they are good representatives of the disparity to be found throughout

N.E. Cumbria with regard to their provision. Also, the location of their outlets is influenced more by freedom of choice and necessity of demand than by imposed policy, which would have been the case for schools or police houses.

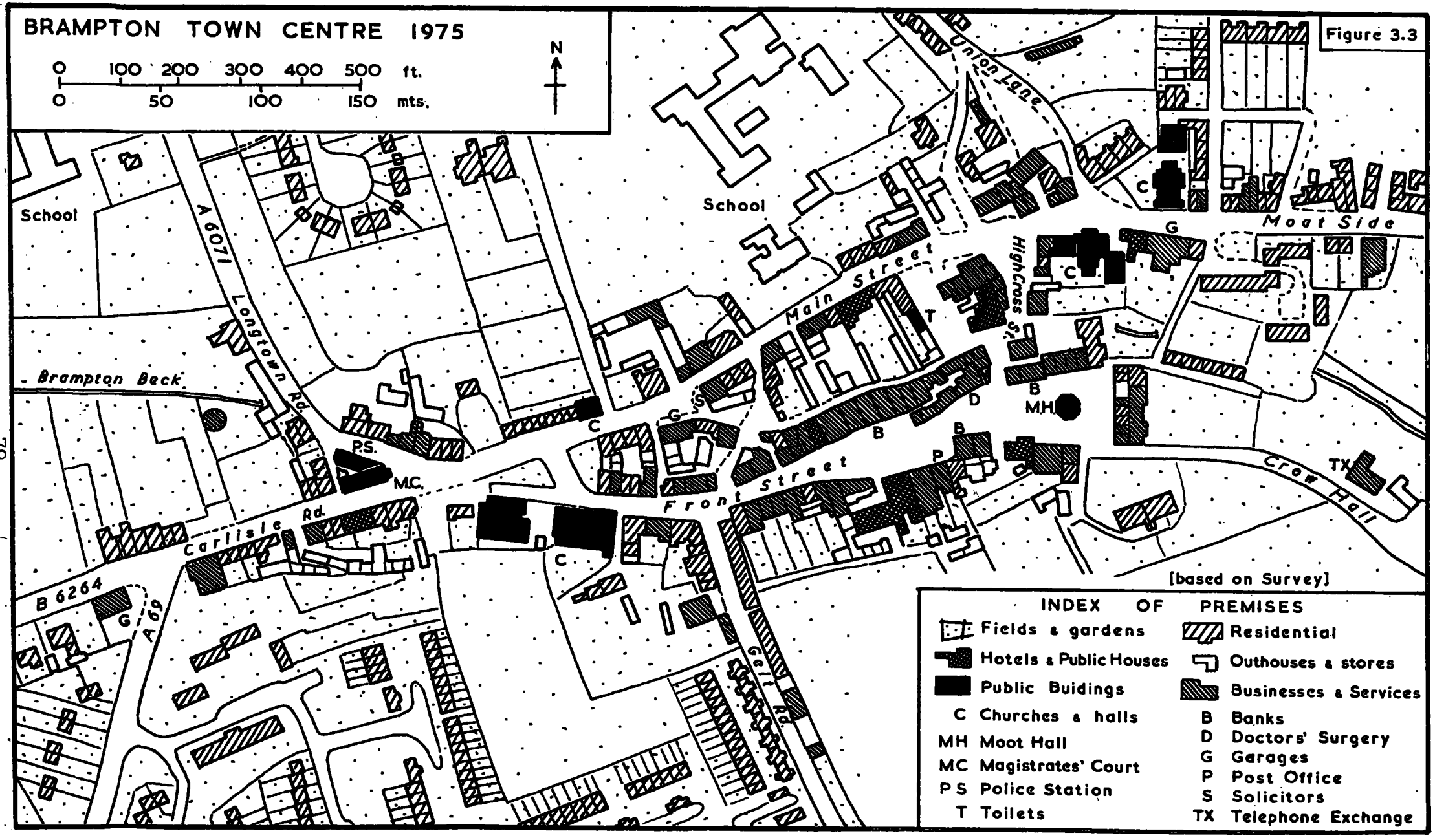
Several interesting situations emerge from the results thus illustrated. Firstly, there are a greater number of services of all types to be found in the area between Carlisle and Brampton (specifically at Scotby, Wetheral and Warwick Bridge) than in the other sectors of the region. This is a reflection of the higher population in this district, and is where the only grocers and butchers outside the main towns are to be found. Gilsland is another centre with a fairly wide range of services, followed by Castle Carrock, Hethersgill and Smithfield.

A second observation to emerge concerns the combination of services at various settlements. In the sector of the region that lies to the north and east of Brampton, where the population is fairly sparse, most post offices and general stores are found as separate establishments, whereas in the other more populous sectors they usually occur together. At Walton however, there is an unusual situation where the post office is on its own but the general store is combined with a garage.

One of the more remote outposts in the survey area to the north of Brampton, is Roadhead which is something of an exceptional community. Although only a small centre for a rather scattered population, it possesses a post office with a general store, a garage, dairy, police house and even a branch-bank. Yet it has a very infrequent bus service, and lacks three services which are normally regarded as part of the village scene, namely a school, church and public house. Another unusual example is Croglin, lying approximately the same distance south of Brampton as Roadhead does to the north. In this village there is a post office with general store, one inn and two places of worship, but no branch-bank, garage or school, and not even a bus service. That such examples do exist only serves to underline the diversity of type and location that can be found throughout a region in respect of the services provided.

3.1.5 The Present Role of Brampton

Another observation worth mentioning is the decline of essential service outlets in many of the villages over the last few decades. As a result of rationalisation in the retail trade, influenced by a changing level of demand for goods and the increased mobility of the population, villages such as Cumwhitton, Low Row, Walton and Roadhead, have lost services like grocers, butchers, blacksmiths and inns. In contrast, it is the larger centres that have usually gained, as exemplified by Brampton. Although suffering from several business


BRAMPTON TOWN CENTRE 1975
0 100 200 300 400 500 ft.
0 50 100 150 mts.
N
Figure 3.3
School
A 6071
Longtown Rd.
Brampton Beck
Carlisle Rd.
B 6264
A 69
P.S.
M.C.
Front Street
Main Street
School
Union Lane
Moot Side
High Cross St.
MH
Crow Hall
TX
Gelt Rd.
[based on Survey]
INDEX OF PREMISES
Fields & gardens
Residential
Hotels & Public Houses
Outhouses & stores
Public Buidings
Businesses & Services
C Churches & halls
MH Moot Hall
MC Magistrates' Court
P S Police Station
T Toilets
B Banks
D Doctors' Surgery
G Garages
P Post Office
S Solicitors
TX Telephone Exchange

closures over the last few years for one reason or another, the town has still been able to add other services to those already in existence, with examples such as a supermarket, a ladies and children's outfitters, a boutique, a domestic appliance shop and two shoe shops. Some of these occupy refurbished premises, whilst others are in newly constructed buildings on slum-cleared sites.

The accompanying map (figure 3.3) shows the structure and layout of Brampton Town Centre, displaying much the same irregular pattern as 200 years ago (figure 1.8). The bulk of the 59 retail shops are to be found around the Market Place, along both sides of Front Street and in High Cross Street. The majority of trades and professions also occur in this area, helping to create a well defined business district or central core. As well as providing space for car parking, the cobbled area around the Moot Hall is also the site for the Wednesday market. In this respect Brampton is fortunate but not unusual. The presence of a weekly market and a convenient site for it not only enhances the status of the settlement, but also helps to promote its role as a shopping centre for the surrounding region.

In comparing Brampton with its two near neighbours of similar size and status, namely Wigton and Haltwhistle, it can be seen that there is much in common between them. All three towns have similar proportions of both high and low threshold services contained within their older areas, and many of them are housed in 18th or 19th century buildings which help to give the settlements much of their old-world character. They all display a mixture of long established family grocers or butchers competing for trade alongside modern supermarkets or discount stores. Brampton has perhaps more new buildings than the other two towns which, together with revitalisation of older property in the central area, is no doubt a legacy from the Spadeadam era.

Most of the attractiveness of Brampton as a market town however, must be ascribed to three important factors. Firstly, the variety and range of retail outlets; secondly, the compact nature of their location; and thirdly, the ease of access and convenience of car parking for out-of-town customers. The traffic problem in many towns is a difficult one to solve and the various proposals for relieving it in Brampton (Brampton Advisory Reports, 1966, and 1976) have met with many objections. Although the traffic flow and parking facilities in Front Street and the Market Place are accepted by both traders and shoppers as something of a hazard, they are also regarded as a necessary convenience that is often impossible to find in larger towns and cities. This factor alone possibly influences where many out-of-town shoppers decide to go for

particular services.

Berry (1967, p.3) sums up the picture succinctly when, with reference to centrality, he states that "..... consumers who must visit a service outlet on a regular basis prefer a location that permits them to do so with the minimum of effort, and if a choice of location is available, they will generally use the one which involves the least effort". That Brampton can provide the services and outlets in a way that is convenient for consumers is an essential factor in preserving its important role as the prime market town and rural centre for N.E. Cumbria.

3.2 SERVICE AREAS AND FIELDS OF INFLUENCE

Several terms have been used to describe the extent and intensity of a town's influence on its surrounding region. Smailes (1947) coined the phrase 'urban field', whilst 'sphere of influence' has been used by Carter (1966), and 'interaction field' by Toyne (1971). In this study it is proposed to use 'field of influence' and 'service area' to describe such a region, although alternative terms may be introduced where it is seen to be appropriate. "The precise term used matters little, provided that it is not taken as the exact description of the relationship between a settlement and its surroundings" (Johnson, 1972, p.87), for this relationship will vary according to the density of population within the region, and the type of services provided by the town. Similarly the delimitation of absolute or maximum service areas is not as important as the recognition of zones of intensity within them. Such zones are often influenced by the threshold level of the activity concerned, and the degree of competition from other centres. For instance, a doctor may have one or two patients as far as 20 miles from his base and much nearer that of another doctor. The location of these patients would indicate the maximum extent of the first doctor's area of service, whereas the bulk of his clients are most probably found within a zone of no more than 5 miles radius from his centre.

With these criteria in mind, it is now possible to examine the second of the two methods of ascertaining centrality as suggested by Brush and Bracey (1955), i.e. the measurement of the area dependant on the centre for goods and services.

3.2.1 Methodology for Service Areas

Several recognised methods have been used to assess the fields of influence of a town, and at the same time help to measure its degree of centrality. The first method of approach endeavours to

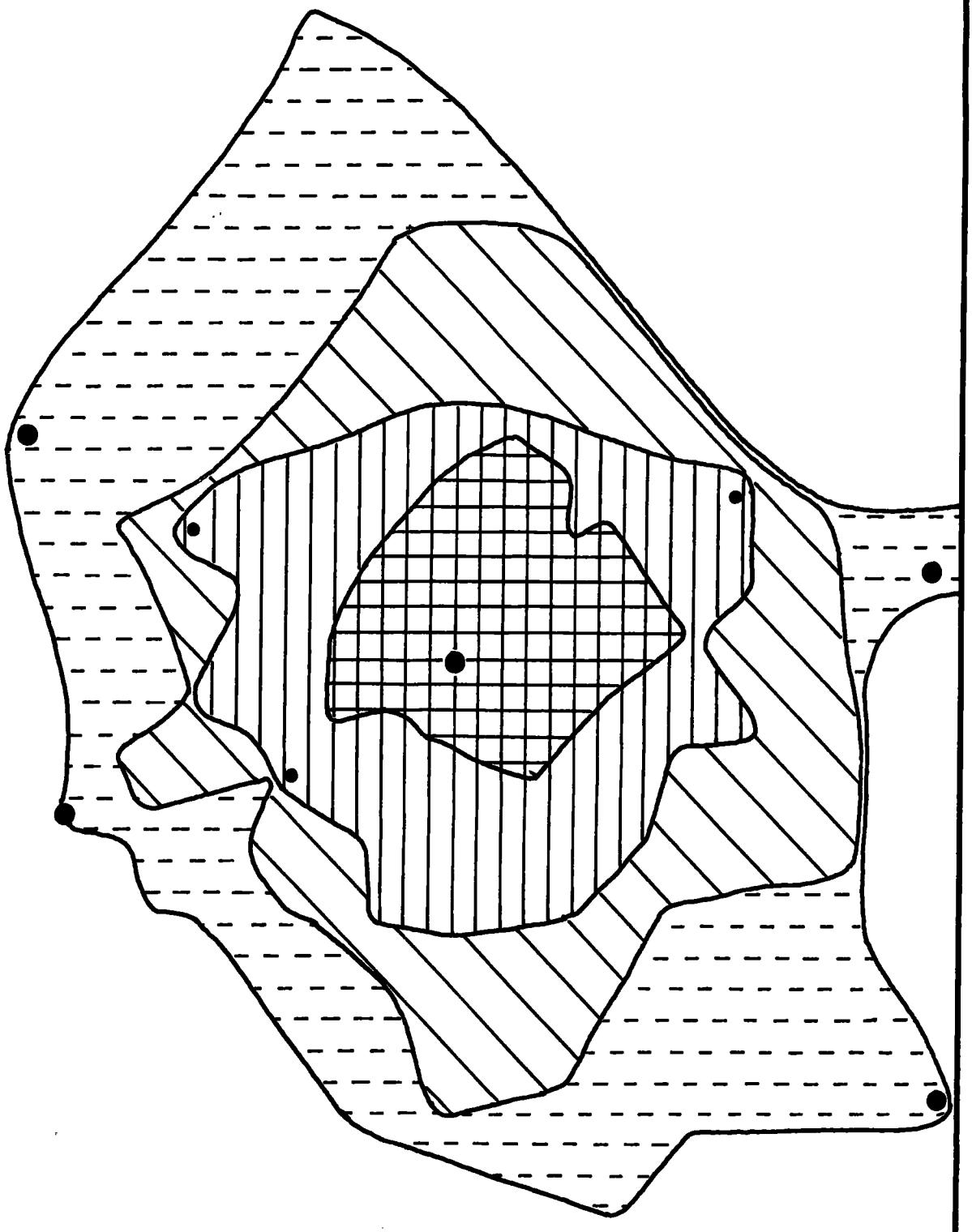
look outwards from a centre into its surrounding region. The task entails collecting information from services based in the centre, and plotting on a map the distribution of customers' homes, and/or the extent of movement by the business as in the case of deliveries. The points are all linked up to form a line which marks the maximum boundary of the service area for the function concerned. Thus the catchment area of pupils at a school, or the extent of letter and parcel deliveries from a post office can be defined.

Ideally, every individual service area should be taken into account in order to obtain the most accurate picture of a centre's field of influence. From a practical point of view however, such an exercise is not feasible, therefore an assessment of a selection of the various services, with representatives of both low and high threshold types, is usually adopted. Each of the sample fields of influence is superimposed on a map of the area, and from the pattern that emerges, the proportional zones of intensity can be discerned. Since intensity decreases with distance from the centre, it should be possible to distinguish a zone of maximum influence nearest the centre, and a minimum zone furthest away. Between these two will occur intermediate zones in which there is considerable variation of influence. Consequently the boundary of a centre's 'mean' or average field of influence (i.e. its general service area), is taken as the zone within which 50% of all trade and customer movement occurs. Outside this zone the centre naturally loses its domination to those of other centres.

No method can be wholly accurate, and although the usefulness of this type of analysis has been ably demonstrated by Smailes (1953), and Carter (1966 and 1972), it has its limitations and disadvantages. Firstly, because it needs to be selective in terms of analysis, the method is subjective. Secondly, an assumption is made that everywhere within a service area is covered by the service in question. This is possibly true for certain functions like schools and post offices, but not for others like grocers, butchers or even doctors. In fact the service areas for most businesses in the retail category overlap with those from other centres. Similarly, customers can change their place of business from one centre to another, therefore the service area so defined is only relevant to the point in time at which it was surveyed. The extent to which a retail firm may influence its customers in the surrounding area also depends on the competition from other firms in other centres at any specific time. For instance, if a furniture shop in centre A is temporarily unable to provide a

ZONES of INFLUENCE

Figure 3.4a



INDEX of ZONES

- INNER > 75%
- MAIN > 50%
- OUTER > 25%
- FRINGE < 25%

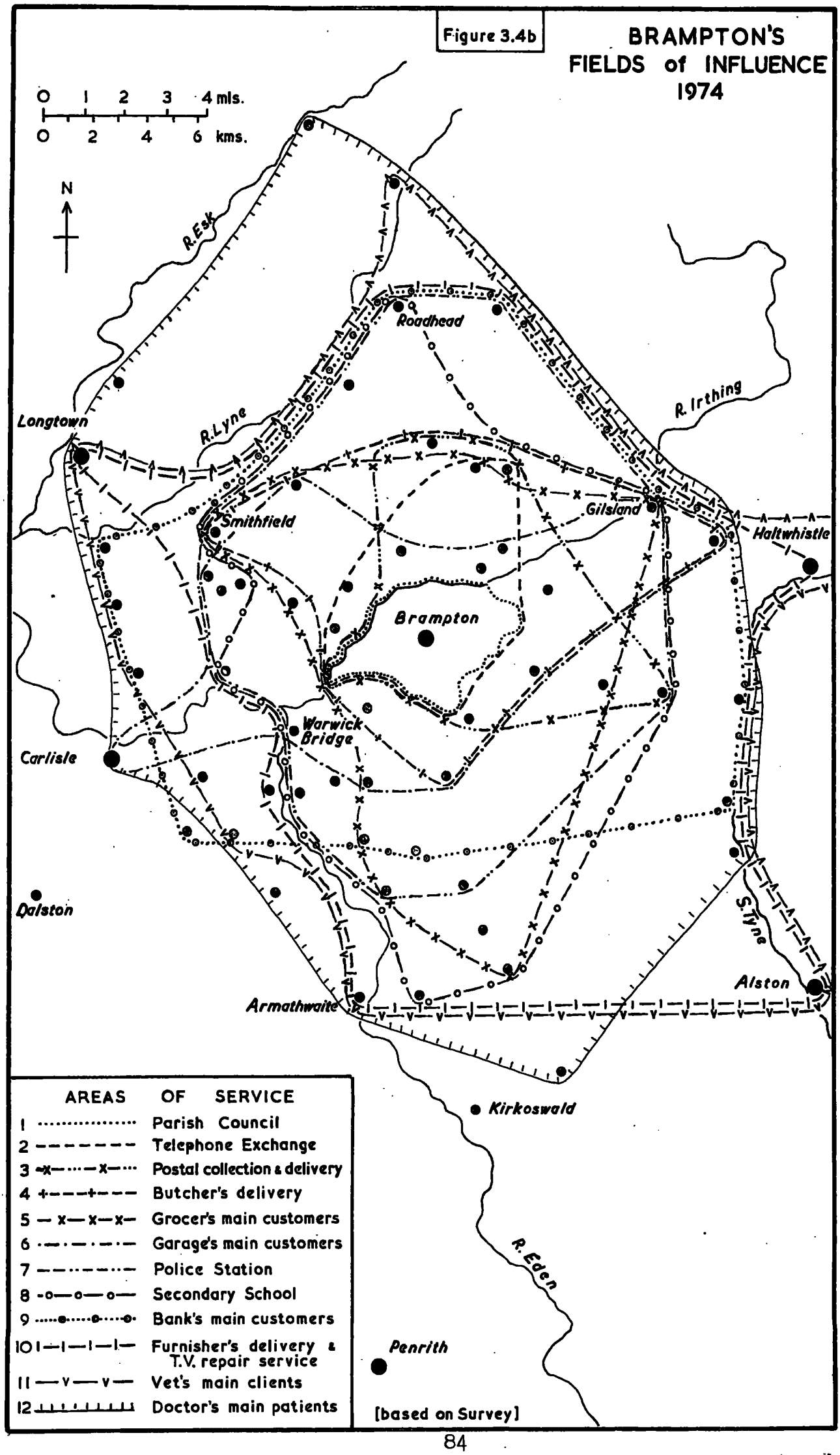


Figure 3.4b
BRAMPTON'S FIELDS of INFLUENCE 1974
0 1 2 3 4 mls.
0 2 4 6 kms.
N
R.Esk
Roadhead
Longtown
R.Lyne
R. Irthing
Smithfield
Gilsland
Haltwhistle
Brampton
Warwick Bridge
Carlisle
Dalston
S.Tyne
Alston
Armathwaite
Kirkoswald
R.Eden
Penrith
[based on Survey]
AREAS OF SERVICE
1 ..... Parish Council
2 – – – – – – Telephone Exchange
3 -x-···-x-··· Postal collection & delivery
4 +---+--- Butcher's delivery
5 — x— x— x— Grocer's main customers
6 —·—·—·— Garage's main customers
7 ———·—·— Police Station
8 -o—o—o— Secondary School
9 ·····•·····•·····•· Bank's main customers
10 I—I—I—I— Furnisher's delivery & T.V. repair service
11 —v—v— Vet's main clients
12 Doctor's main patients

specific item, then a customer is likely to buy it at centre B, whereas 6 months later the reverse may be true. Finally, as with any method of survey, the results are influenced by the amount of information that each business is willing to divulge.

In utilising this method for Brampton, a 'trade' questionnaire was distributed to a variety of businesses and service outlets within the town (appendix 3.3). The questions asked for information on the number and distribution of known customers and also the extent of movement in the case of delivery or service of goods. A final question asked for the durable goods sales turnover in the hope that the Lakshmanan-Hansen model of centrality may have been tested. Only one establishment was prepared to divulge this information however, and so the matter was not pursued. The choice of outlets was based on the list suggested by Everson and Fitzgerald (1972, p.139), and includes a variety of retail and public services with both low and high economic thresholds.

3.2.2 Analysis of Service Areas

The most profitable results came from the services in the public sector, since several of them had statutory areas of influence which could readily be given, e.g. police, school and parish council. Less favourable results came from the retail and trade establishments that were questioned, partly because of some of the reasons outlined above. Many businesses such as bakers, confectioners, shoes and clothing do not provide a delivery service and only have cash customers. They are therefore not always aware of the home location of their customers other than those living in the town itself. Only those services with a recognised delivery service (such as the furnishers), or those with account customers (e.g. a grocer, butcher and garage), were able to supply the necessary information to help define their fields of influence. A bank was, at first, reluctant to divulge the whereabouts of its regular customers, whilst a fuel merchant expressly refused to answer on the grounds of confidentiality.

Although it was hoped to obtain information from 20 different services, 8 of these provided insufficient or unsatisfactory answers for them to be included. Results from the remainder however, have enabled a series of 12 fields of influence to be defined and mapped (figure 3.4b). As can be seen from the illustration, the service areas vary in extent from the small coverage of the parish council, to the wider catchment areas of the grocer, school and bank, and to the extremely large regions covered by the doctor, vet and furnisher.

Each function has its own service area, some more to the north, others more to the south of the town, often depending on the location of a similar service with comparable attraction. No two functions have exactly the same field of influence, but bunching or coincidental alignment of boundaries does occur in several places. In the N.E. of the region there is a fusion of 5 separate boundaries between Bewcastle and Gilsland mainly because of the absence of any population further in that direction. To the east are two bands of bunching, an inner one approximately coincident with the county boundary, and an outer one which is aligned with the course of the South Tyne. Rivers also help to produce bunching in other directions. To the N.W. of Brampton it is the river Lyne and to the S.W. it is the river Eden which have been important influences. It is also significant to note that there are four points within the region where the service areas tend to cluster. One of these is at the S.W. corner of Brampton Parish, and the others, at Warwick Bridge, Gilsland and Smithfield, are all intermediate points on the main routeways from Brampton to the other main centres of the region (namely Carlisle, Haltwhistle and Longtown).

Interesting fields of influence are exemplified by those of the doctor, vet and furnisher. All three are old, single establishment businesses which have undoubtedly built up strong and fairly widespread reputations. Both the furnisher and vet have customers as far distant as Alston to the south-east and Longtown to the north-west. The veterinary practice has recently established a branch-surgery in Haltwhistle, but it already had an existing commitment in that area, so its field of influence has changed very little. The doctor's practice, with six general practitioners and an estimated clientele of about 12,000 people, is one of the largest in the whole of N. Cumbria. Consequently its field of influence is rather large, and presumably overlaps the service areas of other practitioners in the region, notably two at Longtown, two at Haltwhistle and especially the sixteen in Carlisle.

Although the picture as presented by these superimposed service areas appears a rather intermixed and tangled lattice of lines, it becomes more meaningful when it is broken down into zones as illustrated by the overlay to the service area map (figure 3.4a). From the 12 individual fields of influence, zones have been constructed based on a percentage of the total. Thus the 'mean' or 50% general field of influence is where the sixth line occurs (counting outwards from the centre), no matter which service it represents. Similar percentage zones, both lower and higher than the 'mean' can also be identified and mapped.

Because of the significant bunching of service areas along certain boundaries and at certain points, 4 main zones are distinguishable in Brampton's case. They are, an inner with up to 75% influence, the main with 50%, an outer with 25% and a fringe zone with less than 25% influence.

Several interesting observations emerge from the patterns produced by these zones. Firstly, the fringe zone extends as far as, and includes, the three nearest towns in the region (namely Carlisle, Haltwhistle and Longtown). This is natural since there is bound to be some interchange of business between neighbouring centres which are relatively close to each other. Arising from this is the fact that distance, rather than the magnitude of services provided by other centres, appears to be more of an influence in limiting the extent of Brampton's fields of influence. Even though Carlisle has approximately six times the number of services that Brampton can offer, the fact that the distance between is only nine miles enables the influence of some of the smaller centre's high threshold services to be felt within the city. In contrast, the limits of these same services fall short of Penrith (a much smaller centre than Carlisle), which lies 19 miles away to the south. The average limit of this fringe zone appears to be in the region of 10 to 12 miles from Brampton.

A second and very important observation concerns the size, shape and extent of Brampton's main zone of influence. This is as well defined as any, with much of the boundary distinguished by clusters of service area limits, especially at Warwick Bridge, Gilsland and Smithfield. The shape of the zone is fairly regular, particularly on the northern side where there is a more even dispersion of the population. It has a radius of between four and six miles, being shorter in the direction of Carlisle, and longer on the other major routeways.

The final observation concerns the boundary of the school catchment area, within which the household questionnaire was distributed. For the majority of its extent it corresponds with the outer zone of influence. This means that the survey covers not only the main zone, from which it can be expected that a good proportion of business will be with Brampton, but also a zone of 'indifference'. According to Everson and Fitzgerald (1972), such a zone indicates where there will be trade with more than one centre but with no overall preference for any.

3.2.3 Methodology for Market Preference

A different method of enquiry, sometimes used in such surveys, involves the questioning of customers within a centre to find out their home locations and shopping habits. This approach was not adopted

however, because it was regarded as having too many limitations and disadvantages. Firstly, such a survey could be too random and not result in adequate representation unless numerous surveys were carried out, at different establishments, on different days of the week and at different times of the year. Under the circumstances this was not practicable. Similarly, surveys would need to be carried out in other towns and centres in order to obtain an overall impression of people's shopping and business habits. Also many people would possibly be too harassed or reluctant to answer questions in the middle of their shopping expeditions.

The second method of assessing the fields of influence of a town to be used in this study is that which has been ably demonstrated by Bracey (1953) for Somerset, and Berry (1967) in the measurement of consumer travel for the mid-west state of Iowa. It reverses the process of the first approach, and looks inwards to a town from its surrounding region. The task involves questioning a representative sample of people from both the town and surrounding region and asking them which centre they normally visit for particular services. The resulting information can then be plotted both graphically and on a map. With this method several desirable results can be achieved and the advantages tend to outweigh the disadvantages. Firstly, within the limits of the survey area there is a comprehensive cover for all the sample services required. Secondly, business trips will be made to a variety of centres thereby enabling preference to be assessed, and fields and zones of influence to be measured. Similarly the distances travelled for each type of service can be measured and the average range can then be correlated with threshold. A final advantage of this method is that the observed results can be compared with the theoretical measurement of gravity and breakpoint models.

Carter (1972) outlines some of the constraints involved with this type of survey, but as Johnson (1972, p.89) states, the method is .... "particularly well suited for examining the role of a small urban settlement as a central place serving a rural community". This would appear to suit Brampton's case admirably, and it was the answers to the second part of the household questionnaire (appendix 2.1) that enabled this complementary method of service area analysis to be determined. Terms, such as 'trip' or 'desire lines', often used to describe the movement of consumers for their services, have been set aside in favour of 'market' or 'centre preference' which tend to give a more geographical meaning to this type of analysis.

ZONES of PREFERENCE
for BRAMPTON

Figure 3.5a

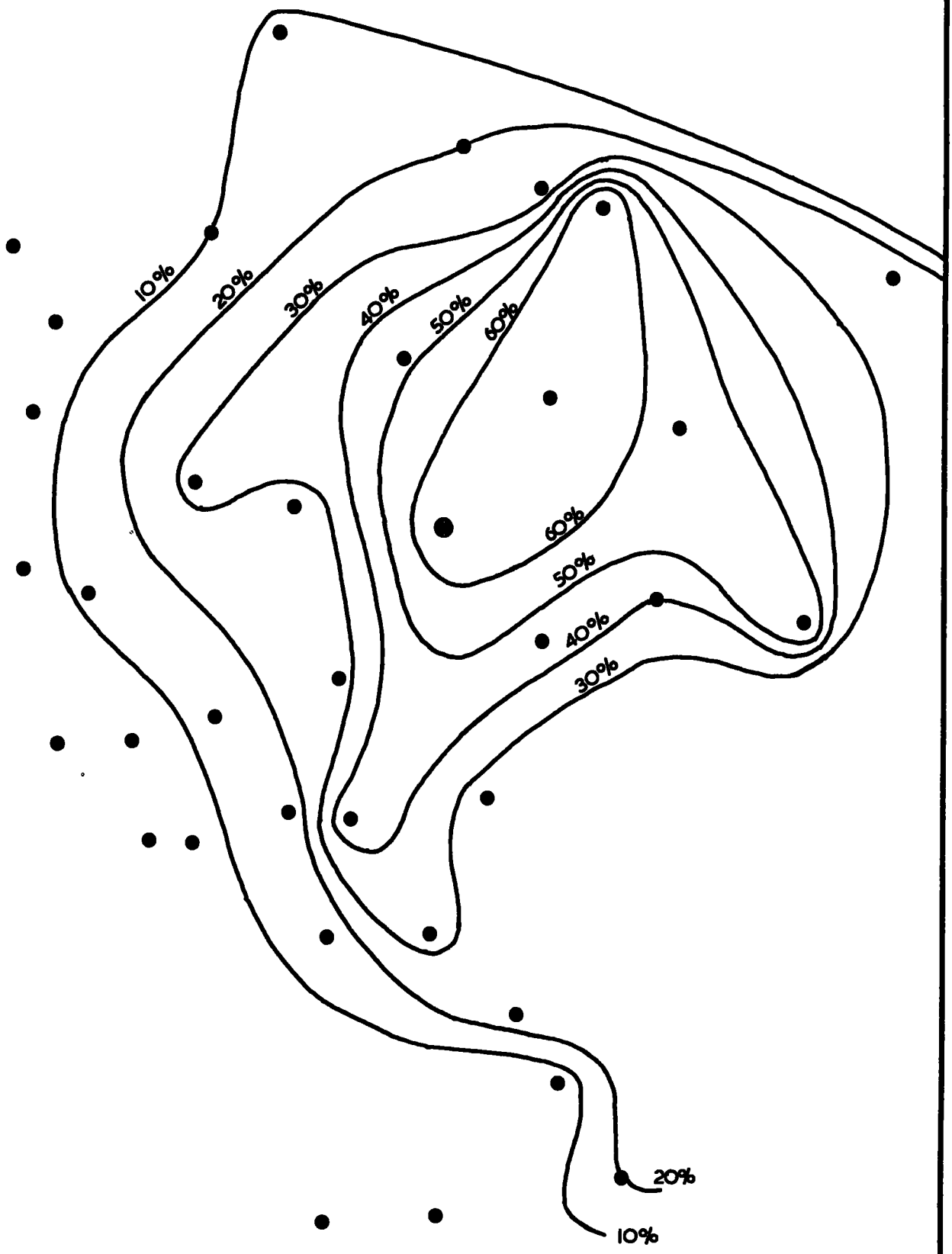
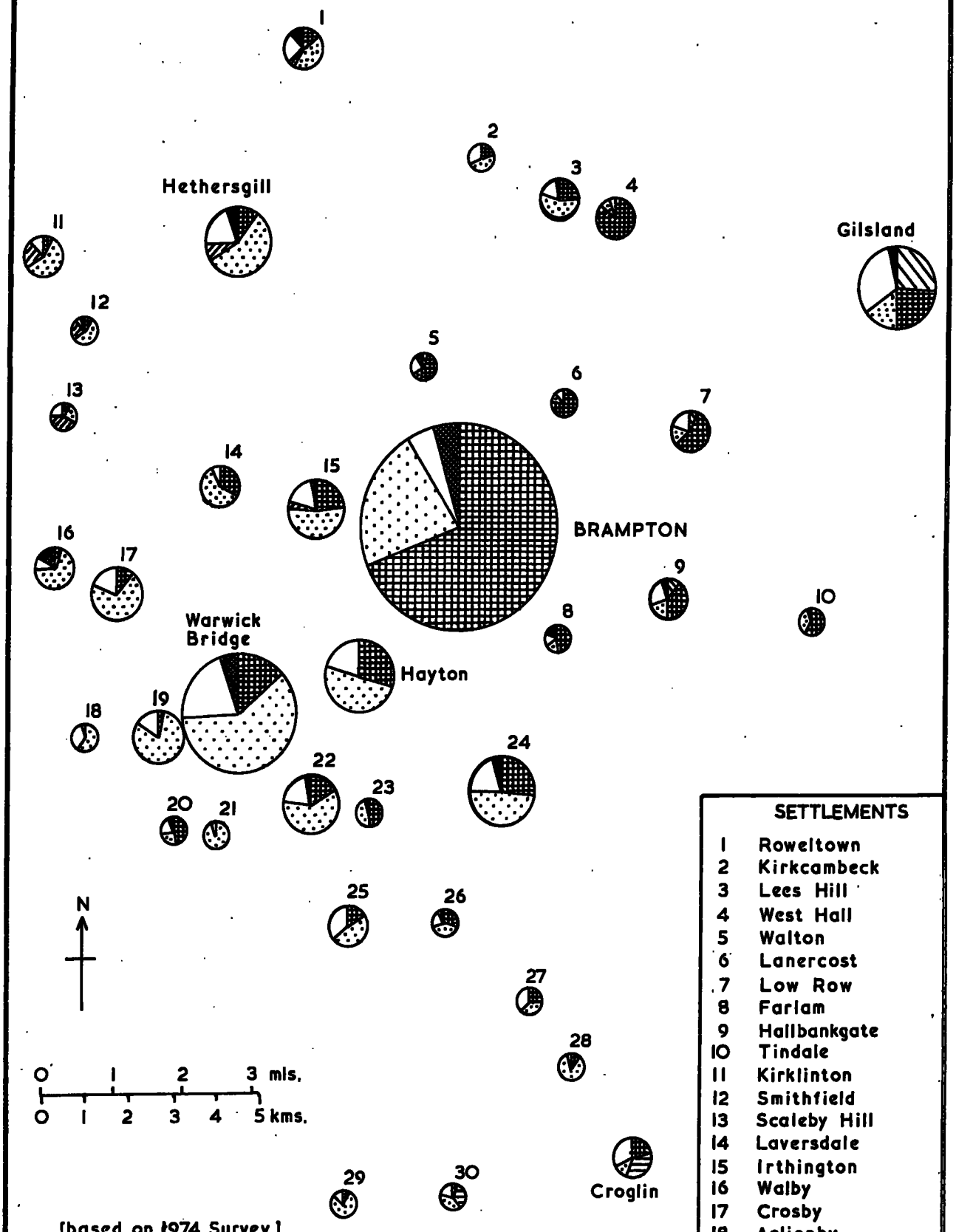


Figure 3.5b

SURVEY AREA MARKET PREFERENCE

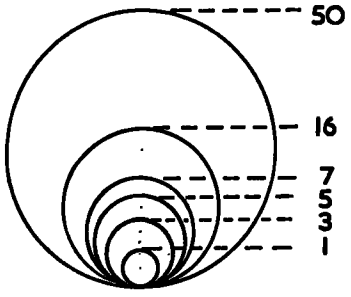


[based on 1974 Survey]

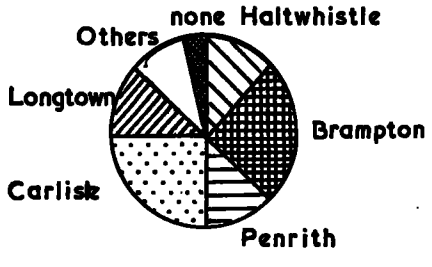
SETTLEMENTS

1 Roweltown
2 Kirkcambeck
3 Lees Hill
4 West Hall
5 Walton
6 Lanercost
7 Low Row
8 Farlam
9 Hallbankgate
10 Tindale
11 Kirklinton
12 Smithfield
13 Scaleby Hill
14 Laversdale
15 Irthington
16 Walby
17 Crosby
18 Aglionby
19 Warwick
20 Wetheral
21 Great Corby
22 Heads Nook
23 Faugh
24 Castle Carrock
25 Cumwhitton
26 Carlatton
27 Cumrew
28 Newbiggin
29 Armathwaite
30 Ainstable

circles proportional to the number of households



INDEX TO CENTRE OF CHOICE



3.2.4 Analysis by Centres

Each family covered by the survey was asked where they went (or would go) for each of 25 services in the retail, trade and professional categories. The overall results (table 3.2 and appendix 3.4), show that there is equal preference for both Carlisle and Brampton with approximately 39% each. In fact over half the population use either Carlisle or Brampton for all the 25 services, and more than three quarters prefer the two centres for 15 out of the 25.

Overall Preference for Centres — Table 3.2

CENTRE OR CATEGORY	HOUSEHOLDS				
	Survey Area	50 in Brampton		90 in rest of Area	
	% of 140	% of 50	% of 140	% of 90	% of 140
Carlisle	39.0	22.4	8.0	48.4	31.0
Brampton*	38.6	68.2	24.4	22.1	14.2
Haltwhistle	2.0	0.6	0.2	2.8	1.8
Longtown	1.4	0.2	0.1	2.1	1.4
Penrith	1.0			1.1	1.0
Warwick Bridge*	1.9	0.2	0.1	2.9	1.8
Other Centres	4.1	1.6	0.6	5.5	3.5
Mobile Shops	3.2	1.4	0.5	4.2	2.7
Self	1.5	1.0	0.4	2.0	1.1
None	4.2	4.3	1.5	4.2	2.7
Same Centre (except *)	3.0			4.6	3.0

Although it is not surprising that the majority of households prefer to use these two towns since there is little other choice within N.E. Cumbria, it is significant to note the differences between those living in Brampton and those living in the surrounding area. More than two thirds of Brampton people use the services of the town, and only 22% show preference for Carlisle, whilst from the rest of the survey area, 48% of the people use Carlisle and only 22% choose Brampton. Also, as might be logically expected, the proportion of households using travelling shops and other centres is higher from the surrounding region than from Brampton.

