



Durham E-Theses

Hetton-Le-Hole: the genesis of a coalmining landscape 1770-1860

Sill, Michael

How to cite:

Sill, Michael (1974) *Hetton-Le-Hole: the genesis of a coalmining landscape 1770-1860*, Durham theses, Durham University. Available at Durham E-Theses Online: <http://etheses.dur.ac.uk/9942/>

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full Durham E-Theses policy](#) for further details.

Hetton-le-Hole: the genesis of a coal-mining landscape
1770-1860

Abstract

The thesis is concerned with the study of the growth of a major coal-mining settlement in the parish of Hetton-le-Hole in east Durham. By the use of cartographic, censal and documentary source material in conjunction with relict landscape evidence, the thesis firstly seeks to explore in detail the morphological evolution of the settlement in relation to the pre-mining landscape. A second section consists of an analysis of the occupation and social structure of the coal-mining households as well as their patterns of movement prior to 1851. The final section takes the form of a total reconstruction of the social and economic life of the community that existed at Hetton in 1851, some thirty years after the initial colliery sinkings in the parish.

Although the growth of the settlement was very rapid, particularly in the first ten years following the opening of Hetton colliery in 1822, the plan of the mining settlement evolved subject to the constraints of the earlier rural landscape. In addition, the influence of the landowners and their relationships with the Hetton coal company, was considerable in determining the ultimate form of the settlement. 53.7% of the households in Hetton in 1851 were occupied by coalminers and their families, which were considerably larger than those of the non-coalmining element in the community; the mining families were highly mobile and had migrated in the thirty years before 1851 largely from contracting to expanding sectors of the Northumberland and Durham coalfield. Very few miners originated from rural parts of the North East or from other parts of the country.

Within the community as a whole coal-mining dominated the economic life and provided the only large-scale high capitalized source of employment. Most of the remaining workers provided goods and services for the miners on a small-scale craft basis. Very few long-distance migrants lived in Hetton in 1851, save the Irish and the Scots. The former rarely worked in the collieries, but

found employment by the provision of low-grade services. The latter in general were more highly skilled than the Irish. An analysis of the occupations throughout the settlement revealed a partial zonation, with the miners concentrated in rows built on land owned by the coal company; in no street however did the incidence of coalmining households fall below 25%. In summary, therefore, this thesis provides a detailed study of the evolution of a coal-mining landscape in one parish in east Durham.

HETTON-LE-HOLE: THE GENESIS OF A COALMINING LANDSCAPE

1770-1860

by

Michael Sill BA

A thesis presented to the University of Durham
for the Degree of Master of Arts, 1974

September 1974

The copyright of this thesis rests with the author.
No quotation from it should be published without
his prior written consent and information derived
from it should be acknowledged.

Contents of Volume 1

		Page
Chapter 1	Introduction	1
Chapter 2	Hetton-le-Hole in 1851 An Overview	16
Chapter 3	Land and Landownership	39
Chapter 4	Population and Settlement growth	66
Chapter 5	The Coal Miners	93
Chapter 6	Hetton-le-Hole: Social structure and economic life in 1851	119
Chapter 7	Conclusion	152

Maps

Listed below are the basic maps used in the study of parish of Hetton-le-Hole. A fuller list of cartographic sources is given in the bibliography in volume 2.

O.S. 7" series 1:63360 Sheet 85 Durham (1961)

O.S. Second series 1:25000 Sheet NZ 24/34

O.S. 1:10,560 Sheet NZ 34 NE (1967)

O.S. 1:10,560 Sheet NZ 34 NW (1966)

Geological Survey of Great Britain (England & Wales)

1:63360 Drift Sheet 27 (1965)

Geological Survey of Great Britain (England & Wales)

1:10,560 Sheet NZ 34 NE (1964)

1:10,560 Sheet NZ 34 NW (1964)

Abbreviations

The following abbreviations have been used in the notes at the end of each chapter and in the bibliography.

U.D.D.P. & D.	University of Durham Department of Palaeography and Diplomatic
C.R.O.	Durham County Records Office
N.E.I.M. & M.E.	North of England Institute of Mining and Mechanical Engineers, Neville Street, Newcastle upon Tyne
Watson Coll.	Watson Collection at the North of England Institute of Mining and Mechanical Engineers
N.C.B. Coll.	National Coal Board Collection of Papers relating to coalmining in North East England, lodged at the Durham County Records Office

Acknowledgement

The author wishes to acknowledge the permission to reproduce Fig.29 from A E Smailes', North England, which was granted by Thomas Nelson & Sons Ltd.

Hetton-le-Hole: the genesis of a coalmining landscape:
1770-1860

CHAPTER 1

INTRODUCTION

This is the study of a small area over a short period of time. The area is the parish of Hetton-le-Hole in County Durham (Fig.1) and the period covers the time immediately before and after the first successful sinking for coal on the concealed coalfield of east Durham. The principal aim of the work is to examine the factors that influenced the establishment, growth and subsequent physical and cultural evolution of this Durham mining village together with the landscape elements associated with the development of coalmining in the first half of the nineteenth century. In order to explore this aim fully three related problems form the detailed objectives which are presented for examination.

The first problem is concerned with the identification of the factors that influenced the initial establishment, growth and early settlement morphology of the Durham mining village. By the use of colliery company records and contemporary cartographic evidence, it is hoped that the influences and forces that were operative during this period at Hetton, can be recognised and their importance evaluated. The second problem is concerned with the nature of the workforce which was attracted to this new large-scale source of employment located in a previously scantily populated rural area. Recourse has been made to the appropriate Census Enumerators' Books in order to produce an analysis of the employment structure of the colliery labour force in the parish; a second analysis reconstructs the social structure of the coal-mining households in 1851, whilst the third study consists of an investigation of the migratory patterns of the coalminers prior to 1851. The third problem seeks to discover the nature of the community

that had come into being in the first thirty years of the life of the collieries in the area. Through a detailed reconstruction of the social and economic life of the village it is intended to demonstrate the complete occupation structure of the community, the overall demographic characteristics of the population, and the extent to which distinct socio-economic zones had been created by the middle of the nineteenth century. In this way, it is considered that a reasoned examination of the genesis of a coal-mining settlement in relation to the pre-mining cadaster, can be achieved within the spatial context of a parish that witnessed the sudden influx of coal-mining folk into a rural landscape.

Geographers in Britain have not displayed very great interest in coal-mining settlement. Such enquiries as have been made, have focussed in particular on the social and economic consequences of the contraction of coalmining in long-established coalfields such as the Northumberland and Durham coalfield. The economic problems attendant upon the closure of collieries in areas such as West Durham, in which unemployment in the 1930s reached disastrously high levels, have rightly held the attention of regional and applied Geographers, as have the post-War measures designed to broaden the economic base of the colliery districts. Few Geographers have studied colliery settlement from the historical viewpoint; one exception is A E Smailes. Writing nearly forty years ago he produced two pioneer studies of the historical geography of the Northumberland and Durham coalfield. In his first paper (1) he traced the temporal and spatial development of the North Eastern coalfield, in which he was able to evaluate the significance of geological conditions, technological developments, transport methods and demand factors within the context of the changing patterns of mining activity. In his later paper (2) Smailes analysed, largely from the printed nineteenth century census abstracts, the nature of the population changes in the colliery districts considered in relation to

the contemporary exploitation factors. He also considered the patterns of settlement that evolved on the Northumberland and Durham coalfield in relation to the date of mining colonization. Apart from the early work of Smailes, however, there has been little study of the origins, structure and morphology of colliery settlement. This neglect of the subject of coalfield settlement has, according to P N Jones, "created a gap in geographical analysis and concepts concerning the interpretation and significance of mining settlement". (3)

In recent years, P N Jones has sought to present the topic of colliery settlement in a firmer, conceptually-based perspective. As he comments, Geographers have in the past noted the striking individuality of the settlement form, the homogeneous demographic structure and the unbalanced socio-economic character of most colliery communities. Jones contends however that too little emphasis has been given to the basic paradox between the relatively permanent "fixed" nature of the mining settlement in locational terms and the exhaustive nature and "mobile" locational characteristic of the collieries. With this in mind Jones, in his paper, seeks to analyse and interpret the form, structure and disposition of colliery settlement in South Wales after 1850. To assist these aims, he erects a multi-stage model of colliery settlement growth into which are introduced factors such as the nature of the land, land-holding patterns and the role of the various agents of housing provision.

The contribution of continental writers such as Sorre (4) and Schwarz (5) is recognised by Jones to the creation of a body of generalizations to permit the consideration of colliery settlement as a distinctive form. Sorre in particular stressed the importance of examining the relationship of mining settlement to the pre-industrial rural pattern. He went on to contribute the generalized distinction between colliery settlement in a previously well-settled area and that which was established in formerly virtually uninhabited territory, a category not to be found in the Northumberland and Durham coalfield. Sorre also emphasised the

significance of the employment capacity of the colliery as an obvious factor determining settlement size. This factor is particularly relevant to the study of coalfield settlement since the early nineteenth century, after which time technical progress led to an increase in the scale of individual collieries.

The study of the genesis of the coal-mining landscape at Hetton derives two of its conceptual bases from these generalizations. Firstly a significant early part of the work seeks to explore the relationship between the pre-mining cadaster and the early mining settlement.

Secondly the innovatory nature and large scale of the mining operations in the parish are intrinsic factors which influenced the size of the workforce, the strength of migration to the area and the ultimate extent of the settlement. In addition the thesis aims to reconstruct, by means of a synthesis, the social and economic life of the village that had been created in the thirty years after the opening of the first colliery in the area in 1822.

The study area consists of the parish of Hetton-le-Hole as constituted in 1847 in recognition of the rapid growth of population in the area after the opening of the collieries. The parish, which was created an Urban District in 1895 with the inclusion of the neighbouring townships of Rainton and Moorsley, contained the three townships of Hetton-le-Hole, Great and Little Eppleton, (Fig.2) with a combined area of 2769 acres and a total population in 1851 of 5771 (6). Hetton shares the administrative history of many English mining communities, with a somewhat tardy reorganization by the Established Church into a separate parish of the ancient township units into which most northern parishes were once divided. This was followed by the creation, late in the nineteenth century, of an enlarged Urban District, an administrative unit which both houses half the coalminers in Britain and which, according to R T Jackson, "whilst recognising that it contains lots of people, does very little for them" (7).

Hetton lies at the western limit of the concealed coalfield of east Durham, and the geological boundary between the concealed coalfield with its transgressive cover of magnesian limestone and the exposed section of the coalfield in the mid-Wear Valley divides the parish into two unequal parts (Fig.1). The greater part of the surface of the study area is underlain by permian limestone; in the north west of the parish the older coal measure rocks occur, although they, like the limestone, are extensively covered by varied glacial deposits (Fig.10). Coal had been mined in the mid-Wear Valley particularly in the area close to the river downstream from Chester-le-Street, from as early as the seventeenth century. In contrast, the concealed coalfield of east Durham was unexplored because of the difficulties of sinking through 150 feet or more of limestone before technological improvements in the sinking, draining and ventilation of collieries permitted the pioneer borings at Hetton between 1820 and 1822. Before the beginning of the nineteenth century coalmining in the Northumberland and Durham coalfield was largely restricted to the production of household coal from tracts where it was accessible at a depth of no more than 500 to 600 feet. Furthermore, although the coalfield was remarkable for the existence of numerous landlocked pits whose small output served a very local market, the landsale pits, large-scale capitalist mining was spatially restricted to those areas where the coal could be transported by waggonway to navigable waterways or to the coast for export to London and other markets, the sea-sale pits. A series of maps illustrate the evolution of the patterns of exploitation from the seventeenth century onwards which developed in relation to technological innovation and market factors.

Smailes (8) has demonstrated how in the sixteenth and seventeenth centuries mining for sea-sale coal at least was restricted to a distance of only about three to five miles from the staithes or loading places along the river Tyne upstream from Newcastle and along the river Wear in

the Lumley area (Fig.3). In the early part of the eighteenth century, the impending exhaustion of attainable coal and the waterlogged condition of the mines close to the river Tyne, stimulated the development of the coal resources in north west Durham by an association of coal-mining families known as the Grand Allies, which dates from 1726. Long waggonways, up to eight miles in length together with the necessary bridges such as the Causey arch, the first "railway" bridge in the world, were built by the Grand Allies to link their collieries to the staithes on the upper Tyne. The end of the eighteenth century saw the centre of mining exploitation shift to the deeply buried section of the coalfield to the east of Newcastle. Here shafts of up to 600 feet in depth were sunk at Wallsend and Jarrow to reach the valuable High Main household coal seam, which lay deep in the syncline of the Wallsend trough. The successful working of these collieries depended upon the application of improved steam engines to the processes of pumping and ventilation. Casson's map (1804) (Fig.4) demonstrates the contemporary pattern of coalmining with the chief centres of activity concentrated on lower Tyneside, in north west Durham and in the river Wear Valley, but still close to the river. During the next twenty years a perceptible shift in the pattern of coal exploitation occurred, with a decline in production on lower Tyneside, owing to the exhaustion of the most accessible reserves, being matched by the rapid exploitation of coal seams in those parts of the Wear district to the south and east of the long-exploited tracts near the river (Fig.5). The working of the lower, Hutton seam in this area provided a substitute which was of equally high quality for household purposes as the original "Wallsend" coal extracted from the High Main seam on Tyneside. The working of the Hutton seam in the Wear district had a threefold influence on the pattern of coalmining in the locality: there was an extension of operations into the Rainton and Pitlington sector with, for example, the opening in 1817 of the Adventure pit near West Rainton which proved the Main Seam at 146 feet and the Hutton Seam at 368 feet, and the Hazard Pit in 1818 near East Rainton, which was sunk to the Hutton Seam at 588 feet

(9). The old districts near the staithes at Penshaw and Fatfield experienced a revival with the existing shafts being deepened to reach the lower Hutton Seam thus initiating an upturn in the cycle of production and population that, according to Smailes, characterized the population changes of many North Eastern mining villages (10). Finally, the proving of the Hutton Seam in the exposed section of the coalfield promoted an interest in tracing its existence immediately eastwards under the magnesian limestone near Hetton, thus focussing attention on the feasibility of sinking through the transgressive cover of the east Durham plateau.

Records of trial borings (11) dating from as early as 1772 indicate an early and sustained interest in proving the existence of coal reserves beneath Hetton parish. Although most of the early trial borings had been attempted in the north western part of the parish close to the old village of Hetton, at least one was made to the east and south east of the village on the limestone between 1793 and 1796 which proved a 4 foot 7 inch thick seam of Main coal at a depth of 534 feet. Boring continued until 1810 to a depth of 683 feet when the enterprise was abandoned without the Hutton Seam having been reached (12). The first successful sinking on the plateau was achieved through 174 feet of limestone at Hetton Lyons, two thirds of a mile to the south east of the village between 1820 and 1822. At Hetton Colliery the Main seam was reached at 654 feet and the Hutton Seam at 888 feet. The achievement of this profoundly significant extension of coal exploitation was only made possible through the development of technical skills concerning the sinking, draining and ventilation of such deep mines. For example, the problem of draining the feeders of water that gushed from the basal sands below the magnesian limestone in the Engine pit at Hetton, at a rate of 2000 gallons per minute, could only be overcome by the novel expedient of lining certain sections of the shaft with pre-fabricated iron cylinders by a process known as "tubbing". Furthermore, the spread of mining into east Durham occasioned the develop-

ment of the first large-scale haulage of coal by steam power (Fig.6). The owners of Hetton Colliery commissioned George Stephenson to lay out the eight mile rail link to their staithes at Bishopwearmouth; the result was the construction of the Hetton waggonway, with an innovatory mixture of three methods of haulage, locomotives, stationary engines and self-acting inclined planes. In addition to extending the location of coal mining in the County, the development of coal mining at Hetton led to the rapid transformation of a rural community of under 300 people in 1811, becoming within twenty years a mining town with a population of almost 6000, set in a coalmining landscape.

Sources of information.

1 Maps.

Amongst a varied collection of maps, the first edition of the Ordnance Survey 6" maps, in particular sheets 20 and 21 of the Co Durham series, have provided a cartographic basis for this study. The relevant first edition 25" plans have also been used for a more detailed analysis of the landscape in conjunction with the Ordnance Survey Book of Reference of 1864 (13) which provides detail on land use and plot size for the 25" plans. The Tithe maps and their apportionment documents have been consulted for the three townships in the study area (14). They provide an invaluable source of information for the reconstruction of the area between the years 1838 and 1840. They have been used to demonstrate the contemporary development of the colliery settlement, but in addition they throw much light on the patterns of landownerships and tenancies as well as the distribution of field names and field shapes. Little use has been made of the generalized agricultural information concerning land-use as this is not strictly relevant to the purposes of the study. In summary, therefore, the information in the Tithe maps and apportionment documents has been principally used in order to

illustrate a stage in the evolution of the coalmining landscape and to trace the impact of the advent of coalmining on the landownership and tenancy patterns in the area.

Additional cartographic evidence, in the form of a series of large-scale estate plans, has been used to trace changes in landownership and the landscape before the publication of the Tithe information. The earliest, which dates from 1776 (15) shows the estate of Thomas Lyon, the principal landowner in Hetton township. The plan indicates the contemporary pattern of settlement and communications, as well as the pattern of fields with their names and acreages. A later plan of Hetton estate, which is undated, but which, to judge from map evidence, must have been surveyed c. 1826 (16) depicts the landscape of the whole of Hetton township in the first few years after the extension of coalmining operations into the area. A landownership key allows comparison with the earlier and later patterns of estate ownership. No map evidence of Great Eppleton township has been found before the 1838 Tithe map but a useful estate plan of Little Eppleton township, again undated but probably surveyed in the 1830s (17) supports the evidence of the Tithe map. Amongst other miscellaneous maps used a collection produced as a Diocesan Record by Order in Council has proved valuable (18). Their original purpose was to indicate the changes in the township and parish boundaries that were occasioned by the creation of new Anglican parishes in industrial areas subject to rapid increases in population. In addition, these maps drawn generally at a scale of 4" to 1 mile also demonstrate the contemporary patterns of settlement, industry and communications. The 1827 map of the parish of Houghton-le-Spring, which was surveyed to indicate the site of the proposed chapel-of-ease at Hetton, has proved to be particularly useful since it specifies the number of houses in each part of the township, and so provides unequivocal evidence of the stage of growth of the settlement by this date, some five years after the opening of Hetton Colliery (Fig.16).

2 Unprinted source material.

(a) The 1851 Census Enumerators' Books: Hetton-le-Hole parish.

The format of the 1851 Census returns and their nature and value to historians, geographers and genealogists have been extensively discussed, as have their limitations for academic enquiry (19). For the purposes of this study three categories of information have been extracted from the censal data of the whole of the parish to produce a threefold analysis involving (a) the occupation structure, (b) social characteristics, (c) migration patterns. Although an occupation is listed for virtually every gainfully employed person in the 1851 census of Hetton, this data has been less valuable than for most other types of settlement because of the preponderance of workers at the collieries who were simply described as "coalminers". In spite of this, there is a sufficiently great variation of colliery job description, to permit a partially complete survey of the occupation structure within the coal trade. In general, however, the information included in the Enumerators' Books in 1851 enables a more detailed social analysis of the settlement than would be possible with the 1841 censal data. In particular, the unambiguous definition of the household in the later census has made possible a detailed reconstruction of the social structure of this mid-nineteenth century mining village. Furthermore, the entries of actual ages and birthplaces for each inhabitant, have permitted not only the geographical analysis of birthplaces, but have also been studied in order to gain some insight into family mobility in the years preceding 1851. Only by an investigation of the Enumerators' Books is it possible to seek interrelationships such as occupation and origin, occupation and family size, or occupation and the frequency of keeping servants. Analysis of this type is not possible from the generalized printed Census abstracts.

The Census returns have been analysed in their entirety in order to reconstruct the community of 5771 people living at Hetton in 1851. The

published results of the work of others analysing the censal data illustrate a variety of alternative techniques imposed by the sheer volume of the material in urban areas. R Lawton (1955) selected sample areas in his study of mid-nineteenth century Liverpool (20), whilst W A Armstrong and others (1968) working in the field of Urban History have developed statistical sampling techniques in order to render manageable the mass of data incorporated in the Census Returns of even a medium-sized town. For instance, in his study of York in 1851 (21) W A Armstrong used a sample of 10% of the households in this city which at the time had a population of c 40,000. Some of Armstrong's findings will be discussed in a later chapter in relation to the evidence from the Hetton Census Returns, the scale of which was not sufficiently large to necessitate any sampling.

(b) Company Records.

A detailed collection of the written records of the Hetton coal company have survived, dating from 1819, to the middle of the nineteenth century. Firstly, a series of agreements and indentures drawn up according to a strictly repetitive formula between the coal company and the major landowners in the parish (22) illustrate the lease arrangements for the extraction of coal and make reference to the many other financial relationships between the parties concerned, such as the payment by the company of wayleave and outstroke rights and of compensation for damage to ground by subsidence and the tipping of waste. Secondly, in a collection of reports, valuations and correspondence concerning the collieries, chiefly between the company and the colliery viewers (23), considerable light is thrown on the evolution of the coal mining landscape with references to pit sinkings, waggonway construction and the building of surface colliery installations as well as housing for the workforce. In addition, detailed costings of expenditure and anticipated income indicate clearly how the speculative venture of sinking

collieries to previously unknown depths was dependent for financial success upon the correct forecast and pursuit of a "critical path" which led from the pithead to the ultimate market, the landscape results of which form the central theme of this study.

(c) Land Tax Returns.

The Land Tax Returns have been consulted for the townships of Hetton-le-Hole and Great and Little Eppleton from 1760 to 1826 for a series of limited purposes (24). Awareness of the limitations inherent in the nature of this source has led to their use for the purposes of tracing the existence of individual landowners' estates, to confirm the evidence of the various estate plans, to seek evidence of the engrossment of certain estates, and to illustrate the impact of the advent of coalmining on the landownership patterns in the parish.

Little use has been made of the Parish Registers of births, marriages and deaths for the study area (25). The register for Hetton dates only from 1832 when a separate chapelry was created within Houghton parish and so the registers do not cover the population growth of the decade between 1820 and 1830 when the area was suddenly transformed from a rural into an industrial community. Furthermore, the demographic value of a source based on the records of the Established Church, must be seriously questioned in a mining settlement which, like many of its kind on the Northumberland and Durham coalfield, showed early evidence of strong adherence to Nonconformism.

The Chronological limits.

The period under examination extends from the 1770s to the middle of the nineteenth century. The late eighteenth century rural landscape provides the base upon which a coalmining landscape was rapidly imposed after 1820. The elements of this rural cadaster, the patterns of landownership, field boundaries and communications, influenced the growth of the new settlement; the landscape significance of these factors is analysed up to the terminal

date which almost coincides with the surveying of the first edition Ordnance Survey in 1856. The study culminates with a reconstruction of, "the visible landscape association, a formal complex in which housing, collieries, associated works, railways and mineral lines, spoil tips, coal company offices and mine manager's residence are invariably present". (26)

The work is ideographic in concept. The uniqueness of the first sinking at Hetton through the limestone was recognised by contemporaries as a revolutionary development of coalmining in County Durham. A large work-force was attracted to the western edge of the east Durham Plateau for the first time, and this exerted a permanent influence on the migration patterns throughout the coalfield. Unlike the long-exploited sections of the coalfield, there had been no earlier evidence of mining activity and so the change at Hetton from rural to industrial was abrupt and rapid in its demographic and landscape effects. Because of the small size of study area there are constraints on the analysis of spatial relationships within the area. The area does not contain sub-regions characterized by contrasting stages of exploitation and patterns of settlement; however, the 1851 census returns do indicate the presence of a degree of socio-economic zonation within the units of settlement, that will be analysed in detail in a later chapter. The thesis does not attempt to compare the settlement morphology of exposed and concealed coalfield villages, nor does it seek to analyse the mining colonization of the whole of the east Durham Plateau. Its more modest aim is to identify the factors responsible for the genesis of a major east Durham mining village, to find out how and why it grew, and to consider the relative importance of the factors which influenced the evolution of the settlement morphology. The work culminates with the reconstruction of the social and economic structure of the community thirty years after the first successful winning of coal. In this way it is hoped to reveal the existence of relationships and problems in the study of colliery settlement that may only ultimately be explained by further research in a wider area.

Chapter 1 - Notes

- 1 A E Smailes, 'The development of the Northumberland and Durham coalfield', Scottish Geographical Magazine, 51, (1935), 201-214
- 2 A E Smailes, 'Population changes in the colliery districts of Northumberland and Durham', Geographical Journal 91 (1938), 220-232
- 3 P N Jones, Colliery settlement in the South Wales coalfield 1850-1926, University of Hull (1969) 1
- 4 M Sorre, Les Fondements de Geographie Humaine, Paris (1952)
- 5 G Schwarz, Allgemeine Siedlungsgeographie, Berlin (1959)
- 6 W Whellan, History, Topography and Directory of the County Palatine of Durham (1856), 620, 623
- 7 R T Jackson, 'Mining Settlements in Western Europe: The Landscape and the Community', 143-170 in Urbanization and its Problems. Essays presented to E W Gilbert, (eds.) R P Beckinsale and J M Houston (1968)
- 8 A E Smailes, North England, second edition (1968), 135
- 9 'Geological Survey of Great Britain (England and Wales)', 1 : 10560, Sheet NZ 34 NW (1964)
- 10 A E Smailes, 'Population changes in the colliery districts of Northumberland and Durham', 220
- 11 An account of the strata in Northumberland and Durham as proved by borings and sinkings, North of England Institute of Mining and Mechanical Engineers, Newcastle upon Tyne, (1878), 218, 219, 222, 223, 224, 229
- 12 An account of the strata in Northumberland and Durham, 219
- 13 U.D.D.P. & D, O.S. Book of Reference to the plan of the parish of Houghton-le-Spring, (1864), Hetton-le-Hole township
- 14 U.D.D.P. & D, Durham Diocesan Records. Tithe Awards and Apportionments, 'Plan and Apportionment of the township of Hetton-le-Hole', 1839, Durham C.R.O. 'Great Eppleton township Tithe Plan and Apportionment' 1838, EP/HH 29, Durham C.R.O. 'Little Eppleton township Tithe Plan and Apportionment' 1839, EP/HH 32
- 15 N.E.I.M. & M.E. 'Plan of the estate of the Hon Thomas Lyon at Hetton-le-Hole', 1776, Watson Coll. 45
- 16 U.D.D.P. & D. 'Plan of Hetton estate', undated, Halmote Court Misc. Maps and Plans, 70
- 17 N.E.I.M. & M.E. 'A plan of Little Eppleton estate', Watson Coll. Maps and Plans, 26
- 18 U.D.D.P. & D. 'Plan of the parish of Houghton-le-Spring in the County of Durham showing the relative situation of the population in the different townships', 1827, Durham Diocesan Record Order-in-Council

- 19 M W Beresford, 'The unprinted census returns of 1841, 51 and 61 for England and Wales', Amateur Historian 5, (1963), 260-269
- W A Armstrong, 'The interpretation of the census enumerators' books for Victorian towns', 67-85, in The Study of Urban History, (ed.) H J Dyos (1968)
- P M Tillott, 'The Analysis of census returns', The Local Historian, Vol 8, No 1, (1968), 2 - 10
- 20 R Lawton, 'The population of Liverpool in the mid-nineteenth century', Transactions of the Historical Society of Lancashire and Cheshire, 107, (1955), 89 - 120
- 21 W A Armstrong, 'The interpretation of census enumerators' books for Victorian towns', 67 - 85
- 22 Durham C.R.O. 'Hetton Coal Company : agreements 1821-50', N.C.B. Coll. 4/9
- 23 N.E.I.M. & M.E. 'Hetton Colliery Reports, estimates and valuations and other papers, Part I', Watson Coll. 45
'Hetton and Little Eppleton Collieries : Reports, letters and other papers relating to the property of Mr Fox, 1820-31', Watson Coll. 47
- 24 Durham C.R.O. 'Land tax returns: Hetton-le-Hole township', LTA/E/N
'Land tax returns: Great Eppleton township', LTA/E/N
'Land tax returns: Little Eppleton township', LTA/E/N
- 25 Durham C.R.O. 'Parish Records 1832-1950', E.P./HH 1-32
- 26 P N Jones, 'Colliery settlement in the South Wales coalfield, 4

CHAPTER 2

Hetton-le-Hole in 1851. An Overview

In order to examine the factors underlying the growth of mining settlement in Hetton parish and to explain the morphology of the village, it is first necessary to establish in the reader's mind the character of the settlement in 1851 and to demonstrate the importance of the key themes outlined in the introduction.

The Administrative Framework

In 1851, the study area consisted of three townships, Hetton-le-Hole, Great Eppleton and Little Eppleton, with areas of 1739, 695 and 335 acres respectively, a total of some 2,769 acres (1). At this date the population of the three townships totalled 5,771 with 5,664 living in Hetton, sixty three in Great Eppleton and twenty four in Little Eppleton (2). Until 1838 these three townships had constituted the southern part of the ancient parish of Houghton-le-Spring and lay adjacent to its southern boundary with Easington parish. In 1838 the three townships were granted parochial status (3), but prior to that in 1832 a church had been erected at Hetton and consecrated as a chapel of ease in response to the rapid growth of population consequent upon the successful exploitation of coal after 1822 (4). In 1847 the parish was constituted as a rectory and finally separated ecclesiastically from the mother parish of Houghton-le-Spring (5).

As was pointed out in the introduction, Hetton parish straddles the geological and physiographic boundary formed by the western edge of the magnesian limestone outcrop (fig.10). To the east, the whole of Great and Little Eppleton townships and the southern and eastern parts of Hetton township lie on the western edge of the rolling limestone plateau rising in places to over 500 feet above sea level (fig.11). Occasional limestone outcrops occur as rounded knolls, two of which have been quarried for building stone, but the plateau is largely covered by varied

glacial deposits. These range in composition from spreads of sands and gravels to boulder clays with a small deposit of lacustrine clay marking the extent of a temporary late glacial lake (fig.10). The borings at the neighbouring collieries proved the variability of the thickness of these superficial deposits; the sinkings at Hetton colliery indicated the existence of thirteen feet of sands and gravels (6), forty eight feet of boulder clay was proved at Elemore colliery (7), whilst at Eppleton colliery a twenty seven feet thick deposit of varied sands and gravels was recorded (8).

The north west section of the parish, including the site of the pre-mining village is located in an embayment of the limestone escarpment. The hollow occupied by the Hetton burn which drains into the river Wear near Lumley is floored by drift deposits to a depth of no more than sixty feet, resting on the underlying coal measure rocks (9).

The Collieries

Since it was through the successful proving and exploitation of the coal resources at Hetton that the development of a coal-mining landscape occurred in the parish, a review of the origins of the collieries that were working in 1851 is now outlined. In the middle of the nineteenth century two collieries existed in Hetton parish, the Hetton Lyons colliery and the Eppleton colliery (fig.18). A third colliery was also in production immediately to the west of the Hetton parish boundary at Elemore Vale. This was Elemore colliery which was located in Pitlington parish, but because it was owned and operated by the same company as the two other collieries, because it was linked by a short waggonway to the Hetton waggonway, and because the workforce at Elemore colliery lived mainly in Hetton township, it is proposed to make reference to it in this study.

The three collieries were all owned by the Hetton coal company, a joint-stock company formed in 1820 with twenty four original shareholders, to finance the large-scale sinking of bore holes and shafts through the limestone which overlay the coal measures (10). Several attempts dating from as early as 1772 had been made to prove the existence of the coal measures beneath Hetton parish, but the first sinking to prove commercial quantities of marketable coal was not begun until 1820. After two years of boring from 1820 the first coal was shipped from Hetton along the newly constructed waggonway to the company's staithes on the river Wear at Bishopwearmouth in October 1822. Hetton colliery consisted of two shafts, the Engine or Blossom pit was commenced on December 6th 1820 and the first coal drawn from it on October 5th 1822 (11). The sinking of the Minor Pit, located about thirty yards from the Blossom pit was begun on December 23rd 1820 and finished on January 26th 1823 (12). Three seams of coal had been reached and worked at Hetton by the middle of the nineteenth century; the Main coal seam at 654 feet, the Low Main at 786 feet and the Hutton seam at 888 feet. Both the Main and Hutton

seams were marketed from the early years of exploitation as household coal, being sold on the London market as "Hetton Wallsend" household coal. The Low Main seam proved to be inferior for household purposes, although the seam was exploited at Hetton Colliery for steam-raising purposes after 1837 in line with the national trend for the consumption of steam coals to rise markedly in the 1830's owing to an increase in the use of steam engines in factories and for locomotion.

Two shafts, the George and the Isabella, were also sunk at Elemore colliery by the Hetton coal company in 1825. The two pits were named after the owner of the Elemore estate, George Baker Esq, and his wife. Boring to the same three seams as at Hetton was successfully accomplished by 1826 (13) but production up to the middle of the nineteenth century was concentrated in the Hutton seam (14). Extreme difficulty had been experienced in the sinkings at Eppleton colliery. Begun in 1825 the Jane shaft sinking had to be abandoned because of flooding from the basal aquiferous Permian sands (15). Production did not commence until 1833. A second shaft, the Caroline, was sunk in 1837 (16). As at Elemore, the production accounts for the period 1833-1843 indicate that the output was derived chiefly from the Hutton seam for household purposes.

These three collieries represented the first successful sinkings through the magnesian limestone rocks of the east Durham plateau. Previous to these attempts, informed geological opinion had been sceptical about the possibility of mining in east Durham but with the realization that commercial quantities of coal lay at accessible depths below the limestone plateau, there was, particularly after 1830, a rapid colonization of the east Durham plateau by coal-mining communities established in the wake of a rash of sinkings through the limestone in the years after the successful exploitation of coal in the Hetton area.

The elements of the landscape in 1851

During the thirty years between the first successful shaft sinking in the

Hetton area and the 1851 census, the landscape of the parish had been considerably altered as a direct result of the exploitation of coal. The rapid creation of a coal-mining landscape did not go unnoticed by contemporary writers. In a report written in 1842 there is reference to the coalfield landscape that was in the process of evolution in east Durham:

"the whole of the district is much intersected with railroads. The country is in no way disfigured by the collieries. The tall columnar chimneys meet the eye and often throw out volumes of smoke, and the steam engines send up clouds of white steam the glittering roofs and neat walls of the collier villages are always a pleasing sight". (17)

In this brief extract, reference is made to the total assemblage of the elements that characterized the immature coalfield landscape in the middle of the nineteenth century. The collieries themselves and their associated surface installations were dominant visual elements in the landscape with their smoking boiler chimneys and gaunt winding headgear towering above the nearby mining communities. The coal transport systems designed to move the product to tidewater, presented a revolutionary element in the landscape taking the form of iron railroads upon which steam power in the shape of locomotives or stationary engines, hauled the coal to the coast. Close to the collieries, the relatively new mining settlements built initially of the locally quarried yellow limestone with red pantiled roofs must have presented a less depressing visual impression than the later larger mining towns of east Durham in which serried ranks of terraced houses were constructed of imported brick and Welsh slate. Possibly the rather optimistic tone expressed in the last sentence of the extract might reflect, superficially at least, the fact that these colliery villages represented more of an advance in housing conditions than has always been admitted by later social commentators.

Each of the three collieries in the study area was surrounded by extensive surface installations. At Hetton, the colliery together with its associated workshops, offices, houses and waste ground totalled sixteen

acres (18), whilst at Eppleton colliery ten acres were similarly utilized. Hetton colliery, the pioneer sinking in east Durham, attracted the attention of contemporaries, to one of whom, T H Hair, we are indebted for a detailed sketch of the surface installations made in the 1830's (19) (plate 1). Together with the evidence of the Tithe map of 1839 and the later First Edition Ordnance Survey 1 : 2500 plan surveyed in 1856, it is possible to achieve a detailed reconstruction of the colliery complex at Hetton Lyons. Hetton had a larger set of installations than was characteristic of the period probably because of the unprecedented scale of the operations involved in sinking through the limestone, and also because of the presence of two shafts with the duplication of their associated winding gear and engine houses. The sketch is orientated towards the south east and shows the Blossom pit to the east (left) and the Minor pit to the west (right). The boiler houses and smoking chimneys of both pits are discernible as are the pulley wheels and winding gear for the lowering and raising of the coal and the men. In addition, pumping and ventilation engines form part of the surface installations. Two branches of the Hetton waggonway emerge from the colliery with an alignment similar to that shown on the Ordnance Survey plan (fig.7) before joining to form the single line that connected the colliery to the staithes at Bishopwearmouth some eight miles away. The evidence of both locomotive and horse traction is visible on the sketch but no stationary locomotives are evident as they were located north of Hetton to assist the transport of the coal waggons up to the slopes of Copt Hill and Warden Law from which the waggons could be conveyed by gravity down-gradient towards the Wear. It is notable that in 1851 the Census Enumerators' Books (20) record the existence at Hetton of both horse drivers and engine drivers. A short terrace of four low stone-built pantile-roofed cottages can be seen within the colliery yard in the same position as the appropriate cartographic representation on the Ordnance Survey First Edition 25 inch plans. Their function as dwellinghouses is confirmed by the relevant entry in the

Census returns in which four Waggonway Houses are recorded as being occupied by men employed on the waggonway system.

Although no contemporary sketches of the two other collieries have been found, a degree of reconstruction can be attempted using the First Edition Ordnance Survey 25" plan. The colliery yard at Eppleton repeats the assemblage of surface installations visible at Hetton Lyons. Two shafts are marked on the map; a third, the New pit was sunk in the 1870's. Winding gear, engine boiler chimneys and pumping and ventilation installations provided a visual manifestation of the mid nineteenth century mining technology. Six houses immediately east of the colliery itself were inhabited by colliery workers (21); a fine network of railway lines linked the shafts to the Eppleton branch of the Hetton railway and two rectangular reservoirs provided water for the boilers of the steam engines. A small waste heap measuring rather less than two acres extended west from the colliery. The small size of this waste heap like the others in the area was characteristic of the coal mining landscape in the middle of the nineteenth century. This was partly because exploitation was still recent and partly because the coal extracted initially was of high quality with a small waste content. At Elemore colliery the George and Isabella shafts were capped with large pulley wheels and frames. The engine houses and boiler chimneys similarly stand out, and the branches of the Elemore waggonway passed from the colliery to link with the Hetton waggonway. The gaunt headgear and smoking boiler chimneys of the three collieries, which were sited in a straight line, orientated from north north east to south south west, dominated the landscape and were ever present visual proof of the central importance of the pits in the lives of the inhabitants of the parish.

The railways that linked the collieries to tidewater at Sunderland or Seaham Harbour were also significant elements in the coal mining landscape. The northern part of east Durham in general, and the Hetton area in particular, witnessed from about 1820 the construction of waggonways

designed to link the coal resources of the mid-Wear valley section of the coalfield in the Rainton area, and the western part of the plateau close to Hetton, to coastal outlets (fig.6). The western edge of the magnesian limestone escarpment had previously been considered to be a barrier to coal transport, but following the application of steam power to haulage, in particular with the development of stationary locomotives, access to the sea was achieved by daring engineering with the construction of the Hetton to Bishopwearmouth waggonway in 1822 and the Rainton to Seaham waggonway in 1832.

The Hetton waggonway, which was engineered for the coal company by George Stephenson, left the Lyons colliery and after passing through a short, shallow cutting crossed over the Durham to Sunderland railway by means of a bridge (fig.7). At this point, the Elemore branch line joined the waggonway and the combined line then ran in a north-north west direction to Hetton dene at the northern limit of the parish. The line cut through five terraces of housing, bisecting them into "high" and "low" streets and separated the Front Street of the village from Hetton Downs (fig.18). Close to where the waggonway crossed Downs Lane a coal depot acted as a central place for the distribution of the miners' household coals. Rail traffic along this section of the line was regulated by two workmen who, on the approach of a train, placed warnings at each side of the railway to stop traffic in each of the streets. Red flags were used during the day and red lamps at night. The railway was furnished with stone sleepers in which holes were drilled to hold the "chairs" or clamps that carried the iron rails (22). Some of these sleepers were subsequently incorporated into the masonry of the miners' rows nearby such as Downs Lane. After leaving the centre of Hetton the line ran north to Hetton dene, receiving a branch from Eppleton colliery (fig.18) before continuing to the wooded dene or valley at the northern limit of the parish. The Eppleton colliery line sloped steeply down to the Hetton waggonway passing across Downs Lane between rows of cottages at the High Downs and Downs Lane.

On reaching Hetton or Rough dene as it was sometimes known, there was a change in the means of locomotion. On the virtually level gradient from Hetton colliery to the dene locomotives were employed on this first mile section, according to Stephenson's general principle in laying down colliery railways of using horses or locomotives where the gradients were less than 1 in 300 (23). George Stephenson employed the Killingworth type of locomotive which probably represented his standard design of engine as developed by 1822; in terms of performance, the Killingworth locomotive was considerably inferior to the "Rocket" of 1829 or the main line engines constructed during the 1830's. In 1824 Nicholas Wood recorded that the engines employed on the Hetton waggonway drew sixteen chaldron waggons, each carrying fifty three hundredweights of coal and weighing four tons, at a speed of three and one half miles an hour on a slight downhill gradient (24). At Rough Dene sidings had been built that acted as the terminal for the locomotives. Haulage up Copt Hill immediately to the north of the parish was effected by a stationary engine in accordance with Stephenson's principle of employing fixed engines where the gradient was between 1 in 30 and 1 in 300 (25). Full waggons to be transported to the Bishopwearmouth staithes were coupled into sets and the haulage ropes were hung on to the front and rear of the set. The same was done with empty waggons at the top of the hill and on a signal, the brakesman set the engine in motion and the full set of waggons was hauled up the 940 yard slope. The empty set of waggons descended, passing the full waggons at a loop halfway up the incline. This was the first stage in the journey that took the waggons to Warden Law at 550 feet above sea level, the highest point in east Durham, before descending to the river Wear by means of self-acting inclines on the steepest gradients of more than 1 in 30 and by means of locomotives on the flattest parts of the haul (26). The belching and puffing of the locomotives and the noisy trundling of the coal waggons were intrinsic features of the Hetton landscape and a visible reminder of the central importance of coal in the

lives of its inhabitants.

The parish was crossed by another railway, the Durham to Sunderland line which had been opened in 1836, as a line for both freight and passenger transport (27). Its embanked course ran a quarter of a mile to the south of Hetton village, crossing the Easington road under a wooden bridge near the Hemels, a group of old farm buildings. Hetton railway station lay just east of the bridge and close by was the Hetton engine, one of the two stationary engines that were sited along the line within the parish (fig.18). Haulage along the entire railway was by such fixed locomotives which pulled the trains up the gradients or "banks" as they were known locally on the journey to the junction with the Haswell branch line. The second engine, the Eppleton, located about one mile east of Hetton was worked by an engineman who lived in one of the neighbouring railway cottages (28), the second cottage being occupied by a waggon conductor (29). From here the line passed eastwards in a deep cutting with motive power provided for the incline of Eppleton bank by the Haswell engine at a height of about 420 feet, making a total climb of 120 feet from Hetton station.