Other important centres used are Haltwhistle, Longtown, Penrith and Warwick Bridge, though mainly by people living closer to those settlements than to Brampton or Carlisle. For instance, as the map (figure 3.5b) illustrates, preference for Penrith is only shown by two villages in the south of the area, - Croglin and Ainstable, and

preference for Haltwhistle by three settlements to the east of Brampton, namely Hallbankgate, Low Row and in particular Gilsland. The overall pattern as shown by the map, illustrates the extent to which households from the settlements covered by the survey make use of the two chief centres of Carlisle and Brampton. Once again, as might be logically expected, preference for a centre diminishes with increasing distance, especially in Brampton's case. There are one or two exceptions, which is understandable since no set of answers can hope to produce a perfect pattern, particularly when they have to relate to human behaviour. The exceptions are shown by settlements such as Wetheral, Great Corby, West Hall and Newbiggin. Part of the reason is the small representation from each of these locations, but an important factor concerns the workplace of the households questioned. This means that for many services, the centre where people work will be used in preference to one that might be nearer to the home location. This is certainly true of the four examples listed, where the households from Great Corby and Newbiggin work in Carlisle, and those from Wetheral and West Hall commute to Brampton.

3.2.5 Analysis by Services

In analysing the results according to each service, it was apparent that several extra categories needed to be designated in addition to those of the main centres. The first inclusion was for travelling shops or vans which, over the last few decades, have played an important part in the provision of retail goods to rural communities, especially where no alternative outlet has been available. Listed under the 'self' category are those households which engage upon the activity themselves, such as decorating and hairdressing. Similarly it was felt necessary to list those families who obtained services from their home village, since these functions would be mainly of the low threshold variety. Finally there were several services to which the answer was 'none' (especially in the case of baby goods), and so a further category in the summary became necessary.

In general, the results (appendix 3.5) have been very fruitful and have enabled a comprehensive picture of market preferences from within the survey area to be established.

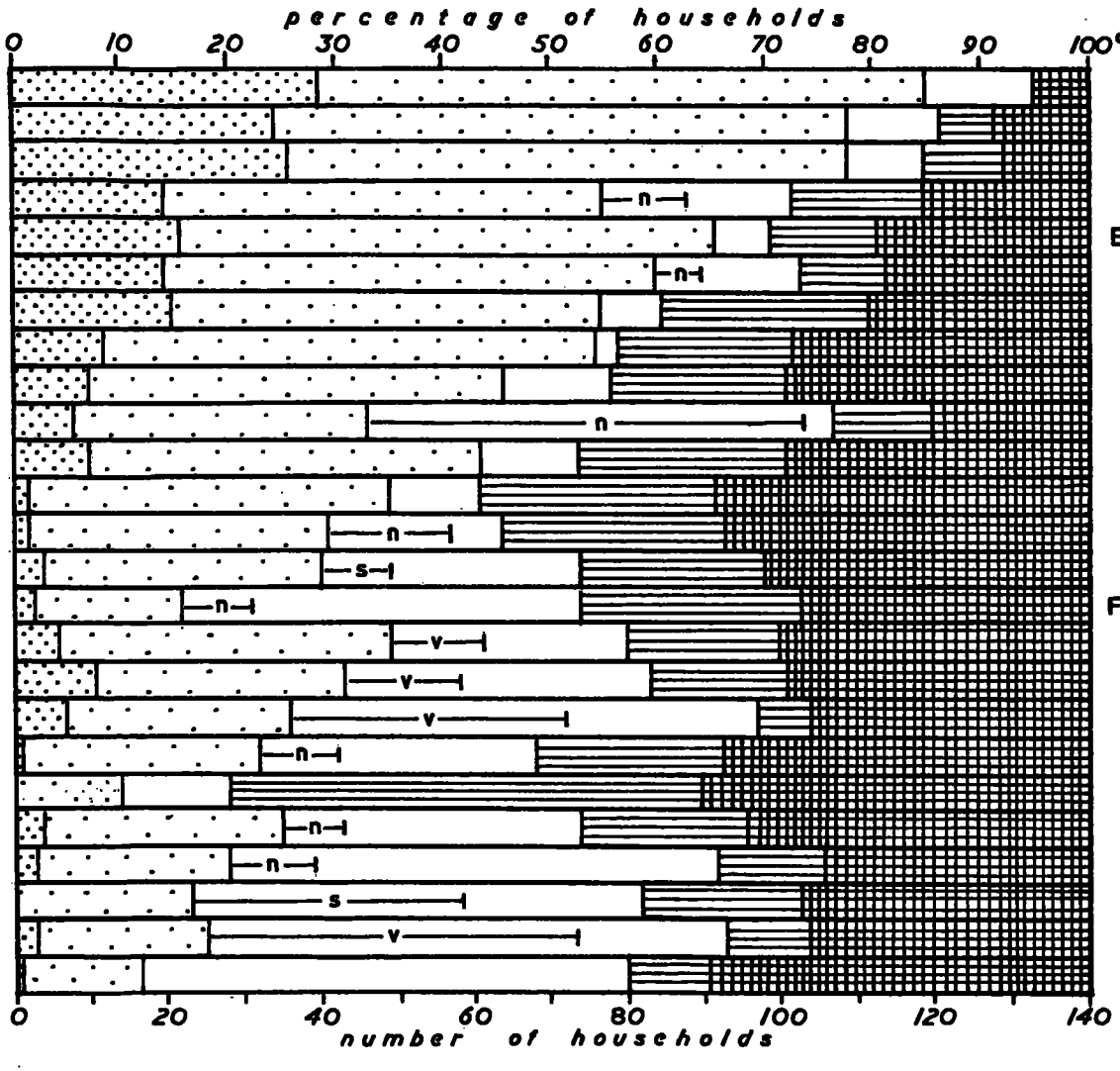
Not surprisingly, it is Carlisle that is preferred for the higher threshold goods and services by the majority of households, both from Brampton and the rest of the area. Although such services are available in other towns in the area, Carlisle has the greater variety and number of outlets. In fact the city is preferred by more than 50% of the people for each of 9 services and between 25% and 50% of the house-

[based on Survey 1974]

SERVICES

Figure 3.6

A. MARKET PREFERENCE

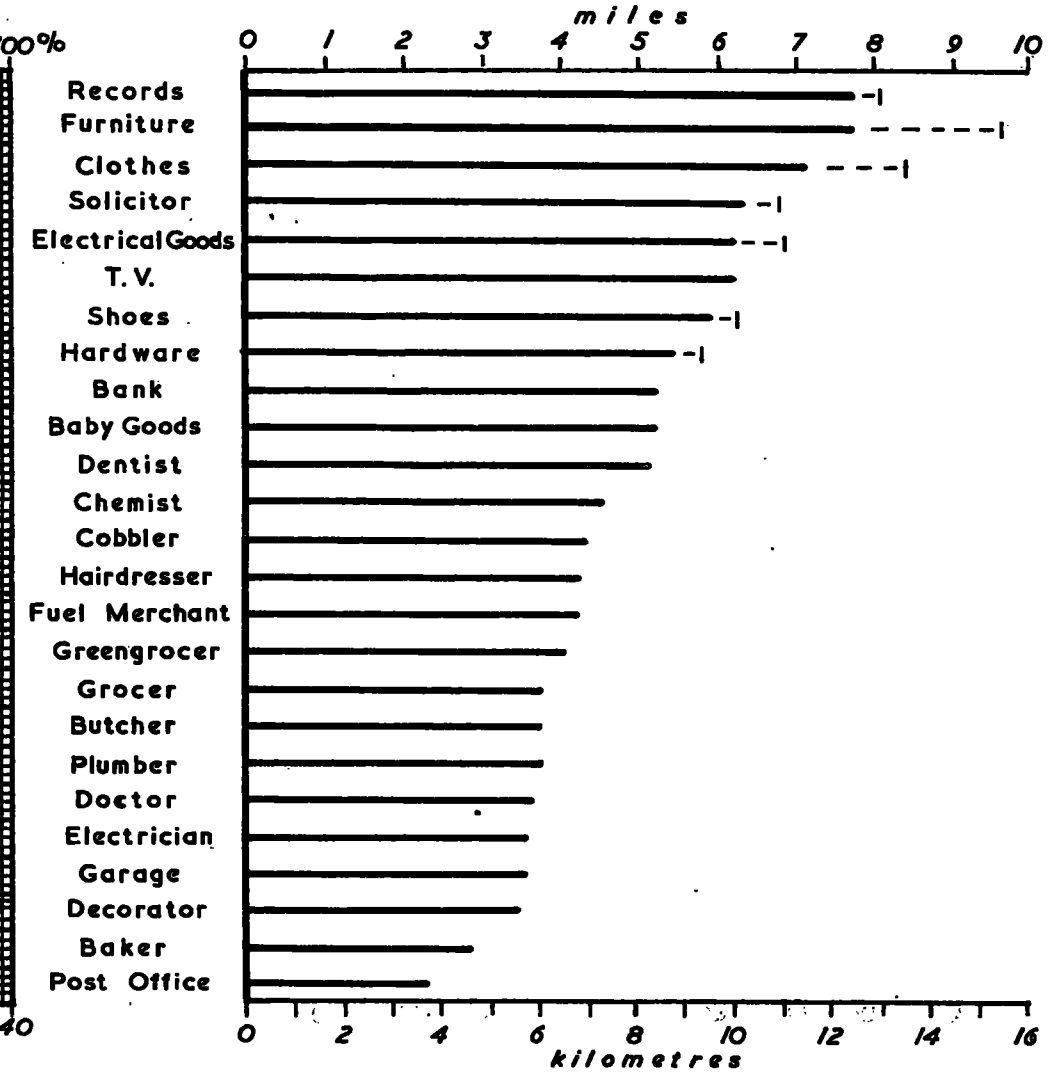


Preference for Carlisle
by Brampton people
by remainder

for Brampton

for other centres
by all 140
[v=van, s=self, n=none]

B. RANGE



average distance travelled for each service
within region ——— plus outside - - -

holds for a further 10 (table 3.3). At the top of Carlisle's list is the preference for records with 119 households (84%), followed by furniture and clothes each with 109 households (78%). At the bottom of the list is the preference for a doctor, with only 14 households (10%), and none of them coming from Brampton.

To some extent the preference list for Brampton is almost the reverse of Carlisle's, with a doctor at the top, and furniture, clothes and records at the bottom. These last three commodities are the only ones in which Brampton people show a greater preference for Carlisle than for their own town, whereas the high choice for a doctor (80%) underlines the existence of a large service area which was established from the first method of analysis.

The histogram (figure 3.6A) illustrates the details of preference for each of the 25 services by comparing Brampton's households with those living in the rest of the survey area. It shows that the majority of Brampton people prefer the town for 20 out of the 25 services, but only one, - the doctor, is chosen by more than 50% of the people from the surrounding area. There are, however, 11 services provided by Brampton which attract between 25% and 50% preference from those living outside the town. They range from the low threshold types, such as a post office and grocer, to the middle threshold group of chemist, dentist, bank, plumber and electrician.

In fact it is from this middle threshold group of services that Brampton's attraction as a centre appears to emanate. Although there are good rates of preference for the lower-order functions, the greatest preferences, particularly from the surrounding area, are for services within this middle group.

The histogram also shows a significant factor concerning the lower threshold services, such as a post office, garage, butcher, baker and grocer. In general more outlets of these services are to be found located in a greater number of settlements than with higher threshold types. Consequently the population has a wider choice from which to select an outlet. This is endorsed by the preference rates shown for low threshold services, where the smaller centres often score at the expense of the larger towns and cities. Two examples from table 3.3 illustrate the point :-

a) post offices, where out of a possible 37 locations within the area (including 5 towns), some 28 are used, giving a preference rate of 44% for small centres, compared to 43% for Brampton and only 12% for Carlisle.

b) garages, where 18 out of 25 locations are used, producing a

39% preference for small centres, 37% for Brampton and 21% for Carlisle.

Market Preferences — Table 3.3

THRESHOLD & SERVICES		% PREFERENCE*FOR CENTRES IN REGION				
		LARGE Carlisle	MEDIUM Other Towns	MEDIUM Brampton Only	SMALL Villages + Vans	Number of Possible Locations
HIGH	1 Records	[89]	10	5		5
	2 Furniture	[78]	16	14		6
	3 Clothes	[78]	18	15		5
	4 Electric Goods	[66]	32	29		6
	5 T.V.	[62]	34	28	3	6
	6 Solicitor	[60]	34	29		5
	7 Shoes	55	[43]	39		5
	8 Baby Goods	55	45	[40]		5
	9 Hardware	54	46	44		5
MEDIUM	10 Bank	46	53	45	1	9
	11 Dentist	44	55	47		5
	12 Chemist	35	65	56		5
	13 Doctor	10	86	80	4	7
	14 Decorator	25	67	63	8	10
	15 Cobbler	33	63	61	4	6
	16 Plumber	26	62	58	12	12
	17 Fuel Merchant	18	62	55	19	12
	18 Electrician	26	55	50	18	13
	19 Hairdresser	31	54	51	15	12
	20 Greengrocer	35	49	43	16	12
	21 Grocer	31	[46]	[41]	[23]	33
LOW	22 Butcher	26	36	31	[38]	12
	23 Garage	21	[40]	37	[39]	25
	24 Baker	18	38	33	[43]	33
	25 Post Office	12	[43]	[43]	[44]	37
Boxed figures indicate a high preference rate		> 60%	> 40%	> 40%	> 20%	

* Net % excludes None and Self Categories

Table 3.3 clearly illustrates the tripartite nature in the choice of centres and helps to underline the relationship that exists between preference and threshold. Carlisle shows dominance for the high-order

services, Brampton and the other towns for the middle group, and local village centres make their attraction felt with the low threshold services. Not surprisingly, there are several examples where preferences for the different types of centre are similar, e.g. bank and dentist, garage and post office. This is mainly brought about by virtue of the attraction of more specialised services in the larger centres which make those of lower threshold available to a larger population.

The following quotation by Scott (1970, p.12) summarises the pattern found in N.E. Cumbria quite clearly :-

> "Small centres generally provide only goods such as foodstuffs which are purchased frequently with minimum consumer travel. Establishments retailing such goods have relatively low conditions of entry (i.e. threshold). On the other hand larger centres provide not only the low-order goods, but also higher-order goods bought less frequently and for which shoppers will travel longer distances ..... Since shoppers in large centres can buy both low-order and high-order goods, shops selling low-order goods located in larger centres will have larger market areas (therefore a larger clientele) than shops of the same type located in smaller centres."

Although the quotation refers specifically to shops and retail goods, the premise can be equally related to most other types of service where the customer has freedom of choice.

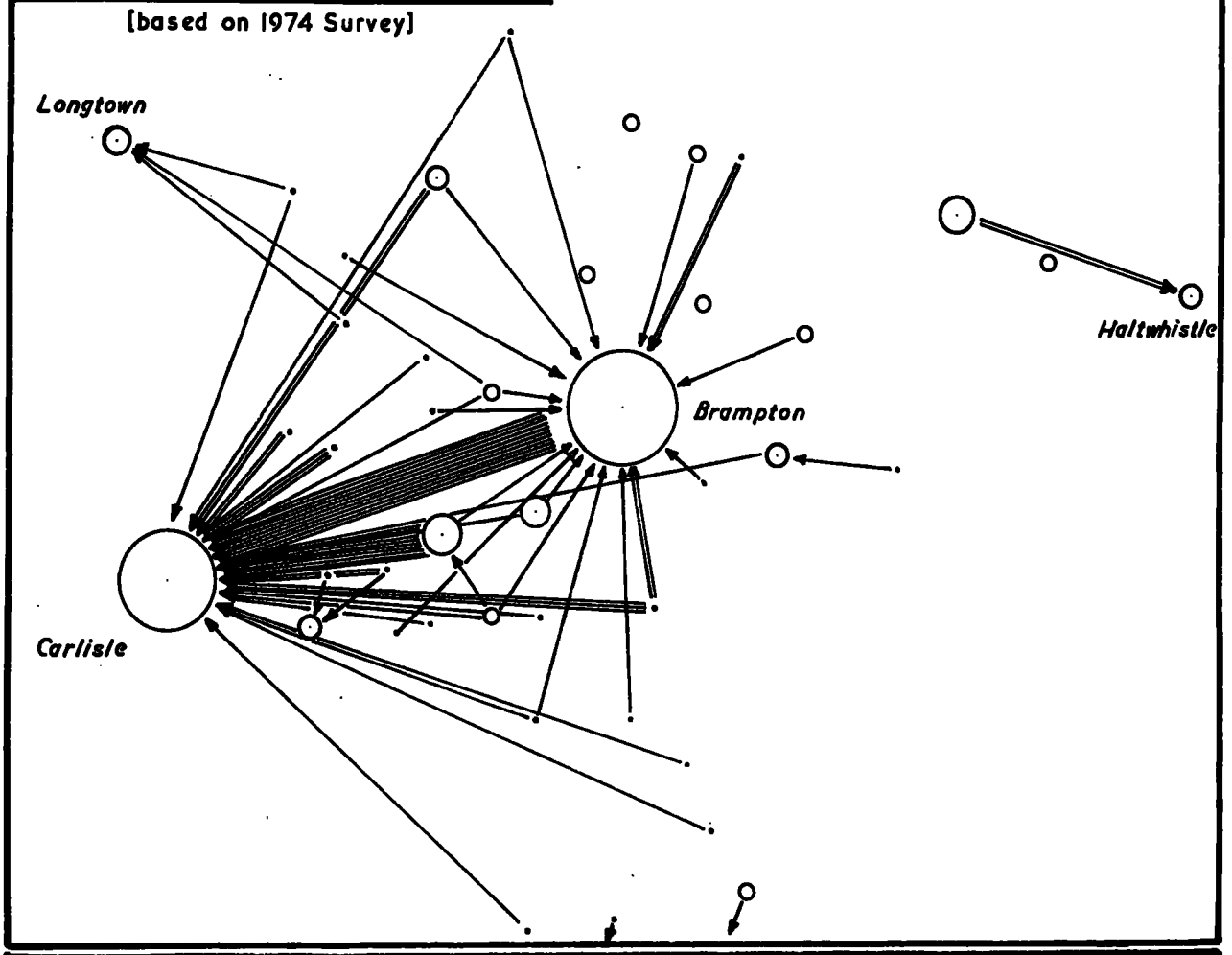
Some of the results from those questioned in the survey on market preference or centre choice are illustrated by figures 3.7, 3.8 and 3.9. They show two examples from each of the three areas of threshold, and visually complement the numerical picture presented by table 3.3.

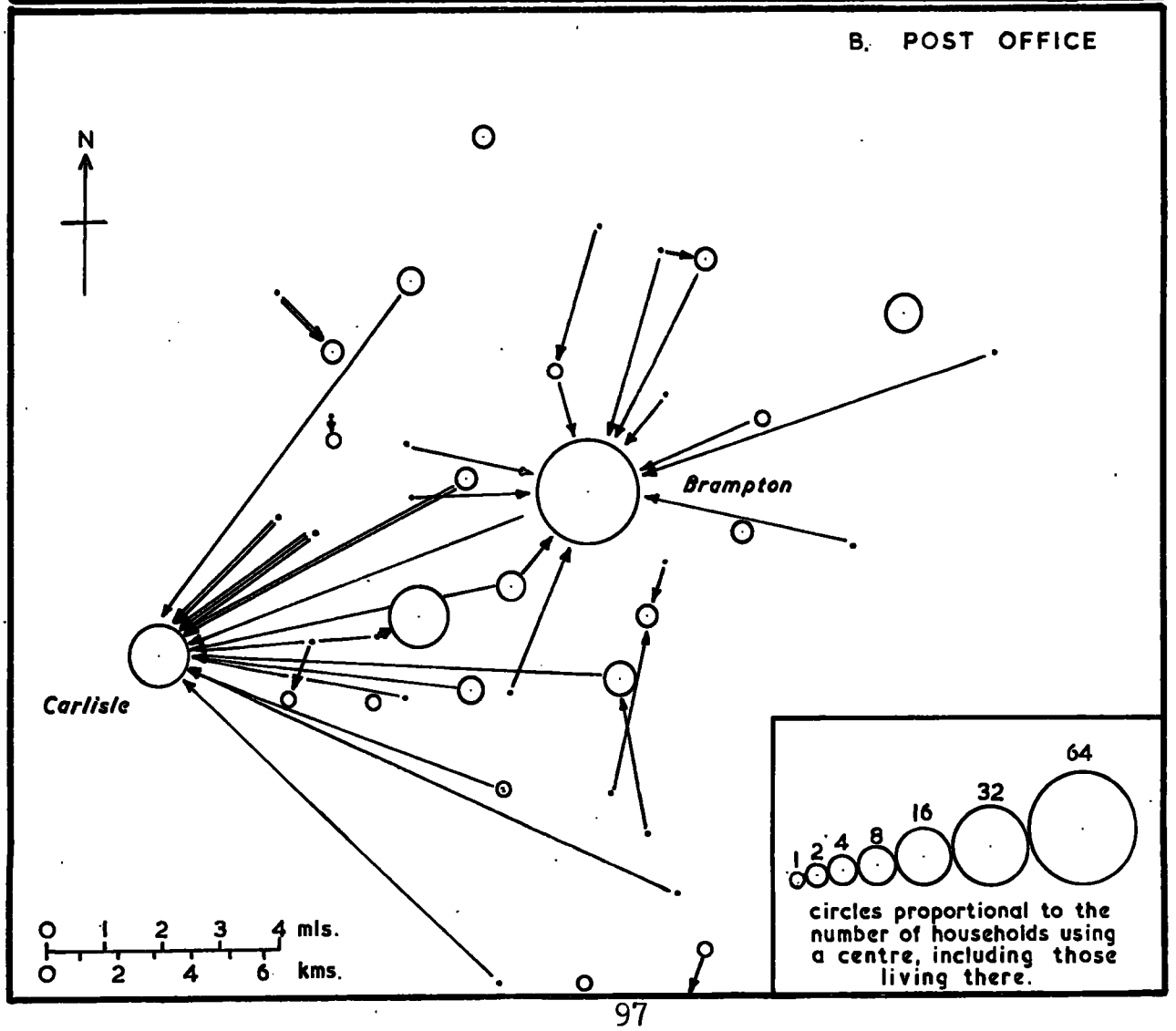
Low-order services are represented by grocers and post offices, and show the large number of local centres that are used (particularly for the latter), with only a small proportion of households from the rural area prefering either Brampton or Carlisle. In the case of groceries, 31% of the population prefer to shop in Carlisle with its stores and supermarkets, and 41% use Brampton, although the majority of this figure is made up of the town's own inhabitants. Because numerous local centres are used for these two services, the trade areas for the two main towns are comparatively small, but an area of overlap does exist particularly in the case of groceries.

MARKET PREFERENCE I.
LOW THRESHOLD SERVICES

Figure 3.7

[based on 1974 Survey]

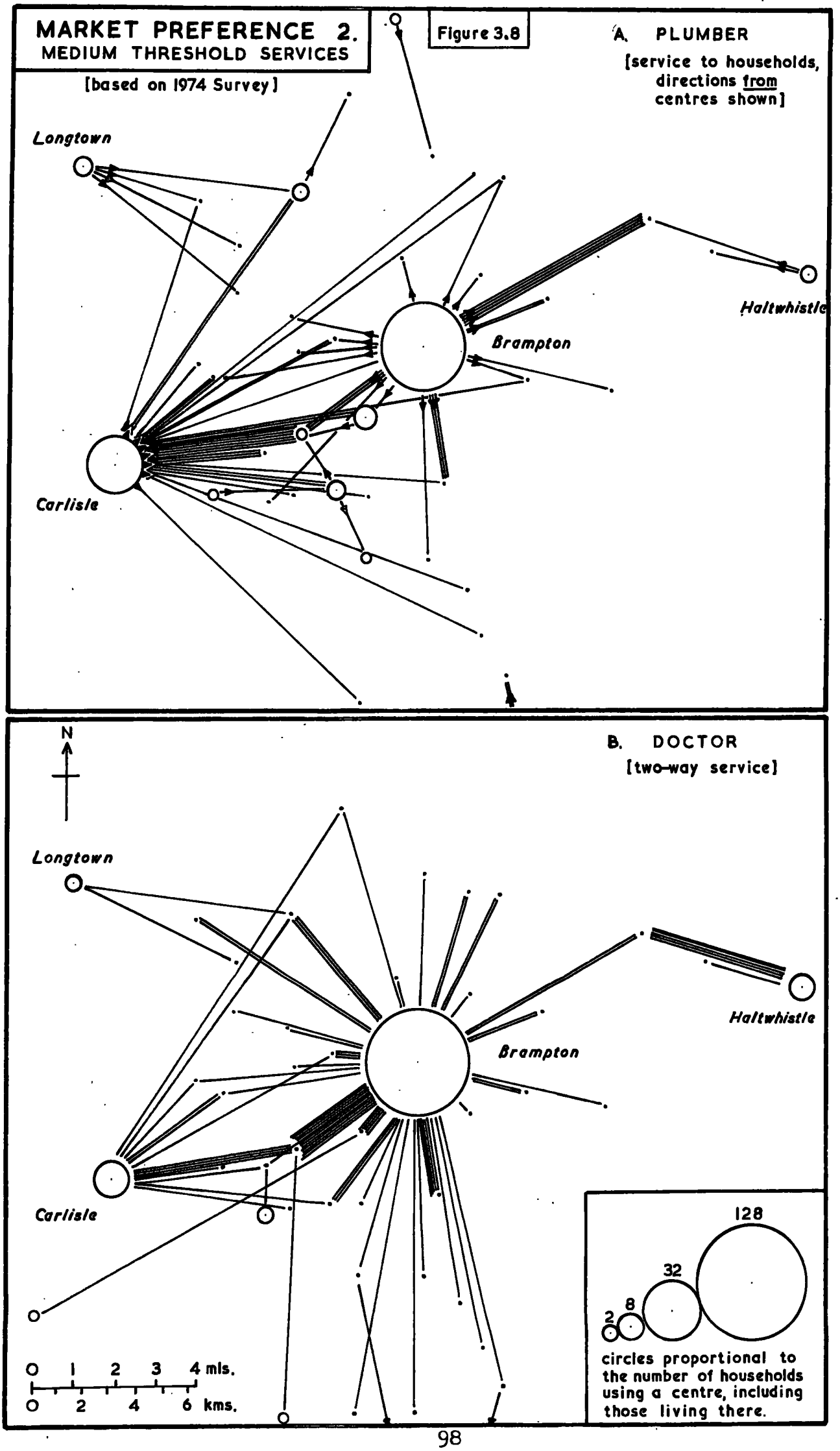




MARKET PREFERENCE 2.
MEDIUM THRESHOLD SERVICES

[based on 1974 Survey]

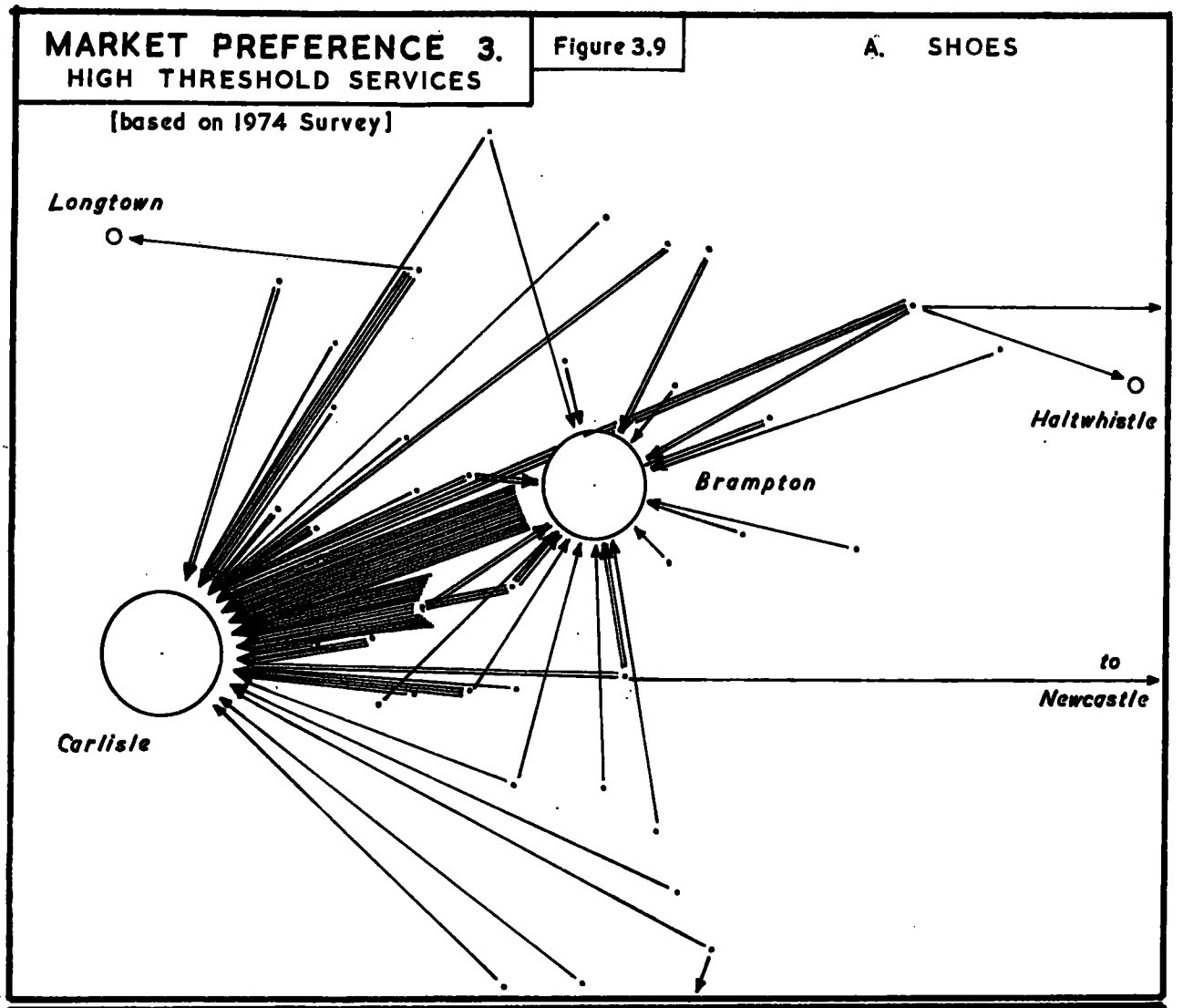
Figure 3.8

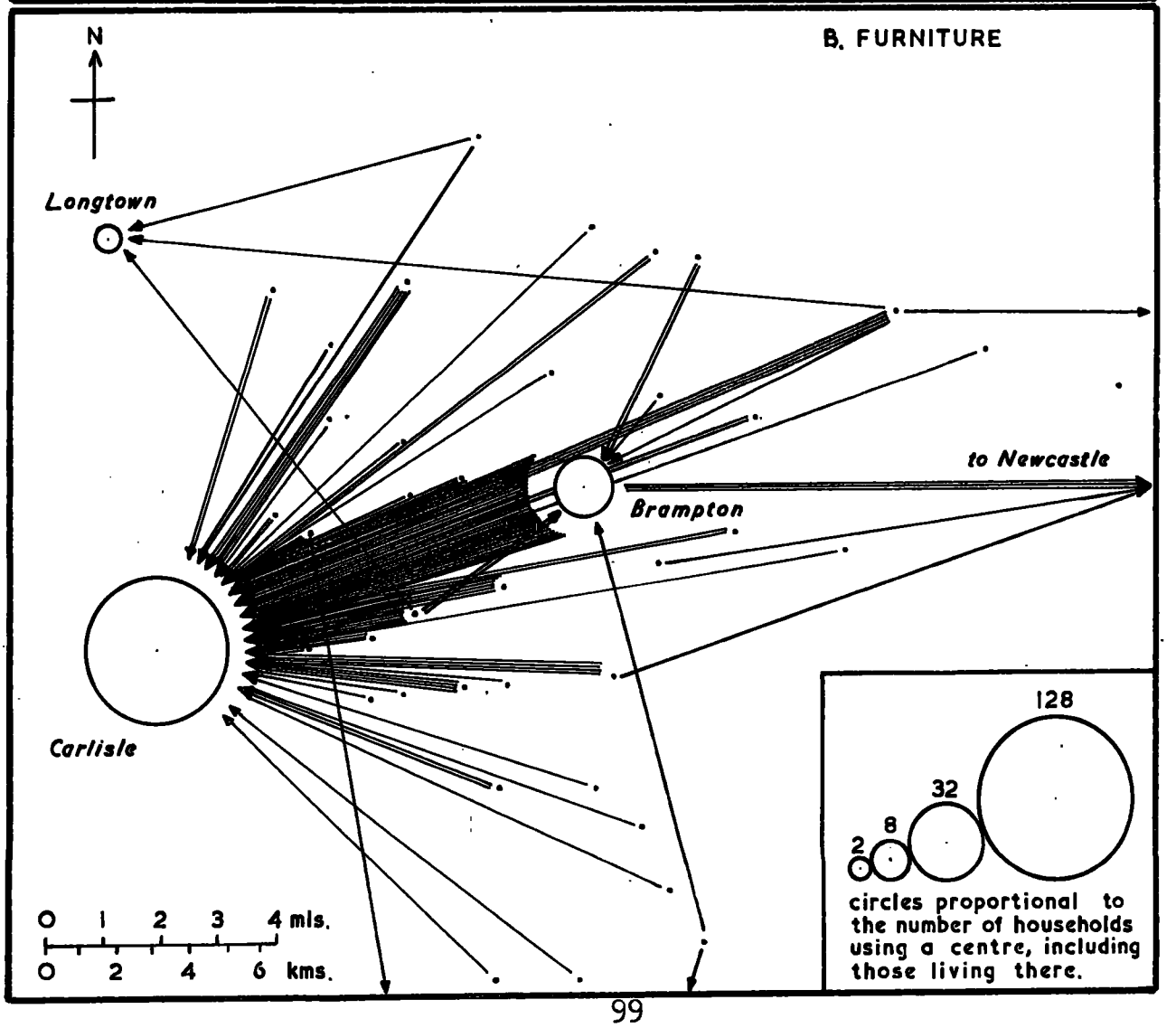


MARKET PREFERENCE 3.
HIGH THRESHOLD SERVICES

Figure 3.9

[based on 1974 Survey]





The representatives of the medium threshold services display wider fields of influence especially in the case of a doctor. It is significant to note that apart from about five exceptions, there is no service area overlap, and that the households preferring the doctor's practice in Brampton display a remarkably good radial pattern. The market preference for a plumber shows more diversity, mainly because there are more available from a greater number of locations, and therefore less use is made of the main towns apart from the people living there.

The final two maps (figure 3.9) show the market preferences for shoes and furniture, both within the high threshold range of services. In both cases the dominance of Carlisle stands out, particularly with furniture where there are 25 outlets in the city and only one in Brampton, compared to the ratio of 22 to 4 for shoes. In both examples the dimensions of Carlisle's fields of influence are clearly seen, but also noticeable is the incursion of Newcastle as a centre of preference, although it is 50 miles away to the east. Another observation from the details of furniture preference, is the attraction of Longtown from places like Warwick Bridge and Gilsland. Although the town has a smaller market potential compared to Brampton or Haltwhistle, it does possess a large furniture discount store which obviously attracts custom from a very wide area.

One constraint with this method of assessing the fields of influence of a particular centre, is the limitation to the size of the area covered by the questionnaire. For instance, it is not known whether there is any movement to Brampton of people from Longtown, Haltwhistle and Carlisle (or beyond), just as there is in the reverse directions. If it is accepted that such movement exists, the amount will almost certainly not be large enough to seriously impair the establishment of service areas from the results already analysed.

3.2.6 Zones of Preference

From the examples illustrated (and those still in tabular form), it is possible to compile a map showing the individual service areas in much the same way as the first method employed. Although not wholly comparable, the overall result would show a degree of similarity along particular boundaries or at specific points, namely Warwick Bridge and Gilsland. However, a simpler method of achieving the same result is illustrated by the overlay figure 3.5a. In this illustration, percentage zones are identified by the preferences shown for Brampton from all the individual locations. Apart from two or three exceptional cases (e.g. Faugh, West Hall and Wetheral), the results show that a 50% zone occurs,

but is smaller and extends less to the west of Brampton than the similar zone obtained by the first method of assessment (figure 3.4a). In fact a better relationship is displayed between this 'mean' and the 75% zone of the earlier technique, as shown in table 3.4.

Comparison of Zones of Influence — Table 3.4

Approximate Sizes	First Method			Second Method				
	Inner - 75%	Main - 50%	Outer - 25%	50%	40%	30%	20%	10%
Area (Sq.mls.)	35	90	200	30	50	65	95	110
Population	5,400	10,100	12,300	5,300	6,000	6,800	9,200	10,500

Whilst neither method produces an accurate measure of Brampton's general field of influence, the patterns that emerge do give a fair indication of the size and extent from which it can be assessed. Therefore a compromise between the two 50% zones would give an area of about 60 square miles, containing approximately 7,700 people. This means that together with a parish population of 4,000, there are about 3,700 people within a main tributary area who can be expected to prefer the services of Brampton for more than 50% of their requirements.

3.3 THRESHOLD AND RANGE

A great deal of attention has been paid in this chapter to the threshold level of services and the roles they play in influencing market preference. Berry and Garrison (1958) have defined threshold as the minimum amount of purchasing power necessary to support the supply of a 'good' from a centre, or the lower limit of the range of that 'good'. The method of measurement, as cited by Everson and Fitzgerald (1969) and Toyne and Newby (1971), is based on the average population of those settlements in which outlets of a particular commodity or service occur. For instance, the average population threshold for a grocer may be 500 (with a minimum of 100 and a maximum of 1,000), whilst a shoe shop, ranging from 750 to 5,000, may have an average of 2,000. Although the average may be similar from region to region, the discrepancy between maximum and minimum is likely to vary enormously.

Whilst this method appears to provide a satisfactory unit of measurement, it excludes one vital factor, - that of any tributary population. The technique only averages the population of settlements

in which outlets of a particular service are located, whereas tributary populations are just as much in need of that service and contribute to its purchasing power, as the inhabitants within the settlements themselves. Therefore an alternative method of assessment might be to include the tributary population as well as that of the centres where services do occur. Take for example the number of cinemas in the whole of N. Cumbria, - seven. Using the first technique of averaging just the population of the three towns in which they occur, gives a threshold of 12,500 people per cinema. It could be argued however, that the seven cinemas serve the whole of N. Cumbria with its 140,000 population (although not all may take advantage of the service), and therefore a better average threshold would be 20,000 people.

Problems arise however, with either method when dealing with the survey area of N.E. Cumbria. Many people from within the area utilise the services of centres which lie either outside the region or just on the fringe, such as Carlisle and to a lesser extent Penrith and Haltwhistle. These towns however, cater for a much larger population than just those customers from N.E. Cumbria. Therefore the exercise for obtaining threshold using either of the aforementioned methods is bound to show great inconsistency without a survey for the whole of the Carlisle region.