Although some of the inhabitants of Hetton in 1851 were employed on the railway lines, the majority relied on the coal mines for work. The settlement had grown in response to the explosive increase in population which had been caused initially by rapid immigration to this new source of employment. By the use of contemporary cartographic and censal evidence in conjunction with relict landscape elements it is possible to effect a reconstruction of the settlement as it had developed by the middle of the nineteenth century. On approaching the parish from Murton to the east of Hetton, even the most perceptive traveller would have gained little immediate impression that over 5700 people lived in this five square mile parish which had witnessed the first coal mining operations in east Durham. On entering the township of Little Eppleton most of the miners' cottages were hidden behind the gently rounded hills

that characterise the landforms of the township. The rectilinear pattern of fields, frequently ten acres or more in area (30) were bounded by unsubstantial hawthorn hedges which underlined the bare, rolling treeless atmosphere of this most exposed part of the parish; a tract where late springs and the creeping dampness of the notorious east coast "sea fret" hindered the maturation of crops and enhanced the inhospitable character of the area. A two acre area of disused flooded brick ponds on the left of the road might have afforded the traveller a clue as to the nature of the industrial activity so evident on the other side of the limestone outcrop of White Hill, but the appearance of Eppleton Old Hall set on the right hand side of the road a few yards further along reinforced the image of a rural landscape. The Hall, with a long but somewhat severe early nineteenth century facade, faced west towards Hetton colliery, the source of so much wealth from coal royalties, to the owner Mr G T Fox (plate 2). The building overlooked a small plantation of a little over two acres, ornamental gardens with a fish pond of one and a half acres, and a walled garden of a little over half an acre (31). Immediately east of the Hall were farm buildings ranged round three sides of a courtyard and surrounded by stackyards, cowsheds and folds (32).

After passing no more than three hundred yards west from Little Eppleton the view was dominated by the prospect of Hetton colliery, its associated installations and the houses and workshops at Hetton Lyons. The road passed between the colliery yard to the north and the locomotive sheds to the south, and the road was lined by a complex of buildings. Those to the north included the colliery offices, a small iron foundry and coke ovens. Part of the south side of the road was lined by houses including the two public houses, one of which also served as a general store and post office. Six houses lay along the unmade road to Easington here. These were the "Lyons houses", substantial stone-built two-storeyed dwellings occupied by skilled workers and colliery officials (33) (plate 3).

The roads at the Lyons were intersected by branches of the Hetton colliery waggonway system which passed in front of the houses and then looped behind the "Lyons houses" to the locomotive shops (fig.7). Here several of the famous Stephenson Killingworth locomotives had been built and they and other engines repaired. The locomotive shops formed a long building constructed of limestone with wide and high arched entrances to permit the entrance of the engines. Wagon and joiners' shops, also linked by branches of the waggonway system, formed a southern range of extensive buildings at the Lyons, and provided further visual evidence of the varied industrial enterprises that constituted the veritable 'coal empire' of the Hetton coal company.

From the Lyons, with its complex of industrial buildings and houses, an unmade road led south to the discrete unit of settlement at Easington Lane. On the right lay small allotment gardens enclosed by limestone walls and cultivated as vegetable plots by the local residents (fig.7). Straight ahead past the terminus of the Hetton waggonway, on the crest of a short but steep rise, extended the settlement of Easington Lane. In this elevated southern part of the parish two rows of cottages extended for approximately half a mile along the road to Easington (fig.8). The way was lined by upwards of two hundred cottages, built mainly of locally quarried limestone with red pantile roofs. Some of the cottages were low, one-storey dwellings (plate 4), whilst others had upper floor windows projecting from the roofs to provide attic accommodation. The east row formed a closed building line fronting on to the Easington road, which was virtually straight, but the west row was interrupted by a one hundred and fifty yard stretch of allotment gardens. Garths, longer on the east side, extended behind the cottages and frequently contained sheds and small workshops occupied by a wide variety of craftsmen. The twelve public houses easily outnumbered the three non-conformist chapels (34). Some of the houses particularly on the east side of the road, were occupied as lodging houses by up to fifteen people. Other houses were multiply-

occupied by more than one family and the social character of Easington Lane was typified by the presence of many long-distance migrants who provided numerous crafts and services for the mining folk (35). For example seventeen cabinet makers lived in this part of the settlement forming a distinctive colony, and selling their manufactures in Hetton and the surrounding pit villages (36).

Two farmhouses, Prospect House with its small 1/10 of an acre garth (37), and Gargles House, a large complex of limestone buildings set in a half-acre garth (plate 5), stood at the southern limit of Easington Lane (38). Gargles House was occupied by a tenant farmer with his wife and nine children, who farmed fifty five acres arranged in ten contiguous fields in the extreme southern part of the parish (39). The landowner was the Hon Maria Bowes Barrington, the owner of Hetton Hall and part owner of the Hetton Coal Company (40). Prospect House was occupied also by a tenant who farmed twenty two acres of land belonging to John Burrell, one of the minor landowners in the parish (41). The twenty two acre holding extended in an L shape between Brick Garth and the Easington road.

Closely intercalated with these farms and their farmland was a large mass of miners' rows called Brick Garth (fig.8). Here 204 houses (42) were crowded on to six acres of land extending abruptly westwards from Easington Lane (43). Largely occupied by coal miners and their families, these low, limestone-built cottages were disposed in short parallel north to south rows, with east to west headrows forming small three-sided courts, not all of which were completely built around the three sides (44). The open spaces between the rows were covered with ash or shale from the neighbouring Elemore colliery and the main street was similarly unmade. Just to the south of the cottages a tramline from Elemore colliery extended almost to the Easington road (fig.8). Coal for the miners' household consumption was brought along the line by horse-drawn wagon, unloaded at the small coal depot and then distributed to the houses by horse and cart. Across the tramline, and lying immediately to the south of Brick Garth,

three fields bore visible signs of the landscape alteration typical of coal-mining villages. These fields, named significantly the "High Moors" in this southern "moorish" part of the parish, were owned by the lady of the manor of Hetton, the Hon Mari^as Bowes Barrington, but had been leased to the Hetton Coal Company (45). In the western field, colliery waste was being tipped from a tramline, so extending the area of the colliery spoil heap on to previously agricultural land (46). Nearer to the Easington road, the fields were becoming progressively occupied by allotments with their customary rash of sheds and outbuildings (47). At the western extremity of Brick Garth, set in the shadow of Elemore Colliery, the Elemore Vale steam corn mill was the home of two millers (48). (fig.8).

Easington Lane and Brick Garth both stood on the higher plateau tract of Hetton Parish at a height of 400 to 420 feet above sea level. On either side of the road the virtually treeless rolling land was divided by wind-blasted flimsy hedges into regularly shaped fields (fig.8). Although most of the land had been improved and was under arable crops or grass, stretches of coarse grass and moorish vegetation known locally as "whins", could still be seen particularly on a spread of intractable stoney boulder clay east of Easington Lane (49) (fig.8). Hetton Moor farm occupied seventy three acres of this former moorland east of the road. The farmhouse (plate 6), a plain double-fronted building constructed out of local limestone masonry and with three ranges of outbuildings, was owned by Jane Hutchinson and occupied by Martin Hardy, one of the chief tenant farmers in the parish (50). It was a striking characteristic of the Hetton landscape that the rural elements of farms and fields were closely interwoven into the colliery landscape. Working farms lay both within and around the fabric of the mining community and farmland separated the discrete units of industrial settlement. For example, the seventy two houses at the Four Lane Ends (51), a largely mining community, were reached after travelling north from Easington Lane for about half a mile along the Hetton road which passed through a purely

rural landscape. At Four Lane Ends the road parted, the left fork passing immediately west of the old village of Hetton, the right turn took one to Hetton Lyons, whilst the road through the village and on to Houghton-le-Spring continued straight on.

Just before reaching the village this road crossed the Durham to Sunderland railway by means of a wooden bridge; almost immediately on the right lay the Hemels, a substantial group of farm buildings ranged around three sides of a yard, and set in a half-acre garth (52). Hemels farm, which was owned by the lady of Hetton Manor, leased by the Hetton Coal Company (53) and occupied in 1851 by a seventy one year old hind, had more than most farms been directly affected by the development of the coal-mining landscape. The farmland lay south and east of the farmstead and included a considerable acreage that had been used by the industrial complex at Hetton colliery, by the Durham to Sunderland railway, the Elemore waggonway, and by the stationary engine and Hetton station. Land sterilized in this manner totalled thirty three acres out of a total farm acreage of approximately one hundred and thirty four acres (55). Part of the old village could be seen from the Hemels farm, but the wooded valley of the intervening Hetton burn was invisible from the farm and the road dipped steeply to cross the valley. Immediately to the left of the road, on an elevated site overlooking the stream, a short row of ten households built of limestone masonry with red tiled roofs extended westwards. This was Bleach Green (plate 7), and from it an irregular mass of buildings could be seen lying huddled in the narrow floor of the valley; one of them was a small brewery. Dominating the northern side of the valley was a large Wesleyan Methodist church which fronted on to the main road (plate 8). This large, plain warehouse-like structure symbolised the strength of non-conformism in Hetton in particular and in Durham mining villages in general. Its foundation in 1824 pre-dated the consecration of the nearby Anglican chapel-of-ease by eight years (56); eight very critical years in the rapid growth of the mining

community. Located almost directly across Front Street from the church, the Colliery Hotel was the largest inn in the village. It housed the magistrate's court as well as providing a more popular service for the inhabitants (57). Next door to the church was another public house, the Brewer's Arms, and next to it was a public reading room, which had been built in 1826 (58). This group of buildings, together with the national school located just across Old Street, were all built of local limestone and provided in some degree a central focus of public buildings at the heart of the mining village.

Most of the fabric of the old village pre-dated the development of coal-mining in Hetton and lay west of Front Street between the Houghton road and the Rainton road, on land which sloped quite steeply down to Hetton burn (fig.9). Old Street provided the principal axis of the old village; the street passed west from Front Street and then turned abruptly south to cross the burn by a ford. On the left hand side of Old Street a closed line of buildings culminated in a large late Georgian house with a frontage of five bays, known as Hetton House (plate 9). In 1851 this was the Rectory and was occupied by the Rev J S Nichol, who, as well as caring for the souls of his parishioners, ran a private school within his commodious house. Apart from the Rector and his family, the Rectory contained a governess, an assistant tutor, thirteen pupils, who had been born principally in Newcastle, two servants and a visitor (59).

A little further down Old Street on the right hand side one of the entrances to Hetton Hall was guarded by a gatehouse in which lived a coachman who was employed at the Hall (60). Little of the Hall and its ornamental grounds could be seen behind the high stone wall which separated the Hall from the village. As Old Street turned abruptly southwards it sloped down to the ford. On the left, standing on an elevated site, a row of buildings including the Joiner's Arms and the smithy commanded a view across the valley of the Hetton burn. A pinfold for stray livestock stood next to the inn (61). This rather irregular row of somewhat substantial two-storeyed stone houses

was known as Mount Pleasant and was largely inhabited by a variety of craftsmen such as carpenters and masons (62); it seemed to stand aloof from the rows of cottages crowded into a small site across the burn in Bog Row (fig.9). Situated immediately opposite Mount Pleasant, the Police Station was controlled by a Superintendent (63). After crossing the ford, the road widened out into a triangular open space. Here a pump at the Bog Row well provided water for much of the village, being transported to the houses by a water carrier (64). Nearby was a group of buildings which included the Fox and Hounds inn and a smithy, a low stone building with a red pantiled roof which jutted out at the crossroads of the Rainton and Moorsley roads (plate 10). Bog Row lay just behind this group of buildings. In marked contrast to the open plan of the old village with its extensive garths extending behind the buildings in Old Street and Mount Pleasant, the small parcel of land between the Rainton Road and the Hetton burn was occupied by the thirty six cottages known as Bog Row. Arranged in three irregular short rows aligned so as to maximise the use of the available space (65), Bog Row was inhabited chiefly by coal miners, some of whom had lived there since the first years of Hetton Colliery. The mean rows of one-storey cottages with ash-covered unmade streets formed a stark contrast to the neighbouring better quality housing on the raised site east of the burn known ironically as Mount Pleasant. The most notable contemporary inhabitant of Hetton was Nicholas Wood, a part-owner of the Hetton Coal Company. He lived in Hetton Hall (66), the ancestral home of the Bowes-Barrington family, which had probably been leased initially for a period of forty two years by the Coal Company in 1820 from when the agreement to mine under Lyons estate had been agreed (67). Wood, who had been born in 1795 near Wylam on the river Tyne, was apprenticed as a boy to Ralph Dodd, viewer of Killingworth Colliery. Here he met and became a close friend of George Stephenson and worked with him on his locomotive, his safety lamp and other engineering enterprises. Although himself an inventor and engineer, Wood's principal contribution

was his book, "A Practical Treatise on Railroads", published in 1825, in which he recorded and adapted into engineering theory many of George Stephenson's empirically derived inventions. Wood maintained a large household in the Hall, which prior to his occupation, had been derelict for some time; the Hall contained a governess and five female servants as well as Wood's wife and four children (68). Built of ashlar in a classical style, the Hall was set in twelve acres of parkland which extended on both sides of the Hetton burn. The sheltered wooded valley provided a marked visual contrast to the higher, more exposed, treeless parts of the parish to the south and east. It was on or close to the site of Hetton Hall that an earlier manor house had stood, the associated estate of which had been sold in 1746 by the Spearman family to the Dowager Countess of Strathmore. From her son and grandson, Thomas Lyon and John Lyon, the estate passed on the death of the latter to the Hon Maria Bowes Barrington.

As a direct result of lordly policy no direct evidence of coalmining was visible from the Hall itself set as it was in secluded grounds; no waggonways passed through the grounds, no colliery could be sunk close to the Hall, and no rows of miners' cottages intruded into the vistas from the Hall. But the fabric of the old village was considerably expanded by the addition of mining rows built immediately to the east of the Front Street. Five short parallel terraces, bisected by the Hetton waggonway, extended eastwards for a distance of about two hundred yards (fig.18). Built, like most of the contemporary settlement, of limestone the three southernmost rows were named Richard Street, John Street and Pemberton Street, a visual reminder of the name of the owner, Mr R J Pemberton, of the field on which they had been built in the 1820's. Immediately to the north of the five terraces lay a triangular open space, just over an acre in area, and surrounded on three sides by miners' cottages. In the centre of the flat open space known locally as the square a brick-built communal bake oven (69), a characteristic feature of Durham pit villages

at this time, provided a focal point particularly for the women-folk.

The Square and its fringe of cottages was owned by the coal company as was much of the land which extended from the Square to the northern limit of the parish (70). This area formed the Downs estate which had been bought by the coal company in the early 1820's (fig.17). It was on this 160 acre tract of land, rising north and east towards the hamlet of Great Eppleton on the airy spacious downland of the limestone plateau, that a large number of miners' cottages had been built from the middle of the 1820's. Downs Lane, a gently curving former rural track linking the old village to the Downs farm, was lined by rows of miners' dwellings as far north as the Eppleton branch railway line. Backyards containing pigstyes, communal ash and refuse heaps, unmade ash-covered streets, communal lavatories and allotment gardens with the habitual clutter of sheds characterised the landscape of colliery settlement (fig.18). The type of housing provision along Downs Lane was the two-storeyed stone built terrace house with a roof sloping low over the backyard to incorporate an outhouse. This type of house provides a contrast with the low one-storey buildings which characterised much of the housing provision at Easington Lane. To the north of the Eppleton line, the miners' rows at the High Downs were disposed in a square in the middle of which was another communal bakeoven. In the most northerly part of the parish two parallel rows formed the unit of mining settlement known as the Low Downs, which sheltered under the eminence on which the High Downs square had been built. By 1851, the various elements of the coal-mining landscape were well established in Hetton parish. Collieries with their associated surface installations, transport systems and mining settlement, had been grafted on to the antecedent rural landscape with great swiftness. Writing in 1841 about east Durham in general, the Child Employment Commissioner noted that,

"Where formerly there was not a single hut of a shepherd, the lofty steam-engine chimneys of a colliery now send their columns of smoke

into the sky, and in the vicinity a town is called, as if by enchantment into immediate existence." (71)

Whilst this writer seriously underestimated the extent of pre-mining rural settlement in east Durham in general, and in Hetton parish in particular, the extract does underline the awe with which contemporaries must have witnessed the mushroom growth of the colliery landscape with its associated technological innovations, in this previously peaceful unexploited section of the coalfield.

Chapter 2 : Notes

- 1 W Whellan, History, Topography and Directory of the County Palatine of Durham (1856), 620, 623
- 2 W Whellan, Directory of Durham, 620, 623
- 3 W Fordyce, The History and Antiquities of the County Palatine of Durham, Vol 2, Newcastle upon Tyne (1857), 578
- 4 W Whellan, Directory of Durham, 620
- 5 W Whellan, Directory of Durham, 620
- 6 An account of the strata in Northumberland and Durham, 225
- 7 An account of the strata in Northumberland and Durham, 275
- 8 An account of the strata in Northumberland and Durham, 301
- 9 'Geological Survey of Great Britain (England and Wales)', 1 : 10560, Sheet NZ 34 NW (1964)
- 10 N.E.I.M. & M.E. 'Hetton Colliery Reports, Estimates and Valuations and other papers, Part 1', Watson Coll. 45.

In a prospectus dated March 23rd 1820 the proposed undertaking to sink the shafts at Hetton was to be divided into twenty four shares and the shareholders were to associate themselves into a Joint Company.
- 11 An account of the strata in Northumberland and Durham, 225
- 12 An account of the strata in Northumberland and Durham, 227
- 13 An account of the strata in Northumberland and Durham, 275, 277
- 14 N.E.I.M. & M.E. 'Lyons Main, Elemore and Eppleton Collieries. Tentale Accounts', Buddle Atkinson Papers, 42
- 15 An account of the strata in Northumberland and Durham, 301
- 16 W Whellan, Directory of Durham, 808
- 17 Durham C.R.O., Children's Employment Commission. Mines Part 1 (1842): Report on the coal mines of the south Durham coalfield between the Wear and the Tees, 119
- 18 U.D.D.P. & D., Durham Diocesan Records. Tithe Awards & Apportionments. 'Plan of the township of Hetton-le-Hole', 1839
- 19 T H Hair, A series of views of the collieries in the counties of Northumberland and Durham (1844), reprinted in 1969, 43
- 20 Census Enumerators' Books, 1851. Registrar's District : Hetton-le-Hole P.R.O. ref HO 107 2393(2)
- 21 ibid

- 22 W W Tomlinson, The North Eastern Railway, its rise and development, Newcastle upon Tyne (1914), reprinted 1967, 91.
Tomlinson refers to the use of similar stone sleepers on sections of the Stockton-Darlington railway.
- 23 R M Gard and J R Hartley, Railways in the making, University of Newcastle upon Tyne, Department of Education (1969).
Details of the construction of the Hetton waggonway and the part played by George Stephenson's brother Robert, who was resident engineer at Hetton Colliery at this time, are given on page 23 of the Handbook of this Archive Teaching Unit.
- 24 R M Gard and J R Hartley, Railways in the making, Handbook 18
- 25 ibid, 23
- 26 ibid, 23
- 27 W W Tomlinson, The North Eastern Railway, 308
- 28 Census Enumerators' Books 1851
- 29 ibid
- 30 Durham C.R.O., 'Little Eppleton Tithe plan and apportionment', EP/HH 32
- 31 ibid
- 32 ibid
- 33 Census Enumerators' Books 1851
- 34 W Fordyce, History of Durham, Vol 2 (1857), 580
- 35 Census Enumerators' Books 1851
- 36 W Fordyce, History of Durham, Vol 2 (1857), 580
- 37 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 38 ibid
- 39 Census Enumerators' Books 1851
- 40 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 41 ibid
- 42 Census Enumerators' Books 1851
- 43 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 44 ibid
- 45 ibid
- 46 Durham C.R.O., 'Ordnance Survey First Edition plans 1 : 2500, Durham County Sheet 21, 9', (1856)
- 47 ibid

- 48 Census Enumerators' Books 1851
- 49 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 50 ibid
- 51 Census Enumerators' Books 1851
- 52 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 53 ibid
- 54 Census Enumerators' Books 1851
- 55 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 56 W Whellan, Directory of Durham, 621
- 57 C Smith, Civic News Letter, 1959, Vol 3, No 2. Hetton Urban District Council
- 58 ibid
- 59 Census Enumerators' Books 1851
- 60 ibid
- 61 Durham C.R.O., 'Ordnance Survey First Edition plans 1 : 2500, Durham County Sheet 20, 8', (1856)
- 62 Census Enumerators' Books 1851
- 63 C Smith, Civic News Letter, 1959
- 64 ibid
- 65 Durham C.R.O., 'Ordnance Survey First Edition plans 1 : 2500, Durham County Sheet 20, 8', (1856)
- 66 Census Enumerators' Books 1851
- 67 Durham C.R.O., 'Hetton coal company agreements', NCB Coll. 4/9
- 68 Census Enumerators' Books 1851
- 69 Durham C.R.O., 'Ordnance Survey First Edition plans 1 : 2500, Durham County Sheet 20, 8', (1856)
- 70 U.D.D.P. & D., 'Hetton-le-Hole Tithe plan', 1839
- 71 Durham C.R.O., Children's Employment Commission. Mines Part 1, (1842), 143

Chapter 3

Land and Landownership

This chapter contains three sets of inter-related aims.