Two other methods however, suggest themselves as being worth consideration and neither involves actual pupulation figures. The first of these alternatives is to base threshold on the ratio of preferences as between large, medium and small centres which provide such services. Whilst no absolute units of measurements are obtained, a hierarchical structure results when the services are arranged in rank order. Such an arrangement is displayed in table 3.3. There, the 25 services are ranked according to the ratio of preference shown for either the large centre of Carlisle, medium-sized centres of Brampton, Haltwhistle and Longtown, or small local centres such as Warwick Bridge and Gilsland.

The second alternative method is derived from W.K.D. Davies' (1967, p.63) formula for measuring centrality described in Chapter 4. It relates threshold to the number of outlets in the centres where they occur, expressed as a ratio of the total number of settlements within the area (in other words opportunity). It can be expressed by the formula:-

$$T = N \times \frac{C}{S}$$

where N = number of outlets,
C = number of centres in which they occur,
S = total number of settlements in area.

This method avoids the constraints of using population (with or without

a tributary area), and therefore it can be used in any area for any number of settlements. By doing so it takes account of :-

a) a high number of outlets in many centres, e.g. a post office.

b) a high number of outlets in only a few centres e.g. clothes.

c) a low number of outlets in only a few centres e.g. a cobbler.

For example, take the three individual cases illustrated here. Within the area surveyed, including the main towns on the periphery, there are 40 settlements with at least one recognised service. Therefore for post offices, with 39 outlets in 37 centres,

$$\text{the threshold, } T = 39 \times \frac{37}{40} = 36.1$$

for clothes with 115 outlets in only 5 centres,

$$T = 115 \times \frac{5}{40} = 14.4$$

and for cobblers with only 9 outlets in 6 centres,

$$T = 9 \times \frac{6}{40} = 1.4$$

Although high values are indicative of low threshold and vice versa, one of the principal advantages of this method is that all values are comparable because they are reduced to a common base. In this case by 40, which is the number of settlements in the area where any service could occur. Therefore translated into words it means that the chance of locating a post office is almost even (36 : 40), there is less opportunity of finding a clothes chop (14 : 40), and only a 1 in 40 chance for a cobbler. The full list and rank order obtained by this method is given in columns H and J of table 3.5, alongside the other three methods of determining threshold.

The rank order displayed by each method shows certain interesting characteristics. Firstly, there is similarity from all four lists in the position of records, T.V., fuel merchant, garage and baker. Secondly, there is variation in the position of clothes (between 3rd and 21st), cobbler (from 1st to 15th), and doctor (13th to 20th). The great variation in the rank of clothes is mainly attributable to the large number of outlets to be found in only five centres, whilst in the case of a cobbler there are very few outlets in only a few centres. The exceptional situation with regard to a doctor has already been expressed, otherwise it may have occupied a higher place in the list nearer to those of a dentist, chemist and bank.

Range and Threshold of Services

Table 3.5

SERVICES	RANGE*		THRESHOLD VALUES & RANK BY FOUR METHODS*							
	Miles	Rank	One		Two		Three	Four	
			Value	Rank	Value	Rank	Rank	Value	Rank
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(J)
Records	7.8	1	3,226	1	12,000	1	1	2.1	2
Furniture	7.8	2	3,226	2	12,000	2	2	6.5	12
Clothes	7.2	3	461	21	1,714	12	3	14.4	18
Solicitor	6.4	4	3,226	3	12,000	3	6	3.3	6
T.V.	6.3	5	3,226	4	12,000	4	5	4.4	8
Electric Goods	6.3	6	1,075	10	4,000	9	4	4.9	10
Shoes	6.0	7	807	11	3,000	10	7	4.8	9
Hardware	5.5	8	1,613	6	6,000	6	9	2.6	3
Baby Goods	5.3	9	1,613	7	6,000	7	8	3.5	7
Bank	5.3	10	605	14	1,714	13	10	6.3	11
Dentist	5.2	11	3,226	5	12,000	5	11	3.1	5
Chemist	4.6	12	1,613	8	6,000	8	12	2.6	4
Cobbler	4.4	13	1,126	9	3,000	11	15	1.4	1
Fuel Merchant	4.3	14	580	15	1,200	17	17	6.6	13
Hairdresser	4.3	15	512	19	857	20	19	22.5	21
Greengrocer	4.1	16	516	18	857	21	20	13.2	15
Plumber	3.8	17	658	12	1,333	14	16	13.2	16
Butcher	3.8	18	648	13	1,200	18	22	15.0	19
Grocer	3.8	19	249	25	273	25	21	67.7	24
Doctor	3.7	20	462	20	1,333	15	13	9.5	14
Electrician	3.6	21	534	17	1,091	19	18	13.3	17
Garage	3.6	22	369	22	500	22	23	37.5	23
Decorator	3.5	23	559	16	1,333	16	14	15.5	20
Baker	2.9	24	288	24	316	24	24	67.7	25
Post Office	2.3	25	338	23	364	23	25	36.1	22
Rank Correlation values of range v threshold				0.77		0.86	0.92		0.70

\+ Average range for area - excludes journeys outside Carlisle Region

* Threshold : Methods One & Two based only on area within which questionnaire was circulated - excludes Carlisle etc.

Column C - Population per outlet - Settlements only
E - Population per outlet - Whole survey area (= 12,000).

Methods Three & Four based on all possible locations of services within the Survey Area.

Column G - Order based on preference rates for centres (Tab 3.3)
H - Outlets per opportunity of centre.

Threshold, however, is only one characteristic of the performance and provision of a service within a region. Another important factor is 'range', with which threshold is often associated. Range has already been defined as the farthest distance people are prepared to travel for a particular service. Therefore long journeys are more likely to be made for very specialised, high threshold goods, and shorter journeys for low-order services. For the purposes of this study, the measurement of average range (with maxima and minima) was easy to calculate from the answers to the questionnaire, and the details are given in appendix 3.6.

For each service, the minimum recorded distance was less than one mile, but the number of households making such short journeys varied enormously. The lowest number was 6 (all from Brampton) for the purchase of records, compared to the highest of 102 for a post office. Maximum distances people were prepared to travel showed wide variations, from 10 miles for a decorator to over 50 miles for clothes and furniture. One household even journeyed 19 miles for a post office. The general pattern, however, was as expected, with lower-order functions having short ranges and higher threshold services longer ranges.

The results and their rank order are given in columns A and B of table 3.5. They exclude journeys made outside the Carlisle region in order to make them comparable with the results of threshold, which themselves are only based on details from within the region. As can be seen from the graphical illustration of range in figure 3.6B, extra-regional journeys only affect about six services, but had they been included the rank order would have been slightly different.

From the results, two important observations emerge. Firstly, in determining the average range for each service, there was significant bunching of distances between four and five miles, and to a lesser extent between eight and nine miles. These therefore, must be regarded as good indications within N.E. Cumbria of the average distances between a) village and town, and b) town and town. The second observation concerns the relationship between range and threshold as displayed by the rank-orders shown in table 3.5. Although there are bound to be variations in the positions of some services, there are several which show great similarity, particularly from the list of preference ratios (column G). The Spearman rank correlation test was applied to each method of obtaining threshold, and all four showed a high coefficient of correlation, but the highest was from the rank-order of preference ratios, with 0.92 (1 being regarded as absolute).

3.4 SUMMARY

Having examined the habits of some of the population of N.E. Cumbria, and demonstrated their desire to do business over a range of services and with a choice of outlets and locations, it can be seen that several important patterns emerge. Firstly, people are prepared to travel longer distances for some services than for others, but only because the more specialised services are located less frequently and therefore the population has to make these longer journeys in order to obtain them. Such services therefore have a wider field of influence than their less specialised counterparts, and are generally found only in the larger centres.

Therefore a hierarchy of centres, with several levels or orders, can be distinguished within the region. In first place is Carlisle, with a greater number of outlets of all the services, many showing a high degree of specialisation or threshold, and for which there are large fields of influence. At a lower level are towns such as Brampton, Haltwhistle and even Longtown. These have fewer outlets, show less specialisation and have therefore smaller fields of influence. The next order is represented by the larger villages of Warwick Bridge, Gilsland and Hethersgill within the main survey area, and Wetheral and Kirkoswald on the fringe. These settlements provide only a small number of low threshold services and therefore attract a lower proportion of the population from a relatively small area. Finally there are the very small centres, such as Hallbankgate, How Mill and Hayton, with only one or two services (often one retail and one in the trade category), which usually attract very local custom and have no appreciable service area.

Although these latter types of centres are more numerous and are located at more frequent intervals than the larger centres, they are catering less for the general needs of the population than they did in past decades. This is especially so since new methods of retailing made their appearance. The provision of pre-wrapped and frozen goods, the advent of supermarkets and discount stores, and the greater use of the motor car, have all given greater attraction to the larger centres.

Perhaps the best summary on the situation to be found in N.E. Cumbria with regard to the provision of services, is the general view of Smailes (1967, p.133) who stated,

> "To a degree quite unknown in the past, the inhabitants of the areas between the urban centres look to these towns and are drawn within their fields of influence. They rely upon and make increasing use of the services located there".

CHAPTER 4

RURAL CENTRALITY

Models of Centrality, Expected v Observed

4.0 INTRODUCTION

The previous chapter sought to investigate the type and range of services within the towns and villages of N.E. Cumbria, and to demonstrate the influence they play in the life of the region. In this chapter it is intended to illustrate how those services and the influence they possess, compare with accepted and recognised models of assessing centrality. From the results, it will be shown in what ways N.E. Cumbria (or parts of it) is both similar to, and different from, an expected pattern. The final section will subsequently examine the degree of centrality for the settlements of the region, based on answers to the second part of the household questionnaire.

The term pattern has been used many times in a variety of ways to describe certain relationships between man and his environment in both spatial and behavioural situations. Some aspects of human activity are largely predictable, but others are not, and all are liable to change from one influence or another. Therefore great care is necessary that when the term is used, its context is fully understood. Similarly, words like average, mean or norm, are only of value when related to the set of facts from which they have been derived. For instance, it could be said that Brampton is typical of a small town, and its field of influence is average for its size. Such a statement would only be true however, if it was related to a set of results obtained from surveying all settlements with similar populations and activities, and in similar proximity to other towns and villages all over the world. What might be more accurate to say at this stage (although it is still hypothetical), is that Brampton displays features of activity and influence that compare favourably with similar sized centres of a rural nature in other parts of northern England. This is where the use of a predetermined pattern or theoretical model can be of value, since the specific example can be related to the pattern to see in what ways there is any similarity or difference.

Naturally, for a pattern or model to be established there has to be a selection of examples on which it can be deduced. Alternatively, a pattern may emerge if a set of examples are seen to have a majority of similar characteristics, even if some of those characteristics display features of human activity that are unpredictable. What is important when a pattern is formulated however, is not that the constituent members are typical of that pattern, but how much variation any single item may show.

4.1 GRAVITY MODELS

The models to be used in this section of the study are based on

patterns of market area interaction and influence. Known as gravity models (because of their derivation from the Newtonian theory of gravity), they were first developed by W.J. Reilly in 1931 in his 'Laws of Retail Gravitation'. The basic model in its simplest form, suggests that movement between two centres is proportional to the products of their sizes, and inversely proportional to the square of the distance separating them. It is formulated as :-

$$I_{ab} = \frac{S_a x S_b}{(d_{ab})^2}$$

where I_{ab} is the interaction between two centres 'a' and 'b',
S_a and S_b are their respective sizes, and
d_{ab} is the distance between them.

In the original instance population was used as the index of size, although other factors have been substituted with equal success.

Subsequent work by many authors, namely S. Stouffer in 1940, P.D. Converse in 1949, D.L. Huff in 1962 and 1964, and B.J.L. Berry in 1967, has resulted in several modifications and extensions to the original model, so that it can be used in a variety of ways to test information relating to market areas and consumer behaviour.

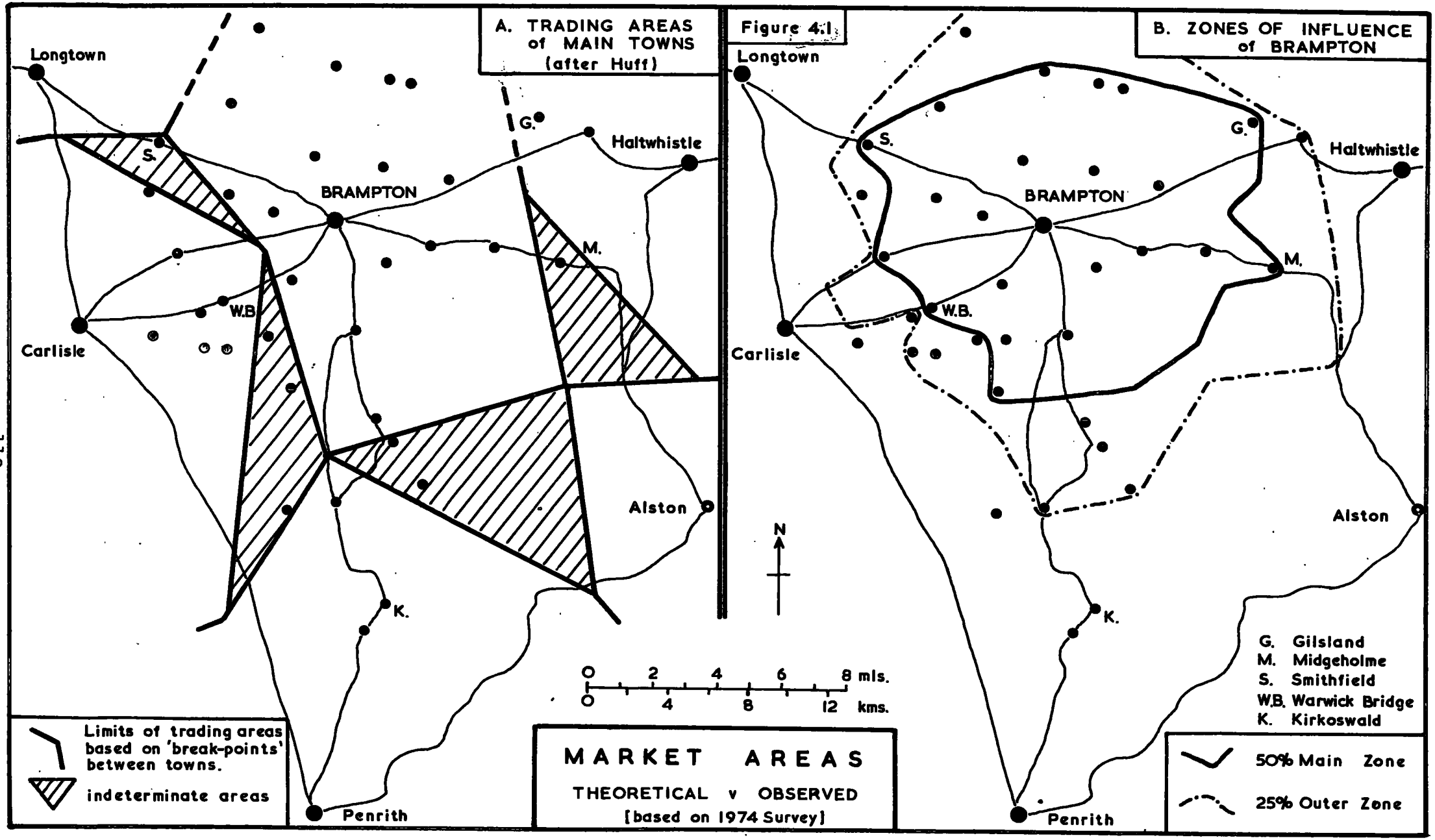
4.1.1 Methodology for 'Break-point' Model

The first of these alternative models that has relevance to this study concerns trade area boundaries between towns, and uses the 'breaking-point' equation as initiated by Converse and subsequently developed by Huff (1964). A 'breaking-point' or point of indifference is the juncture between two competing centres at which consumers are equally attracted to both; in other words the boundary at which 50% of trade will be directed towards one centre and 50% towards the other. Knowing the size of population and services, and the distance between centres, enables this 'breaking-point' (and subsequently the theoretical extent of trade areas), to be determined quite easily. Whereas Converse used population as the index of size, Berry (1967) substituted the number of central functions or services, since this was regarded as a better method of assessing the overall attractiveness of any centre because it was based on trade.

The model states that the 'breaking-point' or trade boundary between two towns 'a' and 'b', is, in miles from b,

$$\text{equal to : } \frac{\text{the distance between a and b}}{1 + \sqrt{\frac{\text{size of a}}{\text{size of b}}}}$$

Figure 4.1


A. TRADING AREAS of MAIN TOWNS (after Huff)
B. ZONES OF INFLUENCE of BRAMPTON
Longtown
Haltwhistle
BRAMPTON
Carlisle
Alston
Penrith
G.
S.
M.
W.B.
K.
N
0 2 4 6 8 mls.
0 4 8 12 kms.
Limits of trading areas based on 'break-points' between towns.
indeterminate areas
50% Main Zone
25% Outer Zone
G. Gilsland
M. Midgeholme
S. Smithfield
W.B. Warwick Bridge
K. Kirkoswald
MARKET AREAS
THEORETICAL v OBSERVED
[based on 1974 Survey]

This is more commonly expressed as :-

$$d_{kb} = \frac{d_{ab}}{1 + \sqrt{\frac{S_a}{S_b}}}$$

where d_{kb} is the distance of the 'breaking-point' 'k' from town 'b'. In the calculations for N.E. Cumbria, 'S' is taken as the number of outlets for the 25 services surveyed in each of the towns, and 'd' is measured as the direct distance between those towns.

4.1.2 Analysis of 'Break-point' Model

Table 4.1 is an abstract of appendix 4.1, and shows the results of using this formula for both population and services. It can be seen that there is appreciable similarity between the two sets, indicative that within the region, the number of service outlets is highly proportional to the population of the settlements in which they occur.

'Break-point' Distances between Main Towns — Table 4.1

Towns and direction of measurement	Size		Direct Distance in miles	Break-point Distance	
	Pop'n.	Service Outlets		based on Population	based on Services
From BRAMPTON	3,226	83			
To Carlisle	71,582	497	8.5	1.5	2.5
Penrith	11,306	198	19.5	6.7	7.7
Haltwhistle	2,780	83	11.5	6.0	5.7
Longtown	2,082	46	10.5	5.8	6.0
Alston	1,533	38	15.0	8.9	9.0
From CARLISLE	71,582	497			
To Penrith	11,306	198	17.5	12.5	10.8
Longtown	2,082	46	8.0	6.8	6.1
From ALSTON	1,533	38			
To Penrith	11,306	198	16.0	4.3	4.9
Haltwhistle	2,780	497	11.0	4.7	4.4

The results based on service outlets are also illustrated in figure 4.1 alongside the observed market area of Brampton already examined in the previous chapter. From map A, showing the theoretical or expected market areas, two significant points emerge. Firstly, since there is no town within the region to the north of Brampton, the boundaries of its trading area with those of its adjacent neighbours,

Longtown and Haltwhistle, have to be assumed. Secondly, four areas of 'indeterminate' nature occur. This is because of the spatial location of the towns concerned, which, according to Huff, is one of the limitations to be found using this method. In his demonstration of the technique he was also able to show that there would possibly be areas of overlap. This would only occur if 'break-points' between towns at the opposite corners of the region had been calculated, i.e. between Penrith and Longtown, or Carlisle and Haltwhistle. In the case of N.E. Cumbria, such 'break-points' would have been unrealistic because of the intermediate locations of Carlisle and Brampton.

Despite these limitations, the model should only be regarded as a guide against which a more realistic pattern obtained from observed data can be compared. Such is the case with this region where map B of figure 4.1, showing two of the observed zones of influence of Brampton, can be seen alongside its theoretical counterpart. Neither method will illustrate the exact situation, because the theoretical one assumes equality of competitive attraction, and the observed is based on a mere sample of evidence at a particular point in time. Nevertheless, certain points of similarity and difference emerge as being of importance.

A high degree of similarity is shown by the location of Smithfield, Gilsland and Midgeholme, at, or very close to the trading area boundaries of Brampton in both the expected and observed situations. There is less similarity however, in the position of the boundary at other points, namely towards Carlisle and Penrith. In the case of Carlisle, the expected 'breaking-point' is nearer to Brampton than the observed, whilst the Penrith boundary is more distant, although the differences are no more than two miles in each case. A final observation concerns parts of the theoretical 'indeterminate' areas which correspond to sections of the outer 25% observed zone of influence for Brampton, thereby underlining the fact that zones of 'indifference' do occur between or around the periphery of market areas.

Although there are only a few similarities between the expected and observed patterns, the degree of their differences is low enough to justify the methods used and comparison made of their results.

4.1.3 Methodology for Probability Model

The second model that has relevance to this study was also developed by Huff, and concerns the proportion of trade likely to be encountered between one place and any number of centres. Known as a 'probability model', this alternative to the original tends to emphasise the role of the consumer by estimating the probability that he will visit one centre or another from a selection of several. Once

again, distance and size of centre are important components of the formula which is expressed as :-

$$P_x = \frac{\frac{S_a}{d_{ax}^z}}{\sum_1^n \frac{S}{d^z}}$$

where P_x is the probability of a consumer at 'x' going to centre 'a',
S_a is the size of centre 'a',
d_{ax} is the distance between 'a' and 'x',
z is a variable parameter,
and there are 'n' different centres to visit including 'a'.
(The numerator relates to one centre at a time, whilst the denominator relates to all the centres every time, including the one for which the probability is being calculated).

One of the main advantages of this model compared to others, lies in the fact that all potential shopping centres are simultaneously taken into consideration. In this respect comparison of the results with observed data will have greater meaning, especially since most of the households surveyed in N.E. Cumbria patronise several centres including their own.

With regard to the working of this model several adaptations were found to be necessary. Although Huff used floorspace area of establishments as the index for size of centre, and time of journeys between 'x' and each centre as the other index, these have been substituted by the number of service outlets and distance. Similarly Huff discovered the value of the parameter 'z' varied for different types of shopping expeditions. By a process of trial and error, it has been discovered that, for this study and with one exception, the best value of the parameter should be the second power. This will give consistency with the parameter's value in the original model of Reilly. The exception made is with regard to the unit of measurement of the consumer's own centre, and here it was found that taking the square-root of the service outlets in that unit, i.e. $\frac{\sqrt{S}}{d^2}$, gave the most satisfactory result. The reasons for this are threefold. Firstly, the consumer's own centre has to be taken into the reckoning in order that observed results can be compared. Secondly, if the distance were taken as nil then the whole of $\frac{S}{d^2}$ would be zero. Thirdly, if 'd' is taken as 1, then d^2 is also 1, and the unit takes the value of 'S'. For most calculations this gives an exaggerated value to the probability for the consumer's own centre at the expense of the other centres he

may visit. Therefore in order to offset the ineffectiveness of the denominator d^2, taking the square root of the numerator 'S' would be the most logical step to adopt. An example will suffice to illustrate the point.

Hethersgill has 7 service outlets which are likely to be used by some of its own consumers, and the other centres most likely to be used are Carlisle with 497 outlets at a distance of $8\frac{1}{2}$ miles, Brampton with 83 outlets at a distance of 5 miles, and Longtown with 46 outlets some 6 miles away. Using Huff's formula would produce the following equation :-

$$P_h = \frac{\frac{S_h}{d_h^2}}{\frac{S_h}{d_h^2} + \frac{S_c}{d_c^2} + \frac{S_b}{d_b^2} + \frac{S_l}{d_l^2}}$$

where h is for Hethersgill
c is for Carlisle
b is for Brampton
and l is for Longtown.

Substituting the values in the equation gives the following probabilities for a consumer living at Hethersgill visiting each centre,

the probability for	Hethersgill	=	0.41
	Carlisle	=	0.35
	Brampton	=	0.17
	Longtown	=	0.06

In other words, Hethersgill could expect to have 41% of the total custom, with Carlisle 35%, Brampton 17% and Longtown only 6%. Using the modification suggested, i.e. substituting :-

$$\frac{S_h}{d_h^2} \quad \text{by} \quad \frac{\sqrt{S_h}}{d_h^2}$$

in both numerator and denominator, would give

the probability for	Hethersgill	=	0.20	(20%)
	Carlisle	=	0.48	(48%)
	Brampton	=	0.23	(23%)
	Longtown	=	0.09	(9%)

As is clearly demonstrated, the use of this modification produces a more realistic set of probabilities not just for the settlement of the consumer, but for the other centres as well.

Whilst this modification to the formula may seem a contrivance to reach a more satisfactory answer that compares with the observed data, there is no reason to suppose that Huff or Berry would not have used something similar. As Huff says about his modification to the model, "..... it is not merely an empirically contrived formulation. It represents a theoretical abstraction of consumer spatial behaviour, from which mathematical conclusions can be deduced". (Ambrose, ed., 1969, p.166).

In similar vein, the original concept of the use of gravity models implies that the degree of attractiveness of any centre will vary depending on what it has to offer and how far away it is from any rival. Therefore, allowance for such variations has to be made in the compilation of any mathematical formula designed to test the model's degree of reality. Hence the inclusion of a variable parameter.

Three other modifications have been made, but none concerns the actual formula. The first adaptation has been to raise the value of the expected probabilities into percentages, thereby bringing them in line with observed results. Secondly, the observed percentages have been calculated on a net basis, i.e. leaving out the 'other centre' and 'none' results since they do not feature in the expected analysis. Finally, settlements showing extreme observed preference values, such as Lees Hill, Great Corby and Newbiggin, have been merged with their immediate neighbours, namely West Hall, Wetheral and Croglin. This is in order to achieve a more balanced result in the analysis, or as Carter (1972, p.107) puts it "..... in order to eliminate individual eccentricities".

4.1.4 Analysis of Probability Model

A sample of the results using this model is given in table 4.2 alongside observed data for preference of centre obtained from analysis of the household questionnaire. The full results are given in appendix 4.2.

In order to show the degree of similarity between the two sets of results, differences between percentages and the average for each settlement are shown in adjacent columns, with a summary of overall differences displayed below.

The results are very enlightening. Out of 31 settlements (or paired settlements) there are 13 above and 18 below the overall average difference of 7.5%. The best example is from Walby with an exact correlation between observed and expected results, followed closely by Warwick Bridge, Crosby and Farlam, all with average differences of 2.6%. The poorest case is illustrated by Scaleby Hill with an average of 22.25%. This is caused by one of those 'individual eccentricities,'

where the single household representing that settlement visits Longtown for most services, rather than travelling to Carlisle as would be theoretically expected. Even if this case had been 'paired' with Smithfield, one mile to the north, the result would have been much the same.

Preference and Probability for Visiting Centres — Table 4.2

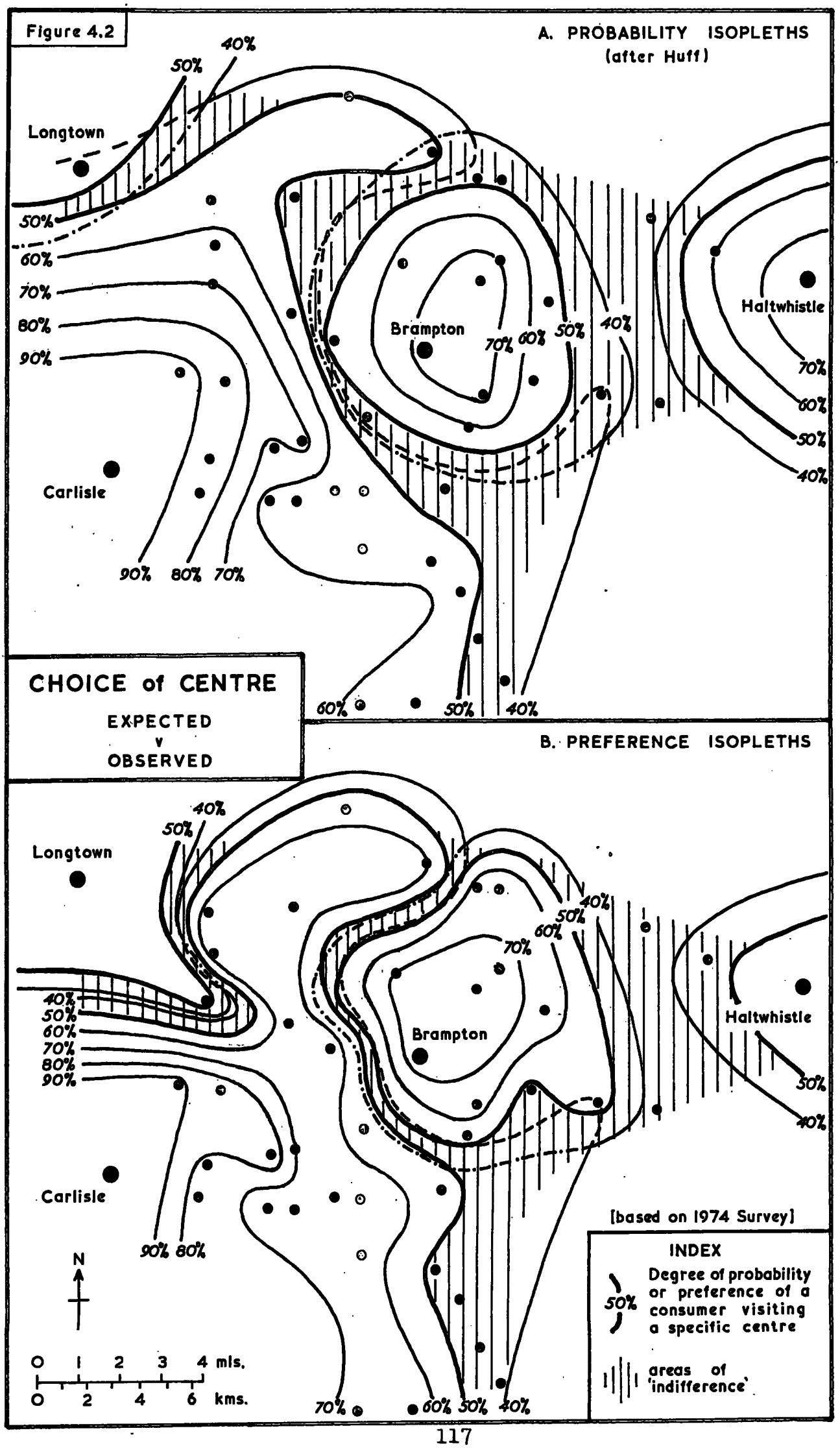
SETTLEMENT & Centres	% Visits Obs.	Exp.	Difference %	Aver.	SETTLEMENT & Centres	% Visits Obs.	Exp.	Difference %	Aver.
SCALEBY HILL	9.5	10	- 0.5	22.3	CUMWHITTON	11	17	-6	4.5
Carlisle	28.5	70	-41.5		Carlisle	63	55	+8	
Brampton	9.5	12	- 2.5		Brampton	21	20	+1	
Longtown	52.5	8	+44.5		Warwick Br.	5	8	-3	
HETHERSGILL	15	20	- 5	8.5	FARLAM				2.6
Carlisle	65	48	+17		Carlisle	22	22	0	
Brampton	11	23	-12		Brampton	67	71	-4	
Longtown	9	9	0		Hallbankgate	11	7	+4	
GILSLAND	20	30	-10	7.0	WALBY				0
Carlisle	19	18	+ 1		Carlisle	92	92	0	
Brampton	29	16	+13		Brampton	2.5	2.5	0	
Haltwhistle	32	36	- 4		Houghton	2.5	2.5	0	

% Differences	Carlisle	Brampton	Other Centre	Own Centre	Overall
Average+	8.6	8.3	7.2	6.0	7.5
Mean*	+1.4	+1.8	+0.2	-3.5	

+Average difference calculated ignoring positive or negative sign.
*Mean is average difference between positive and negative values.

The significance of the positive or negative values in the difference column concerns the way in which observed and expected percentages differ. If positive, then the observed result is larger than the expected, indicating that the proportion of consumers who have been observed to visit that particular centre is greater than the theoretical figure would suggest. With a negative value, then the reverse is true. For each settlement examined, the total positive values balance with the total negative values, but when a specific centre is investiaged throughout the 31 cases, the mean % difference favours one side or the other. Both Carlisle and Brampton show a small balance on the positive side, (1.4% and 1.8% respectively), but visits

Figure 4.2


A. PROBABILITY ISOPLETHS
(after Huff)
Longtown
Brampton
Haltwhistle
Carlisle
40%
50%
60%
70%
80%
90%
CHOICE of CENTRE
EXPECTED
v
OBSERVED
B. PREFERENCE ISOPLETHS
[based on 1974 Survey]
INDEX
Degree of probability or preference of a consumer visiting a specific centre
areas of 'indifference'
N
0 1 2 3 4 mls.
0 2 4 6 kms.

to the consumers own centre show a negative mean of 3.5%. The implications of this are that slightly more people visit the two main towns, and fewer visit their own settlement than would be expected.

Although the term 'expected' refers to the working of the theoretical model, it does not take into account the type and quality of services to be found in the smaller settlements. This is where a degree of human unpredictability occurs which cannot be programmed into a model. People can easily discriminate between the services of one settlement and another, electing to choose those that are of better quality or at a more convenient location. This is where the larger centres score over the smaller centres, because they offer the breadth and range of services that the consumer can utilise in one visit, or simply because that is the settlement where the consumer is employed (c.f. the example of Scaleby Hill). In this respect the results are what might be behaviourally expected rather than mathematically deduced.

Comparison between the theoretical and observed results is also illustrated by the two maps in figure 4.2, where the degree of similarity is strikingly apparent.

The expected situation, using the modification to Huff's formula, is shown in map A as a set of probability 'contours' or isopleths for the main towns. In order to avoid too much overlap with the lower values, only probabilities greater than 40% have been recorded. Several interesting points emerge from the map which are not as apparent from the table. Firstly, the dominance of Carlisle is clearly visible, particularly to the north and south of Brampton, where the 'contours' start to envelop the town's own set of isopleths. Although the 50% isopleths do not meet, they come extremely close in the Irthington district where there is a steepening of the 'demand gradient' between Carlisle and Brampton. Elsewhere gradients are much more gentle, with two 'plateau' areas (one in the north and the other in the south), between the 60% and 50% isopleths for Carlisle. A final observation from this first map is the contrast between the highest probability values for each of the four main centres. The values can be taken as good indicators of the proportion of population who can be expected to use the services of their own centre. In Carlisle's case this is almost everyone (90%), but less than three-quarters of the inhabitants of Brampton and Haltwhistle (70%), and only half the population of Longtown. In Longtown's case the share is almost equal between itself and Carlisle, partly because of the short distance between the centres,

and partly because of the low number of service outlets Longtown possesses, 46 compared to Carlisle's 497.

Map B of figure 4.2 shows the preference 'contours' or isopleths based on the observed choice of centre by consumers from the survey area. Only Brampton's isopleths were illustrated in figure 3.5a, whereas preference values over 40% for all the four main centres are shown in figure 4.2B. Between these two maps it will be noticed that there is a slight difference in the isopleths for Brampton. This is because the method adopted in this chapter uses net values of preference, whereas figure 3.5a, was based on absolute data. In fact the 50% isopleth in this latest map covers an area of approximately 50 sq. miles, which is much closer to the compromise figure of 60 sq. miles for the general field of influence obtained in the last chapter.

The first observation to note from figure 4.2B is the marked similarity with map A, particularly in the shape, extent and value of the isopleths. There are however, one or two differences that need clarification. The most noticeable in map B, concerns the elongation and closeness of the isopleths to the south-east of Longtown. This is caused by the high preference for Longtown shown by the household at Scaleby Hill, whereas households from the settlements further north, namely Smithfield and Kirklinton, have preferences more in keeping with the expected values. Another difference, though not as pronounced, is the steeper 'demand gradient' between Brampton and Carlisle. In this case the isopleths are closer together and nearer to Brampton, indicative that preference for Brampton declines more rapidly in favour of Carlisle than the theoretical situation would suggest. In fact many of the settlements in the north-south corridor between the two centres show a 10% increase in preference over probability for the primate city. Although similar shaped 'plateau' areas do exist, they occur between the 70% and 60% isopleths.

A final observation relates to the areas which occur between the 50% isopleths for each centre. In these districts consumers can be expected, and observed, to show no marked dominance for one centre or another. Known as areas of 'indifference', they effectively mark the outer or fringe zones of attraction between two or more centres. Such is the case at Gilsland where similar preferences are displayed for Haltwhistle, Brampton, Carlisle and itself, without any centre being particularly dominant. Other examples, though not as distinct, are at Newbiggin (paired with Croglin), and Hallbankgate.

Naturally, because of the unpredictable habits of some of the population, it is logical to expect some irregularities in any type of observed pattern. That there is such little variation from the

expected pattern in the observed market preferences of N.E. Cumbria is perhaps unusual, but nevertheless encouraging. The measure of similarity between observed and expected results is therefore a reflection, not only of the way in which the gravity model performs, but also the high degree of accuracy with which reality can be tested.

4.2 ATTRACTION AND INTERACTION

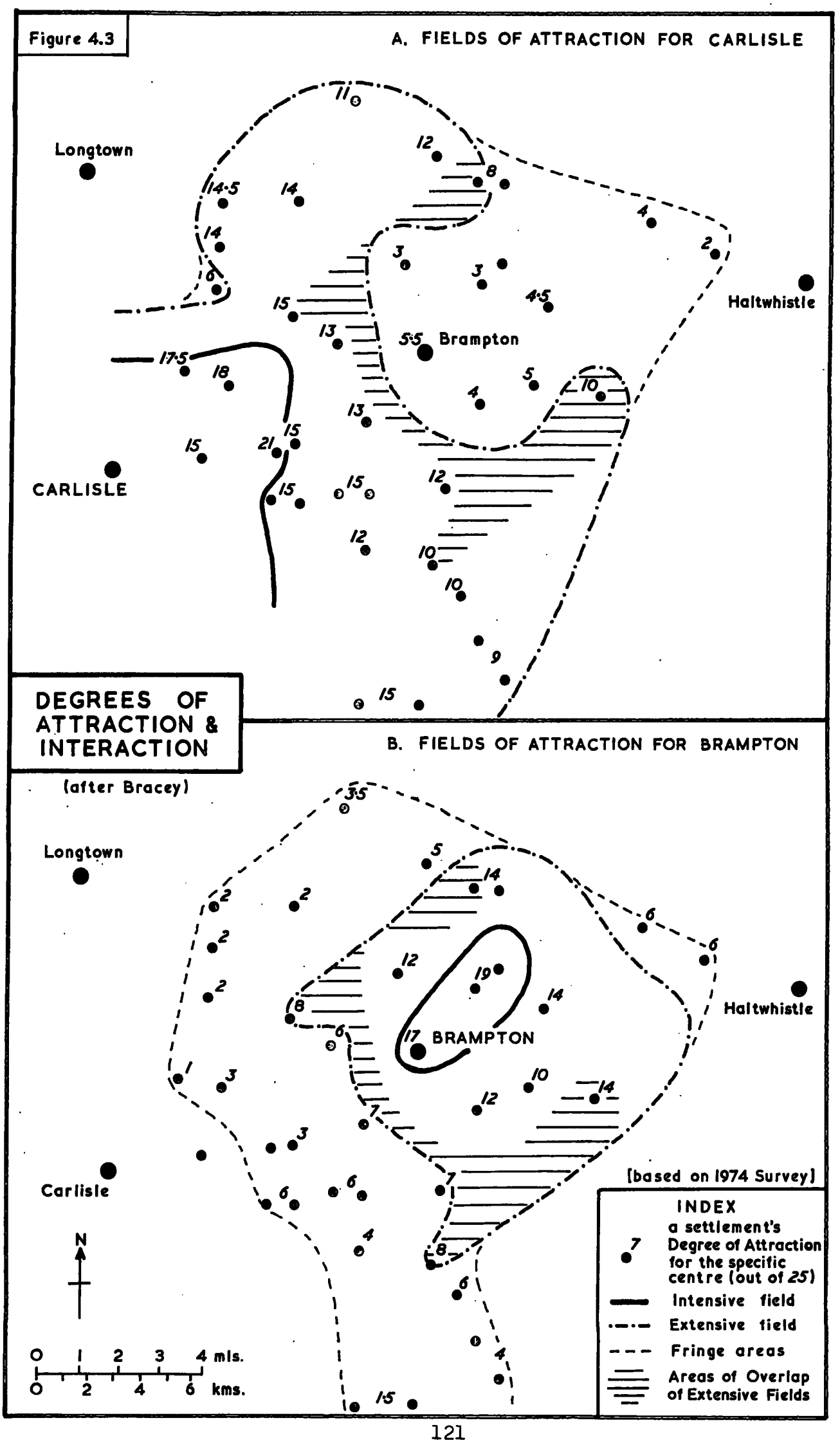
4.2.1 Methodology

A similar test of attraction, or interaction, is the method devised by Bracey (1953) in his study of rural centrality in Somerset. Using data obtained from a questionnaire sent to the villages of the county, he was able to assess the degree of attraction for the main centres for 15 selected services. A points system was instituted for each village and each service. If only one centre was used for a particular service, then the village was awarded one point, if two, half a point, three, a third of a point, and so on. The scroes for all 15 services were totalled and the results for all the villages could then be mapped enabling fields of attraction to be discerned. Theoretically the maximum score any village could attain would be 15, therefore those settlements with high scores would be close to a specific centre, whilst villages with low scores would be more distant and located in the 'indeterminate' area between two or three centres. In this way Bracey was able to identify settlements with high, medium and low scores, from which he was able to construct three areas which he accordingly labelled intensive, extensive and fringe.