Firstly, by an examination of the environmental resource base, both at the surface of the land and concealed at depth, it is intended to outline the nature of the resources which influenced the economic activity in the parish. Secondly, the aim is to demonstrate how the exploitation of these resources influenced the changing patterns of landownership and tenancy during the period under study. Finally, the chapter concludes with an analysis of the legal, financial and tenurial relationships between the Hetton coal company and the major landowners, thus attempting to elucidate the influence of these relationships on the evolution of the coal-mining landscape.

1. The Land

(a) Solid Geology and the Coal Resources.

Apart from a few small exposures of bedrock, almost the whole of the parish is covered by varied drift and lacustrine deposits (fig.10). Unimportant as the solid geology may be as a surface feature, any analysis of the resource base of the area must take into account the nature of the disposition of the coal measures and their transgressive overburden. In terms of solid geology, the parish is divided into two unequal parts. In the north western part of the parish lie the Middle Coal Measures covered by a varying thickness of drift deposits. This portion of the parish represents the most easterly extension of the exposed portion of the Durham coalfield, and in it the coal measures are buried beneath no more than a relatively shallow cover of superficial deposits which varies in thickness in the area immediately to the west of Hetton parish from twenty five to sixty feet (1). Because of this accessibility of the coal measures, the Wear valley section of the Durham coalfield had been exploited from as early as the seventeenth century, and by the early

years of the nineteenth century active exploitation of the coal resources immediately to the west of Hetton was taking place. In this tract of the coalfield, the two principal household coal seams, the Main and the Hutton, could be reached within the contemporary range of exploitation which was about 600 feet. For example the Adventure Pit (1817) sunk near West Rainton found the Main coal at 146 feet and the Hutton seam at 368 feet (2). Nearer to Hetton, in the Hazard Pit (1818), near East Rainton, the Main coal was proved at 376 feet and the Hutton seam at 588 feet (3).

The eastern and southern parts of Hetton township and the whole of the townships of Great Eppleton and Little Eppleton are underlain by the Magnesian Limestone which rests as a transgressive cover on the older coal measures. A layer of basal Permian sands, which outcrops in a narrow north to south band in the west of the parish, lies on the unconformity between the Carboniferous Coal Measures and the Permian Limestone (fig.10), whilst insignificant in terms of landforms within the parish these sands, which are aquiferous, were to provide the gravest problems of water disposal during the sinkings through the limestone from 1820 onwards. Outcrops of limestone are equally rare in the plateau section of the parish, being restricted to a small exposure (456 466) which has been quarried near Four Lane Ends, and an exposure at Hetton Downs which has also been extensively quarried. Elsewhere the plateau is covered by boulder clay, sand and gravel spreads or lacustrine deposits. Because the productive coal measures are concealed beneath the Magnesian Limestone, their exploitation was hazardous, costly and had to await improvements in the techniques of pumping, ventilating and raising coal. Because of the thickness of the limestone which at Hetton Lyons Colliery was 157 feet (4), and the basal Permian sands, which at Eppleton Colliery were 111 feet (5), an exceptional thickness, the coal seams were encountered at greater depths than was the case in the exposed section of the coalfield. For example, the Main coal seam was reached at a

depth of 658 feet at Hetton Lyons Engine pit (6) and at 565 feet at the George Pit at Elemore colliery (7). The Hutton seam, which yielded a higher quality household coal than the Main coal seam and was thus in demand in the first part of the nineteenth century for shipment to the London and south of England market, was correspondingly deeper. At the Lyons colliery the Minor pit had been sunk by January 1823 to the Hutton seam at 884 feet, having proved the Low Main at 781 feet (8); at Elemore colliery these seams were encountered at 765 and 594 feet respectively (9), whilst at Eppleton colliery the Jane pit was sunk through the Low Main seam at 931 feet to the Hutton seam at 1046 feet (10). Production accounts for the period 1833 to 1843 show how the extraction of coal was largely concentrated on the Hutton seam at all three collieries. Although Main and Low Main coal was mined from the Lyons Colliery, the output of the combined collieries was overwhelmingly from the Hutton seam, which had been the principal goal of the speculative sinkings through the limestone (11).

The geological problems connected with the extraction of coal were compounded by the presence of the aquiferous basal Permian sands. Whilst sinking the Engine pit at the Lyons water was encountered from these yellow sands at a rate of 2000 gallons per minute which could only be overcome by "tubbing" off the shaft by the expedient of constructing a cylindrical iron collar around the sides of the shaft. Much greater difficulty was experienced in the sinking of the Jane pit at Eppleton colliery. Here, on reaching a depth of 399 feet in 1827 after two years of sinking, the pit had to be abandoned because water had accumulated and overwhelmed the pumping engines (12). Sinking was not resumed until 1831, whilst in the next year a second shaft, called the Caroline pit, was completely abandoned because the volume of water to be pumped exceeded the capacity of the engine (13). The technical problems connected with the basal yellow sands were met at other collieries on the plateau, particularly the sinking at Murton where,

after beginning in 1838, on reaching a depth of 456 feet the great pressures of sand and water were released in an explosive blast. It took several years of difficult engineering involving a most elaborate system of tubbing before the Main coal seams were reached, with water being pumped away at the rate of 9306 gallons per minute (14). The difficulties of sinking shafts through the limestone, and the very large capital investments that these collieries represented were unprecedented in coal mining in England. Furthermore, the varied thickness of the basal sands and the varying rates of discharge of the water feeders meant that sinking was uncertain; shafts abandoned in one place because of quicksands could have successful pits within a few hundred yards. Certainly within Hetton parish, the extreme difficulty faced at the Eppleton winning was in contrast to the relative ease with which the shafts were sunk at Elemore, where a discharge of 1000 gallons per hour proved to be well within the capacity of the pumping engines (15).

(b) Landforms and the Drift deposits.

To the south of Hetton-le-Hole the junction between the coal measure series of the Wear valley and the Magnesian Limestone of the east Durham plateau coincides with a strongly embayed but sharply delineated escarpment with a scarp slope rising up to 200 feet above the valley. In Hetton parish, however, this escarpment is represented by no more than a gentle rise to the east with virtually no outcropping limestone as almost the whole of the area is blanketed by varied superficial deposits. The geological boundary between the coal measures and the Permian deposits passes directly through Hetton Downs and extends south to Four Lane Ends, but in no part does it produce a pronounced scarp slope and it is entirely masked by deposits of sand and gravel. The whole parish is lacking in pronounced relief features (fig.11). The eastern plateau part of the area at 400 to 500 feet O.D. is somewhat more elevated than the western section which lies generally close to 300 feet O.D., but there is no sudden break of slope to indicate the transition from one to the other.

Indeed the small scale relief features in the parish owe their origin more to the deposition of glacial, meltwater and lacustrine deposits during the Pleistocene Ice Ages and their subsequent erosion than to the distribution and erosional history of the solid rocks.

It is possible to distinguish two broad categories of superficial deposits in the area, the lower drift deposits consisting largely of boulder clay and the overlying interbedded sands, clays and gravel beds. The former occur in the extreme west of the parish and just to the west of the parish boundary these clays have been extracted to make bricks and tiles near to Stobley Moor House (342471) (16). The valley of the Hetton burn and its continuation northwards where it is known as the Rainton burn contain low hills of gravelly sand rising to just over 300 feet. The site of Hetton village and those parts of the plateau immediately to the east of the village are also largely covered by these interbedded sands and gravel deposits (fig.10) (17). For example, the Pemberton's Quarry (356465) exposure shows that the rockhead is overlain by sands and gravels, whilst in the valley of the Hetton burn close to the village sands overlies the boulder clay and form small terraces at c.270 feet (18). Further to the east and south, the highest parts of the plateau surface consist of a complex pattern of boulder clay deposits with isolated rounded spreads of sands and gravels (fig.10). The thickness of the boulder clay depends to a large extent on the rockhead contour pattern. In the buried valleys the drift is thick, being 64 feet at the Isabella pit at Elemore (19). Elsewhere, the clay is thin as at the old brick pits east of Hetton Lyons (369465), where an 8 feet deposit was extracted by the Hetton coal company in the 1820's (20). In the south of the parish at Easington Lane the drift is thin and stony; much of this stony clay area was unimproved moorland used for rough grazing, which survived in part until the middle of the nineteenth century and was known as Hetton Moor. The small patches of sands and gravels in the eastern part of the parish form the low rounded mounds rising to

approximately 500 feet which typify the relief of this section of the plateau and which break down to form gravelly clay-loam soils (fig.11).

The spread of water-deposited sands and gravels at Hetton-le-Hole extends to the north of the parish and appears to be genetically related to Curlew Hope, a meltwater channel just to the north of Eppleton colliery (304 484). This channel is one of a number of such glacial meltwater channels in the Hetton, South Hetton and Haswell areas which drained westwards to a lake which accumulated to the west of the Magnesian Limestone escarpment on the withdrawal of the ice-lobe with the decay of the ice in the Wear valley (21). Further evidence of the effects of deglaciation on the surface deposits in the parish is provided by the existence to the east of Great Eppleton (374 479) of an irregularly shaped deposit of lacustrine alluvium and the slight strand-line features of a former lake (fig.10) (22). This must have been a temporary meltwater lake, on the draining of which a flat floor was revealed as a natural hollow of generally poorly drained marshy land requiring drainage by man and marked as marsh land as recently as 1957 (23).

2 Ownership of the Land

In this section the intention is to examine how the exploitation of the subterranean and surface resources influenced the patterns of ownership and tenancy during the period under review. In order to reconstruct the pattern of landownership in the three townships an analysis of the three relevant Tithe maps will be attempted, to distinguish the distribution of the estates and tenancy holdings in the area in the years 1838 and 1839 (24). By this time coal mining had been established for about seventeen years in the area and a mining community of over 5700 had grown rapidly in response to this demand for labour. The patterns of landownership and land-holding established by this time therefore, can be used as a terminal

base from which to make a retrogressive study of the changes in estate ownership and tenancy which occurred during the period under study. A final section is concerned with an analysis of the relationships between the coal company and the major landowners and seeks to elucidate the influence of these relationships on the evolution of the coal-mining landscape.

The Patterns of Landownership and Tenancy Holdings 1838-39

1 Landownership distribution

In all three townships the pattern of landownership was dominated by one principal estate-owner, this being particularly true of the smaller townships of Great and Little Eppleton, where the land was concentrated in very few hands. As something of a contrast, in Hetton township the land was owned by thirteen people, but even here the following table illustrates the dominant position of the Hon Maria Bowes Barrington who had succeeded to the Hetton estate on the death of John Lyon.

Hetton Township 1839

Table of Landowners as listed in the Tithe Apportionment

<u>Landowner</u>	<u>Acreage</u>
R Anderson	1 - 0 - 27
J Armstrong	3 - 3 - 33
Hon Maria Bowes Barrington	858 - 1 - 37
Hon M B Barrington and Sir James Musgrave	97 - 1 - 10
G Baker	5 - 3 - 15
J Burrell	52 - 2 - 3
Rev J Hutton (executors)	49 - 0 - 1
J Hutchinson	87 - 3 - 12
Hetton coal company	161 - 0 - 17
H Lamb	0 - 2 - 0
J Pemberton	212 - 2 - 32
J Wilson	0 - 1 - 27

T Wood	2 - 1 - 37
Houses	25 - 2 - 1
Lanes, Waste etc	39 - 0 - 37
	<hr/>
Total	1595 - 0 - 9
	<hr/>

The next two tables show the list of landowners and the extent of their estates at Great Eppleton and Little Eppleton.

Great Eppleton Township 1838

<u>Landowner</u>	<u>Acreage</u>
Francis Muscall	526 - 1 - 32
Hon Maria Bowes Barrington	76 - 2 - 23
Edward Shipperdson	92 - 2 - 08
	<hr/>
Total	695 - 2 - 23
	<hr/>

Little Eppleton Township 1839

<u>Landowner</u>	<u>Acreage</u>
Mary Croston and G T Fox	335 - 1 - 24
	<hr/>
Total	335 - 1 - 24
	<hr/>

The distribution of the Estates

The distribution of these estates is indicated in fig.15 for all three townships. Dominating the whole of Hetton township was the estate of the lady of the manor, the Hon Maria Bowes Barrington. Her inheritance covered over half the total area of Hetton township and was disposed in two discrete blocks of land. The larger area was in the north, west and central part of the township and almost totally encircled the old village. This land included Hetton Hall with its parkland, the woodland along the course of the Hetton burn and several of the houses and garths within the old village itself. In addition, the Hon Maria Bowes Barrington owned the land on which Hetton colliery and its surface installations stood. Several of the dispersed farmsteads and their appurtenant farm land were

also owned by the lady of the manor. For example, Lane House farm on the Rainton Bridge road in the north west of Hetton township, embraced the land in that part of the township. Hemels Farm, just to the south of the old village contained land some of which had been occupied by the surface installations of Hetton colliery, whilst Coal Bank farm worked land in the extreme west of the township. In each of these cases the ring-fence farm formed a discrete agricultural unit. However, the Hon Maria Bowes Barrington also owned farmbuildings and associated garths in the old village, the tenants of which worked land which was separate from the farmhouse itself. One such farm was Houghton Way Farm which extended north from the village on either side of the Hetton waggonway. In the extreme south of the township the Hetton estate included a small block of land totalling 68½ acres which was farmed as a unit by the occupier of Gargles House. This farm consisted of ten fields which were markedly rectangular in shape and situated in the southern section of the township which, prior to enclosure and improvement, had been moorland. Evidence to support this statement will be discussed in the next chapter, but the existence of a separate unit of land forming a ring-fence farm in isolation from the principal manorial lands could suggest that on the enclosure of this moorland tract, the Lyon's consolidated their holdings in the southern part of the township and created this discrete farm. Barrington also owned in conjunction with Sir James Musgrave a ninety seven acre contiguous block of land extending south west from the old village to the southern limit of the township. This land formed the nucleus of Peat Carr Farm, a dispersed farmstead worked by a tenant who also held land owned by Barrington singly, which was adjacent to the joint estate.

John Pemberton was the second most important landowner in Hetton township at this time. His estate extended in an irregular arc at the eastern limit of the township from close to the old village in the north, as far south as Murton Lane and Brick Garth (fig.15). Pemberton, who had considerable interests in coal mining elsewhere in east Durham, in partic-

ular at Monkwearmouth, owned land at Hetton under various forms of land-use. Just to the east of the old village he owned a field on which several early rows had been built; he owned gardens and garths behind the rows of houses along Easington Lane; in addition he owned and leased out farmland such as that worked by the tenant at Hetton Moor House to the north west of Easington Lane.

The north eastern section of Hetton township, the Hetton Downs, was owned by the Hetton coal company which had been founded in 1820 to finance and conduct the exploitation of coal in the Hetton area. By 1839 the company owned 161 acres of land in the township forming the Hetton Downs estate. Although chiefly farmland worked from a farmstead at the Downs, the company's land was significant in that it was used to house the largest single concentration of mineworkers in the whole settlement. Three units of miners' housing had been built at the Far, Middle and Near Downs by 1839 on company land, whilst in the extreme south of the company's estate a further concentration of miners' cottages had been constructed around a triangular piece of ground known ironically as the "square" (fig.17). If there was a clear but not exclusive concentration of colliery dwellings on company land, the same cannot be said of the collieries themselves: in each case the land occupied by the collieries and their yards was leased from the Hetton estate by the coal company.

Two other landowners owned significant estates in the township. Jane Hutchinson owned just over eighty seven acres in the south of the area in two parts, the larger one of which formed Hetton Moor Farm which lay between Murton Lane and the farm worked from Gargles House (fig.15). The very name of this farm suggests a creation by the same process of moorland enclosure and improvement as previously referred to. The landowner with the most scattered distribution of land was John Burrell. His fifty two acre estate was separated into three blocks of land. At Easington Lane he owned a unit of a little over twenty two acres which was occupied by a tenant who worked Prospect Farm, which was created by the addition of the smaller part

of Jane Hutchinson's estate of fourteen acres. Burrell owned two other blocks of land which totalled just under thirty acres and which formed part of the larger holding of Peat Carr Farm.

Only three landowners are listed in the Tithe apportionment for Great Eppleton township, and the table shows the territorial dominance of Francis Mascall, an ancestor of whom had purchased the manor in 1692. Mascall's estate in 1838 occupied the whole of the township except for the north western and south eastern parts which were owned by the Hon Maria Bowes Barrington and Edward Shipperdson respectively (fig.15). Mascall also owned, but did not live in, Eppleton Hall together with its parkland and ornamental woodland. The seventy two acre block of land which formed part of the Hetton estate in the north west of the township was narrowly contiguous with the estate in Hetton township and contained the shafts and surface installations of Eppleton colliery which were sited on land leased to the coal company. Finally, the ninety two acre estate of Edward Shipperdson was located in the south east of the township adjacent to Murton township in which Shipperdson was one of the principal landowners. In Little Eppleton township the whole area including farmland, woodland and Old Eppleton Hall with its landscaped grounds, was jointly owned by Mary Croston and G T Fox (fig.15).

Tenancy Distribution

Hetton township

As might be expected in a coalmining district, the coal company had in the first twenty years of its existence acquired the leases for much of the land in the township, with a total of 487 acres being occupied by the company of which 476 acres was rented from the Hetton estate (25). On this tract of land the company had also purchased a series of rights to permit the sinking of shafts and the transport of coal over the land of the lady of the manor (26). The land occupied by the company lay in an arc almost completely surrounding its own Downs estate, including the site of Hetton colliery with its sixteen acre pityard and the whole of the north western part of the township. It is possible that the company had acquired the lease of this portion of the Hetton estate in particular because it coincided with the exposed section of the coalfield in which several attempts dating from as early as 1772 to sink borings to prove coal had been made (27). Included in the tenancy of the coal company were three separate farms, Lane House farm, Houghton Way farm, and Hemels farm; all were working farms, thus illustrating the diversity of interests of the company. The coal company also leased small pieces of land close to its colliery installations with a view to their future use for industrial purposes. For example, the field immediately to the east of Hetton colliery which was leased from John Pemberton, was subsequently used as a colliery waste heap, whilst part of the three fields lying just south of Brick Garth were leased from the Hetton estate and used for a similar purpose within the years immediately after 1839 (28). The proportion of the Hetton estate actually occupied by the lady of the manor was very small being restricted to the mansion house and its grounds, together with the woods along the Hetton burn and two houses in the village.

Apart from the coal company, several other tenants occupied significant areas of land for agricultural purposes, in some cases from more than one landlord. For example, John Beckwith leased 216 acres from both the Bowes Barrington

estate and the jointly-owned estate of Barrington and Musgrave. Apart from four fields south of Brick Garth this tenancy occupied a compact block of land lying to the south west of the old village and formed Peat Carr farm. On a larger scale Martin Hardy leased over 312 acres from five different landowners in widely distributed parts of the township. Land held from the Hetton estate and John Burrell made up Coal Bank farm in the west of the township; Hetton Moor farm was held from Jane Hutchinson in the south, whilst further compact blocks of land without farmhouses were held by Hardy from the executors of the rev J Hutton and from John Pemberton. In contrast, other tenant farmers simply held the land of one landowner with the tenancy holding and estate coinciding areally. For instance, Joseph Adamson held a sixty eight acre farm from Bowes Barrington, called Gargles farm in the south of the township; similarly William Nixon held the forty four acre Hetton Moor House farm from John Pemberton also in the southern part of the township.

The evidence of the Tithe plans and Apportionments for the townships of Great Eppleton and Little Eppleton reveals a simple pattern of tenancies. In the former, Mascall only occupied the plantations in the north west of the township and the woodland and gardens surrounding the Hall. The rest of his estate was held by two tenant farmers, one of whom also held the ninety two acre estate of Edward Shipperdson, so forming a discrete unit of farmland in the southern part of the township. The Hetton coal company occupied the whole of the seventy six acre estate of Bowes Barrington which lay in Great Eppleton of which nearly twelve acres was taken up by Eppleton colliery yard and a section of the Eppleton branch of the Hetton waggonway. The territorial involvement of the coal company with the local landowners was repeated in Little Eppleton township; here Croston and Fox retained the occupance of only the woods and plantations; the coal company held all the agricultural land, the mansion house and its associated farm buildings. In addition to the customary lease arrangements related to the extraction of coal from under the estate, surface resources such as local deposits of

boulder clay had been extracted for brickmaking from the earliest days of the coal company (29).

The Tithe evidence shows that the land in the three townships was totally enclosed with no trace of any evidence of an open field landscape. A reference to the enclosure of some of the land at Hetton in 1617 (30) may be related to the elongated enclosures lying just south of the village, whose shape might have resulted from the early enclosure of groups of to the village. Unfortunately the field names in this part of the township do not offer any confirmation to support this possibility. As has been stated earlier, it is also possible that the land in the southern part of Hetton township was enclosed from moorland probably at a later date than that closer to the village. Certainly a moorland tract existed here, just to the south and east of the township boundary where Haswell moor and Murton moor formerly formed one continuous extent of unimproved land, developed on a stony, obdurate boulder clay.

Irrespective of the date and mode of enclosure, the townships exhibited a high degree of consolidation of land owning and tenure. Most of the estates consisted of discrete units of land, and many of the tenancies consisted of dispersed farmsteads surrounded by ring-fence farms. This pattern is not complete; some farmsteads still existed in 1839 in the old village inhabited either by landless agricultural labourers or by tenant farmers who worked farms on which farmhouses had not been built.