Unfortunately when trying to implement this method in N.E. Cumbria using the results of the household questionnaire, it did not work out initially because of two limitations. Several settlements in the survey area are only represented by single households, therefore using the technique outlined above, the score would always total 25 (25 services are used in all the calculations in this chapter). Similarly, it is theoretically possible that for one service, say groceries, all the households in a village could visit one centre, thus scoring 1; and for another service, say butchers, they could all visit a different centre - also scoring 1. Hence the final total could still be 25.

A modification of the technique has therefore been devised which has resulted in much the same pattern as Bracey's work intended. For every service there is an allocation of one point, which is divided amongst the centres to which visits are made, based on the proportion of households from each settlement who make those visits. For

Figure 4.3


A. FIELDS OF ATTRACTION FOR CARLISLE
Longtown
Haltwhistle
Brampton
CARLISLE
DEGREES OF ATTRACTION & INTERACTION
(after Bracey)
B. FIELDS OF ATTRACTION FOR BRAMPTON
Longtown
Haltwhistle
BRAMPTON
Carlisle
[based on 1974 Survey]
INDEX
a settlement's Degree of Attraction for the specific centre (out of 25)
Intensive field
Extensive field
Fringe areas
Areas of Overlap of Extensive Fields
N
0 1 2 3 4 mls.
0 2 4 6 kms.

instance, if there are five households in one village and two of these visit Brampton and three visit Haltwhistle for a doctor, then the score will be $\frac{2}{5}$ for Brampton and $\frac{3}{5}$ for Haltwhistle. The example in table 4.3, using a sample of six services for the seven households at Gilsland, illustrates the point.

Comparison of Attraction Scores(example for Gilsland) Table 4.3

Sample Services	Centres visited by each family	Score by Bracey's method	Score by Modified method
Chemist	H B H B H B B	$\frac{1}{2}$	H = $\frac{3}{7}$ B=$\frac{4}{7}$
Hardware	C C B C B C B	$\frac{1}{2}$	C = $\frac{4}{7}$ B=$\frac{3}{7}$
Bank	H G H B H H B	$\frac{1}{3}$	H = $\frac{4}{7}$ B=$\frac{2}{7}$ G=$\frac{1}{7}$
Post Office	G G G G G G G	1	G = $\frac{7}{7}$
Cobbler	B B B B B B B	1	B = $\frac{7}{7}$
Clothes	B N C C H C B	$\frac{1}{4}$	C = $\frac{3}{7}$ B=$\frac{2}{7}$ H=$\frac{1}{7}$ N=$\frac{1}{7}$
	C-Carlisle B-Brampton H-Haltwhistle G-Gilsland N-Newcastle	Total 10.7 Scores for 25 Services	C=$\frac{27}{7}$=3.8 B=$\frac{42}{7}$=6.0 H=$\frac{45}{7}$=6.4 G=$\frac{28}{7}$=4.0 N= $\frac{3}{7}$=0.4

As can be seen from the example, Bracey's method can be misleading especially since the scores of 1 each for a post office and a cobbler are in fact for two different centres. The alternative method makes it possible to discriminate between different centres and thereby show the degree of attraction for each in a meaningful way.

4.2.2 Analysis

The results for Brampton and Carlisle (appendix 4.3) are illustrated in figure 4.3, and from them it has been possible to discern fields of attraction similar to those that Bracey identified in his study of Somerset. Intensive fields cover those settlements with a score of 16 and over, while at the other end of the scale with scores of 7 or less, are places on the fringe of the particular field of attraction. Between the two, with scores of 8 - 15, are settlements which Bracey included in an 'extensive' field. In the case of Carlisle, this 'extensive' field is quite large, reaching almost to Brampton, and wrapping itself around the town's own field in a claw-like shape. In so doing it has 'captured' settlements such as Kirkcambeck and Tindale that might have been expected to show more attraction for Brampton being only 4.5 miles distant. In contrast, Brampton's fields

of attraction are much smaller, particularly the intensive field which only covers the town and two very small settlements less than three miles away to the north-east.

One point of note that emerges from these maps is the similarity between the patterns produced and those obtained from the isopleths of probability and preference in the previous illustration (figure 4.2). This is partly to be expected since the same basic data has been used in both cases; only the process is different. The intensive fields of both Carlisle and Brampton tend to correspond with the 70% isopleths, and the limits of the extensive fields are similar to the 40% isopleths. Similarly, the areas of overlap between the extensive fields of Brampton and Carlisle show much the same shape and extent as the area of 'indifference' obtained from the previous method. Such similarity helps to determine the size and location of these districts which are on the periphery of a town's main market area, and in which consumers are not dominantly attracted to either one centre or another.

Although the information using the modification of Bracey's method perhaps shows the degrees of attraction and interaction more clearly, it must be stressed that for all the methods used, the results only reflect the situation in the area covered by the survey. They cannot be taken as representative of the whole region. Therefore, whilst the picture of Brampton and its surrounding settlements may be realistic, that of Carlisle is only a proportion of the role it plays throughout the region of N. Cumbria.

4.3 DEGREE OF CENTRALITY

4.3.1 Methodology

A final method of assessing centrality that is relevant to this study was devised by W.K.D. Davies (1967), and used in his investigation of centrality in part of South Wales. Quite simply it sets out to measure the degree of centrality by expressing the number of service outlets a settlement possesses as an index relative to the total for the whole area under consideration. Each service or function can be examined separately and then totalised to give a functional index for each centre. There are three easy stages involved in arriving at the final answer. Firstly, a location coefficient 'L' is obtained for each type of service or function by using the formula :

$$L = \frac{s}{S} \times 100$$

where s is one outlet of the service and
S is the total outlets for the service in the whole area.

Multiplication of the location coefficient by the number of outlets in

a particular settlement gives the centrality value for that function in that settlement :

$$CV = N \times L$$ where N is the number of outlets.

The final stage is a summing of all the centrality values for the different services a settlement possesses to give the functional index 'F'.

$$F = \sum_{1}^{n} CV \quad \left(\text{i.e. } F = \sum_{1}^{n} N \times \frac{s\ (\text{outlets})}{S\ (\text{total})} \times 100\right)$$

This method has several advantages, which others in the same field tend to lack. Firstly, each functional type is comparable in an objective way because the location coefficient reduces all functions to a common base. Secondly, it is possible to compare the results obtained in one area with those in another. In addition, the measure incorporates all the central functions or services of a place (or those that are being examined), and the final index is capable of being subdivided into its component parts.

Centrality Values and Functional Indices — Table 4.4

Services	Total Outlets in Area	Location Coeff'nt	Armathwaite Out.	Armathwaite C.V.	Laversdale Out.	Laversdale C.V.	Great Corby Out.	Great Corby C.V.
Post Office	39	2.56	1	2.56	1	2.56	1	2.56
Baker	82	1.22	1	1.22	1	1.22	1	1.22
Grocer	82	1.22	2	2.44	1	1.22	1	1.22
Butcher	50	2.00					1	2.00
Garage	60	1.66	1	1.66				
Fuel Merchant	22	4.55					1	4.55
Cobbler	9	11.11			1	11.11		
C.V. - Centrality Value F.I. - Functional Index			F.I.= 7.88		F.I.=16.11		F.I.=11.55	

An important characteristic of this method is the way in which it relates centrality to the availability of services and their outlets. In a broad sense this is another way of defining threshold, and use was made of the idea in the previous chapter. A high coefficient of location will be obtained if there are only a few outlets of a particular function, whilst a low coefficient will result from services with many outlets. Therefore centres with more services of a rare nature will score a high index than centres without or with less. As Davies (1967, p.63) himself stated ..... "the greater the total number of outlets of any particular function the lower will be the degree of focality of each individual outlet since satisfaction of demand is spread over a number of outlets."

Table 4.4 illustrates the situation for three settlements in the survey area, whilst the full list is given in appendices 4.4 & 4.5.

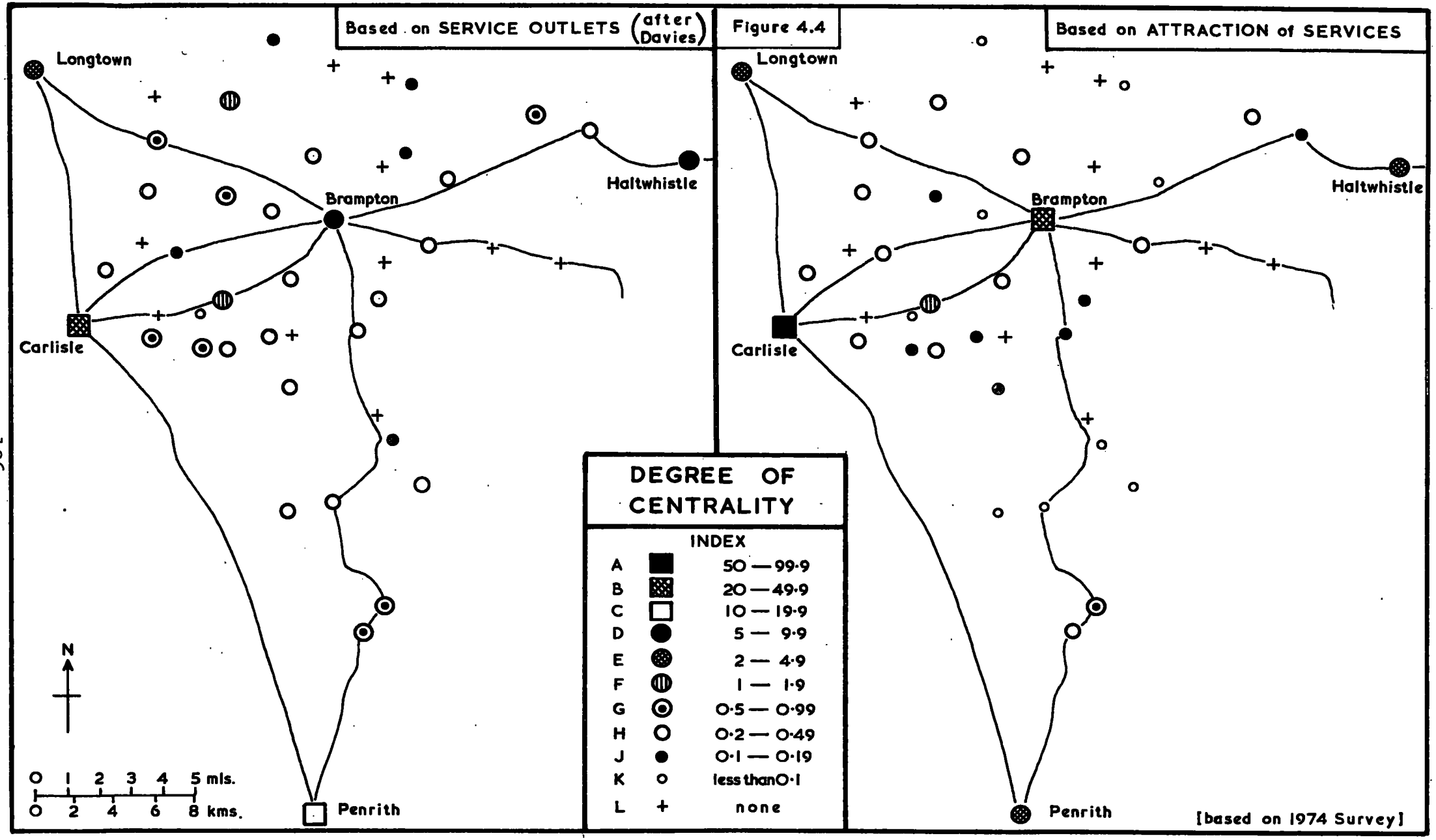
Although Davies in the South Wales study, weighted his location coefficients by the number of employees in order to obtain a centrality value, this has not been possible in this study. Therefore the original method of using the number of outlets for each of the 25 services in the settlements of N.E. Cumbria was adopted. The resulting functional indices were then arranged in rank order, expressed as a percentage of the total, and subsequently divided into ten categories using a logarithmic type of scale. In this way the degree of centrality of a settlement is given a common base by which it can be objectively compared with others, both from the same set and those obtained from another technique.

4.3.2 Analysis

The results from appendix 4.5 are illustrated in figure 4.4A. Carlisle with the highest degree of centrality, 47, is in category B, followed by Penrith in category C with 19. Haltwhistle and Brampton are in category D with indices of 8.0 and 7.7 respectively. One or two settlements appear higher in the order than might otherwise have been supposed because of the rarer type of service which they possess. Examples are illustrated in table 4.4, where the occurrence of a fuel merchant at Great Corby and a cobbler at Laversdale has produced a higher functional index than with Armathwaite, although they all have similar numbers of service outlets. The majority of settlements occur in categories G, H and J, with degrees of centrality ranging from 0.1 to 1. The apportionment is shown in column 3 of table 4.5.

Degree and Category of Centrality — Table 4.5

Degree or Index of Centrality	Category	Number of Settlements based on Functional Index	based on Attraction Index
50.0 - 99.9	A	0	1
20.0 - 49.9	B	1	1
10.0 - 19.9	C	1	0
5.0 - 9.9	D	2	0
2.0 - 4.9	E	1	3
1.0 - 1.9	F	2	1
0.5 - 0.99	G	7	1
0.2 - 0.49	H	16	12
0.1 - 0.19	J	4	7
less than 0.1	K	1	9
none	L	11	11


Based on SERVICE OUTLETS (after Davies)
Figure 4.4
Based on ATTRACTION of SERVICES
Longtown
Brampton
Haltwhistle
Carlisle
Penrith
DEGREE OF CENTRALITY
INDEX
A 50 — 99·9
B 20 — 49·9
C 10 — 19·9
D 5 — 9·9
E 2 — 4·9
F 1 — 1·9
G 0·5 — 0·99
H 0·2 — 0·49
J 0·1 — 0·19
K less than 0·1
L none
N
0 1 2 3 4 5 mls.
0 2 4 6 8 kms.
[based on 1974 Survey]

4.3.3 Assessment of Attraction of Centres

As a complement to the results using Davies' method, a variation on the theme of centrality, based on the attractiveness of a centre, was devised. Assessment was measured by investigating the number of households from every settlement journeying to the various centres for each of the 25 services used in the survey. A weighting number from 1 to 10 was then accorded depending on distance and frequency of bus service available. Details of this have already been given in the introduction (table 0.1). The degree of attraction is based on the fact that if people are prepared to travel long distances for a particular service and there is a poor, or no, bus service, then the centre must be attractive and command a high score. Conversely, a centre will receive a low score if households only travel short distances using a very frequent bus service. The total degree of attraction for the centre will then be the sum of all the indices so measured. Table 4.6 illustrates how the attraction index is obtained using Warwick Bridge as an example of a centre, and the full list is given in appendix 4.5.

Index of Attraction (example for Warwick Bridge) Table 4.6

Settlements from which visits are made to W. Bridge	Distance in miles	Category of Bus Service	Weighting Value	Number of household visits	Index
WARWICK BRIDGE	< 1	-	1	61	61
Brampton	4	A	2	3	6
Hayton	2	A	2	2	4
Warwick	1	A	2	5	10
Heads Nook	1.5	B	3	3	9
Castle Carrock	4.5	B	3	2	6
Cumwhitton	3.5	C	4	2	8
			Total Index of Attraction =		104

As with the previous method, the results were ranked, expressed as a percentage of the total, and divided into the same 10 categories before being mapped in figure 4.4B. Whilst it was not expected there would be any marked correlation between this set of results and those produced by Davies' method, it is significant to note that some similarity does exist. Using the Spearman Rank test, an association of 0.86 was obtained, which is regarded as high.

Several centres well within the limits of the survey area, such as Warwick Bridge, Great Corby, Hayton and Walton, do show similar degrees of attraction to those obtained by the first (Davies) method.

In general, however, the majority of settlements have a lower degree of centrality based on attraction than based on their functional indices. Reference to column 4 of table 4.5 shows that most settlements occur in categories H, J and K with degrees of centrality ranging from 0.01 to 0.5. Only Carlisle and Brampton, which head the list, have higher values by this method. Centres such as Haltwhistle, Scotby, Wetheral, Lazonby and Penrith do not command the same degree of attraction because they are on the periphery of the survey area, therefore their indices are relatively lower. Conversely, settlements such as Hethersgill, Laversdale and Great Corby, which have more specialised services, show a relatively higher degree from the functional aspect.

There are two main conclusions that can be drawn from the results of these last two investigations. In the first instance, the larger centres of Carlisle and Brampton appear to be more attractive and gain a larger share of the consumer market then their functional size would suggest. This would possibly be true of towns like Penrith and Haltwhistle if the survey had been extended to include all their market areas. As it is they still manage to attract a small proportion of custom from what must be regarded as their fringe areas. The second conclusion concerns the small village centres which appear to be less attractive than the number of their services or functional values would suggest.

4.4 SUMMARY

Both these observations corroborate results obtained from earlier exercises in this chapter, but most important of all is the high degree of similarity between observed evidence and expected hypotheses. Centrality in N.E. Cumbria does occur, and evidence for producing a hierarchy of centres has been firmly laid. Although Brampton is a dominant rural centre with distinct fields of influence and zones of attraction, it is not the only one. Carlisle is a larger centre (albeit urban), and others like Warwick Bridge and Gilsland are smaller. Whatever their size and role, all these centres interact to produce a pattern of centrality, and whilst such a pattern may show definite theoretical relationships, it is essentially "..... the result of local circumstance". (Davies, 1967, p.77).

CHAPTER 5

HIERARCHY OF CENTRES, AND CENTRAL PLACE

5.0 INTRODUCTION

The origins of the geography of retailing and service industries lie in the study of central places as initiated by W. Christaller (1933) and additionally by A. Losch (1940). Much subsequent work has led to broader investigations of the factors involved and a wider understanding of the concept of centrality with its applications to spatial and behavioural situations.

Having established from evidence in the previous chapters, that centrality exists in N.E. Cumbria, the stage is now set to examine the nature and character of patterns and relationships displayed by the various centres. By arranging the settlements according to their functional order, it will not only be seen that there is a relationship with population size, but also that a pattern of functional tiers and hierarchy of centres can be identified. This in turn, can be analysed according to the locational pattern that exists within the region. Often, it is the position and distance from other centres that influences the nature and size of a settlement and its provision of services. Population alone is not sufficient a factor in determining the role of a central place, for as Carter (1972, p.70) emphasises

> "..... whereas size might be a measure of importance, it is not a measure of centrality. Centrality, the degree to which a town (or village) serves its surrounding area, can only be measured in terms of the goods and services offered".

With these points in mind therefore, the final section of this chapter will seek to examine the nature and extent of any relationship that may exist between

a) patterns of hierarchy and location as determined by the centres of the region, and

b) those embodied in the classical theories of central place.

5.1 FUNCTIONAL ORDER

Much work has been done by authors such as King (1962) and Berry and Garrison (1958), into the nature of the relationship between the population size of a settlement and the number of functions or services it provides. To echo what was said in the previous chapter, it is natural that the number of services should increase with population, but to note that such an increase is not necessarily in direct proportion. Although there is a substantial correlation between the two, this is bound to vary from region to region depending on the precise nature of the factors which influence the pattern.

A large centre such as Carlisle, with a weighting of city centre services, does not necessarily have twice as many functions as a town with only half its population. It may have more than twice the number of some services and less than twice the number of others. Similarly, a village of 200 people with only two services, may not be half the size of another settlement with four services.

Some settlements cater not only for their own population but also a proportion of the people living in the surrounding area, and therefore they usually have a greater number of services than their size would suggest. Most towns, particularly in rural areas, fall into this category, as do quite a number of villages. Those villages that do, will be termed central villages, echoing Bracey's definition (1962, p.170) that ..... "The village with more shops and services than one would expect for its size which is operating services for neighbouring villages I term a central village".

Several settlements appear to cater just for their own inhabitants, whilst others have very few outlets in relation to their size and are therefore 'parasites' of other centres, being dependent on them for a large proportion of services and functions. Examples of this latter type are often found on the fringe of large towns or cities where they are referred to as urban extensions. Others more distant, have developed over the years (especially since World War II) to become dormitory or commuter villages in which there is a growing 'estate' type of population attached to an older village centre, but in which there has been no related growth of services.

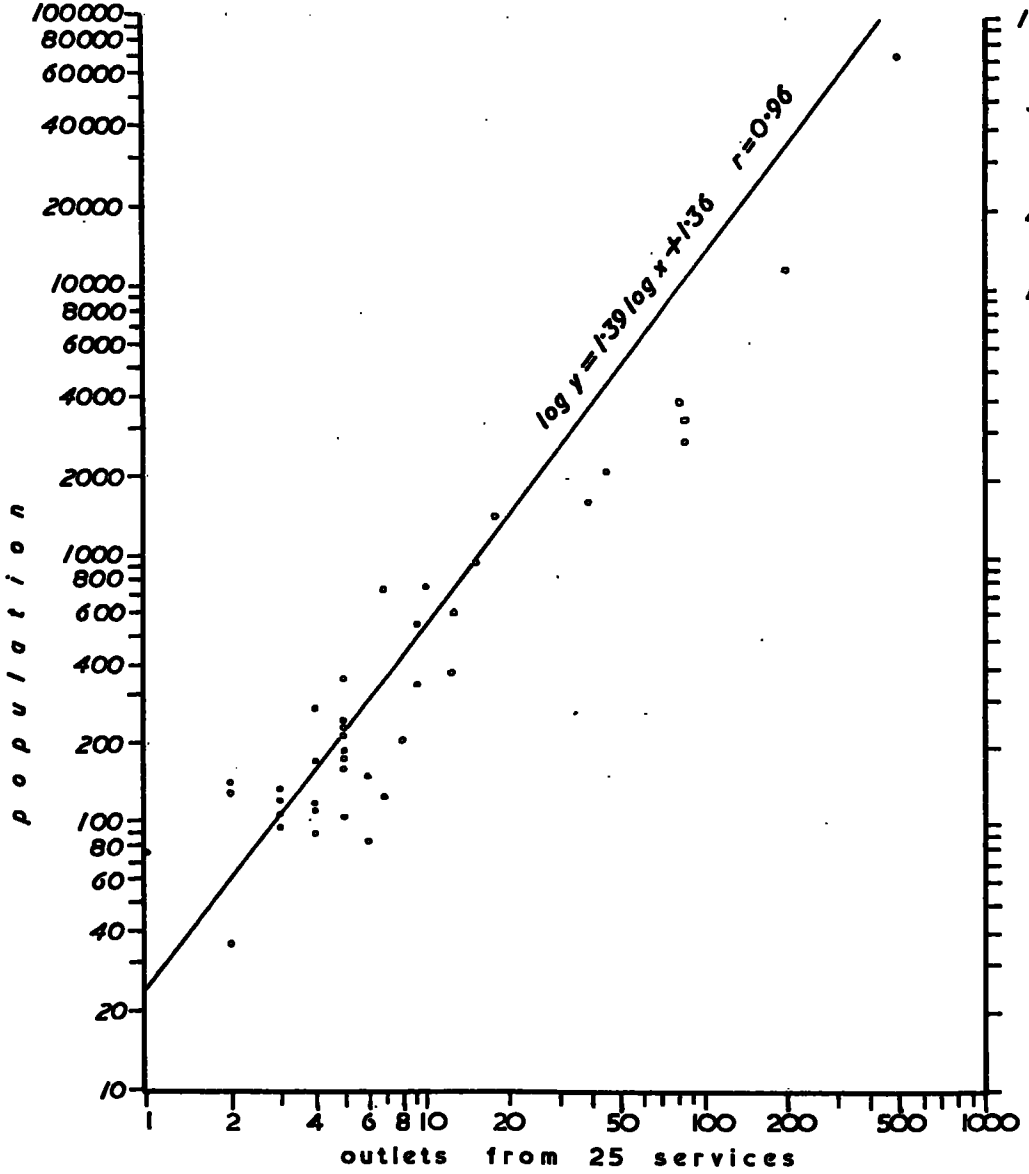
All these types of settlements are to be found in N.E. Cumbria, and the task of identifying them can now begin. It must be stressed however, that as shown by the evidence of the previous chapter, no settlement can be completely self-sufficient and cater entirely for its own inhabitants, even at its own level of provision. Large centres with substantial services and tributary populations to support, still lack certain services that can only be found in other centres.

5.1.1 Methodology

The method chosen to identify the functional order and hierarchy of centres is the scatter-diagram, which was used extensively by Berry (1967) in his analysis of part of the mid-west of the U.S.A. The technique involves plotting the size of population (in this case on the 'y' axis) against the number of functions or service outlets ('x' axis) that each settlement possesses. The data for this is given in appendix 5.1, where 40 settlements, with outlets for the 25 services ranging from 1 to the maximum of 497, are the representatives.

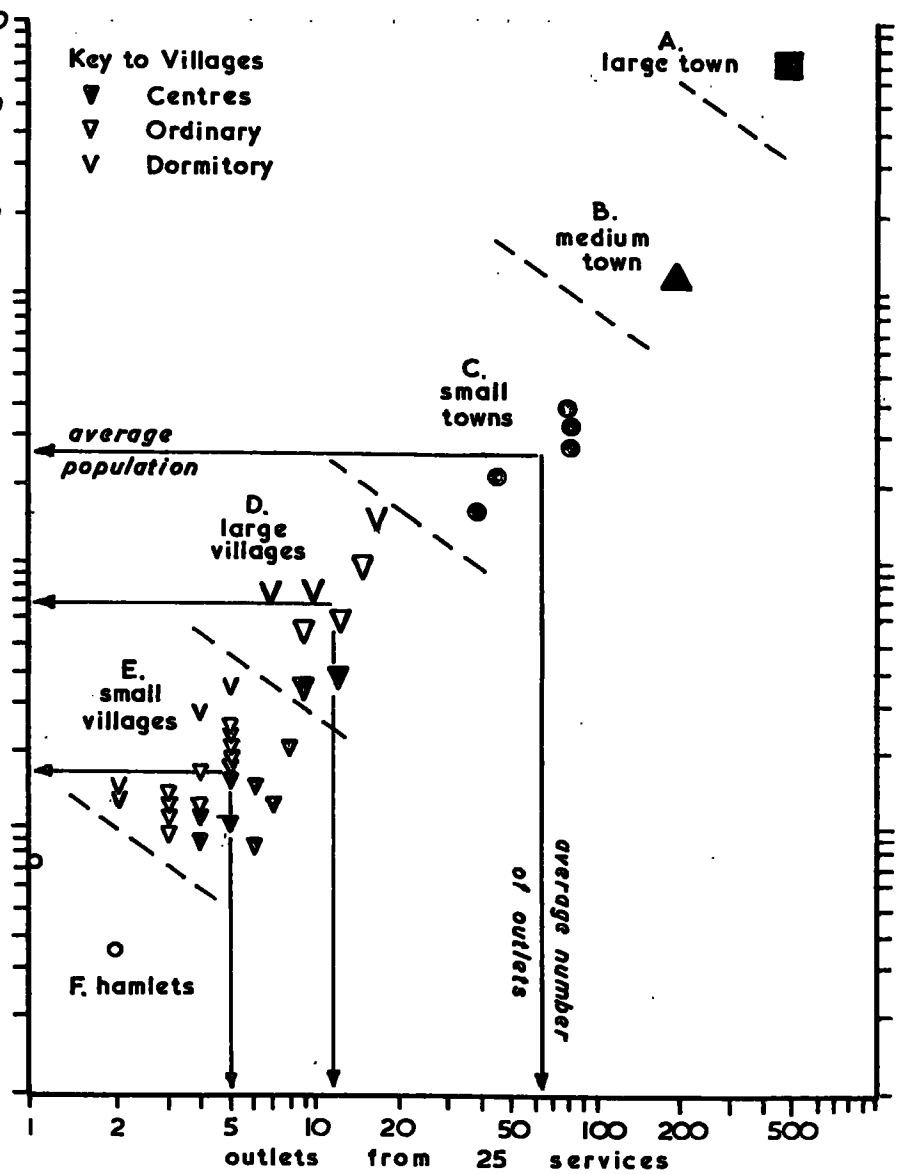
[based on 1974 Survey]

FUNCTIONAL TIERS



HIERARCHY of CENTRES

Figure 5.1



The scatter-graph is illustrated in figure 5.1A, where each of the 40 settlements is represented by a dot. By using a log-scale on each axis, it can be seen that the dots are arranged in a belt that traces a 40^{o} angle to the 'y' axis. Such an arrangement is indicative of a close relationship between population size and number of outlets, and therefore the data was used to calculate a coefficient of correlation 'r' by means of the Pearson Product Moment Test. Encouragingly, this resulted in a coefficient of 0.96 being produced which is very high, even allowing for the fact that extreme examples at each end of the data scale were taken into the reckoning. Although only the outlets from 25 services were used, and only those occurring in the C.B.D.'s of Carlisle and Penrith were recorded, this correlation compares very favourably with coefficients quoted for other regions. According to Toyne and Newby (1971, p.135) the West Riding of Yorkshire shows a coefficient of 0.89, and part of northern France 0.78, both densely populated industrial regions, whereas N.E. Cumbria is largely rural and more sparsely inhabited.

Since the correlation coefficient was so high, and the same calculations could be used, the next step to find the linear relationship between population and service outlets became worthwhile. Known as a 'regression line', it shows the average trend of such a relationship, and suggests the expected size of population to be found in settlements with a definite number of services.
It is generally expressed by the equation :-

$\log y = m.\log x + c$ where y = population size,
x = the number of outlets for 25 services, and
m and c are constants.

In the case of the survey area $\log y = 1.39 \log x + 1.36$, and by substituting different values of 'x' (service outlets) enables the variation in population to be determined. The other regression line showing how services vary with population ($\log x = m.\log y + c$), has such a similar gradient that it has not been graphed.

Although this is a mathematically derived 'best fit' line, it nevertheless serves as a useful yardstick by which to measure the relative provision of services in the settlements of the survey area. In fact, this is the first of three very important observations which it is possible to discern from the arrangement of the dots on the scatter-graph. The other two will be examined subsequently.

5.1.2 Identification of Centres

Since the regression line shows the average trend within the region of how population varies with services, there are bound to be some settlements above, and some below the line. Those that occur below the line have a smaller population than the number of their services would prescribe (whilst the converse is true of settlements occurring above the line). In theory, this suggests that at their own level of provision, such settlements are catering for more population than they possess; in other words they are centres supporting a tributary population. The amount of this tributary population can be calculated by measuring the vertical difference between the regression line and the dot representing the settlement in question.

In reality this theory would appear to be true, for almost all settlements occurring below the regression line are actual centres with tributary areas to support. As depicted by the scatter-graph, all the seven leading settlements (from Carlisle to Alston) have market areas in which a calculable tributary population reside. At a lower level, it is the well established and more isolated settlements such as Gilsland, Kirkoswald and Hethersgill, that emerge as centres. Although their services are minimal compared to those of the larger centres, they nevertheless each cater for a small tributary area as shown by the results of the survey in Chapters 3 and 4.

Size of Tributary Areas by Population and Services — Table 5.1

CENTRES	POPULATION			SERVICE OUTLETS		
	Actual	Tributary Area	Total (approx)	Actual	Ideal* (approx)	Extra (approx)
Carlisle	71,582	56,000	127,500	497	350	150
Penrith	11,306	23,700	35,000	198	90	110
Wigton	3,904	5,600	9,500	80	42	40
Brampton	3,226	6,800	10,000	83	38	45
Haltwhistle	2,780	7,300	10,000	83	33	50
Longtown	2,082	2,500	4,500	46	26	20
Alston	1,533	2,000	3,500	38	22	15
Gilsland	390	310	700	12	8	4
Kirkoswald	329	170	500	9	7	2
Hethersgill	204	200	400	8	5	3
Smithfield	135	215	350	7	4	3
Roadhead	85	215	300	6	3	3

* Ideal - the number of service outlets sufficient for centre only.

Table 5.1 lists the majority of these centres in N.E. Cumbria, and shows the theoretical size of their tributary populations as determined by relationship to the regression line on the scatter-graph. Similarly, by taking the horizontal difference between the regression line and the dot representing the settlement, the extra number of services which the centre provides for its tributary population can be calculated, and these are shown in the final column.

An interesting point to emerge is the close relationship between some of the total population figures displayed in this table and those calculated in previous chapters from census data based on recognisable areas of influence. For instance, the estimate of 140,000 for the total regional population of N. Cumbria (Chapter 3), is only $12\frac{1}{2}$ thousand in excess of the figure for Carlisle obtained here. Although the primate city caters for most of the region, particularly with its specialised services, there is bound to be a small proportion of the regional population, especially in Penrith, which do not require those services. Therefore this latter figure is probably very close to an accurate assessment of the population catered for by Carlisle. On the other hand, Brampton's tributary and total market area populations, calculated by this regression line method, are in excess of the figures obtained from the 50% zones of influence assessed in Chapter 3. This is perhaps to be expected since the scatter-graph method tends to prescribe an 'absolute' figure, whereas the calculation in Chapter 3 only suggests a 'main' or general market area population. The figure of 10,000 is, however, more in accord with the estimated population covered by the outer or 20% zones of influence which include many families who make occasional visits to the town. Therefore the figures are perhaps more comparable than might initially be expected.

At the lower levels of provision similar relationships can be found. Gilsland appears to cater for about 700 people which is only 50 less than the total population of the three parishes by which it is surrounded, and Hethersgill's estimated provision of 400 people is only about 50 more than its own parish total.

In contrast to these centres, are those settlements which, on the scatter-graph, are represented by dots above the regression line. They have a small number of services in relation to the size of their population and are therefore not adequately catering for them. In theory such settlements are described as urban extensions or dormitory villages, and in reality that is exactly what they are. Dalston, with a population of 1,300 (almost as high as Alston's) but with only 17 service outlets, lies only 4 miles south-west of Carlisle for which

it acts as a small overspill and satellite community. The other urban extensions are Houghton and Scotby, whilst villages like Hayton, Irthington and Crosby, have all acquired commuter estates over the last twenty years without any increase in the provision of services.

Such a situation, however, is not necessarily true of settlements like Warwick Bridge and Heads Nook, for although they have similar estates built to house a growing commuter population, their services appear to have increased in relation to the demand. These are the 'ordinary' villages as opposed to the 'centre' or 'dormitory' variety, because theoretically they neither appear to provide for an external population, nor appear to be dependent on other centres. As was said earlier, in reality this is not true, even at their own level of provision.

5.1.3 Hierarchy of Centres

The second important observation that emerges from the arrangement of dots on the scatter-graph is the way in which clusters occur. It is possible, as shown by the second diagram (figure 5.1B), to distinguish six clusters or groups, thereby enabling a hierarchy to be identified. The precise term used to describe such an arrangement matters little, whether it be settlement hierarchy, functional tiers or hierarchy of centres. Each term is appropriate in its own context. What is important, however, is that such an arrangement exists, and the way in which each cluster can be distinguished from its neighbours. The full table is given in appendix 5.1.

This method of identifying clusters in order to determine the character of the settlement hierarchy tends to embody some of the work of Smailes (1946), Brush (1953) and Bracey (1962). Each one used a slightly different approach to the problem, but all based their findings on the proportion of functions and services occurring at different levels of provision. For instance, Brush and Bracey identified their types of centre by the number of retail and service outlets they contained, while Smailes used the presence or absence of specific establishments in a settlement to determine his system of classification. It would be superfluous to attempt a comparison of each of their methods with regard to the settlements of N.E. Cumbria, partly because there are insufficient examples, but mainly because the scatter-graph method is probably more appropriate.

In analysing the arrangement of settlements in the hierarchy, it has been possible to identify common functional 'denominators' by which, not only can the clusters be distinguished, but also differences

between lower-order centres be recognised. As was stated in Chapter 3, those functions which have low threshold requirements are found in nearly every settlement of a region, but services which require a large population in order to be economically viable will only be found in the larger centres where such requirements can be met. Therefore it is natural to expect that as settlements increase in size, higher threshold services will be present in addition to the lower-order types. Being able to distinguish in this way between the range and type of functions that each settlement possesses is therefore one of the main criteria on which a hierarchy can be deduced.

Common Denominator Functions for the Survey Area — Table 5.2

FUNCTIONS	CATEGORIES OF SETTLEMENT									
	A	B	C	D_1	D_2	D_3	E_1	E_2	E_3	F
Court	X									
Museum	X									
College	X									
Multiple Stores	X									
Specialist Shops	X									
Cinema	X	X								
Hospital	X	X								
Bus Station	X	X								
Department Store	X	X								
Boots/Woolworths	X	X								
Solicitor	X	X	X							
Secondary School	X	X	X							
Furniture	X	X	X							
Clothes & Shoes	X	X	X							
Supermarket	X	X	X							
Bank	X	X	X	X						
Doctor	X	X	X	X						
Hairdresser	X	X	X	X	X	X				
Greengrocer	X	X	X	X	X	X				
Butcher	X	X	X	X	X	X				
Decorator	X	X	X	/	/		/			
Fuel Merchant	X	X	X	/	/		/			
Electrician	X	X	X	/	/	/	/			
Plumber	X	X	X	/	/	/	/			
Garage	X	X	X	X	X	X	X	X		
Primary School	X	X	X	X	X	X	X	X	X	
Public House	X	X	X	X	X	X	X	X	X	
Post Office	X	X	X	X	X	X	X	X	X	
General Store (grocery/bakery)	X	X	X	X	X	X	X	X	X	
None										0

Settlement Type	Large	Med.	Small	Cent. LARGE	Ord. VILLAGES	Dorm.	Cent. SMALL	Ord. VILLAGES	Dorm.	HAMLETS
	TOWNS									
No. of Settlements in each Category in Survey Area	1	1	5	3	2	3	6	13	4	
	7			8			23			44

X indicates that the service is common to the places in the category.
/ at least one of the set thus marked is common.

Table 5.2 sets out the arrangement of these groups and lists some of the 'common denominator' functions by which it has been possible to identify the hierarchy.

At the lowest level in hierarchy are the 'F' category settlements or hamlets. 44 separate communities can be identified within the region around Brampton, but only four have any outlets of the 25 functions surveyed, and all have less than 80 inhabitants. The largest of these is Newbiggin with 76 people and a post office, whilst Roweltown has only 35 inhabitants but provides a garage as well as a post office. Both are illustrated on the scatter-graph as examples of the lowest level of provision, but neither can really be classed as centres in the true meaning of the term.

The first real level of provision is supplied by the category 'E' settlements. They have populations ranging from 80 to 350, and between 2 and 8 services, none of which are duplicated. These can be described as small villages, but an important division can be made depending on the type of services they provide. All but two settlements possess the retail functions common to the group, namely a post office and general store (from which groceries and bakery goods are retailed). Central villages (i.e. those which appear to provide for their surrounding areas), such as Roadhead, Barclose, Smithfield and Hethersgill, all possess a garage and one or two 'trade' services in addition. This gives them a greater functional index and degree of attraction than other villages of similar size. The 'ordinary' villages, such as Hallbankgate, Walton and Heads Nook, usually possess a garage in addition to a post office and general store; whilst (on average) the dormitory type of villages lack all but the two basic services. Examples of this latter type are Hayton, Irthington, Crosby and Warwick.

At a higher level of provision are the 'D' category settlements or large villages. They have populations ranging from 350 to 1,500, and between 7 and 20 functions, some of which are duplicated. In addition to the services of the small villages, the common functions at this level are a greengrocer, butcher and hairdresser. Also, like the small villages, a sub-division can be made using the same criteria. Central villages, of which there are three — Wetheral, Gilsland and Kirkoswald, possess either a branch-bank or doctor in addition to the other service outlets. Ordinary large villages, such as Warwick Bridge and Lazonby, do not have these specialised professional services, and the dormitory villages (or urban extensions) of Dalston, Houghton and Scotby have fewer 'trade' outlets than other villages in the same category. This is to be expected, since most trade and professional services required

by these urban extensions will be located in Carlisle where there is a higher population threshold.

The next cluster of settlements, category 'C', are the small towns. They distinguish themselves from the villages by virtue of the greater range of services they provide. As well as duplication of low threshold types, several services such as clothes, shoes and furniture, are at a higher level of threshold. The populations of these towns range from 1,500 to 4,000, and their functional outlets from 38 to 83. Although Brampton is the only one of the five towns with all 25 services represented, Alston, the smallest, provides 20 of them in its 38 outlets (appendix 5.1).

All these towns are centres, providing a range of retail and business services for the population of the surrounding areas as well as their own inhabitants (c.f. table 5.1). Over the last two decades most of them have increased their populations (Alston excepted), and both Brampton and Wigton support a substantial proportion of commuter inhabitants. Unlike some of their village counterparts however, and principally because of their location, role and status within the region, these settlements have been able to let their service provision keep pace with the growth of population and consumer demand.

The final two settlements in the hierarchy, Penrith and Carlisle, are the only representatives of their categories within the region. Apart from the great difference in population, the main distinctions between the two from a functional aspect, are the greater number of service outlets provided by the primate city, particularly from the high threshold variety. Although not recorded as part of the 25 services surveyed, Carlisle has many more specialised retail outlets (such as furriers and milliners), more multiple stores of the Woolworth variety, and a larger range of trades and professions than Penrith. In addition, there are the specialised educational, cultural, social and administrative establishments with which most regional centres are endowed. These latter services therefore, help to place Carlisle in a category on its own, and would still do so had there been another settlement of similar size or with a similar number of functions within the region.

As it is, there appears to be quite a large gap in the hierarchy between Carlisle and Penrith, the implications of which will be examined subsequently. The nearest settlements of any intermediate size are the industrial towns of Workington and Whitehaven on the western side of the county, and Dumfries on the Scottish side of the

Solway Basin. Each town has a population of about 30,000, but all three are outside the region under review, and therefore their services and functions have not been recorded. Had the survey of the North Cumbrian region been extended to include them, then it is highly probable that the gap in the hierarchy would have been more than adequately filled. Figure 5.2 shows the distribution of the settlements identified by their hierarchical order, and their spatial arrangement will be examined in the second section of this chapter.

5.1.4 Thresholds

Having determined the settlement hierarchy of the region based on the scale of provision of services, the final point that can be identified from the arrangement of dots on the scatter-diagram concerns the threshold levels at which the different categories of centre perform. Whilst the 'common denominator' functions have already been defined, the population requirements for specific services have not. In the same way that the general regression line was obtained, linear regressions (and their correlation coefficients) were calculated for each of the four services which could be regarded as representatives of the common functions for their type of settlement. These were groceries for small villages, butchers for large villages, and shoes and furniture for towns. The exercise for medium and large towns would have been meaningless because of the single representatives of each.

Table 5.3 shows the average population requirements for each of the four services based on the linear regression equations which were as follows :-

groceries	:	$\log x = 0.70 \log y - 1.73$	$r = 0.99$
butchers	:	$\log x = 0.67 \log y - 1.79$	$r = 0.99$
furniture	:	$\log x = 0.64 \log y - 1.81$	$r = 0.96$
shoes	:	$\log x = 0.63 \log y - 1.83$	$r = 0.97$

Average Population Requirements — Table 5.3

Number of Outlets	Small Village Service GROCERS	Large Village Service BUTCHER	Town Services FURNITURE	Town Services SHOES
1	300	470	670	800
2	800	1,320	1,990	2,400
5	2,950	5,200	8,300	10,350
10	7,950	14,600	24,600	31,000
20	21,400	41,000	72,600	93,000

It is interesting to note the high coefficients of correlation for all four services, once more indicative of the close relationship between population size and number of services within the region. The other significant point concerns the lower values of furniture compared to shoes (which might have been expected to be the other way round). The reason is because there are more outlets for furniture than for shoes (46 compared to 41), and one of them is at Lazonby which is classified as a large village.

In table 5.4, these averages have been translated into more meaningful terms by comparing the expected number of outlets with the actual number for a selection of settlements within the area.

Expected v Actual Service Outlets — Table 5.4

Category and Settlement	Grocers		Butcher		Furniture		Shoes	
	Exp.	Act.	Exp.	Act.	Exp.	Act.	Exp.	Act.
A Carlisle	48	87*	29	49*	20	25	17	22
B Penrith	13	18*	8	12*	6	11	5	8
C Brampton	6	8	4	4	3	1	2	4
C Alston	3	4	2	2	2	0	1	1
D_1 Gilsland	1	2	1	1				
D_2 Warwick Br.	2	2	2	1				
D_3 Scotby	2	2	1	1				
E_1 Hethersgill	1	1						
E_2 Great Corby	1	1						
E_3 Crosby	1	0						

* Figures are total outlets for Carlisle and Penrith, not just C.B.D. because calculations use total populations of each town.

In general, Carlisle and Penrith have more outlets than their expected number, showing that they obviously cater for tributary populations. In the case of Brampton the differences are not as marked, whilst Alston appears to cater very little for people outside the town, which is not surprising considering the isolated and sparsely populated area in which it is located. With reference to the villages, it is the 'centre' types, such as Gilsland and Hethersgill, that have slightly more outlets than the average would suggest, helping to confirm their status in the hierarchy.

Although no hard and fast boundaries can be drawn between one category and another, table 5.5 shows the average population and average number of services for each group of settlements within the region (also illustrated in figure 5.1B). Two points must be stressed at this

juncture. Firstly, the examples used include all the larger settlements of N. Cumbria (i.e. those with populations greater than 1,000), but the smaller settlements (of village status and lower) are only located in the N.E. of the county, in what can be referred to as Brampton's area of influence. Therefore, the second point is to emphasise that all tables and results apply only to the region or settlements in question, and may not necessarily compare with patterns found in other areas of the country, especially if they are industrial or urban.

Average Size of Population and Services in Survey Area — Table 5.5

Category of Settlement	Population			Outlets for 25 Services		
	Maximum	Minimum	Average	Maximum	Minimum	Average
Large Town	-	50,000	72,000	-	250	500
Medium Town	50,000	10,000	11,300	250	80	200
Small Town	10,000	1,500	2,700	80	20	65
Large Village	1,500	350	710	20	7	11
Small Village	350	80	165	7	$2\frac{1}{2}$	5
Hamlet	80	20	40	$2\frac{1}{2}$	-	-

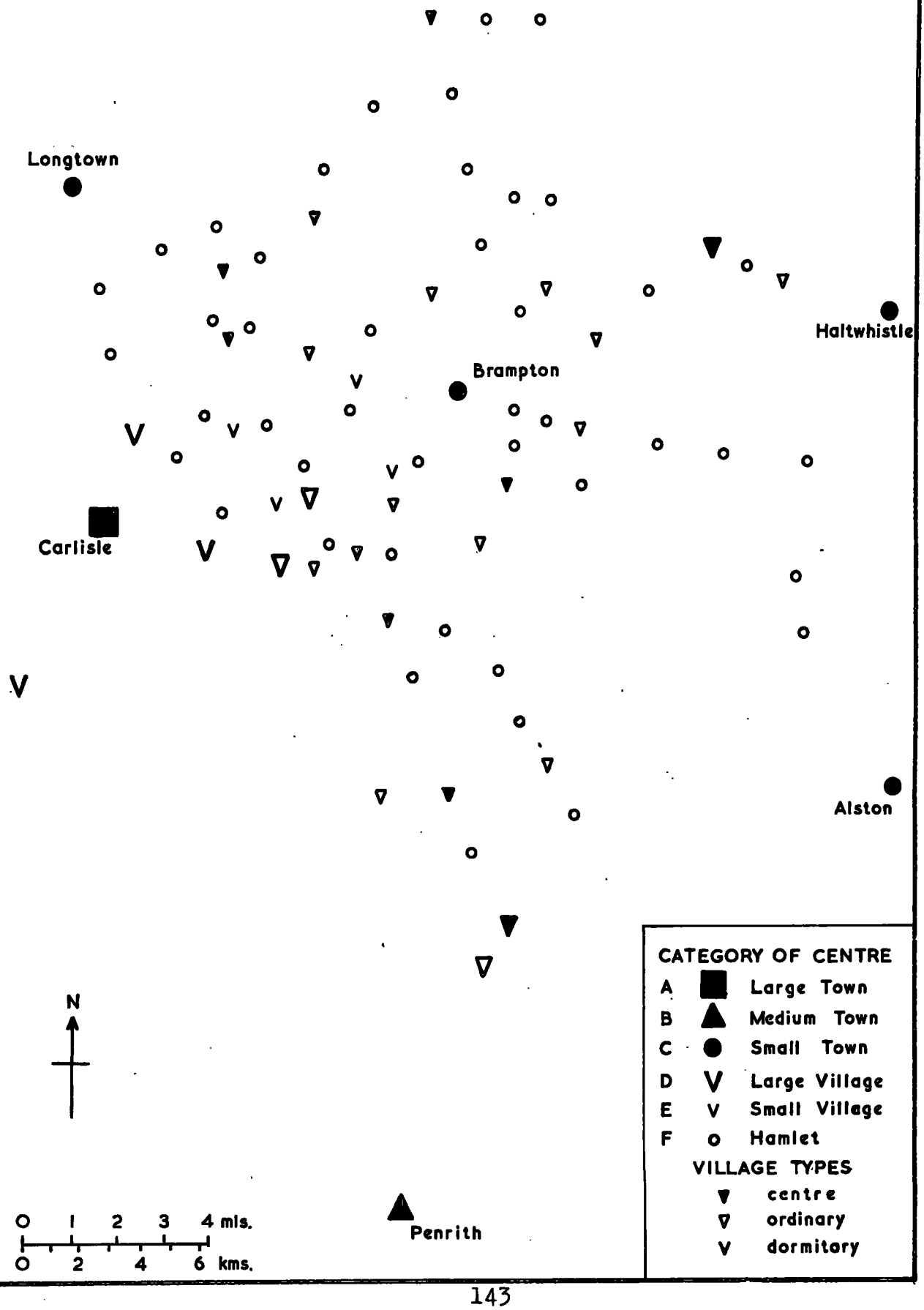
The table helps to illustrate two important points. In the first instance, Penrith, the only medium-sized town represented, is at the lower end of the range for population, but much nearer the maximum for service outlets. This emphasises the role it plays in the region, obviously catering for quite a large tributary population. Similar roles are to be found with the market towns of Wigton, Brampton and Haltwhistle, for while their populations occur in the middle of the range for their group, their number of service outlets is at or above the expected maximum. The second point relates to these characteristics and concerns the absence of another town at an intermediate level between Penrith and Carlisle. If such a centre had been present, then no doubt the provision of services within the region would have been arranged in a different way, with Penrith and the market towns possibly having a smaller share than exists in the present situation.

Therefore despite both the limitations of the size of the area and the constraints imposed by only a sample of services being represented, it is significant that a hierarchical pattern has emerged and from which it can be seen that there is a high degree of correlation between population and the services provided.

Figure 5.2

THE SETTLEMENT HIERARCHY OF N.E. CUMBRIA

[based on analysis of 1974 Survey]



5.2 CENTRAL PLACE

No study which has attempted to examine the character of centrality within a region would be complete without reference to the classical theory of central place as proposed by W. Christaller in 1933. The concept and its applications need very little introduction or explanation, because they have been examined, dissected, analysed and criticised with varying degrees of opinion by many authors ever since they were first postulated.

As was stated in Chapter 4, no theory or model should be taken as the exact pattern for what occurs in reality. Rather it should act as a guide against which the real situation can be tested for any similarities or differences. Although many attempts have been made to make the theory fit reality, especially with regard to spatial location, it is the principles and concepts rather than the application that are the important factors. The final section of this chapter, therefore, seeks to measure the extent to which centrality and the settlement hierarchy of N. Cumbria compare with those of the classical model.

One of the main principles underlying the whole theory of central place, is the notion that certain settlements act as central places for the surrounding region, and that they originate and develop at central accessible points to carry out the provision demanded by the population present. In other words, the location of economic activity is largely determined by the conditions of supply and demand, from which two further concepts emerge, those of threshold and range. Further to this, Christaller was able to postulate that, given certain uniform conditions, there would be a distinct relationship between the number, size and distribution of such central places.

In all these respects, N. Cumbria's situation is in complete accord. The region does have central places at focal points, in which different services of varying thresholds are provided (c.f. figure 5.2); and the settlements can be arranged into an order based on number and size, as has been demonstrated by all the previous evidence. This, however, is where the main similarities end.

5.2.1 Christallen Networks

Concerning the application of the principles to a practical and spatial model, Christaller conceived that there would be regularity in the arrangement and distribution of all the settlements. Each settlement would create a demand to be satisfied by the services of at least one central place of the next higher order, and this situation would progress from one level to the next until an ultimate centre was reached. The role of each central place would be influenced by one

of three functional factors,-market, transport or administration. Whichever influence was present would not only determine the degree of provision experienced by each settlement, but also the extent of the area served by each central place. From this arrangement, Christaller was able to construct his now famous network of hexagonal areas, using demand units, or 'k' values, to obtain the structure. The three basic forms of hexagonal areas would be related to whichever functional factor was seen to be present in the central place. A market influence would produce a k-3 system, transport a k-4 system and a k-7 arrangement would result from an administrative influence. These are illustrated in figure 5.3A. By such an arrangement, not only would a regularity of spatial location be achieved, but also a rigid hierarchy established.

The uniform conditions which Christaller embodied in the model as pre-requisits, were the presence of a flat uniform landscape, evenly populated, and with no variation in wealth or income. Only in rare circumstances would any of these conditions be found. In practice none are constants, but each is a variable factor, therefore the ultimate pattern of a spatially ordered hierarchy can never be absolutely achieved. The best one can hope for is a good approximation.

In the case of N. Cumbria, the landscape within a small area around Carlisle is fairly flat and uniform, but thereafter the physical barriers of the Solway Estuary, the Pennines and the Cumbrian Mountains disrupt the evenness. In consequence, the distribution of population is less uniform, and as with any cross-section of the community there is a natural variation in wealth and income. Therefore any resemblance to an ordered hierarchy is confirmation of the basic principles upon which central place theory was founded.

5.2.2 Central Place Hierarchy

Examination of table 5.6 shows the similarities and differences between the classical hierarchy and the regional results for N. Cumbria. The only manipulation exercised has been to separate Longtown and Alston from the rest of their group and class them as sub-towns.

As can be seen, there are quite a few similarities with both population size and average distances. In the case of Carlisle and Penrith, these distances were measured to the next town of similar status, not necessarily within the region (i.e. Carlisle to Lancaster and Newcastle, Penrith to Maryport and Kendal). The main differences occur in classification and the use of terms. In N. Cumbria the term 'hamlet' has been given to the group of small settlements with low population and without any services. These, therefore, are not central

places, hence the absence of an equivalent group in Christaller's list. His 'hamlet' would seem to correspond in N. Cumbria to a small village, and 'market Hamlet' to a large village. Brampton and Wigton appear to fit the 'county seat' category, and Carlisle is undoubtedly the 'provincial head city', although its population is almost twenty thousand lower than the expected size.

Hierarchy of Central Places — Table 5.6

CHRISTALLER				NORTH CUMBRIA			
Central Place	No.	Dist. (miles)	Pop'n.	Central Place and example	No.	Aver. Dist.	Aver. Pop'n.
				Hamlet Lanercost	44*	1.5	40
Hamlet	486	2.1	250	Small village Hethersgill	22*	2.5	165
Market Hamlet	162	4.3	800	Large village Wetheral	8*	4.5	710
Township Centre	54	7.5	1,500	Sub-Town Longtown	2*	8.0	1,800
County Seat	18	13.0	3,500	Small Town Brampton	3/1*	12.0	3,000
District City	6	22.5	9,000	Medium Town Penrith	1	30.0	11,300
Small State Capital	2	38.5	27,000				
Provincial Head City	1	67.0	90,000	Regional Centre Carlisle	1	60.0	72,000

* N.E. Cumbria only

The one major gap in the hierarchy for N. Cumbria has already been mentioned, and from the classical list the position and size of settlements by which it could be filled are obvious. Workington and Whitehaven, each with populations of about 27,000, are the centres omitted for reasons already stated. A smaller gap occurs at the township level where, within the region, Longtown and Alston are the only representatives. Other settlements that may have been considered for inclusion in this group are East Riggs and Canonbie in Scotland, Appleby to the south-east of Penrith, and Silloth on the west coast. Like their larger counterparts, they lie outside the defined region and have not been surveyed.

One similarity that does exist concerns the number of central places in a particular category. Christaller stated that, based on the 'k-3' market system, this would follow a progression of the following order: 1 : 2 : 6 : 18 : 54 : 162, etc. Taking N.E. Cumbria as the

example, with Brampton as the single county seat representative (and although on the fringe, Longtown and Alston as the next lower centres), then the progression is: 1 : 2 : 8 : 22 : 44.

Although there may be a good relationship here, there is less similarity concerning tributary areas. Christaller computed that the tributary area for a county seat should be about 400 square kilometres (or 160 square miles) and contain about 24,000 people. Brampton's main zone of influence has been calculated to be about 60 square miles and its tributary population either 3,700 (Chapter 3), or 6,800 from the scatter-graph. Similarly, Carlisle's tributary area is about 1,250 square miles and contains approximately 56,000 inhabitants, both of which are appreciably less than the figures suggested by the theoretical table (size 4,100 sq. miles, population 675,000). Therefore it can be surmised that N. Cumbria appears to be underpopulated for the size of region and the role of its centres if comparison with the central place hierarchy is taken too rigidly.

A further contrast is provided by the typical functions to be expected from the various grades of settlement in the hierarchy, as outlined in table 5.7.

Expected Functions of Central Places — Table 5.7

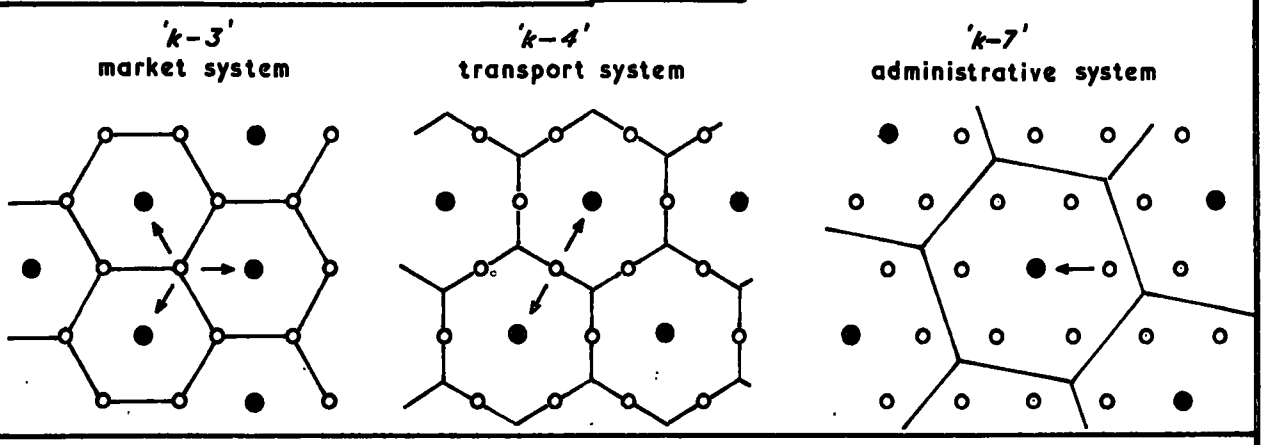
Central Place	Typical Functions (Christaller)		Towns of N.Cumbria with similar range of Functions
Market Hamlet	Head Post Office Railway Station Brewery	small Bank Doctor Dentist	Wigton Brampton Longtown
Township Centre	Court Library & Museum Specialist Shops	Chemist Cinema School	Penrith
District City	Daily Newspaper Labour Office Specialist Doctors	several Banks, Cinemas and Post Offices	Carlisle

With reference to the centres of N. Cumbria which have these functions, it can be seen that their position in the hierarchy is twice removed from the previous order (table 5.6). None of the market hamlet examples within the region possesses the type or range of function suggested, although one or two have either a doctor or branch bank, as previously mentioned. At the township level Alston and Longtown do have schools, a chemist and branch library, but no court, museum, cinema, or the range of special shops suggested. In fact, Wigton and Brampton do not fit this category either, and the first town that does is Penrith. Carlisle, on the other hand, seems

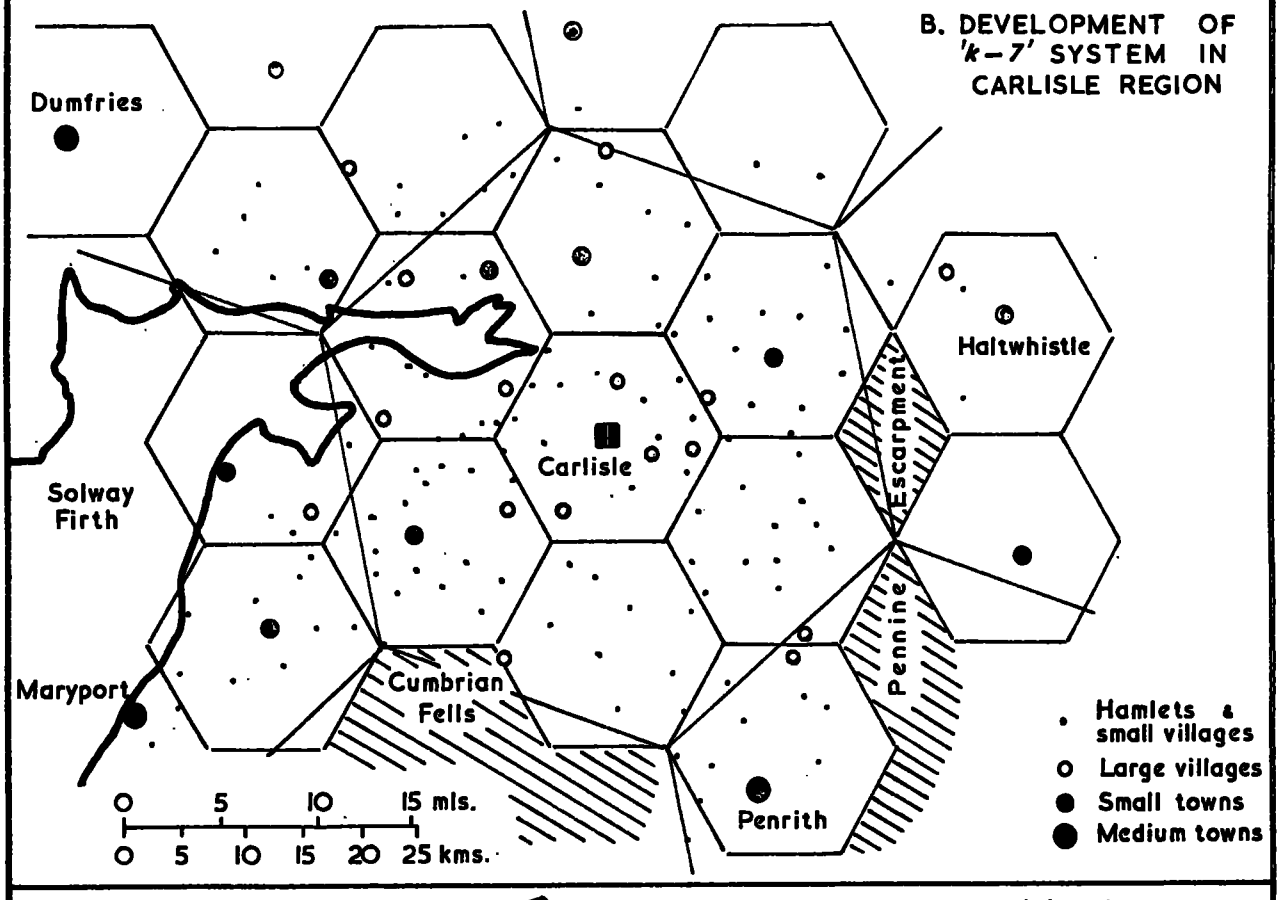
CHRISTALLEN LANDSCAPES

Figure 5.3

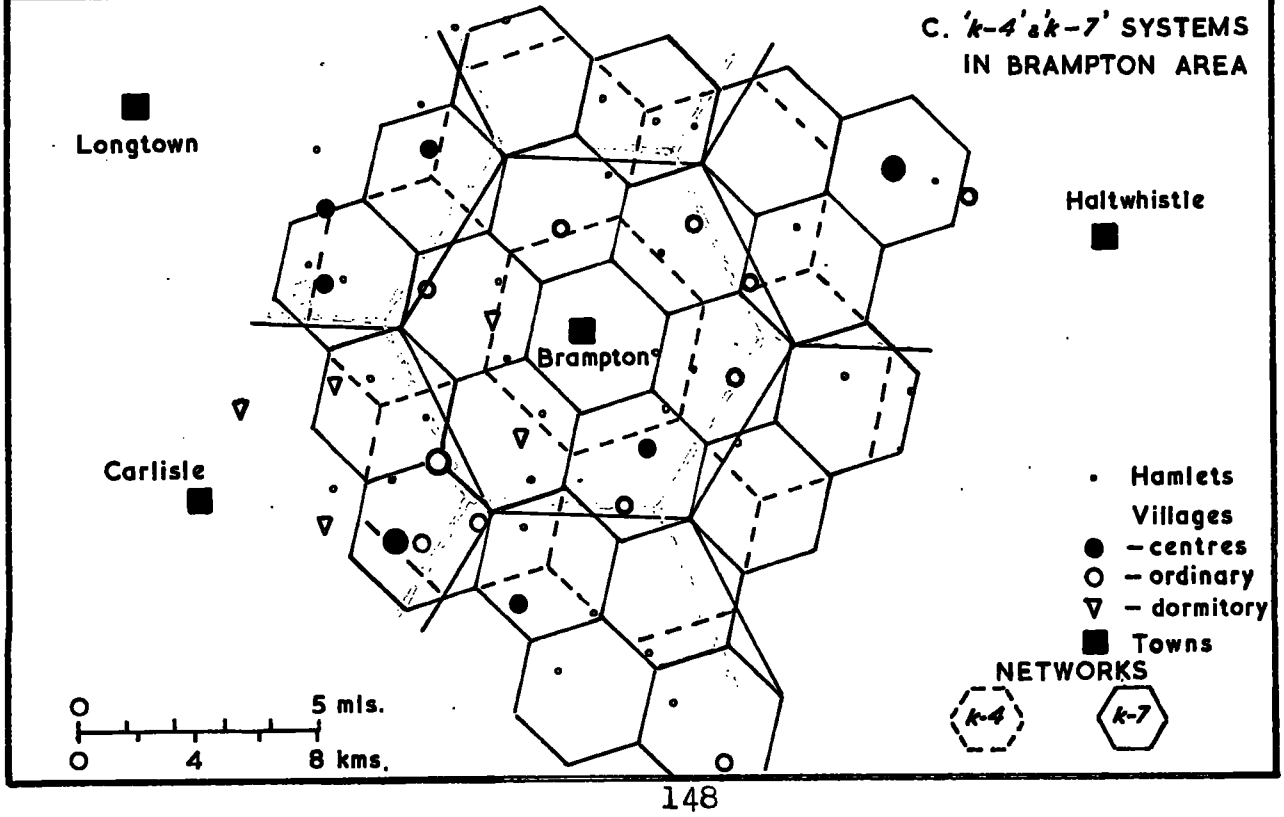
A. DEMAND NETWORKS



B. DEVELOPMENT OF 'k-7' SYSTEM IN CARLISLE REGION



C. 'k-4' & 'k-7' SYSTEMS IN BRAMPTON AREA



to fit the district city class, for it is the only centre in the region with specialised doctors and a daily (albeit evening) newspaper.

The inferences to be drawn from such a contrast lie mainly in two directions. Firstly, the examples suggested by Christaller were founded on evidence obtained largely from South Germany before 1933. Therefore, not only is the regional structure bound to be different, but also the time element will affect the situation. Secondly, as was indicated in Chapter 3, small centres tend to provide less services than they did before the advent of increased consumer circulation and changes in methods of retail distribution. As a result, towns such as Wigton and Brampton that did once possess a local court, a cinema and even a labour exchange, no longer do so; such provision now only being supplied by the larger centres of Penrith and Carlisle. Therefore it is hardly surprising that the expected functions do not match with the actual.

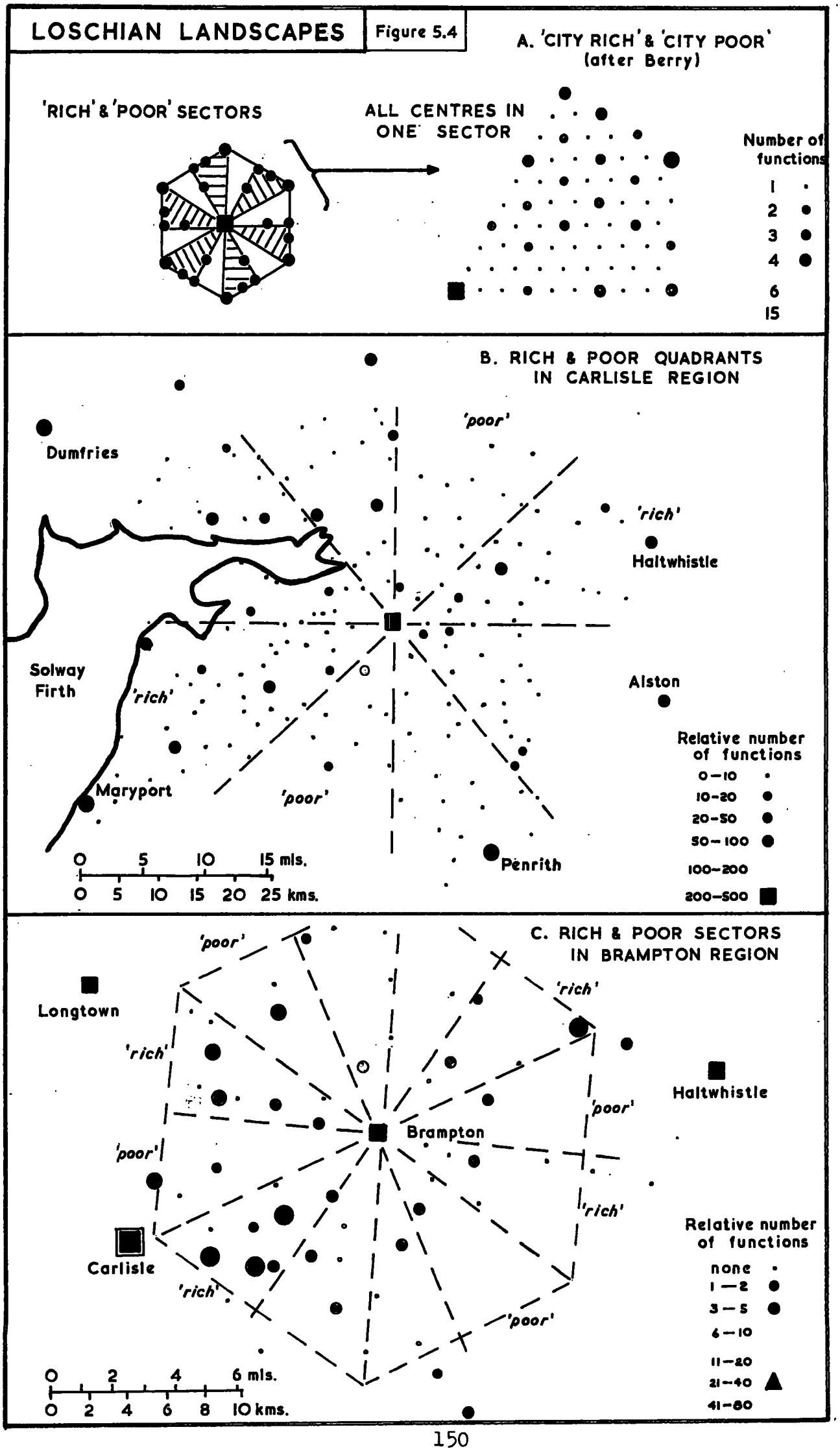
5.2.3 Spatial Location

A further mismatch concerns the spatial distribution of these centres of N. Cumbria which is more random than regular and therefore does not conform to the arrangement suggested by the classical theory. This is partly due to the limitations imposed by the physical landscape, and partly to the resulting uneven distribution of population. Therefore the arrangement of hexagonal trade areas does not fit together as rigidly as the theoretical assumption suggests. Figure 5.3B illustrates a network based on the 'k-7' administrative system, and shows that only in one direction does the network appear to fit. This is because the centres, on a line from Maryport to Brampton, are fairly evenly spaced. However, the spacing of centres over the rest of the region is less ordered (even if Annan and Dumfries are included), and there are no similar lines of centres emanating from Carlisle in regular directions. The only other pattern worthy of note is the direction and location from Carlisle of its nearest lower-order centres. The largest of these, Penrith, is most distant and lies to the south. Longtown, the smallest town, is the least distance away and is located to the north, whilst Wigton and Brampton (of similar size) are each situated about 10 miles from the primate city in westerly and easterly directions. Although not structured in the way Christaller proposed, at least a type of ordered arrangement is present.

A closer look at the Brampton area (figure 5.3C), reveals a more ordered arrangement of the settlements than can be found elsewhere in the N. Cumbrian region. In fact, it was the spatial arrangement of the villages around the town, and its role in the life of the surrounding area, that originally prompted the idea of investigating centrality

LOSCHIAN LANDSCAPES

Figure 5.4



within the region.

As far as the hexagonal networks are concerned, the best fits appear to be those based on either a 'k-7' or a 'k-4' system, which is in contrast with the 'k-3' system suggested by the numerical progression of settlements in the area (stated earlier). Although not every settlement fits exactly into the jig-saw network, there are quite a few that do, particularly those already identified as true centres. This is justification (if any be needed) of the application of central place theory to an actual situation.

5.2.4 Loschian Networks

A more realistic system, however, is perhaps to be found by a brief examination of the alternative central place model as proposed by A. Losch in 1940. Although both he and Christaller were in fundamental agreement about the principles and concepts of central place and the establishment of a hierarchy, it was evidence of variation in functional provision that enabled Losch to produce an alternative arrangement of centres. He surmised that because of the differences in the provision and specialisation of services, centres of the same order and size would not necessarily be found at fixed distances from each other, nor would trade areas fit together in exactly the same pattern all over a region. The results of these investigations produced a variable distribution of centres and trade areas which he referred to as an 'economic landscape'. This enabled him to construct a 'relaxed network' of hexagonal areas, from which 'city rich' and 'city poor' sectors of the region around a central metropolis could be discerned (figure 5.4A).

Application of this 'economic landscape' model to N. Cumbria does produce positive results, but not quite as systematic as Losch outlined. If Carlisle is taken as the central 'metropolis', then centres of varying magnitude can be seen to exist at different locations in the surrounding region, but a division of the network into 'rich' and 'poor' areas only works in four quadrants rather than six sectors (figure 5.4B). The 'rich' quadrants are east and west of Carlisle, and the 'poor' are north and south. However, when applied to Brampton and its immediate surroundings, the six sector pattern seems to fit much better as illustrated in figure 5.4C. That such areas exist (irrespective of the pattern) helps to emphasise an important factor that Losch, more so than Christaller, took into account in producing his model. The factor in question concerns the allowance made for variables, which should always be included in the compliation of any model that tries to express the spatial pattern of human action and interaction.

5.2.5 Summary

It would seem, therefore, that the Loschian pattern is better suited to the N. Cumbrian situation since it allows for variables in its construction. Berry (1967) however, maintains that the 'economic landscape' is more suited to regions of industry and manufacturing, and that the 'fixed network' of Christaller is more appropriate towards understanding the retail and business services of a rural area. Neither model demonstrates the real picture accurately, but at least the fundamental principles and concepts have been shown to exist within the region. Despite the distortions and exceptions, the chief value of central place theory lies in the fact that it provides a sound basis on which an interpretation of the settlement pattern of an area can be made. It cannot be taken as a rigid framework which fits all locations at any point in time, but should be regarded "..... as a useful tool for comparative analysis" (Ambrose, ed., 1969, p.141). In this respect the relationship between 'central place' and the human landscape of N. Cumbria has been clearly demonstrated.