Finally, the Tithe evidence demonstrates vividly the extent to which the coal company had developed a major interest in the land of the three townships. In Hetton township, the company had within twenty years bought an estate of 161 acres at the Downs and had acquired the lease with associated mining rights over about 487 further acres of land, largely from the Hetton estate. The company owned nearly 300 miners' cottages at the Downs, leased three farms, owned property in the old village, and worked the three collieries that provided the only important source of employment in the area. In addition the company occupied the seventy six acre estate of Bowes Barrington in Great

Eppleton, within which Eppleton colliery had been sunk, and at Little Eppleton 297 out of 335 acres, including all the agricultural land, were held by the company. In total some 860 acres in Hetton parish was occupied by the coal company; the fortunes of Hetton were clearly inextricably linked with those of the coal company.

3 The evolution of the landownership patterns

In tracing the evolution of the landownership patterns prior to 1838-1839, the method chosen involves an analysis of the evidence working retrogressively from the terminal base provided by the Tithe plans. Two categories of evidence have been used, namely estate maps and Land Tax returns. In the case of the former, two estate maps have been analysed dating from C.1826 (31) and 1776 (32) whilst the Land Tax returns for the three townships have been used from 1789 to 1831 (33). Earlier returns were found but, as they did not always include the names of the proprietors of land, their value was diminished. D B Grigg (34) and H G Hunt (35) have discussed the possible uses and limitations of the Land Tax evidence and, bearing this in mind, the returns have been used simply to verify the existence of particular landowners, to indicate evidence of the engrossment of certain estates, and to confirm the involvement of the Hetton coal company in the exploitation of the resources of the area. No attempt has been made to calculate the sizes of the estates from the sums payable as tax.

Estate map and Land Tax return evidence have been used in conjunction to reconstruct the pattern of landownership in Hetton township C.1826, only four years after the first drawing of coal from the Lyons colliery. (Fig.14) indicates the distribution of estates on the plan and the following table is taken from the reference on the original plan. The corresponding entries in the Tithe Apportionment are listed in the right hand column. The apparently small discrepancy between the total acreages indicated on the two maps is in fact considerably larger than the figures would suggest. The total acreage recorded in Hetton township on the C.1826 Estate map is only 1481 acres, as the map includes the seventy six acre estate of John Lyon which lay in Great Eppleton township and twenty eight acres of his estates in Moorsley township. This larger difference can be explained by the presence of three entries on the Tithe

Hetton Township : Estate Owners

<u>Estate Map C.1826</u>		<u>Tithe Map 1839</u>	
<u>Landowner</u>	<u>Acreage*</u>	<u>Landowner</u>	<u>Acreage*</u>
John Lyon	947	Hon Maria Bowes Barrington	858
Messrs Lyon & F Musgrave	95	Bowes Barrington & Sir J Musgrave	97
Messrs Lyon & Robinson	12		
Mr Pemberton	222	Mr J Pemberton	213
Hetton Coal Company	158	Hetton Coal Company	161
Executors of late Mr Sill	51	John Burrell	52
Mr Hutchinson	100	Jane Hutchinson	88
	<u>1585</u>	Rev J Hutton	49
		Humphrey Lamb	0½
		J Wilson	0½
		Thomas Wood	2
		R Anderson	1
		J Armstrong	4
		Houses	25
		Lanes, Waste etc	39
			<u>1595</u>

* Acreages have been rounded to nearest whole acre except where the estate was less than one acre.

apportionment which are absent from the earlier Estate map. Firstly, the forty nine acre estate of the Rev J Hutton at the northern limit of the township is not included within the boundary of the estate map, and could have been added to Hetton on the creation of the separate chapelry at Hetton in 1832 from the adjacent mother parish of Houghton-le-Spring; secondly it is possible that the entry of thirty nine acres of lanes and waste recorded in the Tithe Apportionment could have been incorporated in the total acreages indicated in the reference of the Estate map, as could have been the twenty five acres under houses.

In broad terms the pattern of landownership had not changed significantly between C.1826 and 1839. The Hon Maria Bowes Barrington had inherited the estate of John Lyon almost intact including over seventy six acres of land in Great Eppleton township and twenty eight acres in Moorsley township. The estate that she owned jointly with Sir James Musgrave corresponded very closely in size and position with the land previously held by Messrs Lyon and Musgrave. The nine acre reduction in the size of Mr Pemberton's estate can be explained in part by the loss of a field of just over seven acres just east of the old village upon which houses and the first church in Hetton had been built by 1839. The reduction in the acreage of the Hutchinson estate in the southern part of the township can possibly be explained by the sale of the eight and threequarter acre plot upon which Brick Garth and the Elemore Vale corn mill had been built, and by the sale of the land used to build houses along Murton Lane between 1826 and 1839. It is clear that the Hetton coal company had purchased its estate at the Downs before C.1826, upon which it proceeded to build the miners' housing with great rapidity. The only remaining individual proprietor of land mentioned in the reference of the Estate plan were the executors of the late Mr Sill; the similarity in the size of Burrell's estate in 1839 suggests a direct purchase, but in the Land Tax returns for 1826 Anthony Tilley is listed as the sole remaining landowner. Furthermore the fields forming the estate ultimately purchased by Burrell are marked with the initials G.T. on the C.1826 Estate map. No reference to a Mr Sill can be found in the Land Tax returns for Hetton township, but it would appear that on or soon after the death of Mr Tilley, his land was bought by J Burrell. Tilley had died by 1831 as the Land Tax entries for that year refer to his estate being held by his executors.

No Land Tax returns of this date survive for Little Eppleton but the 1826 Tax lists for Great Eppleton confirm the same threefold landownership division of the township as was indicated in the Tithe apportionment. However, between the 1826 and the 1831 Land Tax returns an important change of tenancy had occurred with the Hetton coal company assuming the occupance of that part of

the Lyon estate which lay in Eppleton township; this change must be clearly linked to the sinkings at Eppleton colliery on this land which coincided temporally with the involvement of the company in this section of the township.

In order to trace the evolution of the landownership pattern before the middle of the 1820's use has been made of a plan of the estate of Thomas Lyon at Hetton dated 1776 (fig.12), together with a sequence of Land Tax returns from 1789. As early as 1776 the Lyon family was clearly the principal landowning family in the township, being at that date in possession of an estate totalling 644 acres. The Lyon family had acquired the estate in 1746 when the Countess Dowager of Strathmore,

"gave or devised it to her youngest son, the Hon Thomas Lyon, whose son John Lyon succeeded to the property" (36).

Fig.12 shows the distribution of the Hetton estate only, the land of the other proprietors in 1776 is left tantalisingly blank. Although some 300 acres smaller than in 1826, the Hetton estate in 1776 was substantially similar in disposition particularly in the northern and western parts of Hetton township. It was in the southern and eastern parts of the township that the lord of the manor engrossed his estate in the succeeding fifty years. This engrossment can be traced by the addition of four units of land to the original estate (fig.13). Firstly, Lyon had acquired the ownership of the seventy six acre portion of Great Eppleton township in which Eppleton colliery was located. The date of purchase can be narrowed to between 1793 and 1804 as, by the latter date, the Lyon family were paying tax for a portion of the township's land for the first time. Through this transaction seventy six acres were added to the Hetton estate. Secondly, by a comparison of the two Estate plans, the acquisition by Lyon of Gargles farm in the southern extremity of the township can be seen, adding about sixty eight acres to his estate (fig.13). Thirdly, the estate had acquired by 1826, seventy six acres of land lying to the east of the Easington road which, when added to Lyon's existing four fields in the area, formed Hemels farm. Hetton colliery was subsequently built on

part of this land. Thus since 1776 the lord of the manor had purchased the sites of the two collieries that were subsequently sunk in the parish. It is also probably significant evidence of the close relationships between Lyon and the coal mining interests that the exploratory borings to ascertain the possibility of coalmining under Hetton township which can be dated from 1772, seem to have occurred solely on land owned by the lord of the manor. Finally, the acquisition of land in the north of Hetton township by Lyon consolidated the formerly scattered fields into a farm subsequently known as Houghton Way farm, which like Hemels farm was later leased to the coal company.

Additional evidence to confirm this estate engrossment by the Lyon family is provided by the Land Tax returns for Hetton township. From 1791 to 1819 the bulk of the estate was valued at £7.9.0 out of a total for the township of £13.5.0. However, from 1804 onwards, separate entries appear listing Lyon as the proprietor of parcels of land bearing much smaller valuations. For example in 1804 a separate assessment for £0.7.8 occurs which is valued at £0.7.7 six years later. In 1819 Lyon is listed as the owner of two further parcels of land valued at £0.8.6 and £0.6.6. These pieces of land had been purchased by Lyon in the two years before 1819 as in the 1817 Tax lists they can be identified as belonging to a Miss Purvis, through the similarity of the assessment in each case and the listing of the same occupiers for the respective units of land. In the absence of any evidence concerning the methods of land valuation it is not possible to distinguish between these three entries and the three pieces of land, the purchase of which created the farms already named in Hetton township, but the stated assessments are not unrealistic for parcels of land of the order of seventy to eighty acres each.

Finally, an examination of the Land Tax returns for Hetton township indicates very clearly the impact of the advent of coal mining on the proprietorship and occupance of land and houses. The returns for 1819 show a pattern of the ownership of land and houses which had not altered fundamentally since 1789. Nearly all the land was held by six landowners and the estates of four of them can be traced back directly to 1789. In marked contrast to

this series of Tax lists representing the assessment of a small agricultural township, the 1826 returns reveal the influence of the coalmining interests as a result of mining colonization. Firstly the coal company is listed as a proprietor of land valued at £0.18.6½ which must represent the Downs estate which had been purchased from the Tilley family just before 1823 (37). It is significant to note in this context that Tilley's estate diminished in value from £1.10.6 in 1819 to 3.10½ in 1826. Secondly the Land Tax returns show that the settlement had grown very considerably during this seven year period, as 185 houses are listed as liable to tax for the first time. Although this is many fewer than had been built by 1826 it is important to note that ninety two of them are recorded as being occupied by the coal company; most of these were assessed at the lowest rate of tax, 2d each, and most probably represent miners' cottages in the colliery rows.

The Coal Company and the Landowners:
The Creation of the coal-mining landscape

The surviving records of the coal company when used in conjunction with contemporary cartographic evidence and relict landscape elements permit an analysis of the evolution of the coal-mining landscape in the parish. In chapter four this documentary material is used to assist the analysis of the factors affecting the morphological evolution of the settlement, but in this section the objective is to outline the influence of the legal and financial relationships between company and landowner on the development of the coal-mining landscape.

In a series of agreements between the coal company and the principal estate owners in the three townships there are numerous references to the elements of the coal-mining landscape. For example, an agreement of June 1822 between Lyon and the company contains the following references (38). Lyon granted the following rights to the coal company:-

- (a) pit and heap room
- (b) wayleave by horses, ropes, rollers or engines
- (c) the building of waggonways to the Wear or elsewhere, not to exceed fifteen yards in width, except for mounts, bridges, cuts or batteries
- (d) the building of dwelling houses, hovels, stables, fire-engines, etc

In return for these rights the company paid Lyon three types of rent (39), a clear yearly rent, a royalty on the coal extracted which varied with the seam, and an additional wayleave rent on the tonnage transported over Lyon's land. Further agreements were drawn up between the coal company and the other principal landowners in all three townships in which the rights to mine coal and construct the elements of the colliery landscape, and the royalty payments were fundamentally the same (40). In granting the right to mine coal under their estates, the landowners at both Great and Little Eppleton included restricting conditions concerning the siting of pits and waggonways (41); the effect of these limitations on the evolution of the landscape will

be analysed in chapter four.

A legal agreement no matter how detailed does not prove that the elements of the landscape which were itemised did in fact come into existence. The proof of the enactment of the agreements is to be found in a series of documentary sources, chiefly company valuations and correspondence which complement the later cartographic evidence of the Tithe and early Ordnance Survey maps. An early valuation of the real estate of the coal company dated September 1823 (42) and a set of colliery accounts dated November 1823 (43) contain references to the establishment of a small metal foundry at the colliery and also coke ovens. Furthermore there is reference to the consumption of twelve chaldrons of coal per day by the engines employed in drawing and leading the coals, a direct reference to the colliery engines and the locomotives and stationary engines on the Hetton waggonway. A later report to the Colliery Viewer, Arthur Mowbray, by two Viewers of different collieries, George Hill and George Johnson, gives a more detailed account of the emerging industrial landscape:-

"(there are) ... several engines at the pit; also those upon the waggonway and at the staith (at Bishopwearmouth). We inspected the various workshops at the colliery and stabling and granaries at the Downs the houses that enclose them (engines) are in general good substantial and well-finished buildings.

The different workshops at the colliery, the foundry, the storehouses, sheds, saw-mill, forgehammer and the apartment for fitting up the engine materials ...

The various inclined planes both upon the waggonway and at the staithes are judiciously applied." (44)

Included in this extract are references to the colliery installations and associated industrial complex at Hetton Lyons, to the possessions of the company at the Downs and to the Hetton waggonway with its stationary engines, locomotives and inclined planes along which company coal was transported to the staithes on the river Wear at Bishopwearmouth.

The involvement of the company in the exploitation of the surface resources of the parish as well as the concealed coal seams is illustrated by an agreement between the company and William Hutchinson dated August 1823 (45).

In this document, Hutchinson not only granted the company the right to win, work and lead coal from his estate called Hetton Moor at Easington Lane, but the lessees are also granted the right to dig clay, make bricks, win stone and burn lime. In this reference the origin of the name of the settlement at Brick Garth which was built on this estate, may be found. Further evidence of the exploitation of surface deposits of clay from which to make bricks is afforded by correspondence between the coal company and the proprietor of Little Eppleton. In a letter of March 1829 (46) the company acknowledged responsibility for the damage done to two acres of Brick Garth field by clay having been dug and bricks having been stacked there. Earlier correspondence dating from 1828 showed the scale of involvement of the company in brickmaking with a table (47) indicating the manufacture of five million bricks between 1822 and 1827 on land at Hetton, Little Eppleton and Elemore.

Chapter 3 : Notes

- 1 'Geological Survey of Great Britain (England and Wales)', 1 : 10560
Sheet NZ 34 NW (1964)
- 2 ibid
- 3 ibid
- 4 An account of the strata in Northumberland and Durham, 225
- 5 An account of the strata in Northumberland and Durham, 301
- 6 'Geological Survey of Great Britain (England and Wales)', 1 : 10560
Sheet NZ 34 NE (1964)
- 7 ibid
- 8 ibid
- 9 ibid
- 10 ibid
- 11 N.E.I.M. & M.E., 'Lyons, Elemore and Eppleton Collieries: Tentale accounts',
Buddle Atkinson papers, Vol 42
- 12 An account of the strata in Northumberland and Durham, 301
- 13 N.E.I.M. & M.E., 'Hetton Colliery Reports, Estimates and Valuations,
Part i.' Watson Coll. Vol 45. In a valuation of Hetton Colliery
dated July 12th 1832, the preamble makes reference to the
abandonment of the Caroline pit
- 14 W A Moyes, Mostly Mining, Newcastle upon Tyne (1969), 70
- 15 An account of the strata in Northumberland and Durham, 275
- 16 'Geological Survey of Great Britain', Sheet NZ 34 NW
- 17 D B Smith and E A Francis, Geology of the Country between Durham and
West Hartlepool (1967), 230
- 18 ibid, 230
- 19 ibid, 230
- 20 N.E.I.M. & M.E., 'Hetton and Little Eppleton Colliery Reports, letters
and other papers relating to the property of Mr G T Fox, 1820-1831'.
Watson Coll. Vol 47

In a letter dated May 5th 1829 G T Fox draws the attention of the
Viewer of Hetton Colliery to the value of the damaged ground at
Brick Garth Field in Little Eppleton township, totalling 4 acres -
1 - 36
- 21 Geology of the Country between Durham and West Hartlepool, 244
- 22 'Geological Survey of Great Britain', Sheet NZ 34 NE
- 23 Ordnance Survey Map Scale 1 : 10560, Sheet NE 34 NE (1967)

- 24 U.D.D.P. & D., Durham Diocesan Records. Tithe Awards and Apportionments. 'Plan and Apportionment of the township of Hetton-le-Hole', 1839. Durham C.R.O. 'Great Eppleton township Tithe Plan and Apportionment', 1838, EP/HH 29. Durham C.R.O. 'Little Eppleton township Tithe Plan and Apportionment', 1839, EP/HH/32
- The evidence of the patterns of estate ownership in the three townships during the years 1838-1839, is drawn largely from these three Tithe plans and their respective Apportionment documents. It is therefore proposed not to make separate references to these sources in the section of chapter 3 in which the reconstruction of the landownership pattern is attempted.
- 25 As with the analysis of the patterns of estate ownership, the section of this chapter which is concerned with the distribution of landholdings is drawn from the three Tithe plans and their respective Apportionment documents. A separate note for each detailed reference to this source is not therefore included.
- 26 Durham C.R.O. 'Hetton coal company agreements', N.C.B. Coll. 4/9, 1-40
- 27 An account of the strata in Northumberland and Durham, 218, 219
- 28 Durham C.R.O. 'Ordnance Survey First Edition Plans 1 : 2500', Durham County Sheet 21.9 (1856)
- 29 N.E.I.M. & M.E., Watson Coll. Vol 47. Letter dated May 8th 1829
- 30 W E Tate, 'Durham Field Systems and Enclosure Movements', in The Proceedings of the Society of Antiquaries of Newcastle upon Tyne, 4th series, vol 10, No 3, (1943), 15
- 31 U.D.D.P. & D., 'Plan of Hetton estate', undated. Halmote Court Misc maps and plans, 70
- 32 N.E.I.M. & M.E., Watson Coll. Vol 45. This volume of Hetton colliery reports contains a plan of the estate of the Hon Thomas Lyon at Hetton-le-Hole, dated 1776
- 33 Durham C.R.O. 'Land Tax returns: Hetton-le-Hole township; Great Eppleton township; Little Eppleton township', LTA/E/N
- 34 D B Grigg, 'The Land Tax returns', Agricultural History Review 11 (1963)
- 35 H G Hunt, 'Land Tax assessments', Short Guide to Records No 16 Historical Association (1972)
- 36 W Fordyce, The History of Durham, Vol 2 (1857), 579
- 37 N.E.I.M. & M.E., Watson Coll. Vol 45. In a valuation of Hetton colliery dated September 6th 1823 reference is made to the recent purchase of a twenty eight acre estate from Mr Tilley
- 38 Durham C.R.O. 'Hetton coal company agreements', N.C.B. Coll. 4/9, 2, 3, 4
- 39 ibid, 8, 12
- 40 ibid, 41 - 256
- 41 ibid, 174, 134

42 N.E.I.M. & M.E., Watson Coll. Vol 45

43 Ibid

44 N.E.I.M. & M.E., 'Report on the Hetton colliery company', 28th July
1827. Watson Coll. Vol 45

45 Durham C.R.O. 'Hetton coal company agreements', N.C.B. Coll. 4/9 41-43

46 N.E.I.M. & M.E., Watson Coll. Vol 47

47 Ibid

Chapter 4

Population and settlement growth

Prior to the first successful exploitation of coal at Hetton in 1822, the population of the parish had been small. In 1801 the total population of the three townships was only 253, with 212 being in Hetton township in forty three inhabited houses (table 2) (1). Agriculture formed the chief means of employment in the three townships in 1801 and 1811, and by the latter date the combined population of the three townships had risen to 322 (2). Hetton village still housed the majority of this population with fifty six families, totalling 264 people living in fifty inhabited houses (3). Before the advent of coalmining, settlement in the area consisted of a small non-parochial village at Hetton-le-Hole sited on the sloping valley side of the Hetton burn, two hamlets of Great and Little Eppleton and eleven dispersed farmsteads. Each of the townships was dominated socially and economically by a principal landowner who, as well as owning most of the land, also possessed mansion houses in the respective townships, which expressed in physical terms their significance within the community. The stability of the pattern of estate ownership is attested by the series of Land Tax returns dating from 1760 in the case of Great and Little Eppleton and 1789 in the case of Hetton-le-Hole. From the entries in the Land Tax returns for the thirty year period prior to the first census one can deduce that the land ownership and tenancy patterns were reasonably stable as was the overall population in all probability in this essentially agrarian community.

Of the three dominant landowning families, the most notable was the Lyon family whose estates lay in Hetton township. In 1746 the Dowager Countess of Strathmore had bought the estate from the Spearman family and devised it upon her son, the Hon Thomas Lyon (4). The township of Great Eppleton was dominated by Eppleton Hall which was owned by the Mascall family throughout

the period of this study, whilst in Little Eppleton township, the whole of the land and old Eppleton Hall was owned by a succession of people before coming into the joint possession of G T Fox Esq and Mrs M Croston in the first decade of the nineteenth century (5).

With the development of coalmining at Hetton between 1820 and 1822, the rural settlement pattern was profoundly influenced by the creation of a mining community within a few years of the completion of the first successful sinkings. This new settlement was built to house the rapidly expanding population that had been attracted to this new source of employment. The aim of this chapter is to examine three inter-related facets of the genesis of the mining settlement; firstly the reasons for the growth of the settlement in the first place must be briefly outlined; secondly the growth of the settlement in relation to the pre-mining rural cadaster will be examined, and thirdly an examination of the factors which possibly influenced the evolution of the morphology of the settlement up to the middle of the nineteenth century will be attempted.

There can be no doubt that the extremely rapid growth of population and the settlement at Hetton was the direct result of the initiation of coal mining operations after 1820. The successful sinkings at Hetton Lyons colliery between 1820 and 1822 had come after fifty years of sporadic attempts within the parish to prove the existence of commercially exploitable household coal reserves to the east of the contemporary zone of successful mining operations in the Rainton area. Borings in 1772 and 1793 in the exposed part of the coalfield just east of the old village (6) and in the concealed section to the south east of the village respectively (7) had attained depths of 396 feet and 505 feet and had reached the two highest coal seams, the 3/4 and 5/4. These attempts were abandoned before the potentially productive but lower Main and Hutton seams had been proved. It was not until the sinkings of the Engine pit and Minor pit at the Lyons between 1820 and 1822 that these seams were proved at 654 feet and 888 feet below the magnesian limestone. This successful mining exploration occasioned a population explosion that

was noted in the nascent stage in the 1821 census abstract which comments in a footnote that,

"The population of the townships of Hetton-le-Hole, Houghton-le-Spring, Newbottle and West Rainton, is greatly increased by the extension of collieries." (8)

Ten years later the census abstract offers a more explicit comment.

"The population of the township of Hetton-le-Hole has increased by 4968 (since 1821) by an extension of the collieries. 1004 males over twenty years old and 788 males under that age are employed in the mines at Hetton-le-Hole." (9)

Although the great growth in the settlement can be directly attributed to the development of collieries in the parish, the rate of growth in the first thirty years of mining activity was by no means constant. Examination of cartographic and censal evidence indicates the existence of three distinct phases of growth between the beginning of mining exploitation and the terminal date of the study; a nascent stage up to 1822, a "take-off" phase between 1822 and 1831 and a cyclical phase of stagnation, decline and revival between 1831 and 1851.

Phase 1. The Nascent Stage.

The first coal was drawn from the Engine pit in November 1822 and from the Minor pit in January 1823 (10). Even before the extraction of the first coal however, there had been a marked increase of population in the township. The sinking of the shafts, which had begun in 1820, the building of surface colliery installations and the construction of the Hetton waggonway at the same time to the coal company's staithes at Bishopwearmouth, were all labour-intensive activities and must largely explain the marked growth of population in Hetton township from 264 in 1811 to 919 in 1821 (table 2) (11). The census abstract for 1821 indicates clearly that this rapid expansion of numbers, which must largely have coincided with the sinkings after 1820, outstripped the provision of housing. The 919 inhabitants lived in only 107 households, an average of 8.6 per household (12); this is a much larger figure than that found in 1831 (5.6), in 1841 (4.5) or indeed in the pre-

mining years of 1801 (5.0) and 1811 (5.3) (table 2). In 1821 the 107 households contained 145 families. This high rate of multiple-occupance, which together with the influx of single lodging workers augmented the size of the households greatly, was a demographic characteristic of the pioneer phase in a mining community. Evidence of similar severe overcrowding in the raw earliest years of the growth of a new industrial community is shown by J D. Porteous at Goole, where in 1826, two years after the foundation of the company town, an average of eleven persons occupied each dwelling in the new town area (13). By 1828, the figure had fallen even more rapidly than at Hetton to 6.2 persons per dwelling. Similarly the sex-ratio in 1821 at Hetton of 59.4% males (14) is typical of new mining settlements to which male workers would be overwhelmingly attracted, and compares quite closely with the male incidence of 62% at Goole in 1826 (15) (table 2).

In view of the greatly increased numbers living in each household it seems likely that many of the newly-arrived population settled initially in the existing housing in the village. However fifty seven more houses were recorded in Hetton township in 1821 compared with 1811 and this doubling of the housing stock in the township must represent the earliest provision of dwellings for the immigrant industrial population. Much of this housing seems to have been constructed within the plan of the old village by a process of the infilling of vacant spaces. The first housing to be built in Hetton for the influx of coal-miners seems to have been a series of short irregular terraces known as Bog Row, which were laid out on a cramped and sloping site close to Hetton burn between the old village and the Rainton road (fig.9). The construction of these cottages probably ~~em~~plifies the process of infilling the old rural settlement noted by J C Creigh at neighbouring villages such as Pitlington and Newbottle as an initial stage in the development of the coalmining settlement (16). Map evidence confirms the existence of Bog Row before 1825 (fig.9) (17) and

the 1851 Census Enumerators' books indicate that the rows were inhabited largely by coalminers in sharp contrast to the old village; furthermore thirty six households were recorded at Bog Row in 1851 in the Census. It is likely that rather more than thirty six houses had originally been built at Bog Row as the Tithe map of 1839 (18) shows the existence of two short rows in the centre of the Bog Row area which had disappeared by 1856 when the First Edition Ordnance Survey 25" Plan was surveyed (19). Unless they had been pulled down in the five years between 1851 and 1856, then it appears quite possible that nearly the whole of the increase in the housing provision in the village between 1811 and 1821 had occurred at Bog Row.

Phase 2. 1822-1831: The "Take-off" Decade.

Between 1821 and 1831, 945 houses were added to the settlement fabric of Hetton township (20). In 1831 1092 families totalling 5887 people lived in 1052 occupied households, and the sex-ratio of 53% males, although still male-dominated, was considerably more evenly balanced than that of 1821 (table 2). The decade had witnessed therefore, not only an extremely rapid growth of population of nearly 5000, but also the development of a permanent community of families living largely in single-family households in contrast to the 'new' community of 1821.

A series of maps drawn for a variety of purposes during this momentous decade enables a detailed reconstruction to be made of the physical growth of the settlement at Hetton during a period when an average of almost 100 houses were built each year and an average of 500 people per year were added to the population. Two maps drawn in 1825 indicate the expansion of the settlement during the first three years of coal mining. The 1825 plan of the Hetton Estate shows the infilling of housing at Bog Row and the early stages of the construction of the short rows of houses built to the east of Front Street (21) (fig.9). Housing is also indicated at Hetton Lyons both within the colliery yard and immediately south of the Little Eppleton road at the Lyons

Houses. Further evidence of the early growth of settlement at Hetton is provided by a map drawn in the same year to show the route of a projected turnpike road between Crathorne in North Yorkshire and Newcastle (22). The road was never built through Hetton parish but the map confirms the findings of the Estate map and provides additional evidence for the southern part of Hetton township where a linear pattern of settlement, extending along both sides of the Easington to Houghton road, formed the early nucleus of Easington Lane.

During the second half of the decade a truly remarkable growth of settlement occurred in Hetton township. Evidence of both the rate of growth and the emerging plan of the settlement is provided by a plan of Houghton parish, in which the township still lay, drawn in 1827 to show the proposed site of the Anglican chapel-of-ease at Hetton as well as the contemporary settlement growth (23). This map shows not only the contemporary settlement pattern but also the number of houses in each part of the township (fig.16). Considerable expansion had occurred even since 1825. In the southern part of the township the linear development of cottages along Easington Lane had been extended southwards and totalled 180 houses. 101 houses were recorded at Brick Garth which had not existed two years previously and thirty eight houses are listed at Hetton Lyons. The map indicates 230 houses at the much expanded old village including those built at Bog Row, along Front Street and in the rows to the east of Front Street. Finally 110 houses are shown in the north eastern part of Hetton township at the High and Low Downs. By 1827 therefore some 659 houses existed in the township, excluding the dispersed farmsteads, a 600% increase over the 1821 total of 109 houses, in only six years. Within these few years therefore a short phase of maximum growth had created the framework of the settlement plan that characterised the morphology of Hetton in the 1850's, and which survived almost intact for another hundred years. Furthermore it is most likely that a substantial proportion of the 1851 population of 5664 was to be found at Hetton as early

as 1827. No censal evidence exists but on the somewhat conservative basis of the 1831 figure of 5.6 persons per household, a population of nearly 3700 has been calculated for Hetton in 1827.

In terms of the detailed morphology of the settlement in 1827 it is possible to distinguish two units of housing in the southern part of Hetton township (fig.16); the street village of Easington Lane extended accordantly for over half a mile along both sides of the Easington road with a closed building line on the east row and an open one on the west (24). Striking west from Easington Lane, Brick Garth stretched for about 700 yards as a discordant unit of housing towards Elemore colliery. It is possible that Brick Garth was under construction in 1827 as when completed it contained 204 houses and its plan would suggest that it had been built as a unit. Close to Hetton colliery, the fabric of the housing at the Lyons was clearly identifiable as early as 1827 (fig.16), the thirty eight houses recorded in that year being not significantly fewer than the fifty two listed in the 1851 Census returns. The plan of the old village also included the elements that later characterised the fully established mining settlement. By 1827 the rural core which focussed on Old Street had been augmented by the short irregular terraces at Bog Row, the parallel terraces to the east of the Houghton road and by the development of Front Street along this road (fig.16). Finally, in the north of the township, the early provision of miners' housing in the form of the square at the High Downs and the two rows at the Low Downs can be seen to predate the construction of terraces along Downs Lane, which by the middle of the century had linked the Downs to the old village.

The extremely rapid growth of population and settlement continued certainly until 1831, in which year the Census records a total of 1052 inhabited houses in Hetton township occupied by 1092 families, with a population total of 5887 (25). This figure was not exceeded again until 1861. In 1831 twenty six houses were being built, five fewer than in 1821 (26), and in view of

the much larger housing stock available in 1831, this probably indicates a marked slowing down in the rate of house building. The phase of rapid expansion must have terminated very soon after 1831 as censal evidence in 1838 (27) indicates the existence of only 1144 houses with a total population of 5751 in the newly created Ecclesiastical District of Hetton-le-Hole which coincided with the old township of Hetton. Furthermore only 1145 houses, of which 228 were uninhabited, with a total population of 4158, were recorded in the 1841 census (table 2). In neither 1838 nor in 1841 were any houses being built in Hetton. Clearly therefore the period 1831 to 1838 saw the addition of only just over ninety houses to the housing stock in the township, and from 1838 or possibly a little earlier a cessation of house building had occurred which lasted until at least 1851. The Tithe map of 1839 therefore must illustrate the settlement pattern that had been established by soon after 1831 and can be used to demonstrate the effect of the building that had occurred since 1827, on the units of settlement already distinguished (28). The Tithe map shows that subsequent to 1827 the existing units of settlement were infilled with a thickening of new houses, but the overall settlement plan was little altered by the creation of new developments (fig.17). In the south of Hetton township, the west building line of Easington Lane was virtually closed, Brick Garth was completed and incipient building had occurred along Murton Lane. Similarly elsewhere in Hetton, extension to the settlement fabric was achieved by the addition of a few rows to existing centres of population. For example the five terraces east of Front Street were extended east of the Hetton waggonway, and just to the north the three rows built around the "Square" were erected during this period. Only along Downs Lane was the settlement pattern significantly extended by the construction of rows on both sides of the unmade track forming the beginning of the physical link between the Downs estate and Hetton village.

Phase 3. 1832 to 1851: Cyclical stagnation, decline and revival.

The period between the early part of the 1830's and 1851 witnessed a marked change in the demographic and settlement evolution of Hetton compared with the previous decade. During the 1820's Hetton had grown in population and fabric at a rate scarcely exceeded even by that at Middlesbrough, a town habitually quoted as a prime example of the "mushroom" growth of a new industrial community, the population of which had grown from just over one hundred in 1831 to 7341 twenty years later (29). However, unlike Middlesbrough, the growth rate at Hetton slowed down very rapidly during the five or so years before 1838, and indeed by the latter date the population had fallen by 136 to 5751 compared with 1831. Furthermore the next three years witnessed a greatly accelerated rate of population decline to 4158, a fall of 1729 over the decade 1831 to 1841, with a staggering reduction of 1593 in the last three years of the censal period (table 2) (30). Demographic conditions such as prevailed at Hetton in the late 1830's and early 1840's offered no incentive to build new houses and so extend the fabric of the settlement. Indeed the reverse applied and the number of uninhabited houses leapt from nineteen in 1838 to 228 in 1841 (31). In the next section an examination of the possible factors responsible for this marked decline will be included.

By 1851 Hetton township had experienced a considerable revival of population with a population of 5664 inhabiting 1129 houses with only 18 houses recorded as uninhabited (32). It seems likely that the newly-arrived immigrants, whose arrival augmented the population in the years before 1851, could be largely housed in the vacant houses which had been recorded as uninhabited ten years previously. The large scale of this immigration can be measured to some extent by the fact that 40% of the children under five years of age living in Hetton in 1851 had been born outside the township, with significant numbers originating from those east Durham mining villages such as Haswell, Wingate, Shotton and Kelloe that had themselves received

migrants from Hetton in the late 1830's (33). The decennial increase of population noted in 1851 did not cause any extension of the settlement. Only two houses were added to the housing stock of Hetton during this period, whereas the years immediately after 1851 witnessed a resumption of building. Map evidence dated 1856 indicates the construction of a terrace of thirty four houses along the west side of Downs Lane and one of seventeen houses along its east side, thus effecting an almost continuous link between Hetton and the mining settlements at the Downs (34) (fig.18).

Factors influencing population growth and the evolution of the plan of the mining settlement.

The preceding description of the population trends and the growth of the mining settlement suggests the existence of a very close relationship between these aspects of the study and the economic conditions of the collieries owned and worked by the Hetton coal company. Since the economic life of the community was dependent upon the success with which the company could extract coal and transport it to a market, then any deviation from this critical path to profitability would have an almost immediate effect on the employment opportunities offered by the industry. The causal links between coal production, mining employment and population trends are clearly demonstrated by an examination of the company colliery production figures in relation to the census data. Detailed accounts of the production of coal at the three collieries have been found for some of the years between 1822 and 1842; in particular between 1822 and 1824 at Hetton Lyons Colliery, for 1829 to 1832 at the Lyons and Elemore collieries, and for the period 1833 to 1842 at all three collieries (35). From this somewhat incomplete evidence it is nevertheless possible to note a positive relationship between the population increase of the decade 1821 to 1831 with an increase of coal production in particular at Hetton Lyons colliery from 26,736 scores* in the

* a score was a standard number of tubs of coal upon which the hewers' and putters' prices for working were paid. On the Wear the score consisted of 21 tubs.

year 1822 to 1823, the first full year of production, to 35,695 scores in the following year. By the year 1829-1830 production had reached a peak of 51,557 scores, won almost equally from the Main and Hutton seams, both providing the good quality household coal for which the demand was greatest at this time (34). The combined production from Hetton and Elemore collieries also reached a peak in the year 1829-1830 with a total of 80,419 scores (37). Eppleton Colliery had not entered production by this date. It would appear therefore that there was a close temporal relationship between the peak of coal production and the maximum population recorded in the 1831 census.

In the succeeding ten years there is another positive relationship between the population trends and coal production at Hetton. During the decade 1831 to 1841 the drop in population of 1729 was mirrored by a decline in the combined coal production of the three collieries from 75,407 scores in 1833 to 47,674 scores in 1842 as is shown in the following table, despite the commencement of production at Eppleton colliery in 1833.

Total Coal Output in scores from Hetton Lyons, Elemore and Eppleton Collieries

1833	75,407	1838	67,989
1834	63,949	1839	60,842
1835	71,087	1840	59,683
1836	75,767	1841	54,280
1837	74,020	1842	47,674

The marked decline in production seemed to have occurred after 1837 and seems to have affected Hetton Lyons colliery in particular, where production fell from 42,749 scores in 1838 to as little as 13,212 scores in 1842 (38). At the two other collieries production fluctuated between 1838 and 1842 but did not decrease to any extent. It is probably significant that the population of Hetton township of 5751 in 1838 which was only slightly smaller than in 1831, had decreased by over 1500 in the next three years, at a time of diminishing coal production.

The author of the footnotes of the 1841 Census abstracts was in no doubt as to the reason for this decline. He states that,

"the great number of uninhabited houses and the decrease of population, particularly in Hetton-le-Hole, arises from several new collieries having been opened in the surrounding townships, which has caused a large portion of the mining population to remove thither." (39)

Certainly in the decade 1831 to 1841, the population of Haswell township immediately to the south of Hetton increased by 3718 as the result of mining colonization (40), whilst there were similarly large increases of population in some other east Durham plateau townships such as Thornley and Wingate, which experienced rises of 2680 (41) and 2510 respectively (42). The new population in these colliery villages was drawn in part from the Hetton area which was close by and contained men experienced in working in deep collieries on this concealed section of the coalfield (43). Whilst it is true that the date of reduced production and population coincides almost exactly with the extension of coal mining operations in east Durham, it is unlikely that this was the sole cause. An explosion at Hetton colliery in 1836 cost the lives of twenty two miners and must have caused at least a temporary setback to coal production. More significant probably was the underlying effect of the progressive increase in competition from other coalfields such as the Yorkshire field for the provision of household coal to the London market. In a valuation dated as early as July 1832 reference is made to the anticipated reduction in prices resulting from such competition (44). It is also possible that any reduction in the prices of household coal might render increasingly uneconomic any exploitation of the Main and Hutton seams at Hetton colliery in particular since this had been the first mine to be opened and would have begun to work through its more accessible coal reserves.

Although no coal production figures have been found for the period between 1842 and 1851, except for 1843 for which year a further reduction of combined production to 44,801 scores was recorded (45), it would appear reasonable to suggest that output had begun to pick up from the middle of the 1840's to

1851 in keeping with the known population increase and considerable immigration of mining folk into Hetton in the latter part of the 1840's. In the light of the evidence that the source of some of these migrants was the very same group of east Durham colliery villages to which Hetton folk had moved scarcely ten years previously (46), it would appear that here was local exemplification of the cyclical nature of the population trends that according to A E Smailes characterised the growth of Durham mining villages in the first half of the nineteenth century (47).

Agents of housing provision.

The observed relationship between colliery production, population trends and the development of the settlement pattern raises the related question of what agencies were responsible for the construction of the housing within the settlement. P N Jones has identified in the South Wales Coalfield the influence of a number of agencies operative after 1850 compared with which the role of the colliery companies was relatively insignificant (48). Through an analysis of the Register of Deposited Plans Jones demonstrated that the provision of houses in the South Wales mining valleys was largely a speculative response to a rapid growth in demand, with the efforts of speculative builders augmented in places by agencies such as building clubs and owner-occupiers. No such body of information exists for Hetton before 1851 as the period of this study predates the compilation of the Register which was not compulsorily maintained until 1875. Furthermore, an examination of the surviving evidence in the records of the Hetton coal company reveals an apparent lack of interest in the provision of housing for the mining settlement. Company reports, valuations, estimates and correspondence all provide much evidence concerning the financial and technical implications of the introduction of coal mining in the parish, but they only contain scattered passing references to the housing of the labour force. However, most of the available evidence does suggest that the coal company was

closely involved in the provision of housing in the rapidly growing settlement. Even before the sinking of the shafts at Hetton Lyons financial estimates for the new colliery included the cost of building the houses for sinkers and other key workers. For example, in an estimate of September 10th 1819 the first colliery Viewer outlined various categories of expenditure, including waggons, horses, locomotives, tracks "as per Stephenson", and one hundred workmen's houses at a total of £4000 (49).

In June 1822 an indenture drawn up between John Lyon, the principal landowner in Hetton, and the coal company granted the lease of mining and other rights to the company on Lyon's estate as well as the right to

"build dwelling houses, hovels, stables and fire-engines." (50)

In the same year a letter from the coal company to the Viewer states explicitly that,

"the pitmen's houses are to be immediately commenced with." (51)

Similar indentures drawn up between the other landowners in the parish and the company included in some cases references to the right of the company to build houses on their respective estates. In other cases, the company was expressly forbidden to erect more than a specific number of dwellings (52).

Two subsequent valuations of Hetton colliery and its fixed capital assets in 1823 and 1832 provide written evidence that the building rights bestowed on the company in these indentures had to some extent been actualised. In the earlier valuations reference is made to the company's estate at Hetton Downs including-

"workmen's houses, stables and other erections." (53)

A further reference is made to stone-built houses which had recently been built on Mr Lyon's grounds; this could well refer to the houses at Bog Row which lay on Lyon's land and which were amongst the earliest miners' housing in Hetton. The 1832 valuation confirms this evidence and indicates an extension of the company's involvement in the provision of houses over the preceding decade by referring to the value to the company of the workmen's

houses, granaries, stables etc at the Downs, to the Mansion House at Hetton with offices and cottages, and to the houses at Easington Lane (54). Thus the company owned property and had built houses at the three zones of the settlement in which dense concentrations of mining folk occurred, namely the Downs, parts of the old village and at Easington Lane or more probably at Brick Garth. Although it would seem to be unlikely that the coal company was the sole agent of housing provision prior to 1851, no firm evidence has been found to further the analysis.

Factors influencing the siting and morphology of the village.

In this section a detailed examination of possible factors will be made in an attempt to determine the relative significance of influences such as proximity to the pithead, physical conditions, and the antecedent land-ownership and rural landscape patterns.

Proximity to the pithead.

Earlier writers on the morphology of mining settlements have stressed the close spatial association between the colliery and the colliery village with its rows of cottages huddled under the shadow of the headgear and the waste heap. According to R T Jackson this relationship tended to persist despite developments in public transport systems later in the nineteenth and during the twentieth centuries (55). Consideration of the siting of the units of settlement in Hetton in relation to the pitheads in operation at the time of housing construction, would suggest that close proximity to the colliery was not always achieved or even sought. Whilst the area of the parish in 1851 was no more than five square miles and no part was more than one and a half miles from a working colliery, within these spatial limits, proximity to the pithead does not appear to have been a significant locational factor. The earliest housing provision for the coal miners had been built in, or very close to the old village, at Hetton Downs and at Easington Lane, each being over half a mile from the Lyons Colliery. The construction of the miners'

cottages at the Downs, which predated the sinking of the nearby Eppleton colliery, could scarcely have been located further from the Lyons Colliery and still lie in the township. In contrast, very little housing for coal miners was provided at Hetton Lyons itself. Only thirty eight houses were recorded there in 1827 (56) and fifty two in 1851 (57). The Census Enumerators' Books for 1851 show that the Lyons houses were occupied chiefly by colliery officials, engineers and other skilled workers, and that no attempt had been made to house the bulk of the mining workforce close to the colliery. Although the miners' cottages at the Downs were located no more than eight hundred yards from the site of Eppleton colliery, their construction predates the opening of the colliery in 1833 as 110 of the houses at the Downs are known to have been built by 1827 (58). Clearly the increased employment opportunities afforded by the production of coal at Eppleton had no influence over the decision to site the mining rows at the Downs. Only at Brick Garth, which was being built during 1826 and 1827 was there spatial proximity to a contemporaneously developing source of employment, namely Elemore colliery, which first "drew coals" in 1826.