CONCLUSION

6.1 SUMMARY

The main theme of this study has been centrality and the extent to which it exists in N.E. Cumbria, with special attention paid to the role of Brampton as the chief rural centre for the area. From the evidence obtained and the methodology adopted, a number of important results have emerged. In addition, factors which have been influential in both constructive and adverse ways have been examined and considered.

The first and main conclusion that can be drawn, is that centrality does exist within the region. Secondly, from the variety of settlements in which centrality is present, there is a definite hierarchy in which distinct levels of provision can be identified, from one large regional centre at the top of the order to numerous small villages at the lower end.

A third conclusion concerns the degree of centrality displayed by any one centre. This has been shown (mainly by the results in Chapters 3 and 4) to be dependent not only on the number and type of services provided, but also on the collective influence they have within the region surrounding a centre. In other words, the main zone of influence of a settlement, or the extent of its attraction throughout the area, is largely determined by the range and threshold of the services it possesses. It has also been shown that such characteristics are often affected both by the scale of provision of neighbouring centres, and by their spatial location.

A further conclusion can be drawn from the observation that all these elements are products of the basic premise that services are provided to meet the needs of the population, and that the degree of such provision is directly related to the distribution and structure of that population. In this respect N.E. Cumbria is really no different from any other area or region, and any differences which have occurred (such as those between actual and expected patterns of centrality) only serve to illustrate the fact that some variations from a theoretical norm are present within the region.

In this respect, the surveys which were undertaken (from the detailed plotting of services to the questioning of a random sample of the population) were of paramount importance. The results which they produced not only enabled a representative picture of service provision, influence and market preference to be ascertained, but they also illustrated the extent, and often the reasons, by which differences from an expected pattern occurred. The examination of population characteristics in Chapter 2 and services in Chapter 3, showed the extent by which the surveys were representative of the area, therefore

the reasons for some of the differences which did occur can only be ascribed to variations in consumer behaviour.

A final conclusion concerns the extent to which both behavioural and spatial patterns of centrality, plus their similarities and differences, can be related to the physical and historical background. A deterministic view would suggest that in north and north-east Cumbria there is a very strong relationship. The examination of the physical and historical landscape in Chapter 1 therefore, not only set the stage on which various roles of human activity have been played, but it also provided many reasons by which centrality can be seen to have developed into its present pattern. Not least is the example of Brampton.

6.2 BRAMPTON AS A CENTRAL PLACE

In 1971 the parish of Brampton contained just over 4,000 people, and the town had an estimated population of about 3,250. From the survey of services undertaken in 1974, it possessed 60 retail and business functions covering 150 outlets in 125 establishments. Collectively these figures enable the town to be ranked in fifth place in the Carlisle region, and classified as a third-order centre along with Wigton and Haltwhistle.

Brampton is a centre by virtue of the fact that it has more services and outlets at this third order of provision than its own population warrants, and as the results of Chapter 5 show, would appear to cater for about 10,000 customers (i.e. an extra 6,000). The town has a variety of services, with several outlets of the low threshold variety (e.g. groceries 8), fewer of the medium (e.g. banks 3), only single outlets from the high threshold group (e.g. furniture and solicitor), but none from the very high range such as opticians and cinemas. Therefore as a centre, Brampton scores mainly at the medium threshold level of provision, since it is services from this group that attract most custom from the surrounding area.

The influence of its services is felt over a wide area of N.E. Cumbria, with those of the doctor, vet and furnisher having the largest cover. Brampton's general zone of influence, which attracts 50% or more custom, has been calculated to cover an area of about 60 square miles and contain approximately 7,700 people (Chapter 3). Although 2,300 less than the figure obtained from the scatter-graph method, this latter estimate does not take into account those people who may occasionally visit the town to take advantage of the more specialised services which it provides (i.e. customers from the outer and fringe zones of the area, and tourists from other parts of the

country). The figure of 7,700 however, compares very favourably with that of 7,600 which has been estimated as being the number of persons in the shopping catchment area of Brampton (Brampton Advisory Plan, 1976, p.7).

It would seem, therefore, that Brampton is catering at three different levels of provision. Firstly, at an intensive level for its town and parish population; secondly, at a middle-order level for about 7,700 inhabitants - those covered by the general zone of influence; and thirdly, at a less intense but higher level for about 10,000 people.

The area covered by the general zone of influence is fairly regular but extends more to the north-east of the town than towards the south-west, where there is the dominance of Carlisle and its services. In fact there is quite a good measure of similarity between the area covered by this zone and the district over which the Lords of Gilsland held baronial power (c.f. figure 1.4). That such a similarity exists is not merely a factor of chance, but more an illustration of the way in which the development of the human landscape has been influenced by a particular historical situation.

A further characteristic which enhances Brampton's role as a rural centre is the compact location of many of its services, and the comparative ease with which consumers can visit the establishments where they are provided. In fact all the central functions of the town are located either in High Cross Street, Main Street, along Front Street or around the Market Place, thus forming a well defined core area or small central business district (plate 8). Contained within this functional zone, mainly around the Market Place and along Front Street, is space for car parking (plates 17,18 and 19). Although perhaps inadequate by today's standards, such facilities alongside shops and businesses enables Brampton to retain an important element of its attraction as a service centre, particularly for the consumer who lives outside the town. Another important attraction allied to the central services is the Wednesday market. Although revived only a few years ago, stallholders come from a wide area of the county and Northumberland to trade with local customers, and as a result the town is often busier on market day than any other day of the week.

Apart from the services and convenient car parking facilities, Brampton also attracts custom because of its focus as a route centre at the junction of three major roads and two minor ones. In this respect, the character of its form and functions must be regarded as important assets. Although much of the 'through' traffic between north-eastern England and the Solway Lowlands perhaps only regards

Brampton as a minor convenient stopping place, nevertheless the town is strategically situated to be able to promote itself as an important route centre and market town.

In fact, it is the site and situation of the town that has proved to be one of the most important elements which have influenced its growth, development and regional status over the years. Physical assets and human decisions have all combined to make Brampton what it is. Although the proximity of Carlisle and the fluctuating fortunes of local economic activities may have tempered and even muted its role and influence over the years, Brampton still remains as good an example of a central place in a rural environment as any other settlement within the region.

6.3 FUTURE DEVELOPMENT

As a result of regional and local planning policies, Brampton is regarded as a small rural anchor point in the Newcastle to Carlisle growth corridor. However, because of its proximity to Carlisle, it is seen as coming within the framework of economic activity planned for the primate city rather than being considered as a separate entity. This is reasonable since Carlisle is where a major proportion of the region's employment is to be found, and for which Brampton has been developing as a dormitory centre over a number of years.

This aspect of Brampton's role, however, is not new. It has acted as a dormitory settlement on at least two other occasions, - during the 19th century with the development of the coalfield at Midgeholme, and more recently with the technological project at Spadeadam (plate 21). Partly as a result of the latter enterprise, and partly through local planning action, many new developments have occurred within the town.

On the housing side, several new estates have been built to accommodate the growing population, the most recent on a reclaimed site in Gelt Road adjoining the town centre (plates 8 and 22). It has been the council's policy to re-house families from slum dwellings, build houses or hostels for senior citizens, and encourage the construction of private homes. As a result, the town has almost doubled in both area and housing capacity within the last twenty years. Unfortunately some of the new units are more functional than visually attractive, and do not blend with the rest of the buildings to give good townscape qualities.

New developments have also occurred in the central area with regard

to services. Some old property has been pulled down to make way for new shops (plate 19), a few gaps have been infilled, and other establishments have been revitalised (plate 18). Several new services, or outlets for them, have made their appearance during the last decade, namely a supermarket, freezer centre and gift shops. Other amenities provided have been two small (albeit inadequate) car parks, public conveniences, and re-development of the junction between the Carlisle and Longtown roads. In addition, the development of several light industries on the western outskirts of the town (plate 22), has provided the local population with a small, but desirable, outlet for employment.

A recent (1976) Advisory Plan for Brampton, prepared by the District Planning Office, has put forward suggestions for the re-development and revitalisation of the central area (figure 6.1). Some of the ideas have met with objections and counter proposals by a newly formed body of townspeople - the Brampton Amenity Association. Although both groups seem to agree that the chief assets of the town should be preserved and developed, each has different ideas on how this should be implemented.

Briefly, Brampton's assets are :-

a) its role as a rural,service, route and dormitory centre;

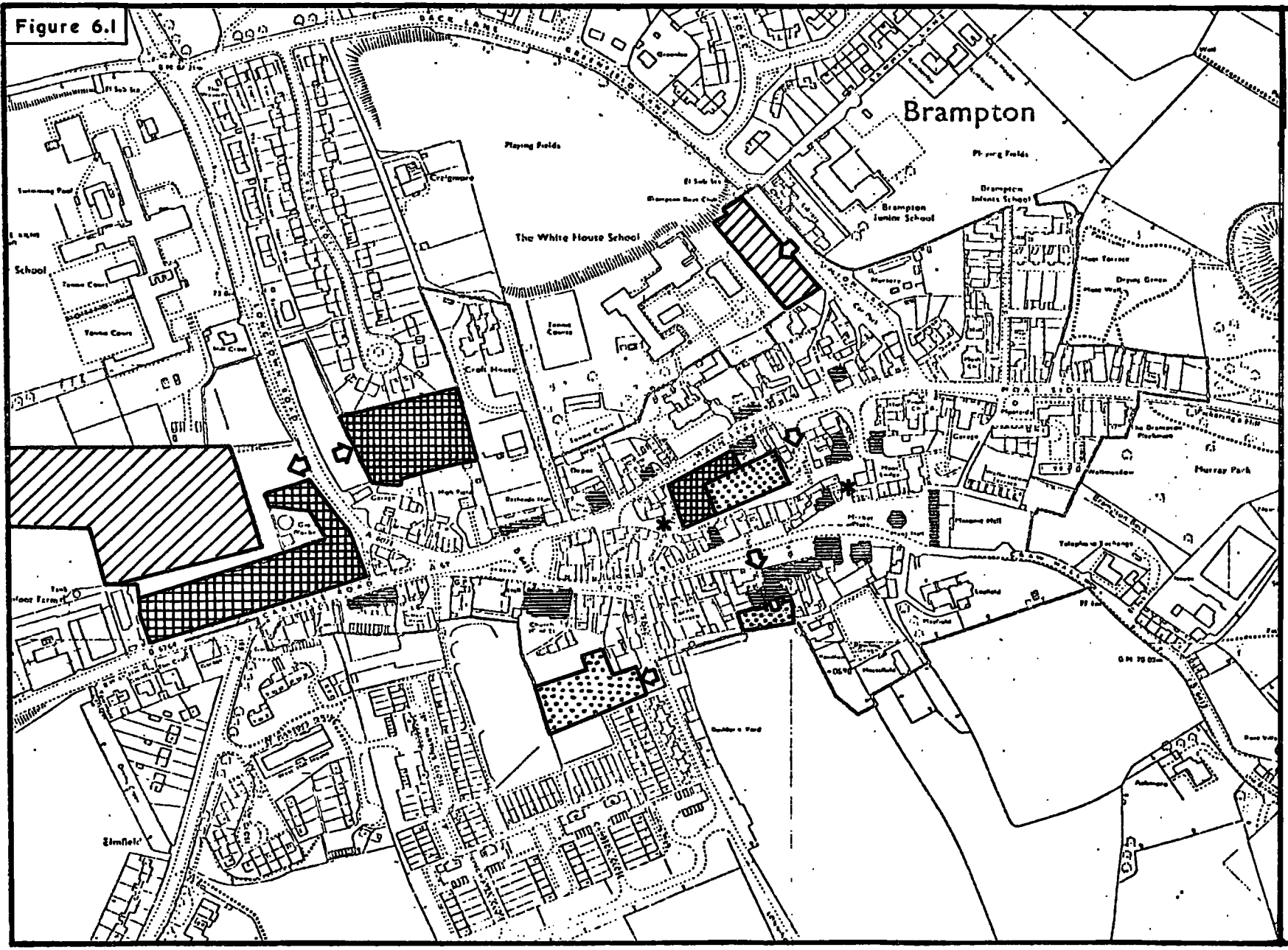
b) its character in the form of physical, historical, architectural, and spatial features; and

c) the attractiveness resulting from the inter-relationship of all these aspects.

It would seem therefore that any plan for the future development of Brampton must take various factors into consideration, not least the conservation of the assets mentioned above. In addition, any short-term measures must be seen in the context of a long-term strategy plan for the town and its surroundings.

One of the chief factors to be considered concerns the routeways into, and through the town. On no account should Brampton lose its attraction as a route centre, but the present system of roads, junctions, and the form of the A69 through the town, is outdated. There is constant danger of congestion and accidents at the narrow points along Main Street, and the vibrations from heavy traffic are causing structural deterioration of property along its length. Therefore, a prime measure that should be implemented is the construction of a by-pass. By the spring of 1977 all other towns on the A69 will have been by-passed. Since the road is the major routeway in the growth corridor between Newcastle and Carlisle, and it can be expected to carry an increasing volume of

Figure 6.1



BRAMPTON CENTRAL AREA

Main Proposals for Future Development from the Brampton Advisory Plan 1976

Buildings of Merit or Listed

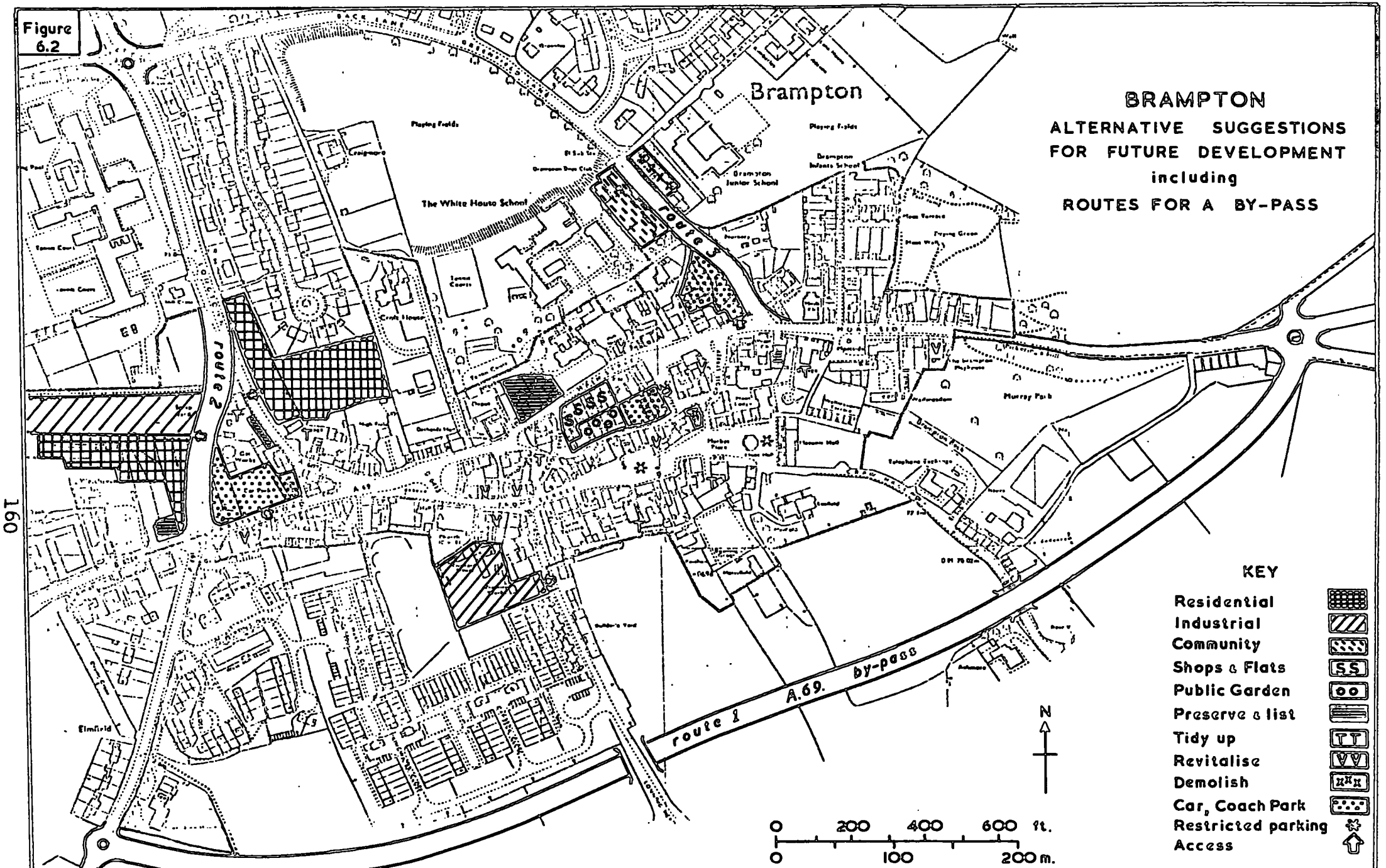
REDEVELOPMENT

- Residential
- Industrial
- Car Parking
- Access
- Restricted Access

N

0 200 400 600 ft.
0 100 200 m.

Figure 6.2


Brampton
BRAMPTON
ALTERNATIVE SUGGESTIONS
FOR FUTURE DEVELOPMENT
including
ROUTES FOR A BY-PASS
The White House School
Brampton Junior School
Brampton Infants School
Playing Fields
Murray Park
route 2
route 1
A.69. by-pass
Elmfield
KEY
Residential
Industrial
Community
Shops & Flats
Public Garden
Preserve & list
Tidy up
Revitalise
Demolish
Car, Coach Park
Restricted parking
Access
N
0 200 400 600 ft.
0 100 200 m.

traffic every year, the desirability of a by-pass for Brampton will become a vital necessity.

Because a new road is outside the jurisdiction of the District Planning Office, the Advisory Plan gives no details of where a by-pass will be located; its only reference being that it "..... is proposed for 1980, but there is no guarantee in view of the present uncertain economic climate that this will be implemented on schedule". (Brampton Advisory Plan, 1976, p.11). It would seem illogical however, to plan for Brampton's future without some knowledge of the route such a by-pass might take, since it is quite feasible that developments accepted for implementation in the short term, may seriously constrain, or even prevent, an acceptable or desirable route being available.

In Brampton's case the choice of a route for a by-pass is difficult (but not impossible) for the following reasons :-

a) It should be near enough to the town to allow continued use of the services and amenities by travellers and tourists.

b) It should have good access points to all five major routeways (3 on the west and 2 on the east), as well as into the town.

c) It should not seriously sever the town into two or more sectors without adequate links being provided.

d) It should be constructed along a route that meets with the least objections, from visual impact, increased noise, demolition of property, or despoilation of physical and historical features.

Taking all these factors into consideration, it would seem that there is only one satisfactory solution, and that a by-pass could consist of two or three parts as shown in figure 6.2, and plate 22. These routes would alleviate the present traffic flow through the centre of Brampton without much disruption or demolition of existing property. In addition, car, coach and lorry parks could be provided at the sites suggested. One major obstacle, however, concerns the land which route 2 would cross. In the Advisory Plan this is earmarked for residential and industrial development, whilst at the moment most of it is lying derelict. Similarly, if the scheme suggested here (or one like it) could be adopted then there would be little need for the proposed one-way traffic system in the town centre with its associated 'stopping up' of High and Low Cross Streets. Such a system would only deter customers from using the services available. Consequently trade would decline, and Brampton would no longer be fulfilling one of its major roles - that of a developing service centre.

Other ideas outlined in the Advisory Plan would seem to be desirable and acceptable in general terms, with possibly only a few minor modifications (figures 6.1 and 6.2). They include the redevelopment of some poor areas of the town, revitalisation of certain property and preservation of buildings that have historical or architectural qualities (plate 20). A small amount of new housing is envisaged to cater for the projected increase of an extra 500 people by 1981. There are many sites available for this growth particularly as 'infills' between existing units.

On the provision of services, the Advisory Plan has little to say except that they appear to be adequate. It can be suggested, however, that whilst type and range are probably at the correct level, there may be an inbalance with regard to the provision of certain outlets. An injection of more competition is required for some services such as furniture, and those catering for tourists such as cafes and gift shops, but perhaps fewer outlets are necessary for clothes and shoes at the present level of demand. With continued growth, however, these 'extra' outlets would be needed, as would new higher-threshold services such as fresh fish and poultry, and even an optician plus photographic establishment.

Overall, the proposals recommend conservation of the town and its character, but allowing development to occur that will not only increase its attraction as a service centre, but also enhance its townscape qualities. Whatever disagreements may arise over planning details, the future for Brampton seems basically assured. It will continue to serve the sub-region of N.E. Cumbria and provide a worthwhile role as a rural central place for many years to come.

PLATES

LANERCOST PRIORY

Plate 2

from the west

Ruined part

16th.cent. Vicarage now farmhouse

Restored Nave now used as the Parish Church

NAWORTH CASTLE

Plate 3

from the south

Valley of river Irthing lies behind trees

Castle half hidden in part of the Park

THE 'MOTE' - part of Kame Belt moraine looking north-eastwards from Gelt Rd. Plate 4

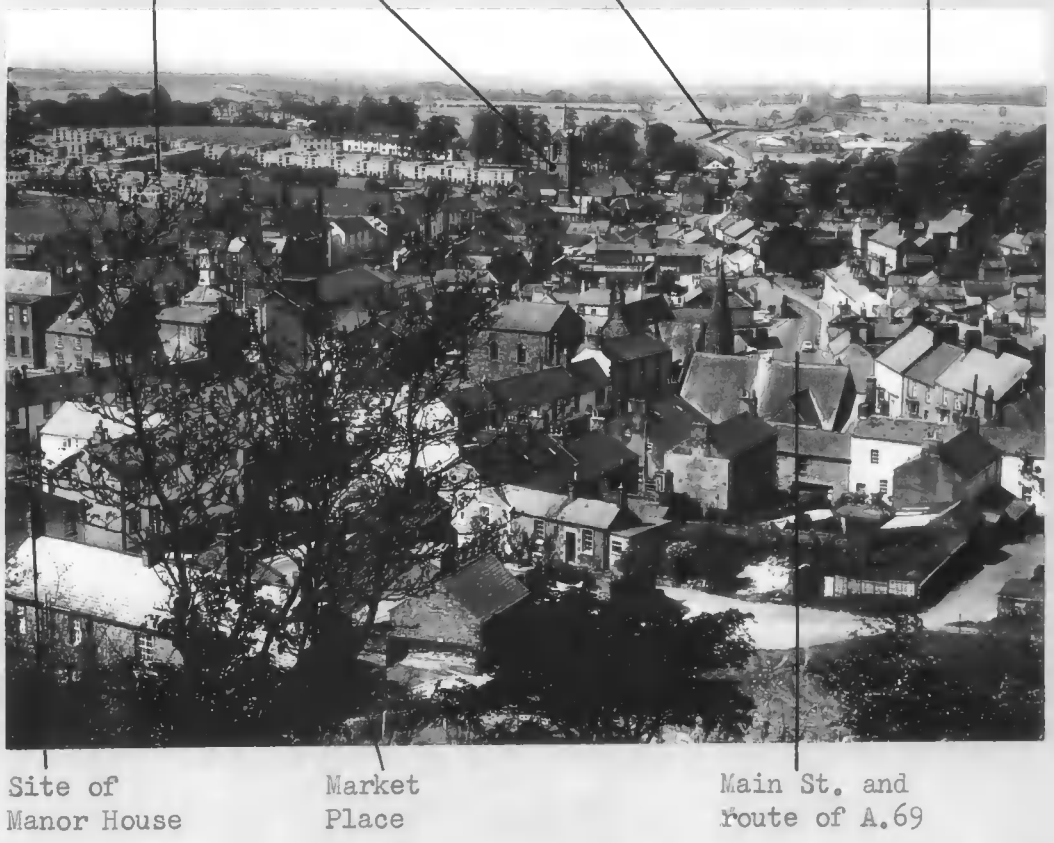
BECK LANE, BRAMPTON looking west Plate 5

THE SANDS, BRAMPTON - former triangular green looking south-east from the Mote Plate 6

A.69 B.6292

BRAMPTON TOWN CENTRE (May 1975)
looking west from the 'Mote'

Plate 7



BRAMPTON CENTRAL AREA (July 1975)
looking north-west from 800 feet.

Plate 8

MOOT HALL, BRAMPTON

Plate 9

Octagonal structure built 1817 by 5th Earl of Carlisle.

MAGISTRATES COURT, BRAMPTON

Plate 10

Originally National School & on site of Tithe Barn.

TINDALE (July 1975)
looking north-west from 1000 feet.

Plate 11

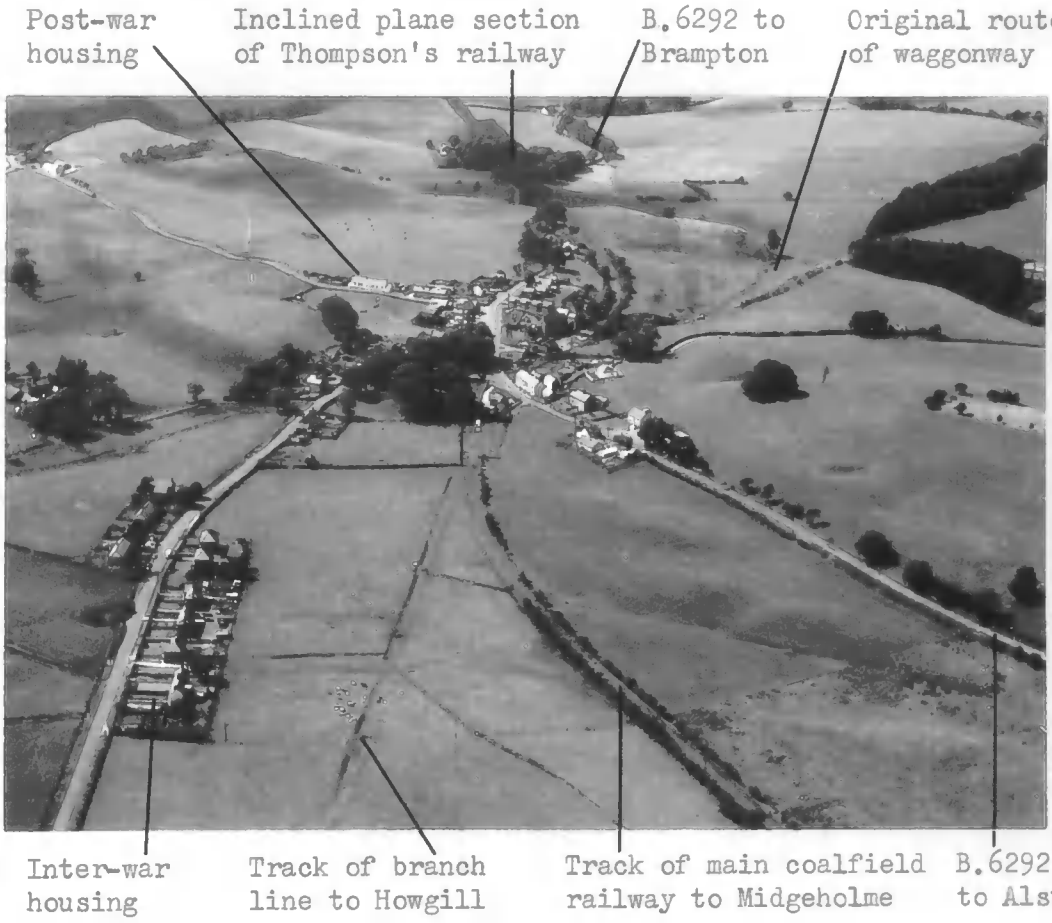
HOWGILL (July 1975)
looking E.S.E. from 1000 feet.

Plate 12

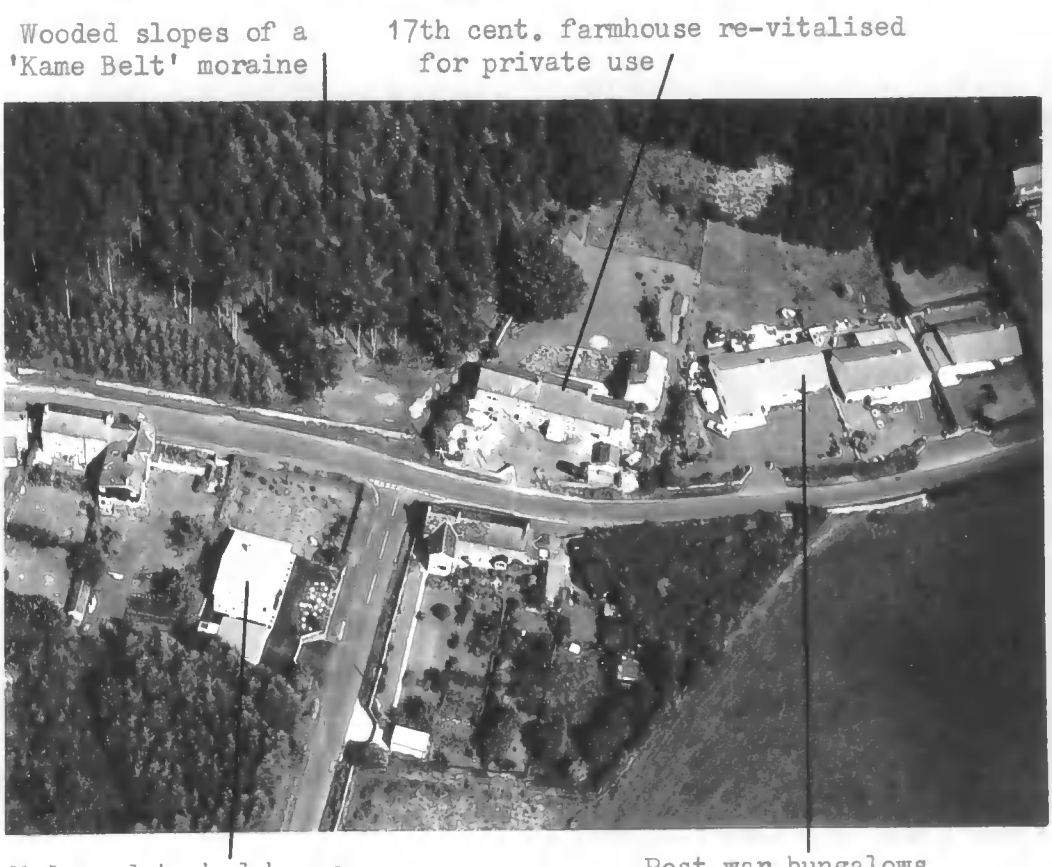
MIDGEHOLME (July 1975) Plate 13
looking south-east from 1000 feet.

BRAMPTON JUNCTION (March 1968) Plate 14
looking eastwards

HALLBANKGATE (July 1975) Plate 15
looking north-west from 800 feet.



HAYTON TOWNHEAD (July 1975) Plate 16
looking eastwards from 800 feet.



FRONT STREET, BRAMPTON,- North side (May 1975)

Plate 17

showing commercial development and convenient car-parking facility.

Most of the buildings have been refurbished, but still display irregularity of line and height.

FRONT STREET, BRAMPTON,- South side (May 1975)

Plate 18

showing modernisation to front of property

MARKET PLACE, BRAMPTON (March 1968) Plate 19

showing new development on slum-cleared site.

New shops | Senior Citizen's hostel | The 'Mote' | Moot Hall

Cobbled area used by Wednesday Market

CARLISLE ROAD, BRAMPTON (May 1975) Plate 20

showing 18th. cent. house used for weaving which should be 'listed'

Garage | Weaving garrets | Cottages likely to be demolished

B.6264 & A.69 road junction

SPADEADAM (1963) looking north

Plate 21

Rocket launcher test sites with 'Blue Streak' on right-hand pad

Bleak semi-forested moors

(source - IISmith esq.)

BRAMPTON (July 1975)
looking north-east from 1000 feet.

Plate 22

APPENDICES

Stratigraphical Table of Rocks in the Brampton Area — Appendix 1.1

(after Trotter & Hollingworth 1932)

PERIOD	DIVISION	LOCAL SERIES	LITHOLOGY	THICKNESS (in feet approx)
Quaternary	Recent and Post Glacial	Hill and basin peat, river alluvium and gravel		variable
Pleistocene	Glacial	Sand, gravel & boulder clay		variable
Triassic	Keuper	Stanwix Shales	Red & green clays & lsts. ssts. and some gypsum	900
	Bunter	Kirklinton Sandstone	Soft red false-bedded Sandstone	800 to 3,200
		St. Bees Sandstone	Red compact ssts.& chocolate shales	
		St. Bees Shales	Dull red shales with some gypsum	70 - 300
Permian	Penrith Sandstone not represented in Brampton Area			
// Major Unconformity //				
Carboniferous	Igneous	Whin Sill	Quartz dolerite	10 - 30
	Coal Measures	Middle	Shales, ssts. & workable coals	500
		Lower	Shales, ssts. & a few thin coals	variable
	Millstone Grit	not represented in Brampton Area		
	Limestone Group	Upper	Ssts. grit, Shale thin lsts. & coal	1,600
		Middle	Ssts. lsts. Shale & very thin coals	1,200
		Lower	Ssts. lsts. Shale and thin coals	800
		Birdoswald	Ssts. lsts. Shale grit and coal	1,400
	Sandstone Group	Craighill	not represented	
		Fell	Ssts. Shales, thin lsts & coal	6,000
		Cementstone not represented		

Succession of Main Events of Pleistocene Ice Age — Appendix 1.2

(after Trotter 1929 and Smailes 1960)

PERIOD	DIVISION	LOCAL SERIES		LITHOLOGY	LOCATIONS
Pleistocene	Devensian	Second Scottish Phase	Retreat	Upper Sands and gravels	Small area 4 miles N.W. of Brampton
			Advance	Upper boulder clay	Area between R. Irthing & Brampton
		Main Phase	Retreat	Middle Sands and gravels	'Kame Belt' from Naworth to Croglin
			Advance	Middle boulder clay (laminated)	Area next to river and N. of Brampton
		First Scottish Phase	Retreat	Lower gravel & laminated clays	Small areas near river Irthing
			Advance	Lower boulder clay	not present

Population of Parishes in Brampton Area 1801 - 1971

Appendix 1.3 (a)

(from Directories & Official Censuses)

PARISHES	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891
Brampton Parish[z]	2,125	2,543	2,921	3,345	3,304	3,825	3,585	3,557	3,438	2,790
(Town)	1,682	2,043	2,448	2,842	2,754	3,189	2,933	2,917	3,025	
Dentons (Neth.& Upp.)	330	352	387	396	413	446	402	397	467	521
Farlam & Midgeholme[x]	592	672	663	816	1,035	1,259	1,393	1,481	1,727	2,069
Hayton	915	977	1,102	1,291	1,244	1,243	1,256	1,434	1,420	1,254
Carlatton	50	51	54	70	69	67	71	66	67	75
Castle Carrock	252	307	346	383	351	346	350	323	307	262
Cumrew	181	194	231	216	201	166	136	137	122	103
Cumwhitton	446	478	544	579	582	574	529	509	497	453
Walton	421	417	480	481	440	455	407	440	395	335
Irthington	865	911	1,020	1,023	1,036	1,001	977	898	853	764
Askerton[+]	356	433	503	473	470	479	380	328	318	291
Banks & Burtholme[+]	414	420	503	535	540	437[a]	338	337	298	288
Kingwater[+]	374	357	331	365	369	407	391	362	331	301
Waterhead[+]	99	125	175	177	184	411[a]	410	319	323	248
TOTAL for DISTRICT*	7,420	8,237	9,260	10,150	10,238	11,026	10,625	10,588	10,563	9,754

PARISHES	1901	1911	1921	1931	1951	1961	1971
Brampton	2,494	2,392	2,590	2,635	3,130	3,521[e]	4,033
Dentons (Neth.& Upp.)	465	414	502	431	397	437	389
Farlam & Midgeholme[x]	1,649[b]	1,245	1,255	1,055	958	784	504
Hayton	1,216	1,068	1,210	1,112	1,413	1,350	1,700
Carlatton	61	57	61	52	46	46	46
Castle Carrock	285	299	361	316	290	289	298
Cumrew	113	94	103	98	96	73	69
Cumwhitton	468	429	444	381	355	325	277
Walton	318	303	286	282	261	262	269
Irthington	723	708	671	646	841[d]	678	685
Askerton[+]	248	235	245	226	176	154	127
Banks & Burtholme[+]	247	241	253	229	222	209	184
Kingwater[+]	264	233	258	216	225	234	152
Waterhead[+]	234	264	637[c]	258	209	345[e]	279
TOTAL for DISTRICT*	8,785	7,982	8,876	7,937	8,619	8,707	9,012

Notes

a - Banks t'ship divided- Waterhead gained most

b - fall due to closure of collieries

c - rise due to patients in convalescant home

d - rise due to camp at Carlisle airport

e - rise due to Spadeadam

z - ceased as separate township after 1891

x - Midgeholme Parish created 1851

\+ - All were townships of Parish of Lanercost until 1871

* - Brampton Registration District 1851 - 1931, then part of Border Rural District - 1974 Now part of Carlisle District of Cumbria

Inhabited Houses & Persons per Household 1801 - 1971 Appendix 1.4(a)

(from Directories & Official Censuses) (* see note 'c' of appendix 1.3)

INHABITED HOUSES	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961	1971
Brampton "Parish	419	474	515	581	619	685	733	716	699	625	583	563	598	637	941	1,137	1,310
(Town)	339	392	434	488	520	572	619	603	624								
Dentons (Neth.& Upp.)	61		61	62		87	85	92		105	97		100		123		120
Farlam & Midgeholme	115		114	130		223	256	273		372	328		272		288		190
Hayton	190		203	241		232	261	328		300	283		289		404		565
Carlatton	6		6	7		6	10	7		7	8		9		9		10
Castle Carrock	47		65	72		70	68	72		60	59		73		89		101
Cumrew	36		44	40		29	30	26		22	20		20		22		20
Cumwhitton	94		94	103		107	106	104		94	94		94		91		85
Walton	77		82	76		78	80	86		74	71		73		86		85
Irthington	150		177	180		205	210	196		165	156		154		221		205
Askerton	82		74	75		76	68	61		58	52		51		47		35
Banks & Burtholme	85		93	92		70	66	67		61	59		55		67		60
Kingwater	71		53	55		78	72	73		65	58		60		51		50
Waterhead	17		22	21		69	67	62		47	51		44		49		50
TOTAL For District	1,450		1,603	1,735		2015	2112	2163		2055	1,919		1,892		2,488		2886

(* see note c of appendix 1.3)