Physical Factors

In no parts of Hetton parish are physical features inimical to the construction of houses. Settlement has been effected in all parts of the area irrespective of geological, soil or physiographic conditions. For example, Easington Lane and Brick Garth were built on the magnesian limestone plateau in the south of the parish; the units of housing at Hetton Downs were constructed on or close to the scarp slope of the limestone, which presents only a subdued west-facing slope in this locality; the mining settlement in the old village was located on the Middle Coal Measures of the exposed coalfield which underlies the north western part of the township and forms an embayment in the limestone escarpment occupied by the valley of the Hetton burn. In no part of Hetton parish in particular or

east Durham in general, except for the deeply-incised denes, has the siting of housing been controlled at all closely by geological or slope conditions such as have influenced the morphological evolution of the pattern of industrial settlement in the South Wales valleys.

Settlement at Hetton was sited with a similar disregard of the drift deposit conditions. Examination of the distribution of the drift deposits in relation to the mid-nineteenth century settlement pattern shows that miners' housing had been built on a variety of superficial deposits ranging from brown boulder clay at Easington Lane (364462) to gravel at Hetton Downs (354482) (59). The location of the various units of the mining settlement does not indicate the subtle influence of siting factors such as soil quality, drainage or aspect. Unlike ancient rural settlement, the mining village was speedily built in order to house a rapid influx of workers, the majority of whom were employed underground; the nature of the surface of the earth must have been of little interest to the agents of housing provision.

It might be reasonable to assume that the new settlement might be laid out on land that was inherently less fertile and less valuable for agriculture, such as existed particularly in the southern part of Hetton township. Evidence from a variety of sources would suggest the existence here of an impoverished soil, late enclosure and only partial improvement of the land by as late as the middle of the nineteenth century. Much of the southern part of the township is covered by drift deposits consisting largely of stony clay with scattered spreads of glacial sands and gravels. The stony boulder clay in particular must probably have proved ^{most} not intractable to drainage and ploughing. Fields in some instances bore the name "moor" (60) (fig.12 and table 1); the whole area was called Hetton Moor on the First Edition 25" Ordnance Survey Plan (61). The name of Hetton Moor Farm provides additional evidence (fig.8). Although direct evidence concerning the enclosure of this part of the township is lacking, the rectangular or square shape of the fields and the unsubstantial nature of the hawthorn hedges,

suggests rather late enclosure of an area of former rough grazing, some of which survived in 1856; a lowland "moor" located at the southern limit of the ancient parochial territory of Houghton-le-Spring (fig.8).

Some mining settlement had been constructed in this part of the township by the middle of the nineteenth century. For example, Brick Garth had been built in the 1820's on an eight acre field following an agreement signed in August 1823 between the landowner and the coal company. This field formed part of the landowner's estate of eighty eight acres, which was referred to as lying in Hetton Moor, and which was distributed principally to the east of the Easington road, except for one curiously elongated enclosure of eight acres and three roods, which extended abruptly west from the road (fig.14). It was in this field that Brick Garth was built in the years immediately following the agreement. However, soil quality and former land-use were not significant factors in the siting and plan development of the miners' rows at Brick Garth. The houses were built on the landowner's estate because of the agreement between the two parties concerned, and the ultimate plan of the rows was largely influenced by the shape of the enclosure chosen as the site for this extension of the settlement. Furthermore, as only a small proportion of the former moorland zone of Hetton township had been occupied by housing as late as 1856 (62), it can be assumed that the agents of housing provision had by no means implemented a policy of concentration in this tract.

The attitude of the landowners.

In order to reach an understanding of the factors which exercised some control over the decisions which influenced the siting of the mining settlement, it is necessary to examine the records of the coal company. Written evidence from this source gives some insight into the attitudes of the local landowners to the intrusion of this large-scale extractive industry of great potential profitability into a former rural area. These attitudes

exerted both positive and negative influences over the siting of colliery housing as well as other elements in the coal-mining landscape such as transport systems and the collieries themselves. The coal company itself began to purchase land soon after its formation in 1820. An initial twenty eight acres had been bought at the High Downs before 1823, as a valuation dated September 1823 includes reference to its purchase (63). The size of the company's estate was enlarged rapidly to 157 acres by C.1826 (64) and by 1839 had increased slightly to 161 acres, concentrated entirely at Hetton Downs in a discrete block (fig.17) (65). It is surely no coincidence that the early construction of the miners' rows at the Downs occurred on this land. The coal company in addition to purchasing land outright, entered into lease agreements with the major local landowners in all three townships to mine coal and to construct the total assemblage of elements that constituted the coal-mining landscape. In some cases the leases contain specific references to the building of houses. For example in the agreement made between John Lyon and the company in which Lyon leases the mining rights under his estate for forty two years from 1820, the landowner agrees,

"that the workmen's houses be paid for at a rack rent to be fixed." (66)

The general siting of the mining settlement seems to have been influenced largely by the distribution of the estates of those landowners who either sold or leased land to the company. Other landowners however exerted a negative influence over the siting of the elements of the coal mining landscape. For instance, the joint landowners of the whole of Little Eppleton township, G T Fox Esq and Mrs Mary Croston, insisted in a lease agreement of November 1820 that the lessees, ie the company,

"were not to build any dwelling houses to be inhabited or used as a dwelling house on the Estate, except such houses not exceeding six in number as shall be necessary for the residence of the Engine and machine men." (67)

This restriction was subsequently complied with and only two cottages were constructed in the township; they were known as the Railway Cottages and were built close to the Eppleton stationary engine, one being occupied in

1851 by an engineman and one by a waggon conductor (68). The two other principal estate owners, John Lyon and Francis Mascall of Great Eppleton, did not specifically limit the number of houses to be built on their land but the agreements between owner and lessee did in both cases lay down spatial restrictions on the siting of other elements of the coal-mining landscape that have influenced the evolution of the landscape. In 1822 Lyon forbade the sinking of any pit within 500 yards of Hetton Hall (69), whilst in 1824 Mascall did not allow any sinking to take place in any part of his estate (70). As a result, Eppleton Colliery was sunk in the extreme west of Great Eppleton township on land owned by Lyon and leased to the company (fig.15). The routing of waggonways and railways was also influenced by such "lordly intervention". Lyon insisted that no waggonway should cross the grounds of Hetton Hall (71), and Mascall precluded the construction of any line within 440 yards of his mansion at Great Eppleton (72). At Little Eppleton Fox and Croston were even more specific in insisting that the company could not,

"make or lay any waggonway nearer to the south side of the mansion house than 150 yards, nor any such way on the north side of the mansion to the south of the beck which runs the thicket or fox cover." (73)

In each case these constraints were observed, and the siting of pits, the alignment of waggonways and the general distribution of the units of settlement in the mining village were all influenced considerably by the various demands of the local landowners.

The factors influencing the evolution of the settlement morphology.

It now remains to distinguish the factors responsible for the creation of the detailed morphological characteristics of the settlement by a consideration of the extent to which the layout of buildings and streets was related to the pre-mining rural cadaster. With this in mind reference has been made to two large-scale maps, the Hetton township Tithe map of 1839 and the Hetton Estate map dating from c.1826. The latter map

provides evidence of the patterns of landownership, field shape and communications in the township at a very early stage in the evolution of the settlement pattern, with which the landscape of 1839 can be compared.

Unlike D Ward's study of Leeds (74), in which Tithe maps are used as a baseline from which to trace the influences of the pre-urban cadaster on the subsequent urban pattern, this analysis works retrogressively from the Tithe map as the morphology of the settlement had been already well established by 1839.

A comparison of the two maps shows the existence of several examples of the strong influence of landownership and field shape on the alignment and plan characteristics of the rows of miners' cottages. A series of five parallel east-west orientated rows were built immediately to the east of the Houghton road in the middle of the 1820's in a field owned by Mr R J Pemberton (fig.14). The shape of this field which was slightly more than seven acres influenced the alignment of the rows as they paralleled the long axis of this rectangular enclosure. Furthermore the closely packed double rows occupied the whole available width of the field. By 1851 the five rows contained 189 houses at an average of twenty seven per acre (75). The actual density within the streets was appreciably higher than this however, as open spaces still survived as late as 1856 within the former field, particularly to the east of the Hetton waggonway (76) (fig.18). A more extreme example of the influence of the antecedent field pattern on the morphology of the settlement is afforded by the housing at Brick Garth. Here 204 houses had been built in a field which was extremely elongated with overall dimensions of 700 yards by 70 yards. Not all of the total acreage of eight acres and three roods was occupied by housing as the westernmost section with an area of two acres 1 rood and thirty eight perches contained a steam mill (77) (fig.8). The houses were built therefore in an area of just over six acres at an average density of thirty four dwellings per acre. In 1851 the population density at Brick Garth averaged 165 per acre (78). In order to achieve this high

density of housing Brick Garth was planned as a series of twenty two short rows aligned across the width of the former field, with eleven headrows disposed along its long axis. In addition a row fronted on to Easington Lane. Two short rows and one headrow formed a three-sided unit of up to eighteen dwellings, with each side containing six dwellings in the complete examples (79). In this manner the maximization of the available space was achieved (fig.8). A third example serves to complete the illustration of the influence of plot shape on settlement morphology. At Bog Row the early miners' cottages were built on a cramped triangular-shaped piece of land which sloped down to Hetton burn. The Tithe map shows how this housing was laid out in three short rows sited around the perimeter of the plot, with two other rows within the enclosed central space so compressing the maximum number of houses into the area (fig.17). By 1856 these internal rows had disappeared.

The pattern of housing at Hetton Downs provides a complete contrast to these examples of the influence of plot shape on the settlement plan. At the Downs a large number of miners' cottages were built in an enclosure of twenty nine acres which probably corresponds to the 28 acres 1 rood 23 perch estate purchased by the coal company prior to 1823. This area is shown as being undivided on the C.1826 Estate map. Within this large unrestricting space the company built two squares of houses, the High and Low Downs at the northern and southern boundaries of this property. Even by 1839 only about nine acres had been used for housing, gardens and roads, the remainder having been divided into two large fields of nine and ten acres. In this part of the township there had been no necessity to maximize the utilization of the available space by cramming rows of houses together; as a result the early miners' housing at the Downs assumed the form of two squares with the central open spaces in one case occupied by a communal bake oven, together with separate rows (fig.17).

In other parts of the village, the morphology of the settlement shows the influence of the pattern of rural communications. By 1839 Easington Lane

consisted of two rows of houses which fronted on to the Easington road for half a mile and which extended no further back from the road (fig.17). This linear plan accords exactly with the gently curving course of the road. A similar relationship is illustrated by Downs Lane, the former rural track which linked Hetton village to the Downs estate. By 1856 the lane was paralleled by rows of cottages aligned precisely along its irregular course (fig.18). The location and plan characteristics of the village in its development up to the middle of the nineteenth century therefore would appear to owe much to the influence of the pre-mining cadaster. The mining settlement was rapidly created within the existing framework provided by the rural pattern of fields and roads, but the control exerted by the major landowners ensured that the elements of the mining landscape were not ruthlessly imposed on their properties. It should also be remembered that only a small proportion of the area was actually covered by settlement. The 1145 houses in Hetton township occupied no more than fifty two acres, of 3% of its area (80), whilst the proportion of the two other townships that was built up was negligible. The agents of housing provision had considerable freedom to choose building sites and the early mining settlement was more accordant with the rural landscape than the mining towns of the late nineteenth century which were frequently characterised by a grid-iron pattern of monotonous terraces.

Chapter 4 : Notes

- 1 Enumeration Abstract of the Answers and Returns, 1801 Census, Easington Ward, North Division, Hetton-le-Hole township.
Hereafter this source is abbreviated to 'Census abstract'.
- 2 Census Abstract 1811, 92
- 3 ibid, 92
- 4 W Fordyce, The History of Durham, Vol. 2 (1857), 579
- 5 Durham C.R.O. 'Land Tax returns. Little Eppleton township', 1760-1804.
LTA/E/N
- 6 An account of the strata in Northumberland and Durham, 218
- 7 ibid, 219
- 8 Census Abstract, 1821, 88
- 9 Census Abstract, 1831, 170
- 10 An account of the strata in Northumberland and Durham, 227
- 11 Census Abstracts, 1811 and 1821, 92 and 88
- 12 Census Abstract, 1821, 88
- 13 J D Porteous, The Company Town of Goole. An essay in Urban Genesis, University of Hull (1969), 29
- 14 Census Abstract, 1821, 88
- 15 J D Porteous, The Company Town of Goole, 29
- 16 J C Creigh, 'Landscape and People in East Durham', in Northern Geographical Essays in honour of G H J Daysh, (ed.) J W House, Newcastle upon Tyne (1966), 219
- 17 Durham C.R.O. 'Plan of Hetton estate 1825', NCB Coll. P/23
- 18 U.D.D.P. & D. 'Tithe plan of the township of Hetton-le-Hole' (1839)
- 19 Durham C.R.O. 'Ordnance Survey First Edition plans 1:2500', Durham County sheet 20.8 (1856)
- 20 Census Abstract, 1831, 170
- 21 Durham C.R.O. 'Plan of Hetton estate 1825', NCB Coll. P/23
- 22 Durham C.R.O. 'Map of projected turnpike 1825', 4" to 1 mile, Q/DP/22
- 23 U.D.D.P. & D. 'Plan of the parish of Houghton-le-Spring in the County of Durham showing the relative situation of the population in the different townships', 1827. Durham Diocesan Record Order in Council
- 24 ibid

- 25 Census Abstract, 1831, 170
- 26 ibid, 170
- 27 Census Abstract 'Houses and Population in Ecclesiastical Districts and new ecclesiastical parishes', Hetton-le-Hole, May 15th 1838
- 28 U.D.D.P. & D. 'Tithe plan of the township of Hetton-le-Hole' (1839)
- 29 A Briggs, Victorian Cities, 1963, 248, 253
- 30 Census Abstract, 1841
- 31 ibid
- 32 Census Abstract, 1851
- 33 Census Enumerators' Books, 1851
- 34 Durham C.R.O. 'Ordnance Survey First Edition map 1:10560', Durham County sheets 20 and 21 (1856)
- 35 N.E.I.M. & M.E. 'Lyons, Elemore and Eppleton Collieries. Tentale Accounts', Buddle Atkinson Papers, Vol.42
- 36 ibid
- 37 ibid
- 38 ibid
- 39 Census Abstract, 1841, 85
- 40 Whellan, Directory of Durham, 597
- 41 ibid, 609
- 42 ibid, 613
- 43 A E Smailes, North England (1968), 166
- 44 N.E.I.M. & M.E. 'Hetton Colliery reports, estimates and valuations', Watson Coll. Vol.45
- 45 N.E.I.M. & M.E. 'Lyons, Elemore and Eppleton Collieries. Tentale accounts', Buddle Atkinson Papers, Vol.42
- 46 Census Enumerators' Books, 1851
- 47 A E Smailes, 'Population changes in the colliery districts of Northumberland and Durham', Geographical Journal 91 (1938), 220-232
- 48 P N Jones, Colliery settlement in the South Wales coalfield 1850-1926 (1969), University of Hull
- 49 N.E.I.M. & M.E. 'Hetton Colliery reports, estimates and valuations', Watson Coll. Vol.45
- 50 Durham C.R.O. 'Hetton coal company; agreements', NCB Coll.4/9, 4

- 51 N.E.I.M. & M.E. 'Hetton Colliery reports', Watson Coll. Vol 45
- 52 N.E.I.M. & M.E. 'Hetton and Little Eppleton Collieries. Reports, letters and other papers relating to the property of Mr Fox', 1820-1831. Watson Coll. Vol 47
- 53 N.E.I.M. & M.E. 'Hetton Colliery reports'. Valuation of Hetton Colliery and its stock dated 6 September 1823. Watson Coll. Vol 45
- 54 N.E.I.M. & M.E. 'Hetton Colliery reports'. Valuation of the Hetton coal company and its stock dated 12 July 1832. Watson Coll. Vol 45
- 55 R T Jackson, 'Mining Settlements in Western Europe. The Landscape and the Community', 6, in Urbanization and its Problems (eds) R P Beckinsale and J M Houston, Oxford (1968), 147
- 56 U.D.D.P. & D. 'Plan of the parish of Houghton-le-Spring', 1827. Durham Diocesan Record. Order in Council.
- 57 Census Enumerators' Books, 1851
- 58 U.D.D.P. & D. 'Plan of the parish of Houghton-le-Spring', 1827. Durham Diocesan Record. Order in Council.
- 59 'Geological Survey of Great Britain (England & Wales)' 1:10560 Sheet NZ 34 NE (1964)
- 60 N.E.I.M. & M.E., Watson Coll. Vol 45. This volume contains a plan of the estate of the Hon Thomas Lyon at Hetton-le-Hole dated 1776 on which field names are given and listed in fig.1.
- 61 Durham C.R.O. 'Ordnance Survey First Edition plan 1:2500'. Durham County sheet 21.9 (1856)
- 62 Durham C.R.O. 'Ordnance Survey First Edition map 1:10560'. Durham County sheet 21 (1856)
- 63 N.E.I.M. & M.E. 'Hetton Colliery reports', Watson Coll. Vol 45
- 64 U.D.D.P. & D. 'Plan of Hetton estate', undated. Halmote Court Misc. maps and plans, 70
- 65 U.D.D.P. & D. 'Tithe plan and apportionment of the township of Hetton-le-Hole', 1839
- 66 N.E.I.M & M.E. 'Hetton Colliery reports', Watson Coll. Vol 45
- 67 N.E.I.M. & M.E. 'Hetton and Little Eppleton Collieries reports', Watson Coll. Vol 47
- 68 Census Enumerators' Books, 1851
- 69 Durham C.R.O. 'Hetton coal company: agreements', NCB Coll 4/9, 18
- 70 ibid, 174
- 71 ibid, 18
- 72 ibid, 174
- 73 ibid, 134

- 74 D Ward, 'The pre-urban cadaster and the urban pattern of Leeds',
Annals of the Associated American Geographers 52 (1962), 150-166
- 75 Census Enumerators' Books, 1851
- 76 Durham C.R.O. 'Ordnance Survey First Edition plan 1:2500'. Durham
County sheet 20.8 (1856)
- 77 ibid, sheet 21.9
- 78 Census Enumerators' Books, 1851
- 79 Durham C.R.O. 'Ordnance Survey First Edition plan 1:2500'. Durham
County sheet 21.9 (1856)
- 80 This figure has been calculated from the evidence of house plot size
which is given in the apportionment document of the Tithe plan
for the township of Hetton-le-Hole

Chapter 5

The Coal Miners

Coal miners dominated Hetton-le-Hole in 1851, comprising, as they did, some 56% of the total employment structure of the settlement (1) (table 15). They provided the labour force for the industry, the development of which had occasioned the extremely rapid increase of population since 1820. Before the first colliery sinkings few coal miners had lived in the area; with this sudden growth of a large colliery labour force in a formerly rural district, it is possible to make a detailed analysis of this newly created mining community from the evidence of the Census Enumeration Books for 1851. This chapter seeks evidence concerning three aspects of the social and economic structure of the thirty-year-old mining community at Hetton. Firstly the occupation structure within the coal industry will be examined; secondly the social composition of the coal miners' families will be analysed, and thirdly a detailed reconstruction of family mobility prior to 1851 will be made.

1 The Occupation Structure of the Coal Miners in 1851.

The occupation entries in the Census Enumerators' books indicate that of the 1175 listed coal miners, 915 were simply termed "coal miner", 127 were given an occupational description indicative of underground employment, ninety seven had surface occupations, and thirty six were of official status. Table 3 lists each entry and gives the number in each category resident at Hetton in 1851.

The imprecise definition of the actual colliery trade followed in the cases of the 915 coal miners makes a detailed analysis of the colliery employment structure very difficult. The fact that only one coal hewer is classed would suggest that many of the coal miners were hewers since they were dominant numerically in the mines at that time. However, it is unlikely that all those called "coal miners" were actually hewers. If this were the case then it is difficult to see how only twenty nine putters and eight

deputy overmen could keep pace with, and control the output of, 915 hewers. It is probable that the term "coal miners" was used in a generic sense by the Census Enumerators, and that embedded in this category there were representatives of several colliery trades and occupations.

When analysing the occupation structure of the colliery workforce it is also important to consider that the Census Returns refer to the workers resident in the settlement; they do not in the great majority of entries furnish direct evidence of their place of work. Whilst it is most likely that the great majority of the colliery workers at the local mines lived in Hetton parish, the possibility of daily journeys to work from neighbouring colliery villages such as Moorsley and East Rainton cannot be ruled out. However, in the light of the total lack of evidence of local journeys to work in the period up to 1851, it must be assumed that such journeys would be on foot and only made by a small minority of the colliery labour force.