PERSONS per H'SEHOLD	1801	1811	1821	1831	1841	1851	1861	1871	1881	1891	1901	1911	1921	1931	1951	1961	1971
Brampton Parish	5.1	5.3	5.7	5.8	5.3	5.6	4.9	4.9	4.9	4.5	4.3	4.2	4.3	4.1	3.3	3.1	3.1
(Town)	5.0	5.2	5.6	5.8	5.2	5.5	4.7	4.8	4.8								
Dentons	5.4		6.3	6.4		5.1	4.7	4.3		5.0	4.8		5.0		3.2		3.2
Farlam & Midgeholme	5.1		5.8	6.3		5.6	5.4	5.4		5.6	5.0		4.6		3.3		2.6
Hayton	4.8		5.4	5.4		5.4	4.8	4.4		4.2	4.3		4.2		3.5		3.0
Carlatton	8.3		9.0	10.0		11.2	7.1	9.4		10.7	7.6		6.8		5.1		4.6
Castle Carrock	5.4		5.3	5.3		4.9	5.1	4.5		4.4	4.8		4.9		3.3		2.9
Cumrew	5.0		5.3	5.4		5.7	4.5	5.3		4.7	5.6		5.2		4.4		3.4
Cumwhitton	4.7		5.8	5.6		5.4	5.0	4.9		4.8	5.0		4.7		3.9		3.2
Walton	5.5		5.8	6.3		5.8	5.1	5.1		4.5	4.5		3.9		3.0		3.2
Irthington	5.8		5.8	5.7		4.9	4.7	4.6		4.6	4.6		4.4		3.8		3.3
Askerton	4.3		6.8	6.3		6.3	5.6	5.4		5.0	4.8		4.8		3.7		3.6
Banks& Burtholme	4.9		5.4	5.8		5.0	5.1	5.0		4.7	4.2		4.6		3.3		3.1
Kingwater	5.3		6.2	6.6		5.2	5.4	5.0		4.6	4.6		4.3		4.4		3.0
Waterhead	5.8		8.0	8.4		6.0	6.1	5.1		5.3	4.6		14.5*		4.3		5.6
DISTRICT AVERAGE	5.1		5.8	5.8		5.5	5.0	4.9		4.7	4.6		4.7		3.5		3.1

Occupations of Brampton People in 1851 — Appendix 1.5(a)

(From Brampton History Papers ed. Penn 1972)

Brampton Township		Population 3.188 (Male 1,576, Female 1,612)			
Attorney	1	Carter/Carriers	7	Gas Maker	1
Accountants	2	Curate	1	Glass/China Dealer	1
Architects	2	Clerks	9	Glassmaker	1
Annuitants	14	Cordwainers	2	Gamekeepers	2
Builder	1	Commission Agent	1	Grocers*	34
Boot Closer	1	Coroner	1	Handloom Weavers	284
Bookseller	1	Cellarman	1	Hatters*	13
Bakers	9	Clock/Watchmakers	7	Hat Trimmers	2
Bobbin Winders	81	Corn Factor	1	Hat Maker	1
Butchers*	11	Coopers*	6	Housekeepers	12
Blacksmiths*	8	Constables	2	Innkeepers*	24
Bacon Dealer	1	Curriers*	4	I'Kpr/Farmers	6
Brewery Manager	1	Dressmakers*	58	Ironmongers	3
Brewer/Maltsters	6	Draymen	4	Labourers	39
Barber/H'dressers	4	Draper/Mercers*	14	Lodging-house K'prs	6
Black/White Smiths	7	Engineers	1	Laundresses	11
Cartwright/Joiners*	32	Earthenware Dealer	1	Landowners	7
Charwomen	4	Errand Boys	4	Milliners	6
Chemist/Druggists*	7	Farmers	20	Millwrights	2
Chemist/Grocers*	3	Farm Labourers	109	Nurses	2
Cotton Dealer	1	Farrier	1	Nurseryman	1
Cattle Drover	1	Fellmongers*	2	Nailmakers*	13
Cloggers*	6	Furrier	1	Officer of Taxes	1
Coal Leaders	3	Flower Dealers	2	Ostlers	3
Confectioners	2	Gardeners	8	Printer/Bookbinder*	3
Chimney Sweeps	2	Grooms	5	Pastrycooks*	8

Paupers	81	Scholars	540	Tailors*	34
Pawnbroker	1	Surgeons & G.P.s	4	Timber/Slate Mcht	1
Painter/Glaziers*	9	Servants	144	Turner/Rake maker	1
Plumber/Braziers*	2	Shoemakers*	54	Tea Dealers	2
Pedlars	4	Spirit Merchants	2	Teachers	20
Plasterers*	5	Solicitors	3	Vagrants	10
Proprietors	7	Straw-bonnet mkrs*	12	Vicar/Ministers	4
Potter	1	Sawyers	2	Washerwomen	13
Provision Dealers	4	Saddlers*	5	Weavers	17
Pig Dealers	3	Sailors	3	Wool Spinner	1
Pensioners	13	Stocking Knitter	1	Wool/Cotton Dyer	1
Shepherds	3	Students	4	Woodmen	6
Steward	1	Turner/Braziers	2	Workhouse Matron	1
Stonemasons*	28	Tallow Chandlers*	4	Well Sinker	1

Easby & Naworth Townships. Population 636 (Male 345, Female 291)

Annuitants	3	Gamewatchers	2	Paupers	6
Apprentices	3	Gardener	1	Quarryman	1
Blacksmiths*	4	Gate/Toll-bar K'prs	2	Railway/Sta.Staff	6
Bobbin Winders	5	Governess	1	Railway Labourers	6
Coal Miners	51	Grocer	1	Smelters of Ore	11
Coal/Lime Agent	1	Groom/horsekeepers	3	Sawyers*	2
Charwomen	2	Handloom Weavers	28	Scholars	93
Cartman	1	Housekeepers	3	Schoolmistress	1
Dressmakers	5	Innkeepers	2	Servants	42
Farmers/Managers*	22	Land Agents	2	Shepherds	4
Farm Labourers	16	Labourers	6	Stonemason	1
Furnaceman	1	Post Boy	1	Tailors	2

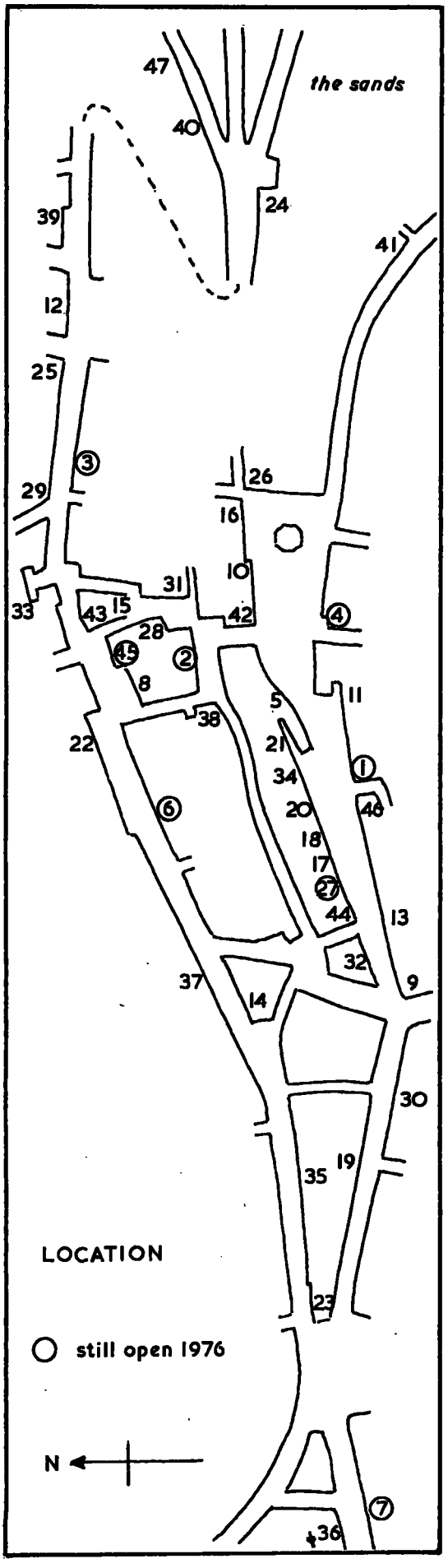
* Includes Assistants, Apprentices & Journeymen.

(from Directories - Hutchinson 1794, Parson & White 1829, Mannix & Whellan 1851, Bulmer 1884, and Survey 1974)

BUSINESS OR TRADE	BRAMPTON					WIGTON		
	1794	1829	1851	1884	1974*	1829	1884	1974*
Acadamies/Schools		5	5	6	4	9	12	6
Attorney/Solicitors	1	2	3	3	1	5	6	2
Banks				2	3		3	5
Blacksmiths	7	6	6	4		8	4	
Booksellers		2	2	2	2	2	4	2
Boot/Shoemakers	21	11	9	12	4	23	18	2
Brewer/Maltsters	2	2	2	2		4	1	
Butchers	10	7	5	5	4	8	9	6
Butter/Bacon Factors		6	4	1			3	
Carrier/Carters	2	9	7	1		3	1	
Chemist/Druggists	1	4	3	3	2	2	3	3
Clock/Watchmakers	3	2	3	3	1	4	4	1
Clog/Pattern-makers	2	4	3	4		6	4	
Clergy	2	4	5	5	5	3	5	6
Coal Merchants				1	2		5	2
Confectioners			5	4	5	1	5	9
Coopers	3	3	2	1		4		
Currier/Leatherw'krs	1	3	3	1		4	4	
Farmers	40	5	18	15	16	12	24	27
Grocer/Tea Dealers		19	18	22	8	25	28	7
Hairdresser/Barbers	3	2	4	3	7	3	3	6
Hatters		4	4	1		3		
Inns and Taverns	14	34	35	19	8	27	22	11
Ironmongers	2	4	3	2	2	2	4	2
Joiner/Cabinetmakers	9	9	7	5	2	7	10	3
Linen/Wool Drapers		9	6	12	1	8	14	2
Manufacturer(Textiles	1	1	1			4	2	1
Milliner/Dressmakers	5	2	4	11	6	5	23	8
Nail/Iron Merchant	2	2				5	3	
Painter/Glaziers	2	2	2	3	4	4	5	3
Post Office		1	1	1	1	1	1	1
Saddlers	3	5	3	5		7	3	
Shopkeepers		15	6	5		22	15	
Skinners	3					2		
Straw-hatmakers		7	7			5		
Stonemason/Builder	9	1		3	4			9
Surgeon/Doctors	3	4	3	5	6	5	3	2
Tailors	9	8	7	14	1	11	8	2
Tallow Chandlers		3	2	2		3		
Tanners	2	1	1	1		2	2	
Tinplate/Braziers		2	3			2	2	
Wine/Spirit Merchants		3	4	5	3	6	6	2

* Equivalent Trades included for 1974 e.g. Shoe shop for Shoemakers.

(From Brampton History Papers ed. Penn 1972)



Date	No.	Date	No.	Date	No.
1790	12	1851	35	1894	20
1794	14	1858	32	1901	20
1811	20	1861	31	1905	14
1829	34	1869	23	1961	11
1847	34	1884	19	1976	8

LIST

1 Howard Arms
2 White Lion
3 Bush
4 Nag's Head
5 George
6 Scotch Arms
7 Barley Stack
8 King's Arms
9 Crown
10 Globe
11 Packhorse
12 Willie Brewed
13 Red Lion
14 General Wolfe
15 White Hart
16 Joiners Arms
17 Samson
18 Black Bull
19 Blue Bell
20 Half Moon
21 Sportsman
22 Wheatsheaf
23 Nursery Arms
24 Sandhouse
25 Three Crowns
26 Grapes

27 Shoulder of Mutton
28 Plough (Graham Arms)
29 Commercial (Mark's Vaults)
30 Greyhound (Horse & Hounds)
31 Freemason's Arms
32 Shepherd (Lion & Lamb)
33 String of Horses
34 Jolly Butcher (Riddells Vaults)
35 Coach & Horses
36 Tom & Jerry Ewart's Buildings
37 Tom & Jerry Back Street
38 Tom & Jerry Central Place
39 Tom & Jerry Moatside
40 Earl Grey (Wellington)
41 Oddfellows Arms Moss House
42 Goodburn's Vaults
43 Elliot's Vaults
44 Modlen's Vaults
45 Carrick & Riddell's Vaults (Highland Laddie)
46 Crown & Anchor (Lord Nelson, Shepherd)
47 Ridge House Inn (Bay Horse, Horse & Groom)

Previous names in brackets

(from V.C.H.1905, Trotter & Hollingworth 1932, Dyer 1969 and Charters 1971)

AREAS	COLLIERIES PITS and ADITS	OPENED	CLOSED
Geltsdale	Gairs	1909	1936
Talkin Fell	Talkin (Moss, Caroline & Wyatt)	1747	1830
	George	1810	1830
Forest Head	Blacksike	1820	1872
	Havannah & Dove	1955	1957
	Howgill	1820	1880
	Old Venture	1747 & 1920	? 1923
	New Venture	1933	1939
	Duke	1955	1971
Coal Fell	Howard & Campbell	1873	1896
Denton Fell	Roachburn	1522 & 1894	? 1912
	Greenside & Huttons	1880	1903
	Gapshields	?	1948
	Byron	?	1908
	Backstand	1931	1935
Tindale Fell	Tarnhouse (West, William, Hazard, Recovery, Shop, Know, Stag, Fox & Morpeth)	1747	1870
	Bishops Hill or Henry	1810	1910
Midgeholme	Prior Dyke	1736 & 1920	? 1928
	Prior Highside	1931	1932
	Craignook	1736	?
	King	1824 & 1951	1893 1955
	Whitescut	1914	1924
	Minthill	1926	1930
	Low (East, West, North & Banner)	1933	1951
	Slag	1938	1946
	Pepperill	1924	1939
Lambley	Hartleburn Swan	1850	1960

(from Dyer 1969 and Charters 1971)

Date	Average Output in Tons			
	Daily	Weekly	Monthly	Annual
1736	140	840	3,640	43,680
1739	158	945	4,095	49,140
1801	1,326	7,956	34,478	413,731
1810	1,875	11,251	48,758	585,091
1819	1,338	8,030	34,800	417,603
1829	234	1,405	6,089	73,069
1952	38 - 52	266 - 364	1,153 - 1,577	13,832 - 18,928

Q U E S T I O N N A I R E (for Households) Appendix 2.1

1. Please give your Postal Address _____

_____

2. Please state the number of persons in your household by age and sex.

Years:	0 - 5	6 - 15	16 - 44	45 - 65	65 +
Male:	____	____	____	____	____
Female:	____	____	____	____	____

3. Please indicate the location of schools which each child attends and the method of travel to that school. (e.g. 2 at Hayton, walk).

School:	_____	_____	_____	_____	_____
Travel method:	_____	_____	_____	_____	_____

4. Please indicate the type of occupation of each employed member of your household, where the occupation is located and method of travel:

Occupation	e.g. Garage Mechanic				
Where	Haltwhistle	_____	_____	_____	_____
Travel method	Car	_____	_____	_____	_____

5. Please indicate how long you have been at your present address, from where you moved and main reason for moving (e.g. change of job)

a)_____ b)_____ c)_____

6. Please indicate the name of the village or town where you do most of your shopping for the following services. (if from a travelling shop, please write 'Van' and state which firm).

Grocer _____ Clothes _____

Butcher _____ Shoes _____

Baker _____ Electrical goods _____

Greengrocer/ Fruiterer _____ Hardware _____

Chemist _____ Furniture/ Carpets _____

7. Please indicate where you go (or would go) for the following services:

Bank _____ Fuel(Coal,coke,oil) _____

Doctor _____ Garage _____

Dentist _____ Hairdressers _____

Solicitor _____ Cobbler _____

Post Office _____ T.V. (Purchase or rent) _____

Electrician _____ Records/Music _____

Plumber _____ Pet Supplies _____

Decorator _____ Baby Goods _____

(Answers to Questions 3 & 7 - Pet Supplies not used in final analysis)

Population of Leading Settlements within the Carlisle Region (approx. 20 miles radius)

Appendix 2.2(A)

(based on 1971 Census)

RANK	SETTLEMENT	SIZE	RANK	SETTLEMENT	SIZE
1	Carlisle	71,582	25	Thursby	443
2	Penrith	11,306	26	Langwathby	434
3	Annan*	6,051	27	Burgh by Sands	408
4	Wigton	3,904	28	Gilsland+	390
5	Brampton	3,226	29	Cummersdale[z]	386
6	Haltwhistle+	2,780	30	Eaglesfield*	370
7	Aspatria	2,470	31	Kirkbride	360
8	Gretna*	2,412	32	Hayton	344
9	Langholm*	2,344	33	Carleton[z]	340
10	Silloth	2,130	34	Kirkoswald	329
11	Longtown	2,082	35	Caldbeck	317
12	Alston	1,533	36	Skelton	309
13	Dalston	1,341	37	Bowness	297
14	Cannonbie*	1,223	38	Stainton	288
15	East Riggs*	1,164	39	Irthington	274
16	Warwick Bridge	958	40	Greystoke	263
17	Ecclefechan*	826	41	Great Salkeld	249
18	Newcastleton*	818	42	Castle Carrock	236
19	Scotby[z]	792	43	Cotehill	235
20	Houghton[z]	762	44	Bothel	228
21	Wetheral	607	45	Armathwaite	226
22	Abbey Town	548			
23	Lazonby	531			
24	Skinburness	482			

* Southern Scotland
\+ Northumberland
z Urban extensions of Carlisle (or almost)

Population of N.E. Cumbria by Parish, Enumeration District and Settlement

Appendix 2.2 (B)

(based on 1971 Census)

PARISHES Name	Size	E.D. Size	E.D. Key
Ainstable	425	175	A1
		250	A2
Askerton	127		B
Bewcastle	334	130	C1
		204	C2
Brampton	4,033	3,645	D1
		388	D2
Burtholme	184		E
Carlatton	46		F
Castle Carrock	295		G
Cumrew	69		H
Cumwhitton	278		I
Farlam	443	189	J1
		254	J2
Hayton	1,700	113	K1
		491	K2
		594	K3
		435	K4
Hethersgill	344		L
Irthington	685	103	M1
		582	M2
Kingwater	151		N
Kirklinton	260		O
Midgeholme	254		P
Nether Denton	253		Q
Scaleby	319		R
Stanwix Rural	2,033	1,498	S1
		505	S2
Stapleton	230		T
Upper Denton	132		U
Walton	271		V
Waterhead	173		W
Wetheral	4,081	470	X1
		451	X2
		470	X3
		282	X4
		631	X5
		463	X6
		314	X7
		874	X8
Greenhead+	355		Y
Thirwall+	461		Z

+ Northumberland Parishes

* Calculations based on 80% of Parish or E.D. figures.

Rank	SETTLEMENTS* Name	Size	Parish Location
1	Brampton	3,226	D1 & D2
2	Warwick Bridge	958	X5
	(Little Corby		K2 & K3
	& Corby Hill)		K3 & K4
3	Wetheral	607	X3 & X6
4	Gilsland	390	U,W & Z
5	Hayton	344	K2
6	Irthington	274	M2
7	Castle Carrock	236	G
8	Hallbankgate	215	J1 & J2
9	Hethersgill	204	L
10	Walton	189	V
11	Great Corby	182	X4 & X5
12	Low Row	177	Q
13	Heads Nook	161	X4
14	Cumwhitton	156	I
15	Low Crosby	153	S2
16	Greenhead	142	Y
17	Warwick	138	X6
18	Smithfield	135	O
19	How Mill	127	K4
20	Ainstable	124	A1
21	Laversdale	117	M2
22	Croglin	107	A2
23	Barclose	102	R
24	Newtown	98	M2
25	Scaleby Hill	93	R
26	Banks	92	E
27	Talkin	90	K1
28	Faugh	87	K4
29	Roadhead	85	C2
30	Fenton	82	K4
31	Milton	78	D2
32	Newbiggin	76	A2
33	West Hall	72	N
34	Bewcastle	65	C1
35	Scaleby	64	R
36	Boltonfellend	60	L
37	Broadwath	58	X5
38	Lanercost	55	E
39	Cumrew	54	H
40	Kirkcambeck	51	B
41	Farlam	50	J2
42	Less Hill	45	B
43	Midgeholme	43	P
44	Carlatton	37	F
45	Roweltown	35	T

Analysis of Age Structure of Population

Appendix 2.3

(From 1971 Census & 1974 Questionnaire)

A. BRAMPTON REGISTRATION AREA 1971					B. SURVEY AREA 1974			
Age Range	Males	Females	Total	%	Males	Females	Total	%
0 - 4	310	314	624	6.9	16	13	29	4.3
5 - 14	770	686	1,456	16.2	150	138	288	43.1
15 - 44	1,643	1,575	3,218	35.7	127	135	262	39.2
45 - 64	1,174	1,195	2,369	26.3	39	32	71	10.6
(15 - 64)	(2,817	2,770	5,587	62.0)	(166	167	333	49.8)
over 65	554	791	1,345	14.9	7	11	18	2.7
TOTAL	4,451	4,561	9,012		339	329	668	

(From results of Questionnaire 1974)

A. Duration in Present House (in years)								B. Reasons for Move			
Resident in	1- 5	6-10	11-15	16-20	20+	n/c	TOTAL	Job	HOUSE	M/R	n/c
Brampton	22	15	11	1	1		50	17	28	5	
Rest of Area	35	12	17	11	6	9	90	31	42	8	9
TOTAL	57	27	28	12	7	9	140	48	70	13	9
% of 140	41	19	20	9	5	6		34	50	9	6

C. Chief Sources of Movement (in miles)

Now Resident in / From	Same Place < 1	Survey Area 1- 4	Survey Area 5-10	Mainly County 11-20	Outside County 20 +	No Change	TOTAL
Brampton	18	8	4	2	18		50
Rest of Area	21	32	9	8	11	9	90
TOTAL	39	40	13	10	29	9	140
% of 140	28	29	9	7	21	6	

D. Time v Distance v Reason

Area	Distance in miles	Reason	Time in years 1- 5	6-10	11-15	16-20	20 +	n/c	TOTAL	% (140)
Same Place	< 1	Job	2		2		1		5	4
		House	13	8	6	2			29	21
		M/R	1		1	2	1		5	4
Survey Area	1- 4	Job	3	2	2	1	1		9	6
		House	14	7	6	1			28	20
		M/R	1		1		1		3	2
	5-10	Job	2			1			3	2
		House	4	2	1		1		8	6
		M/R				2			2	1
Mainly County	11-20	Job	1		4				5	4
		House	3	1					4	3
		M/R	1						1	1
Outside County	20 +	Job	10	6	5	3	2		26	19
		House	1						1	1
		M/R	1	1					2	1
TOTAL			57	27	28	12	7	9	140	
% of 140			41	19	20	9	5	6		

M/R - Marriage or Retirement, n/c - no change

(based on Table 0.1 prescribed in the Introduction)

Moved to	Time	Dist	W*	No.	INDEX
BRAMPTON					
From					
Brampton	-	< 1	1	18	18
Irthington	9	2	3	1	3
Talkin	10	2	3	1	3
Hallbankgate	4	3	2	1	2
Hallbankgate	9	3	3	1	3
Cas. Carrock	2	4	2	1	2
Warwick Br.	3	4	2	2	4
Great Corby	8	5	4	1	4
Wetheral	6	6	4	1	4
Cotehill	5	8	3	1	3
Carlisle	3	8	3	1	3
Carlisle	13	8	5	1	5
Southwaite	5	12	5	1	5
Penrith	15	19	7	1	7
Aspatria	3	26	6	1	6
Cockermouth	6	32	7	1	7
Kirkby Step.	19	50	9	1	9
Durham	5	50	6	1	6
Newcastle	7	50	7	1	7
Darlington	13	50	8	1	8
Berwickshire	43	50	10	1	10
Blackburn	3	80	6	1	6
Chorley	1	90	6	1	6
Rosyth	2	90	6	1	6
Derby	13	150	8	1	8
Nottingham	13	150	8	1	8
Buckingham	15	240	8	1	8
Aldermaston	15	260	8	1	8
Newbury	8	260	7	1	7
Colchester	8	260	7	1	7
Overseas	1	300+	6	1	6
Overseas	6	300+	7	1	7
TOTAL					196
WARWICK BRIDGE					
From					
Warwick Br.	-	< 1	1	4	4
Wetheral	3	2	2	1	2
Hayton	12	2	4	1	4
Scotby	2	3	2	1	2
Cotehill	8	4	3	1	3
Brampton	1	4	2	1	2
Brampton	8	4	3	1	3
Carlisle	3	4	2	3	6
Hallbankgate	3	7	3	1	3
Dalston	3	8	3	1	3
TOTAL					32

Moved to	Time	Dist	W*	No.	INDEX
CASTLE CARROCK					
From					
Cas. Carrock	-	< 1	1	1	1
Halibankgate	13	3	4	1	4
Carlisle	2	9	3	1	3
Hexham	20	25	9	1	9
Lanarkshire	22	50	10	1	10
TOTAL					27
HEADS NOOK					
From					
How Mill	24	1	6	1	6
Irthington	6	4	3	1	3
Canonbie	13	15	7	1	7
Kendal	1	45	6	1	6
TOTAL					22
GILSLAND					
From					
Gilsland	-	< 1	1	4	4
Haltwhistle	1	4	2	1	2
Haltwhistle	12	4	4	1	4
N. Shields	17	50	9	1	9
TOTAL					19
HETHERSGILL					
From					
Hethersgill	-	< 1	1	1	1
Smithfield	13	2	4	1	4
Carlisle	2	9	3	1	3
Carlisle	16	9	6	1	6
N'ton Arlosh	5	19	5	1	5
TOTAL					19
HAYTON					
From					
Hayton	-	< 1	1	1	1
Faugh	10	2	3	1	3
Warwick Br.	1	2	2	1	2
Brampton	5	2	2	1	2
Scotby	13	4	4	1	4
TOTAL					12
IRTHINGTON					
From					
Irthington	-	< 1	1	1	1
Heads Nook	12	4	4	1	4
Silloth	4	25	6	1	6
TOTAL					11

Moved to	Time	Dist	W*	No.	INDEX
WARWICK					
From					
Wigton	4	15	5	1	5
Lanarkshire	1	70	6	1	6
TOTAL					11
LEES HILL					
From					
Roadhead	20	5	6	1	6
Carlisle	2	11	5	1	5
TOTAL					11
CROSBY					
From					
Crosby	-	< 1	1	1	1
Carlisle	3	4	2	1	2
Penrith	9	19	6	1	6
TOTAL					9
WEST HALL					
From					
Bewcastle	26	4	6	1	6
Brampton	1	4	2	1	2
TOTAL					8
LOW ROW					
From					
Lanercost	4	2	2	1	2
Denton Fell	18	2	5	1	5
TOTAL					7
CROGLIN					
From					
Newbiggin	8	2	3	1	3
Renwick	12	3	4	1	4
TOTAL					7
CUMWHITTON					
From					
Cumwhitton	-	< 1	1	1	1
Carlisle	17	6	6	1	6
TOTAL					7
NEWBIGGIN					
From Gretna	12	19	7	1	7
KIRKCAMBECK					
From Dalston	14	16	7	1	7
TINDALE					
From Durham	9	50	7	1	7

Moved to	Time	Dist	W*	No.	INDEX
AGLIONBY					
From Derby	6	150	7	1	7
SCALEBY HILL					
From Brampton	22	6	7	1	7
SMITHFIELD					
Fr. Cleveleys	1	75	6	1	6
GREENHEAD					
Fr. Lancaster	1	60	6	1	6
HALLBANKGATE					
From York	2	100	6	1	6
LANERCOST Fr.					
Hallbankgate	19	3	5	1	5
LAVERSDALE					
From Dalston	1	11	5	1	5
GREAT CORBY					
From Carlisle	11	4	4	1	4
FARLAM					
From Hayton	12	4	4	1	4
WETHERAL					
From Brampton	2	6	3	1	3
WALBY					
From Crosby	7	2	3	1	3
ARMATHWAITE					
From Cumrew	1	4	2	1	2

Remainder all moved within the same place therefore Index = 1

FAUGH

AINSTABLE

CUMREW

ROWELTOWN

WALTON

KIRKLINTON

* Weighting x Number = Index

(From Ribble Bus Co. Timetable 1974) (figures for both directions)

SERVICE	Mon-Fri	Sat	Su	CAT
C'sle/Newcastle				
Aglionby	38	36	18	A
Warwick	38	36	18	A
Warwick Bridge	38	38	18	A
Hayton	36	36	18	A
BRAMPTON	38	38	18	A
Low Row	30	30	18	A
Gilsland	30	30	18	A
Greenhead	30	30	18	A
Carlisle/Alston				
Aglionby	10	10		B
Warwick	10	10		B
Warwick Bridge	10	10		B
Fenton	4	3		C
How Mill	4	3		C
Hayton	10	10		B
BRAMPTON	14	16		B
Milton	12	14		B
Hallbankgate	12	14		B
Tindale	8	10		C
Midgeholme	8	10		C
Carlisle/Brampton				
Aglionby	10	8		B
Warwick Br.	10	8		B
Broadwath	8	7		C
Great Corby	7	6		C
Heads Nook	10	8		B
Faugh	7	2		C
Cumwhitton	3	6		C
Hornsby	3	6		C
Carlatton	3	6		C
Cumrew	3	6		C
Castle Carrock	10	8		B
Talkin	6	2		C
BRAMPTON	4	-		C
Carlisle/Wetheral				
Scotby	48	44		B
Wetheral	48	44		B

SERVICE	Mon-Fri	Sat	CAT
Carlisle/Penrith			
Cumwhinton	12	12	B
Cotehill	12	12	B
Armathwaite	12	12	B
Ainstable	9	10	C
Renwick (8 Tue)	4	4	C
Kirkoswald	17	14	B
Lazonby	17	14	B
Penrith	17	14	B
C'sle/Noblestown			
Barclose	10	10	B
Scaleby	10	10	B
Smithfield	10	10	B
Hethersgill	10	10	B
Boltonfellend (2 Mon)	4		D
Roweltown (2 Mon)	4		D
Lyneholmeford (2 Mon)	4		D
Roadhead (2 Mon)	2		D
Noblestown (2 Mon)	4		D
Carlisle/Brampton			
Low Crosby	9	9	C
High Crosby	9	9	C
Laversdale	7	7	C
Newtown	7	7	C
Irthington	7	7	C
Walton (8 Wed)	4	4	C
Lees Hill (2 Wed)		-	D
Banks (2 Wed)		-	D
Lanercost (2 Wed)		-	D
BRAMPTON (11 Wed)	7	7	C

CATEGORIES

A more than 20 daily + Sunday

B from 10 - 20 daily

C less than 10 daily

D less than 10 weekly

Classification of Occupations

Appendix 2.7 (a)

(From Brampton Advisory Plan 1966 and Questionnaire 1974)

CATEGORY	A. BRAMPTON EMPLOYMENT AREA 1966				B. SURVEY AREA 1974				National
	Male	Fem.	Total	%	Male	Fem.	Total	%	%
1 Agriculture Mining and Quarrying	245	35	280	12.8	30		30	14.8	5.3
2 Manufacture	934	127	1,061	48.5	27	11	38	18.8	37.1
3 Construction and Building	184	7	191	8.7	8		8	4.0	6.9
4 Transport	110	22	132	6.0	19		19	9.4	6.9
5 Distributive (Retail and Wholesale)	62	75	137	6.2	10	3	13	6.4	12.6
6 Finance and Banking	23	10	33	1.5	6		6	3.0	2.5
7 Administration and Public Services	21	52	73	3.3	13	11	24	11.8	7.6
8 Professional	62	169	231	10.5	23	18	41	20.3	9.5
9 Miscellaneous (hairdressing catering etc).	24	29	53	2.4	8	15	23	11.4	11.3
TOTAL	1,665	526	2,191		144	58	202		
%	76	24			71	29			

Breakdown of Occupations of Sample Population — Appendix 2.7(b)

Resident in:	Brampton		Rest of Area	
	Male	Fem.	Male	Fem.
Agriculture				
Farmers	2		21	
Labourers			3	
Engineer	1		1	
Cattle D'lr			1	
Miner	1			
Manufacture				
Engineers	3		7	
Joiners			4	
Textiles	1	1	1	4
Fitter			1	
Millwright			1	
Lithographer			1	
Turner			1	
Supervisors	1	1		1
Inspectors	2		1	
Operator			1	
Tracer		1		
Sampler		1		
Printer	1			
Metalworker	1			
Buscuitmaker				1
Hatmaker				1
Coachbuilder			1	
Construction				
Builders	2		1	
Engineer	1			
Bricklayer			1	
Plumber			1	
Plasterer	1		1	
Transport				
Manager			1	
Drivers	6		7	
R'ly Guard			1	
Bus C'ductor			1	
Mechanic	1		2	
Haulage Con.			2	
Distributive				
Chemist			1	
Dept. Manager			1	
Shop Owner			2	
Shop Assist.		1		2
Sales Man'er			1	
Sales Rep.	3		1	
Timber M'ant			1	

	Brampton		Rest of Area	
	Male	Fem.	Male	Fem.
Finance				
Bank Manager			1	
Bank Assist.	2			
Insurance Ag'nt	2		1	
Administration & Public S'vee				
Office Man'ger			2	
Secretary		1		3
Clerks	3	3		2
Typists		2		
Postman			1	
Fireman	1			
Policeman			1	
Warden			1	
C.C. Workmen	1		1	
Airman			1	
Soldier			1	
Professional				
Co. Directors			2	
Teachers*	4	3	8	10
Students		1	1	
Architect			1	
Dentist	1			
Draughtsman	1			
Surveyor	1			
Accountant	1			
Vet			1	
Probation Off'r	1			
Technician			1	
Occ. Therapist		1		
Nurses		2		1
Miscellaneous				
Hoteliers			3	1
Catering		5		6
Cleaners		1		1
Hairdressers				1
Bookmaker			1	
Entertainers			1	

* High figure for Teachers is purely by chance - only two specifically given the questionnaire to complete

Location of Workplace & Method of Travel

Appendix 2.8

(From results of Questionnaire 1974)

People living in:	A. BRAMPTON				B. REST OF AREA						
Working in:	Method Walk	Car	Bus	Sub-Total	Method Walk	Cyc.	Car	Bus	sub Total	GRAND TOTAL	% (202)
Same Place					31		7	1	39	*68/39	19
Brampton	15	14		29		2	12	3	17	17/46	23
Carlisle		22	3	25		4	38	5	47	72	36
Haltwhistle		1	1	2			1		1	3	1½
Longtown		1		1			4		4	5	2½
Penrith		1		1			2		2	3	1½
Rest of Area		7	2	9		2	15	1	18	27	13
Elsewhere		2		2			5		5	7	3½
TOTAL	15	48	6	69	31	8	84	10	133	202	
%	22	69	9		23	6	63	7			

METHOD TOTALS	ALL Workers	% 202	Actual+ Commuters	% 134
Walk	46	23		
Cycle	8	4	8	6
Car	132	65	111	83
Bus	16	8	15	11

* figure includes 29 for Brampton from first part of the table since it can be regarded as same place

\+ excludes people who work in the same place since they are not true commuters

(based on Table 0.1 prescribed in the Introduction)

Working in:	Bus	Dist	W*	No	Index
BRAMPTON From					
Brampton	-	< 1	1	29	29
Greenhead	A	9	3	1	3
Gilsland	A	8	3	2	6
Low Row	A	3	2	1	2
Hallbankgate	B	3	1	1	3
Farlam	E	3	6	1	6
Cumrew	C	7	5	1	5
Faugh	C	4	4	1	4
Hayton	A	2	2	1	2
Wetheral	B	6	4	1	4
Warwick Br.	A	4	2	3	6
Lees Hill	D	4	5	2	10
Lanercost	D	3	5	1	5
Smithfield	E	6	7	1	7
TOTAL					92
CARLISLE From					
Brampton	A	9	3	25	75
Tindale	C	13	7	2	14
Armathwaite	B	9	4	1	4
Newbiggin	E	10	7	2	14
Cas. Carrock	B	9	4	2	8
Faugh	C	7	5	1	5
Heads Nook	B	6	4	2	8
Hayton	A	7	3	3	9
Aglionby	A	3	2	2	4
Wetheral	B	4	3	1	3
Warwick Br.	A	4	2	11	22
Irthington	C	7	5	2	10
Ruleholme	E	6	7	1	7
Kirklinton	E	7	7	1	7
Hethersgill	B	9	4	4	16
West Hall	E	13	9	2	18
Lees Hill	D	12	8	2	16
Great Corby	C	5	5	3	15
Warwick	A	4	2	5	10
TOTAL					265
LONGTOWN From					
Brampton	E	10	7	1	7
Scaleby	E	6	7	1	7
Roweltown	E	8	7	1	7
Kirklinton	E	5	7	1	7
TOTAL					28
PENRITH From					
Brampton	E	19	9	1	9
Cumrew	E	13	9	1	9
Crosby	E	19	9	1	9
TOTAL					27

Working in:	Bus	Dist	W*	No	Index
HALTWHISTLE From					
Brampton	A	12	5	2	10
Gilsland	A	5	3	1	3
TOTAL					13
WARWICK BRIDGE From Warwick B.	-	< 1	1	5	5
Brampton	A	4	2	2	4
Cas. Carrock	B	4	3	1	2
Hayton	A	2	2	1	2
TOTAL					14
GREENHEAD From					
Brampton	A	9	3	2	6
Gilsland	A	1	2	1	2
TOTAL					8
GILSLAND From					
Gilsland	-	< 1	1	5	5
Brampton	A	10	3	1	3
TOTAL					8
SCOTBY From					
Heads Nook	B	4	3	1	3
Hayton	B	6	4	2	8
TOTAL					11
HOW MILL From					
Brampton	C	3	4	1	4
Heads Nook	C	2	4	1	4
TOTAL					8
CROSBY From					
Crosby	-	< 1	1	3	3
Brampton	C	4	4	1	4
TOTAL					7
HETHERSGILL Fr					
Hethersgill	-	< 1	1	2	2
Brampton	E	6	7	1	7
TOTAL					9
LANERCOST From					
Lanercost	-	< 1	1	2	2
Cumwhitton	E	8	7	1	7
TOTAL					9
LEES HILL From					
Brampton	D	4	5	1	5

Working in:	Bus	Dist	W*	No	Index
KIRKOSWALD From Croglin	E	4	6	1	6
LAZONBY From Croglin	E	5	7	1	7
IRTHINGTON Fr. Irthington	-	< 1	1	2	2
WEST HALL Fr. West Hall	-	< 1	1	3	3
LOW ROW From Low Row	-	< 1	1	2	2
CASTLE CARROCK From C.Carrock	-	< 1	1	4	4
CROGLIN From Croglin	-	< 1	1	2	2
HEADS NOOK Fr. Heads Nook	-	< 1	1	2	2
WALBY From Walby	-	< 1	1	2	2
KIRKLINTON Fr. Kirklinton	-	< 1	1	2	2

Remaining Settlements all have one Worker from the same place therefore Index is ONE

HALLBANKGATE

CARLATTON

CUMWHITTON

AINSTABLE

HAYTON

RULEHOLME

LAVERSDALE

WALTON

KIRKCAMBECK

ROWELTOWN

* W (Weighting Value) x No. (Number of Workers) = Index

Service Outlets & Establishments for Main Towns — Appendix 3.1(a)

(From Survey 1974) Starred* Services used in measuring Centrality

SERVICES	CARLISLE C.B.D. Type of Shop Outlet					PENRITH C.B.D. Type of Shop Outlet				
	Sing	Doub	Trip	Mult	Total	Sing	Doub	Trip	Mult	Total
RETAIL										
*Grocery	4			8	12	6			4	10
*Greengrocery	4	3		8	15	1	3		4	8
*Butcher	10			8	18	8			4	12
*Bakery	17	3		8	28	5	1		4	10
Fresh Fish	3	1			4	1	1			2
Confectionery		3	3	8	14	1	4	7	4	16
Dairy	2				2	1				1
Off/Licence/Wine	4			8	12	1			4	5
Fish & Chips	3				3	4				4
Cafe/Restaurant	22	3			25	11	1			12
General Store	2				2	3				3
*Clothes Men	20	7		6	33	8	3		1	12
*Clothes Women	21	9		7	37	10	2		2	14
*Clothes Baby	5	5		7	17	3	1		2	6
*Shoes	20			2	22	7			1	8
*Furniture/Carpet	20	2		3	25	9			2	11
Drapery/Linen	1	3		3	7	1			2	3
Wool	3	2		2	7	2			1	3
*Hardware/D.I.Y.	5			3	8	3			2	5
*Electric/Dom.App	9	3		3	15	5	2		2	9
*T.V./Radio/HiFi	7	4		3	14	6	2		2	10
Decorating/Paint	10			3	13	4			2	6
Stationary/Books	8	3		5	16	1	2		4	7
Newsagents		4	3	1	8		1	7	1	9
Tobacconists	6	4	3	3	16	2	3	7	2	14
*Chemists/Toilet.	7			4	11	4			1	5
Florist/Garden	5	2		3	10	1	2		2	5
Gifts/Fancygoods	9			5	14	11			4	15
Antiques	3				3	3				3
*Records/Music	2			5	7	1			4	5
Glass/Pottery	3			2	5	1			1	2
Watches/Jewellry	11			3	14	5			2	7
Leather goods	3			2	5	1			1	2
Sport/Camping	6	1		2	9	3	2		2	7
Toys/Models	4			5	9		2		4	6
Auto/Cycle acces	6			3	9	3	2		2	7
Total No. of Outlets	265	62	9	133	469	136	34	21	73	264
Total No. of Establishments	265	31	3	15	314	136	17	7	8	168
% of Total Establishments	84	10	1	5		81	10½	4	4½	

SERVICES	WIGTON Type of Shop S.	D.	T.	M.	Outlet Total	BRAMPTON Type of Shop S.	D.	T.	M.	Outlet Total
RETAIL										
*Grocery	4	1		2	7	5	1		2	8
*Greengrocery	2	1		2	5	2	3		2	7
*Butcher	4			2	6	2			2	4
*Bakery	2			2	4	2	1		2	5
Fresh Fish	1				1					
Confectionery	1	6		2	9		2	1	2	5
Dairy		1			1					
Off Licence/Wine				2	2	1			2	3
Fish & Chips	2				2	1				1
Cafe/Restaurant	3				3	2				2
General Store	2				2	1				1
*Clothes Men	1	1			2	1				1
*Clothes Women	6	2			8	4	2			6
*Clothes Baby		1			1		2			2
*Shoes	2				2	4				4
*Furniture/Carpet	2	1			3		1			1
Drapery/Linen	2				2	1				1
Wool	1				1	1				1
*Hardware/D.I.Y.	3	1			4	2				2
*Electric/Dom.App.		2			2	3				3
*T.V./Radio/HiFi		2			2		1			1
Decorating/Paint	2				2	3				3
Stationary/Books		2			2		1	1		2
Newsagents		3			3		1	1		2
Tobacconists		6			6		1	1		2
*Chemists/Toilet.	3				3	2				2
Florist/Garden	1	1			2	1	2			3
Gifts/Fancygoods	2	2			4	2		1		3
Antiques	1				1	3				3
*Records/Music								1		1
Glass/Pottery										
Watches/Jewellry	1				1	1				1
Leather goods										
Sport/Camping							1			1
Toys/Models	2				2		1			1
Auto/Cycle acces.	1				1					
Total No. of Outlets	51	33	2	12	96	44	20	6	12	82
Total No. of Establishments	51	$16\frac{1}{2}$[z]		2	$69\frac{1}{2}$	44	10	2	2	58
% of Total Establishments	$73\frac{1}{2}$	$23\frac{1}{2}$		3		76	17	$3\frac{1}{2}$	$3\frac{1}{2}$	

[z] other $\frac{1}{2}$ is Post Office

SERVICES	HALTWHISTLE Shop S.	D.	Type T.	M.	Out's Total	LONGTOWN Shop S.	D.	Type T.	M.	Out's Total	ALSTON Shop S.	D.	Type T.	M.	Out's Total
RETAIL															
*Grocery	4	2		3	9	3	2	1	1	7	3				3
*Greengrocery		1		3	4		2		1	3	1	1			2
*Butcher	2	1		3	6	2			1	3	2				2
*Bakery		2		3	5			1	1	2	1				1
Fresh Fish		1			1	1				1					
Confectionery		2	2	3	7		2	1	1	4	1	1			2
Dairy															
Off Licence				3	3				1	1					
Fish & Chips	1				1		1			1		1			1
Cafe/Restaurant	2	2			4		2			2	3	2			5
General Store	2				2	1	1			2	1				1
*Clothes Men	1	1		1	3		1			1		2			2
*Clothes Women	1	4		1	6		2			2	2	2			4
*Clothes Baby		1		1	2		1			1		1			1
*Shoes	2			1	3	1				1	1				1
*Furniture/Carp.	2	1		1	4	1				1					
Drapery/Linen		1		1	2	1				1		1			1
Wool		1			1										
*Hardware/D.I.Y.	3	1			5			1		1	1				1
*Electrical	2	1		1	4			1		1		1			1
*T.V./Radio/Hifi		1		1	2			1		1		1			1
Decorating	2			1	3		1			1	1	1			2
Stationary			2		2										
Newsagents			2		2		2			2			2		2
Tobacconists			5		5		2			2			2		2
*Chemists	2				2	1				1	1				1
Florist/Garden		2			2							1			1
Gifts/Fancy Gds	1	1	3	1	6		1	1		2	2		2		4
Antiques						2				2	2				2
*Records/Music	1	1		1	3			1		1					
Glass/Pottery				1	1							1			1
Watches/J'llry				1	1										
Leather goods				1	1										
Sport/Camping	1			1	2			1		1					
Toys/Models	1		1	1	3										
Auto/Cycle gds.	1			1	2	1				1	1				1
Total No. of Outlets	31	27	15	36	109	14	20	9	6	49	23	16	6		45
Total No. of Establishments	31	13½ [z]	5	4	53½	14	10	3	1	28	23	8	2		33
% of Total Establishments.	58	24	10	8		50	36	11	3		70	24	6		

[z] other ½ is P.O.

Service Outlets & Establishments (continued) Appendix 3.1(d)

SERVICES	CARLISLE C.B.D.	PENRITH C.B.D.	WIGTON	BRAMPTON	HALT-WHISTLE	LONGTOWN	ALSTON
TRADES							
Cleaners	6	6	3	1	1		1
*Hairdresser	28	8	4	5	5	4	2
*Barber	9	5	2	2	1	1	1
*Cobbler	3	2	1	1			
Bookmaker	3	4	3	2	1	1	1
Undertaker	2	2	1	1	1	2	
*Fuel Merch't	4 (7)	(3)	2	2	2	1	1
*Electrician	(22)	(6)	2	3	1	1	1
*Plumber	(24)	(8)	1	2	1	2	
Builder			9	4	2	1	1
Joiner			3	2	1	1	1
*Decorator	(44)	6	3	4	2	1	1
*Garage/Petrol	17	11	4	5	4	3	3
Hotel/Pub.H.	17	26	11	8	5	3	7
Total Outlets	89	70	49	42	27	21	20
PROFESSIONAL							
*Post Office	2	2	1	1	1	1	1
*Banks	12	5	5	3	2	2	3
Accountant	8	2	2	1	2		
Estate Agent	9	1	1		1		
Building Soc.	15	7	1	1	1	1	1
*Solicitor Pr.	9(18)	1(4)	2	1	2	1	1
*Doctors	4(33)	3(8)	2	6	2	2	2
*Dentist Prac.	1(16)	2(5)	2	1	2	1	
Optician	6	2					
Vet. Practice		1	1	1	1	2	
Total Outlets	66	26	17	15	14	10	8
COMMUNITY							
Registrar	1	1	1	1	1	1	1
Health Clinic			1	1	1	1	1
Hospitals			1	1	1	1	1
Schools			6	4	3	3	2
Churches etc.	9	4	6	5	4	3	3
Police Sta.	1	1	1	1	1	1	1
Fire Sta.	1	1	1	1	1	1	1
Library	1	1	1	1	1	1	1
Museum	1						
Cinema	2	2			1		
Total Outlets	16	10	18	15	14	12	11
GRAND TOTAL of Outlets	640	370	180	154	164	92	84
TOTAL No. of Establishments	485	274	153	125	108	71	72

N.B. Figures in brackets are those located outside the C.B.D. which are used in the measurements of Centrality

(From results of Survey 1974)

SETTLEMENTS	Population	Bus Service Category	SERVICES																					Total Outlets
			General Store	Grocer	Greengrocer	Butcher	Baker/Confectioner	Furniture/Electrical	Hairdresser/Barber	Cobbler	Fuel Merchant	Electrician	Plumber	Decorator	Garage/Petrol	Hotel/Public House	Post Office	Bank	Doctor	School	Church	Police		
Dalston	1341	A	1	2	1	2	1		2		1		1		3	2	1	1	1	2	2	1		24
Warwick Bridge	958	A	1	1	1	1	1		1	1	1	1	1	1	1	4	1			1	1	1		20
Scotby	792	B	1	1	1	1	1		1				1		1	2	1			1	1	1		14
Houghton	762	A	1	1	1				1						1	1	1			1	2			10
Wetheral	607	B	1	1	1	1	1		1		1				1	2	1		2	1	2	1		17
Lazonby	531	B	1	2	1	1	1	1							1	2	1			1	2	1		15
Gilsland	390	A	1	1	1	1	1		1			1		1	1	3	1	1		1	1			16
Kirkoswald	329	B	1	1	1	1									1	3	1	1	1	1	2	1		15
Hayton	344	A	1									1	1			2	1			1	1			8
Irthington	274	C	1									1				1	1			1	1	1		7
Castle Carrock	236	B	1						1					1		2	1			1	2	1		10
Cotehill	235	B	1								1					1	1			1	1	1		7
Armathwaite	226	B	1	1											1	2	1				1			7
Hallbankgate	215	B	1								1				1	1	1			1	1	1		8
Hethersgill	204	B	1							1		1	1			1	1	1		1	2			10
Walton	189	C	1									1			1	1	1				1			6
Great Corby	182	C	1			1					1					2	1			1	1			8
Cumwhinton	180	B	1													1	1			1	1			5
Low Row	177	A	1												1	1	1				1	1		6
Heads Nook	161	B	1										1		1	1	1							5
Cumwhitton	156	C	1									1	1		1	1	1				1			7
Crosby	153	C			1										1	3				1	1	1		8
Greenhead	142	A									1				1	1	1			1	1			6
Warwick	138	A	1													1								2
Smithfield	135	B	1								1	1		1	1	1	1			1		1		9
How Mill	127	C	1													1	1							3
Ainstable	124	C	1												1	1	1			1	1			6
Laversdale	117	C	1							1						1	1			1				5
Croglin	107	E	1													1	1				2			5
Scaleby Hill	102	B	1								1				1	1	1							5
Banks	92	D	1														1				1			3
Talkin	90	C	1											1		2	1				1			6
Roadhead	85	D	1										1		1		1	1				1		6
Newbiggin	76	E														1	1				1			3
West Hall	72	E															1				1			2
Bewcastle	65	E														1	1			1	1			4
Lanercost	55	D														1				1	1			3
Kirkcambeck	51	E														1					1			2
Boltonfellend	40	D													1	1								2
Roweltown	35	D													1	1	1							3

QUESTIONNAIRE (for Businesses) Appendix 3.3.

The aim of this survey is to ascertain the extent and sphere of influence of the retail and service functions of BRAMPTON and to measure the attractiveness of various Service Centres in Cumbria. I would be obliged therefore of you would kindly complete, as fully as possible, the questions below that are relevant to your particular establishment.

All answers will be treated in the strictest confidence.

Thank you for your cooperation.

M.B.KIRK.

---

1. Type of category of establishment _____

2. Address _____

3. Number of employees _____

4. Please list the town or village where each employee lives and how each travels to work. e.g. '2 from Carlisle - bus'

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

(if not enough space, please use other side of sheet).

5. If you have regular customers (such as those with an account) please indicate how many _____

6. If you know where these regular customers live would you please indicate the farthest limits in every direction by underlining the towns or villages on the attached map *

7. If you deliver/visit/or travel in the course of your business would you please indicate the farthest limits in every direction by placing a X against the towns or villages on the attached map *

8. Please indicate how many cars/vans/lorries used for delivery _____

9. Please list the places from which you obtain the majority of goods or products used in your business.

_____ _____ _____ _____ _____

10. Please indicate, if at all possible, the annual durable goods turnover for your establishment _____

* N.B. If beyond the limits of the map please write places around the margin of the map.

(Answers to Questions 8, 9, & 10 not used in final analysis)

Market Preference A - Origin and Destination of 140 Households For 25 Services

Appendix 3.4

(From results of Questionnaire 1974)

Settlement of Origin & Number of Households		DESTINATION Carlisle	Brampton	Haltwhistle	Longtown	Penrith	Same Place (*repeated)	Van	Self	Other Centres	None
Brampton	50	280	853	8	2		853*	17	13	23	54
% of 50		22	68				68	1	1	2	4
Warwick Bridge	16	245	53		1		52	9	6	12	22
Gilsland	7	27	42	45	1		28	13	4	9	6
Hayton	6	76	44				19	4	1	6	
Castle Carrock	5	61	33				12	1	2	9	7
Hethersgill	5	71	12		10		6	8	2	9	7
Heads Nook	4	61	16				5	6	1	8	3
Irthington	4	53	23	1	3		3	4	3	6	4
Crosby	3	53	8			3	1	6		3	1
Warwick	3	62	1					1	1	10	
Croglin	2	5	10			18	1	5	1	9	1
Cumwhitton	2	24	8			1	4	6		6	1
Hallbankgate	2	10	20	5			6		1	5	3
Kirklinton	2	29	4		11					6	
Laversdale	2	30	16				1		1	1	1
Lees Hill	2	28	12					3	4	1	2
Low Row	2	9	28	3	1		2	3	2	1	1
Roweltown	2	22	7		2		4	3	1	5	6
Walby	2	35	2		1			3		1	8
West Hall	2	4	43				1				2
Aglionby	1	15							4	5	1
Ainstable	1	10	1			9	2		3		
Armathwaite	1	20	2					1	2		
Carlatton	1	10	8					1		4	2
Cumrew	1	10	6	1				3	1	4	
Farlam	1	4	12							4	5
Faugh	1	12	12								1
Great Corby	1	24						1			
Greenhead	1	2	6	8			2	3	1	1	2
Kirkcambeck	1	12	5					1		7	
Lanercost	1	3	19					3			
Newbiggin	1	22	2					1			
Scaleby Hill	1	6	2		11		2	1		1	2
Smithfield	1	14	2		6		1				2
Tindale	1	10	14							1	
Walton	1	3	12	1			1	4		1	3
Wetheral	1	6	12				3		1	1	2
TOTAL(- Bramp)	90	1088	497	64	47	31	156	94	42	136	95
% of 90		48	22	3	2	1½	7	4	2	6	4
GRAND TOTAL	140	1368	1350	72	49	31	1009	111	55	159	149
% of 140		39	39	2	1½	1	29	3	1½	4½	4½

Market Preference B - Destination for the 25 Services from 140 Households

(From the results of the Questionnaire 1974)

Appendix 3.5

SERVICES	CARLISLE				BRAMPTON				HALTWHISTLE	LONGTOWN	PENRITH	SAME PLACE	VAN	SELF	OTHER CENTRES	NONE	WITHIN REGION		
	Brampton People	People in rest of the Area	Total	%	Brampton People	People in rest of the Area	Total	%									Centres Available	Centres Used	Total No. of Outlets
Records/Music	40	79	119	85	6	1	7	5	5		2				1	6	5	5	17
Furniture	34	75	109	78	12	7	19	14		3	1				8		6	6	46
Clothes	36	73	109	78	11	10	21	15	3		1				6		5	5	115
Solicitor	20	57	77	55	21	17	38	27	1	2	3				8	11	5	5	26
Electric Goods	22	70	92	66	27	14	41	29	2	1	1				3		6	6	33
T.V./Radio	20	64	84	60	26	11	37	26	7		1				5	6	6	5	29
Shoes	21	56	77	55	28	27	55	39	2	1	2				3		5	5	38
Hardware	12	64	76	54	38	23	61	44		2	1						5	5	21
Bank	10	54	64	46	39	23	62	44	5	3	3	1			1	1	9	7	28
Baby Goods	8	38	46	33	20	13	33	24	2	1	1					57	5	5	28
Dentist	10	51	61	44	39	27	66	47	9		2				2		5	5	25
Chemist	2	47	49	35	48	31	79	56	5	4	3						5	5	21
Cobbler	2	39	41	29	47	29	76	54			2	2			3	16	6	6	9
Hairdresser	4	36	40	28	42	24	66	47	2	2		11		9	9	1	12	12	75
Fuel Merchant	3	19	22	16	37	29	66	47	3	5		4			19	21*	12	12	22
Greengrocer	6	43	49	35	40	20	60	43	4	2	2	8	12		3		12	12	44+
Grocer	11	32	43	31	39	18	57	41	2	3	2	14	15		4		33	10	82+
Butcher	7	29	36	26	36	7	43	31	2	5	1	7	36		10		12	12	50
Plumber	1	31	32	23	47	25	72	51	2	4		7		5	8		12	12	44
Doctor		14	14	10	50	62	112	80	6	2		1			5	10	7	7	54
Electrician	4	31	35	25	44	22	66	47	3	3	1	12		4	8	8	13	13	41
Garage	3	25	28	20	34	14	48	34	2	1		24		1	25	11	25	18	60
Decorator		23	23	16	37	21	58	41	2	2		5		35	2	13	10	9	62+
Baker	3	22	25	18	36	11	47	33	3	3	1	9	48	1	3		33	11	82+
Post Office	1	16	17	12	49	11	60	43			1	51			11		37	28	39

* Includes gas, oil and electric central heating. + Includes General Stores

(From results of Questionnaire)

SERVICES	DISTANCES (in miles)																					Average Range	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	30	40	50	Gross	Net*
Records/Music	6		1	2	29	5	12	4	52	4	2	5	6	1			2						1	8.1	7.8
Furniture	13		1	3	26	6	11	6	44	5	1	4	4	1		1	5	1		1			6	9.6	7.8
Clothes	12		4	5	29	6	11	5	45	4	1	5	4	1			3						4	8.4	7.2
Solicitor	21		3	5	27	7	8	7	28	3	2	4	3	1	1		1				1	1		6.8	6.4
Electric Goods	28		4	6	29	5	11	5	33	3	1	5	3				4						2	6.9	6.3
T. V.	26		2	3	33	8	9	6	31	3	2	3	3	1			1	1		1				6.3	
Shoes	28		8	8	28	7	10	6	29	1	1	4	3				4						1	6.3	6.0
Hardware	38		8	7	31	4	9	5	21	4	1	5	2	1			3						1	6.3	5.5
Bank	40		5	7	34	5	9	7	20	2	2	4	2	1					1					5.8	
Baby Goods	20		3	4	23	5	7	2	14	1	1	2					1							5.3	
Dentist	40		4	9	34	9	6	7	16	2	3	4	2	1					1					5.3	
Chemist	48		6	9	36	6	7	6	11	3	2	3	2							1				5.2	
Cobbler	48		7	7	24	6	8	8	9	1	2	1	2				1							4.6	
Hairdresser	53		10	7	25	5	6	3	9	4	1	3	2	1					1					4.4	
Fuel Merchant	41	9	11	6	24	4	5	3	7	6		1	1	1			2							4.3	
Greengrocer	60	1	4	7	30	3	7	6	14	2	2	2	1	1										4.3	
Grocer	68	3	4	5	26	4	4	2	17	2	2	3												4.1	
Butcher	80	3	2	3	18	1	5	3	13		4	2	2	2			2							3.8	
Plumber	60	1	6	12	23	5	6	7	4	2	1	1	2											3.8	
Doctor	52	1	11	12	40	7	3	8	2	3		1												3.8	
Electrician	57		5	12	21	7	5	4	8	3	1	2	2											3.7	
Garage	60	6	8	6	20	6	4	2	9	2	1	2						1						3.6	
Decorator	43		7	1	22	5	7	2	3	1	1													3.6	
Baker	93	3	2	2	19	2	2	2	9	1	2	1	1	1										3.5	
Post Office	102	5	3	6	9	3	2	2	4	1	1	1							1					2.9	
																								2.3	

N.B. Figures in each column are number of households who travel that distance for the service in question

* Net Range excludes journeys made outside N. Cumbria (i.e. over 20 miles) - only 7 services affected

Breakpoint Distances

Appendix 4.1

based on Huff's equation $D_b = \frac{d(a-b)}{1 + \sqrt{\frac{S_a}{S_b}}}$ where d - distance, S_a - size of centre a, S_b - size of centre b

SETTLEMENT	Direct Distance in Miles	Population	Breakpoint Distance 1 in miles from 'b'	Outlets for 25 Services	Breakpoint Distance 2 in miles from 'b'
a Carlisle		71,582		497	
b Brampton	8.5	3,226	1.5	83	2.5
a Penrith		11,306		198	
b Brampton	19.5	3,226	6.7	83	7.7
a Haltwhistle		2,780		83	
b Brampton	11.5	3,226	6.0	83	5.7
a Longtown		2,082		46	
b Brampton	10.5	3,226	5.8	83	6.0
a Alston		1,533		38	
b Brampton	15.0	3,226	8.9	83	9.0
a Penrith		11,306		198	
b Carlisle	17.5	71,582	12.5	497	10.8
a Longtown		2,082		46	
b Carlisle	8.0	71,582	6.8	497	6.1
a Penrith		11,306		198	
b Alston	16.0	1,533	4.3	38	4.9
a Haltwhistle		2,780		83	
b Alston	11.0	1,533	4.7	38	4.4

Preference & Probability for Visiting Centres

Appendix 4.2(a)

(based on Huff's formula and results of Questionnaire)

SETTLEMENT & Centres	% Visits Obs.	% Visits Exp.	Difference %	Difference Aver.
SCALEBY HILL	9.5	10	- 0.5	22.3
Carlisle	28.5	70	-41.5	
Brampton	9.5	12	- 2.5	
Longtown	52.5	8	+44.5	
IRTHINGTON	4	8	- 4	14.0
Carlisle	64	36	+28	
Brampton	28	54	-26	
Longtown	4	2	+ 2	
GREENHEAD	11	15	- 4	11.5
Carlisle	11	15	- 4	
Brampton	33	10	+23	
Haltwhistle	45	60	-15	
HAYTON	13.5	7	+ 6.5	10.8
Carlisle	54	39	+15	
Brampton	31	43	-12	
Warwick Br.	1.5	11	- 9.5	
KIRKCAMBECK				10.6
Carlisle	60	51	+ 9	
Brampton	25	41	-16	
Walton	15	8	+ 7	
WETHERAL & GREAT CORBY	7	12	- 5	10.5
Carlisle	65	58	+ 7	
Brampton	26	12	+14	
Warwick Br.	2	18	-16	
LANERCOST				10.0
Carlisle	14	24	-10	
Brampton	86	76	+10	
HEADS NOOK & FAUGH	4.5	8	- 3.5	9.8
Carlisle	66	56	+10	
Brampton	25.5	16	+ 9.5	
Warwick Br.	4	20	-16	
LEES HILL & WEST HALL	2	14	-12	9.3
Carlisle	36	38	- 2	
Brampton	62	48	+14	

SETTLEMENT & Centres	% Visits Obs.	% Visits Exp.	Difference %	Difference Aver.
WARWICK	1	2	- 1	9.0
Carlisle	87	69	+18	
Warwick Br.	8	24	-16	
Scotby	4	5	- 1	
AGLIONBY				9.0
Carlisle	79	88	- 9	
Scotby	21	12	+ 9	
HETHERSGILL	15	20	- 5	8.5
Carlisle	65	48	+17	
Brampton	11	23	-12	
Longtown	9	9	0	
LOW ROW	5	15	-10	8.0
Carlisle	21	26	- 5	
Brampton	67	51	+16	
Haltwhistle	7	8	- 1	
TINDALE				7.3
Carlisle	40	42	- 2	
Brampton	56	45	+11	
H'Bankgate	4	13	- 9	
GILSLAND	20	30	-10	7.0
Carlisle	19	18	+ 1	
Brampton	29	16	+13	
Haltwhistle	32	36	- 4	
SMITHFIELD	4	14	-10	7.0
Carlisle	61	62	- 1	
Brampton	9	12	- 3	
Longtown	26	12	+14	
BRAMPTON	74	61	+13	6.5
Carlisle	25	36	-11	
Haltwhistle	0.5	2	- 1.5	
Longtown	0.5	1	- 0.5	
CUMREW & CARLATTON				6.5
Carlisle	49	59	-10	
Brampton	34	28	+ 6	
Cas.Carrock	5	8	- 3	
Kirkoswald & Lazonby	12	5	+ 7	

SETTLEMENT & Centres	% Visits Obs.	Exp.	Difference %	Aver.
LAVERSDALE	2	11.5	- 9.5	6.3
Carlisle	64	58.5	+ 5.5	
Brampton	34	30	+ 4	
CAS. CARROCK	11	14	- 3	6.2
Carlisle	56.5	44	+12.5	
Brampton	30.5	38	- 7.5	
Warwick Br.	2	4	- 2	
ARMATHWAITE & AINSTABLE	4.5	13.5	- 9	5.3
Carlisle	68	57.5	+10.5	
Brampton	7	8.5	- 1.5	
Penrith	20.5	20.5	0	
KIRKLINTON				5.2
Carlisle	61.5	57.5	+ 4	
Brampton	8.5	12.5	- 4	
Longtown	23.5	17	+ 6.5	
Smithfield	6.5	13	- 6.5	
WALTON	6	11	- 5	5.0
Carlisle	18	23	- 5	
Brampton	70	63	+ 7	
Haltwhistle	6	3	+ 3	
CROGLIN & NEWBIGGIN	6	12	- 6	4.8
Carlisle	41	47	- 6	
Brampton	17	14	+ 3	
Penrith	26	19	+ 7	
Kirkoswald & Lazonby	10	8	+ 2	

SETTLEMENT & Centres	% Visits Obs.	Exp.	Difference %	Aver.
HALLBANKGATE	15	13.5	+ 1.5	4.5
Carlisle	24	25	- 1	
Brampton	49	57	- 8	
Haltwhistle	12	4.5	+ 7.5	
CUMWHITTON	11	17	- 6	4.5
Carlisle	63	55	+ 8	
Brampton	21	20	+ 1	
Warwick Br.	5	8	- 3	
ROWELTOWN	10.5	17	- 6.5	4.4
Carlisle	58	50	+ 8	
Brampton	18.5	15.5	+ 3	
Longtown	5	6.5	- 1.5	
Hethersgill	8	11	- 3	
WARWICK BR.	15	11	+ 4	2.6
Carlisle	70	73	- 3	
Brampton	15	16	- 1	
CROSBY	2	4	- 2	2.6
Carlisle	85	87	- 2	
Brampton	13	9	+ 4	
FARLAM				2.6
Carlisle	22	22	0	
Brampton	67	71	- 4	
H'bankgate	11	7	+ 4	
WALBY				0
Carlisle	92	92	0	
Brampton	2.5	2.5	0	
Houghton	2.5	2.5	0	

% Difference	Carlisle	Brampton	Other Centre	Own Centre	Overall
Average+	8.6	8.3	7.2	6.0	7.5
Mean*	+1.4	+1.8	+0.2	-3.5	

+ Average difference ignores positive or negative sign
* Mean is difference between positive & negative values.

Attraction for Centres

Appendix 4.3

after Bracey using formula AI = $\frac{V}{H}$ where V - visits to a centre from one settlement and
H - households represented.

SETTLEMENT	Carlisle	Brampton	Haltwhistle	Longtown	Penrith	Same Place
Greenhead	2/1	6/1	8/1			2/1
Gilsland	27/7	42/7	45/7	1/7		28/7
Low Row	9/2	28/2	3/2	1/2		2/2
Tindale	10/1	14/1				
Hallbankgate	10/2	20/2	5/2			6/2
Farlam	4/1	12/1				
Lanercost	3/1	19/1				
Armathwaite & Ainstable	30/2	3/2			9/2	2/2
Newbiggin & Croglin	27/3	12/3			18/3	4/3
Cumrew	10/1	6/1				
Carlatton	10/1	8/1				
Cumwhitton	24/2	8/2			1/2	4/2
Cas. Carrock	61/5	33/5				12/5
Heads Nook & Faugh	73/5	28/5				5/5
Aglionby	15/1					
Warwick	62/3	1/3				

SETTLEMENT	Carlisle	Brampton	Haltwhistle	Longtown	Penrith	Same Place
Warwick Br.	245/16	53/16		1/16		52/16
Great Corby & Wetheral	30/2	12/2				3/2
Hayton	76/6	44/6				19/6
Scaleby Hill	6/1	2/1		11/1		2/1
Laversdale	30/2	16/2				1/2
Walby	35/2	2/2		1/2		
Crosby	53/3	8/3			3/3	1/3
Irthington	53/4	23/4	1/4	3/4		3/4
Smithfield	14/1	2/1		6/1		1/1
Kirklinton	29/2	4/2		11/2		
Roweltown	22/2	7/2		2/2		4/2
Hethersgill	71/5	12/5		10/5		16/5
Lees Hill & West Hall	32/4	55/4				1/4
Kirkcambeck	12/1	5/1				
Walton	3/1	12/1	1/1			1/1
Brampton	280/50	853/50	8/50	2/50		

Functional Indices for Main Towns
Using Location Coefficients and Centrality Values

Appendix 4.4

based on Davies' formula $FI = \frac{N.s.100}{S}$

SERVICES	No. of Outlets in area	Location Coeff'nt	CARLISLE Out-lets	CARLISLE Centr'y Value	PENRITH Out-lets	PENRITH Centr'y Value	BRAMPTON Out-lets	BRAMPTON Centr'y Value	HALTWHISTLE Out-lets	HALTWHISTLE Centr'y Value	LONGTOWN Out-lets	LONGTOWN Centr'y Value
Records/Music	17	5.88	7	41.16	5	29.40	1	5.88	3	17.64	1	5.88
Furniture	43	2.33	25	58.25	11	25.63	1	2.33	4	9.32	1	2.33
Clothes	115	0.87	70	60.90	26	22.62	7	6.09	9	7.83	3	2.61
Electric Goods	33	3.03	15	45.45	9	27.27	3	9.09	4	12.12	1	3.03
T.V. & Radio	29	3.45	14	48.30	10	34.50	1	3.45	2	6.90	1	3.45
Solicitor	26	3.85	18	69.30	4	15.40	1	3.85	2	7.70	1	3.85
Shoes	38	2.63	22	57.86	8	21.04	4	10.52	3	7.89	1	2.63
Baby Goods	28	3.57	17	60.69	6	21.42	2	7.14	2	7.14	1	3.57
Hardware	21	4.76	8	38.08	5	23.80	2	9.52	5	23.80	1	4.76
Bank	28	3.57	12	42.84	5	17.85	3	10.71	2	7.14	2	7.14
Dentist	25	4.00	16	64.00	5	20.00	1	4.00	2	8.00	1	4.00
Chemist	21	4.76	11	52.36	5	23.80	2	9.52	2	9.52	1	4.76
Doctor	54	1.85	33	61.05	8	14.80	6	11.10	2	3.70	2	3.70
Decorator	62	1.61	44	70.84	6	9.66	4	6.44	2	3.22	1	1.61
Cobbler	9	11.11	3	33.33	2	22.22	1	11.11				
Fuel Merchant	22	4.55	7	31.85	3	13.65	2	9.10	2	9.10	1	4.55
Plumber	44	2.27	24	54.48	8	18.16	2	4.54	1	2.27	2	4.54
Electrician	41	2.44	22	53.68	6	14.64	3	7.32	1	2.44	1	2.44
Hairdresser	75	1.33	37	49.21	13	17.29	7	9.31	6	7.98	5	6.65
Greengrocer	44	2.27	15	34.05	8	18.16	7	15.89	4	9.08	3	6.81
Grocer	82	1.22	12	14.64	10	12.20	8	9.76	9	10.98	7	8.54
Butcher	50	2.00	18	36.00	12	24.00	4	8.00	6	12.00	3	6.00
Garage	60	1.66	17	28.22	11	18.26	5	8.30	4	6.64	3	4.98
Baker	82	1.22	28	34.16	10	12.20	5	6.10	5	6.10	2	2.44
Post Office	39	2.56	2	5.12	2	5.12	1	2.56	1	2.56	1	2.56
TOTAL CENTRALITY VALUES = Functional Index			FI = 1145.8		FI = 1145.8		FI = 191.6		FI = 201.1		FI = 102.8	

Degree of Centrality based on Indices of Function and Attraction

A. Based on FUNCTION (after Davies)				B. Based on ATTRACTION (using method prescribed in the Introduction - Table 0.1)			
Rank* Settlement	Functional Index	Index as a %	Category+	Rank* Settlement	Attraction Index	Index as a %	Category+
1 Carlisle	1146	46.9	B	1 Carlisle	5270	55	A
2 Penrith	483	19.3	C	2 Brampton	2884	30	B
3 Haltwhistle	201	8.0	D	3 Longtown	330	3.5	E
4 Brampton	192	7.7		4 Penrith	243	2.5	
5 Longtown	102	4.1	E	5 Haltwhistle	217	2.2	
6 Warwick Br.	36.7	1.47	F	6 Warwick Br.	104	1.1	F
7 Hethersgill	25.7	1.03		7 Kirkoswald	59	0.61	G
8 Wetheral	23.0	0.92	G	8 Lazonby	42	0.44	H
9 Gilsland	22.3	0.89		9 Gilsland	41	0.43	
10 Lazonby	18.7	0.75		10 Great Corby	37	0.38	
11 Kirkoswald	17.6	0.70		11 Houghton	33	0.34	
12 Scotby	17.0	0.68		12 Walton	30	0.31	
13 Laversdale	16.1	0.64		13 Hethersgill	29	0.30	
14 Smithfield	15.3	0.61		14 Hayton	27	0.28	
15 Great Corby	11.6	0.46	H	15 Scotby	21	0.22	
16 Houghton	11.5	0.46		16 Scaleby Hill	21	0.22	
17 Cumwhitton	11.4	0.46		17 Hallbankgate	20	0.21	
18 Scaleby Hill	11.2	0.45		18 Smithfield	19	0.20	
19 Hallbankgate	11.2	0.45		19 Crosby	19	0.20	
20 Hayton	9.7	0.39		20 Heads Nook	18	0.19	J
21 Walton	9.1	0.36		21 Cas. Carrock	17	0.18	
22 Heads Nook	8.9	0.36		22 Greenhead	16	0.17	
23 Greenhead	8.8	0.35		23 Wetheral	15	0.16	
24 Armathwaite	7.9	0.32		24 Talkin	15	0.16	
25 Cas. Carrock	7.9	0.32		25 Laversdale	12	0.13	
26 Low Row	6.7	0.27		26 Cumwhitton	10	0.10	
27 Ainstable	6.7	0.27		27 Irthington	7	0.07	K
28 Talkin	6.6	0.26		28 Roweltown	7	0.07	
29 Irthington	6.2	0.25		29 West Hall	7	0.07	
30 Croglin	5.0	0.20		30 Croglin	6	0.06	
31 Roweltown	4.2	0.17	J	31 Low Row	5	0.05	
32 Crosby	3.9	0.16		32 Ainstable	2	0.02	
33 West Hall	2.6	0.10		33 Armathwaite	1	0.01	
34 Newbiggin	2.6	0.10		34 Newbiggin	1	0.01	
35 Warwick	2.4	0.09	K	35 Warwick	1	0.01	

* Rank Correlation Coefficient = 0.86 (using Spearman method)

\+ Category divisions shown in Table 4.5

Functional Tiers and Settlement Order

Appendix 5.1

(From results of Survey 1974)

Type of Centre / SETTLEMENT	OUTLETS OF 25 SERVICES — Low Threshold → High Threshold: Post Office	Baker	Grocer	Garage	Butcher	Greengrocer	Hairdresser	Electrician	Fuel Merc't	Plumber	Cobbler	Decorator	Bank	Doctor	Chemist	Dentist	Hardware	Baby Goods	Shoes	Solicitor	TV & Radio	Electrical	Clothes	Furniture	Records	TOTAL
A Carlisle CBD.	2	28	12	17	18	15	37	22	7	24	3	44	12	33	11	16	8	17	22	18	14	15	70	25	7	497
B Penrith CBD.	2	10	10	11	12	8	13	6	3	8	2	6	5	8	5	5	5	6	8	4	10	9	26	11	5	198
C Brampton	1	5	8	5	4	7	7	3	2	2	1	4	3	6	2	1	2	2	4	1	1	3	7	1	1	83
Haltwhistle	1	5	9	4	6	4	6	1	2	1		2	2	2	2	2	5	2	3	2	2	4	9	4	3	83
Wigton	1	4	7	4	6	5	6	2	2	1	1	3	5	2	3	2	4	1	2	2	2	2	10	3		80
Longtown	1	2	7	3	3	3	5	1	1	2		1	2	2	1	1	1	1	1	1	1	1	3	1	1	46
Alston	1	2	4	3	2	2	3	1	1			1	3	2	1		1	1	1	1	1	1	6			38
D Dalston	1	2	2	3	2	1	2		1	1			1	1												17
Warwick Br.	1	2	2	1	1	1	1	1	1	1	1	1														14
Wetheral	1	2	2	1	1	1	1		1					2												12
Gilsland	1	2	2	1	1	1	1	1				1	1													12
Scotby	1	2	2	1	1	1	1			1																10
Lazonby	1	1	2	1	1															1	1		1			9
Kirkoswald	1	1	2	1	1								1	1												9
Houghton	1	1	2	1		1	1																			7
E Hethersgill	1	1	1				1	1		1	1		1													8
Smithfield	1	1	1	1				1	1			1														7
Cumwhitton	1	1	1	1				1	1	1																6
Roadhead	1	1	1	1					1	1			1													6
Hayton	1	1	1	1				1		1																5
Cas. Carrock	1	1	1	1			1					1														5
Armathwaite	1	1	1	2	1																					5
Hallbankgate	1	1	1	1	1				1																	5
Walton	1	1	1	1	1			1																		5
Great Corby	1	1	1	1		1			1																	5
Heads Nook	1	1	1	1	1					1																5
Scaleby Hill	1	1	1	1	1				1																	5
Irthington	1	1	1	1			1																			4
Low Row	1	1	1	1	1																					4
Ainstable	1	1	1	1	1																					4
Laversdale	1	1	1	1						1																4
Talkin	1	1	1	1							1															4
Greenhead	1	1		1				1																		3
How Mill	1	1	1	1																						3
Croglin	1	1	1	1																						3
Banks	1	1	1																							3
Crosby			1		1																					2
Warwick		1	1																							2
F Roweltown	1		1																							2
Newbiggin	1																									1

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