The Underground Workers

As table 3 demonstrates, the great majority of the colliery workforce resident at Hetton in 1851 worked underground, although the possibility of some of those termed "coal miners" working on the surface cannot be ruled out. Hewers would be numerically dominant amongst the underground workers; they worked at the coal face with pick and shovel in teams, drawing lots for the various working places in the bord and pillar system of mining prevalent in the Durham mines in the middle of the nineteenth century. At Hetton, their ages ranged from twenty one to seventy in 1851. A hewer was expected to buy his own gunpowder for shotfiring purposes, his own candles and his own pick. It has been estimated that on average, a hewer would spend 1/- per fortnight on gunpowder, 1/- per fortnight on candles, 1/- to 1/6d on a new pick and 4d for each new pick shaft (2). Furthermore, hewers were fined 6d if their coal tubs contained pyrites or stone, and they received no payment for tubs that were less than full measure. Because of these conditions and because hewers were paid by output which could vary from

seam to seam it is difficult to provide an accurate account of their real wages, but contemporary evidence would suggest that hewers earned usually between 3/9d and 4/3d per day (3). In crude financial terms Durham coal hewers were more highly paid than most of the other sectors of the mid-nineteenth century workforce in England; they earned on average up to twice the wages of agricultural labourers, a wage differential that could be traced back through the eighteenth century (4).

Before becoming a hewer, a coal miner passed through other forms of underground employment. The youngest group of workers were the trappers, of whom fourteen were recorded at Hetton in 1851 (table 3). They were boys, all aged between ten and fourteen years, whose function it was to open and shut the trap doors in the underground roadways, which were designed to control the flow of air through the mine. They sat in hollows in the side of the roadway frequently in complete darkness as candles were too costly to be burned continuously by them. Their earnings averaged 10d per day (5).

Two other categories of juvenile employment are indicated by the Census returns. Twenty nine drivers lived at Hetton and most probably worked at the local collieries (table 3). They were boys, occasionally called rolley drivers, almost invariably aged between fourteen and sixteen years, whose function was to drive the pit ponies on the main underground roadways to the shaft; for this work they received an average of 15d per day (6). With developing physical maturity the drivers became employed as putters, of whom twenty nine are recorded in the Census returns (table 3). G C Greenwell describes their function as follows,

"the putters put (push) the tubs of coal from the working places to the cranes, flats or stations, whence it is taken by horses along the main or rolley ways to the shafts." (7)

The Hetton putters were invariably between seventeen and twenty one years old. Their arduous work was made particularly difficult where the roadways along which they had to push the tubs were steeply inclined. In such circumstances they might be assisted by a young boy, called a foal. The

wages of putters in the middle of the nineteenth century averaged 40/- to 44/- per fortnight (8).

When the coal tubs reached the shaft bottom or any other landing or stopping place, they were loaded on to the cages by workers known as onsetters. Only three onsetters are recorded at Hetton in 1851 (table 3). This is likely to be an underestimate and it is probable that some of the onsetters are described simply as coal miners. The Census returns indicate the residence at Hetton of other identifiable classes of underground workers. For example, one master wasteman and six wastemen are listed (table 3); they were almost invariably older miners whose function was to walk round the old workings to check that the roof had not fallen in, so impeding ventilation. They also built pillars of waste stone to support the roof in the working areas (9). Three watermen are also recorded at Hetton (table 3). Their primary function was to sprinkle water on the roadways to keep the dust down and so reduce the risk of underground explosions (10).

Surface Colliery Workers

Of the ninety seven workers who were recorded as being employed at the surface, forty were directly involved with the transport of coal. The existence of ten horsekeepers provides a reminder of the use of horses both below ground and on the surface waggonways. Although Stephenson's Hetton waggonway used three means of locomotion, inclined planes, locomotives and stationary engines, horses were employed to move the coal waggons in the colliery yards as Hair's sketch of Hetton colliery clearly demonstrates (11). The waggonmen, waggon riders and waggon drivers were responsible for the surface movement of coal from the collieries to the shipping points (table 3).

Before being despatched to market, the coal was handled by other categories of colliery workers. For example the nine banksmen who lived at Hetton-le-Hole were responsible for drawing the full tubs from the cages at the surface and replacing them with empty ones (table 3) (12). They then put

the full tubs on the weighing machines, kept an account of the coal and stone drawn each day and then put the tubs to the coal screens upon which they poured or "teemed" the coal. Screenmen and screen boys were then employed to sort the waste from the coal (table 3). In 1851 eight screenmen and two screen boys lived at Hetton. As the banksman overturned the tubs to put the coal on the screens, the axles were lubricated by a boy known as a greaser. Another group of key surface workers were employed in running and maintaining the steam engines. Brakesmen, of whom five were recorded at Hetton, were the enginemen who attended to the winding engines (13). The seventeen further enginemen must have been employed in the running of the other colliery engines as well as the locomotives and stationary engines on the waggonway (table 3). Finally, the Census returns record the existence of a small number of miscellaneous surface workers. A watchman at Elemore pit lived in neighbouring Brick Garth; a lampkeeper and a token keeper also worked at the surface, whilst a pick sharper, a colliery smith who sharpened the hewers' picks, is also recorded (table 3).

The Colliery Officials

The table of colliery officials shows that thirty six men in this class lived in Hetton in 1851 (table 3). At the head of the social scale, the coal owner, Nicholas Wood, stands apart from the officials whose task it was to see to the running of the collieries owned by the Hetton coal company. The head of mid-nineteenth century coal-mining operations was the Viewer. His function was rather wider than that of the modern colliery manager; he was responsible to the owners for the operation of the mine both underground and on the surface, as well as with the legal and financial management of colliery affairs. However, mid-nineteenth century viewers were frequently responsible for the running of a group of mines for one or more owners, and the first viewer at Hetton, Arthur Mowbray, was also a part-owner in the Hetton coal company. The high social standing of the Viewer in the

contemporary coal mining society is further demonstrated by the fact that in 1851 the Viewer of Hetton colliery lived at the Lyons in the purpose-built "Viewers House" (14). Two assistants worked under the Viewer.

Under the Viewer a group of officials were responsible for the operation and safety of the underground workings. Overmen of whom were recorded seven at Hetton, superintended the working areas, checked for gas and tested the roof supports. They were former ^{miners} viewers who had passed through all the grades of colliery employment, and for their skilled services usually received about 26s to 28s per week (15). Below them, deputy overmen (deputies) of whom eight were recorded at Hetton, also acted as officials. Their multifarious duties included the fixing of pit props, the drawing of pit props no longer needed to support the roof, the erection of "brattices" or wooden divides in the shaft, and the assignment of hewers' workplaces and the tubs for the putters. Of the minor officials living at Hetton it is noteworthy that the Census records a company coal weigher and a coal miners' weigher. The latter, whose modern equivalent is termed the check-weighman, was responsible for protecting the interests of the hewers by checking the company weigher's assessment of the weight of their tubs as they were brought to bank. Clerical staff are also recorded at Hetton as well as a small group of inspectorate staff. A coal fitter also lived at Hetton: his important function was to act as a broker to conduct the sale of coal between the colliery company and the shipper of the coal to the markets particularly in London (16).

The total number of officials living at Hetton is considerably in excess of that found by R T Jackson at the neighbouring colliery settlement of South Hetton in 1835 (17). It is probable that the Hetton total of thirty six compared with the twelve officials at South Hetton, reflects the centrality of Hetton in the running of the Hetton coal company's "empire". The management of the three company collieries was centralized at Hetton Lyons whereas the South Hetton was the only one run by its owners, the South Hetton Coal Company.

2 The Social Structure of the Coalmining Families.

From the Census Enumeration Books an analysis of the social composition of the households occupied by the coal miners has been made. It is only by means of a detailed investigation of each household that a thorough examination of the social structure of any one economic group within the community can be attempted, and this information cannot be extracted from the printed census abstracts.

641, or 53.6%, of the households at Hetton in 1851 were headed by a coal miner (18). These households frequently contained several other miners who were usually the sons of the head of the household; less frequently they were relatives or unrelated lodgers. For the purposes of this study, those households in which the head was a widow but which contained a coal miner son or sons, have been excluded, even though it is likely, but not certain, that the widow's husband had been a miner.

Family Size

For the purposes of this analysis the family has been defined as the nuclear unit consisting of parents and children, including step-children, but excluding other residents either related or unrelated. Within these mining households the mean size of the miners' families has been calculated as follows:

Coal Miner head of household	1.00	per household
wife	0.94	per household
children	2.51	per household
mean family size	<u>4.45</u>	

The mean family size for the total population of Hetton was 4.03. To facilitate a further comparison of mean family size, the following table shows the mean family sizes of the five Social and Economic Groups calculated by Armstrong for York in 1851 (19)

Family Size and the distribution of children by class. York 1851.

S.E.G.	1	2	3	4	5
Mean Family Size	3.39	2.98	3.70	3.22	3.65
Mean number of children	1.85	1.37	1.93	1.52	1.94

The Hetton coal miners had a greater mean number of children per family than any of the social groups at York in the same year, including social groups 3 and 4 in which the coal miners would be classed according to Armstrong's use of the 1950 General Register's office fivefold classifications of occupations.

Only forty of the 641 coal miner households were headed by unmarried men. They fell into two categories; firstly single men often living with siblings or aged parents, and secondly widowers. The latter frequently employed residential housekeepers to perform domestic duties. The great majority of the families however were nuclear, with the father, mother and children only in a minority of cases sharing the dwelling with relatives and lodgers. It was very rare for the wife of a coal miner to be gainfully employed outside the household. The paucity of opportunities for female employment was as characteristic of Hetton as of many other coal-mining communities. The chief form of female employment was in the personal clothing trade, usually as dressmakers working at home.

The size of the families of the coalminers varied greatly in relation to the age of the coal miners, and is indicated in the following table, in which the miners are placed into five year age groups, the total number of the children of miners in each of the age groups is indicated as well as the mean number of children per coalminer within the same five year age spans. The table demonstrates clearly that the largest mean number of children per coalminer occurred amongst the middle-aged miners. The mean number shows a general increase to the very high figure of 3.95 children in the 45-49 age range, with a steady decrease in the older age groups which becomes particularly pronounced from the age of 55 onwards, as might be expected. The smaller mean numbers of children in the families of the younger coal

miners under the age of thirty simply reflects the shorter length of married life in which to produce children.

Total number of children in the families of the coal miners who were heads of households

Age Group of Miners	Number of Children	Number of Miners	Mean number of Children/Miner
15-19	0	1	0
20-24	39	46	0.85
25-29	188	125	1.51
30-34	305	115	2.65
35-39	358	94	3.80
40-44	217	59	3.68
45-49	258	65	3.95
50-54	129	41	3.12
55-59	64	39	1.64
60-64	42	30	1.40
65+	13	26	0.50
Total	1613	641	2.51

Certainly the close birth dates of the children of many of the younger miners would suggest that in the years after 1851 they would have large families like the older coal miners.

The figures of the mean number of children per miner mask a wide range of individual family sizes within the same age groups. The table above indicates the distribution of the numbers of children per family within the five year age groups, whilst table 4 shows the number of families with the indicated number of children. The preponderance of coal miner families having two or fewer children in the under thirty age groups is to be expected as a function of a short period of marriage; what is possibly more surprising is that the high mean family size of the middle-aged coal miners is less the product of very large families with seven or more children, than the result of the frequent occurrence of families with

between four and six children. Of the 358 children of the coal miners aged between 35 and 39, 239 lived in families with between four and six children, whilst only 53 occurred in families with seven or more children. Furthermore the frequent incidence of between four and six children in the families of coal miners aged forty years and over is maintained up to the age of fifty. However, amongst the older coal miners there is a marked reduction in the frequency of large families; only six of the 136 families headed by coal miners aged over fifty contained six or more children. This is probably the result of early deaths and the movement of some of the surviving older children away from the parental home in the search for work. Table 4 confirms the trends discussed above and demonstrates that 96.3% of all coal miners' families contained six or fewer children.

The nuclear family unit, sometimes augmented by lodgers or visitors, was the dominant social group in the mining households at Hetton in 1851. Although multi-generation families with an accompanying range of more distant blood relatives did exist, they were by no means common in the coal-mining households. The mean family size of the miners was larger than for that of the whole settlement, which itself exceeded the mean family size at York in the same year. The maximum mean family size occurred amongst the group with fathers aged between forty five and forty nine when the parents had reached their reproductive limit, but probably before many of their children had left home. Colliery workers rarely became hewers before the age of twenty one and usually did not marry until they had reached that status. The Census returns also demonstrate vividly the hereditary factor which was operative in the provision of the colliery labour force. It was rare for the sons of coal miners not to work at the pit. In family after family, a string of sons can be found finding employment appropriate to their age at the colliery. This family pattern of the coal mining workforce probably helped produce the contemporary attitude of miners being regarded as a distinct and separate social "caste", very prone to perpetuate the family tradition of colliery employment, and

more likely to change their place of residence than their work.

In order to provide a detailed insight into the composition of actual mining families, a sample of fifty households has been studied, drawn from Downs Lane, a miners' row built by the Hetton coal company on its own estate between 1827 and 1839. The households have been taken in sequence along the Lane, from the Census Enumerators' Books, to illustrate the socio-economic structure of this unit of housing.

Downs Lane. Houses Nos 1-50.

Total number of residents gainfully employed			105
A Total number of residents employed in coal mining			<u>88</u>
Coal mining occupation list:	Coal Miner		66
	Coal Miner & Publican		1
	Deputy Overman		2
	Screenman		3
	Brakesman		1
	Putter		5
	Driver		6
	Switch boy		1
	Halt boy		1
	Trapper		2
B Other occupations	<u>Male</u>	<u>Female</u>	
	Grocer & Draper	Schoolmistress	1
	Assistant to Grocer & Draper	Dressmaker	3
	Agricultural labourer	Housekeeper	1
	Stonemason	Houseservant	4
	Apprentice gardener		
	Labourer		
	<u>8</u>		<u>9</u>
C Not gainfully employed			
	Pauper		2

In this fifty household sample coal mining clearly dominated the employment structure with 92% of the males working at the collieries. Although most of the colliery workers are simply recorded as coal miners, there is a sufficiently comprehensive list of alternative work titles to indicate the presence of officials, surface workers and boy employees. The pattern of female employment was severely limited; only the school-mistress was employed outside the domiciliary household, the other eight women working in the houses in which they were resident:-

Family Size in Downs Lane

<u>Number in the family</u>	<u>Number of families</u>
1	1
2	10
3	10
4	5
5	7
6	9
7	3
8	3
9	1
10	0
11	0
12	1
	50
	—

The above table, which shows the distribution of family size in the Downs Lane sample, demonstrates several noteworthy characteristics. The fifty households contained exactly fifty families, there being no multiple-occupance of any dwelling in the sample. 42% of the families contained no more than three people; these small families were headed usually either by a young recently married coal miner or by an elderly miner whose children had probably left home. Amongst the larger families the commonest number

of children was three or four, and only two families, 4% of the sample, contained seven or more children.

Apart from the members of the nuclear family, there were few other residents in the households. A total of ten relations lived in seven separate households. This incidence of resident relations is considerably lower than for the whole of Hetton, in which one household in five recorded a relation, and is also lower than the $21\% \pm (2.9)$ frequency at York in the same year (20). The 10% incidence of servants is similarly low and compares closely with the 8.2% frequency for all the households in Hetton, a much lower incidence than that found at York where the existence of a significant middle class increased the likelihood of households with servants (21). 14% of the sample houses contained lodgers. In each case the host was a coalminer, and the lodgers were all male coalminers, being with one exception single and under thirty years of age. Although well above the average incidence of lodging at Hetton, which was only 7.7% of all households, the frequency of lodgers in the Downs Lane sample was markedly lower than that found in York where Armstrong has demonstrated the existence of lodgers in $21\% \pm (2.9)$ of the households in 1851 (22). At this date Hetton did not have the pronounced shortage of housing that would have produced a high incidence of both lodging and the multiple-occupance of dwellings. This is probably due to the existence, during the decade 1841-51, of a surplus of housing consequent upon the marked population decline noted in the 1841 census. It is likely that much of the population increase of nearly 1500 between 1841 and 1851 could be accommodated in the 228 houses recorded as uninhabited in 1841.

3 The Coal Miners: Birthplace and mobility patterns.

The 1851 Census Enumerators' Books provide the earliest comprehensive source of information from which the detailed mobility patterns of individual families can be reconstructed. As this was the first census in which actual birthplaces and ages were recorded, it is possible to see where families were living at given dates before 1851. In this section two analyses have been attempted from this data. Firstly, the birthplaces of the coal miner heads of households have been plotted and secondly the birthplaces of their children have been recorded. For this purpose, the children have been placed into five year age-groups from 0-4 years upwards, and the distribution of the birthplaces of these different age groups have been analysed in the context of the contemporary development of the Northumberland and Durham coalfield.

An analysis of the distribution of the birthplaces of the coal miners alone would reveal little of the migration patterns that characterized the rapidly expanding coalfield in the first half of the nineteenth century, as no account would be taken of possible mobility between the birthplace and the assumption of residence at Hetton. This deficiency can be partially remedied by plotting the birthplaces of the children by age-group, thus showing generalized distributions of birthplaces during known five year periods. The use of this method will, however, not permit a total reconstruction of coal miner migration prior to 1851. There is no evidence of the detailed movements of single miners, and of childless couples; also there is incomplete information concerning movement in the cases of families with children of widely-spaced ages. Furthermore, the death of children before 1851 and their subsequent absence from the Enumeration Books will reduce further the completeness of the evidence. However, despite the warnings of Armstrong concerning the use of this censal evidence to attempt migration reconstructions (24), the birthplace distribution of children in their respective age groups does reveal a changing spatial pattern that

can be closely related to the contemporary patterns of exploitation of the North Eastern coalfield.

Birthplace of Coal Miners: General Distribution

Hetton-le-Hole	23
Co Durham	339
Northumberland	182
North of England	60 (Cumberland, Westmorland, Yorkshire, Lancashire)
Rest of England and Wales	16
Scotland	5
Ireland	5
Foreign	1
Born at sea	1
Not known	9
	<hr/>
	641
	<hr/>

The overwhelming majority of the coal miner heads of households were born in the North East of England, with 85% of them originating from Northumberland and Durham (fig.19). Only a small number of the miners had been born in the Hetton area, as might be expected on the newly-exploited concealed section of the coalfield. Clearly the small pre-mining rural population played a negligible part in the provision of labour for the collieries established after 1820. Of the remaining northern counties, Lancashire was the birthplace of only one miner, and only six originated from Westmorland (table 7). Twenty four miners had been born in Cumberland, particularly in the Pennine lead dales or on the West Cumberland coalfield. The former probably exemplify the general migration of leadminers on to the coalfield which, according to Smailes, occurred in the 1830's owing to a depression in lead-mining (24). In contrast, the twenty nine Yorkshire-born coal miners nearly all originated from rural areas, with nine coming from Reeth in Swaledale, and others coming from other Pennine dales as well as from lowland agricultural areas (fig.19) (table 7). This source of recruitment before 1851 was probably supplied by the depressed linen weaving

industry of the North Riding (25), although it must be remembered that the Census Returns offer no direct evidence of employment before residence at Hetton.

Very few coal miners had been born outside the north of England (fig.19). Of the sixteen born in the rest of England and Wales, six originated in Derbyshire coalfield locations and could have been brought into the Durham coalfield as strike breakers by the coal owners at the time of the great miners' strikes of 1831 and 1844 (table 7). Four miners had been born on Welsh coalfields, and the rest seemed to originate in a random scatter of locations. Surprisingly, only five miners had been born in Scotland and a similar number in Ireland. This evidence would tend to contradict the findings of R T Jackson, who seems to have assumed that the 5% Irish-born element in the 1851 population of the neighbouring Registration District of Houghton-le-Spring, were almost exclusively employed in coal mining (26). The evidence from the Hetton census returns would indicate that the reverse was the case, the Irish-born here rarely seeking employment in the coal mines.

The distribution of birthplaces in Co Durham

The 339 Durham-born miners originated from 95 identifiable places. Table 5 lists these locations, and figs. 20 and 21 illustrate the distribution in the context of the Durham coalfield. It is immediately apparent that very few of the miners had been born in places that at the time of their births were not exploited sections of the coalfield. Only nineteen miners had been born in such extra-coalfields locations in Pennine Durham and the south east of the county. The majority of the miners had been born in two sections of the coalfield, the mid-Wear valley lying immediately to the west of Hetton, and lower Tyneside. Two hundred and eleven miners had been born in the former area, and with the opening of the collieries in the Hetton area a large-scale, but very short-range migration had occurred to these new sources of employment. This migration trend is related to

the pattern of coal exploitation which had produced the development of mining in that part of the mid-Wear valley area lying immediately to the west of Hetton in the first two decades of the nineteenth century. The stimulus to extend mining operations at locations such as Pitlington, Moorsley and Rainton had been the temporal coincidence of the proving of the deep Hutton seam as a high quality household coal with the need to replace the nearly exhausted High Main seam on lower Tyneside. It is also significant that the miners' distribution of birthplaces reveals locations close to the river, in the long-established part of the mid-Wear section of the coalfield such as Fatfield and Oxclose, as well as locations much closer to Hetton where mines had been opened in the first two decades of the nineteenth century such as Pitlington and Rainton.

Lower Tyneside, which has been defined as the Durham side of the river downstream from the Tyne bridge, was the birthplace of fifty five coalminers. The peak of coal mining activity in this part of the coalfield had occurred at the beginning of the nineteenth century, and by 1820 a decline had set in (27). Some of the subsequent emigration of miners was clearly directed to the Hetton area, where the mining of the deep Hutton seam household coal had been stimulated by the impending exhaustion of the accessible reserves of household coal in the collieries on lower Tyneside. Few of the coal miners had been born in the old-established sections of the Durham coalfield on upper Tyneside and in north west Durham possibly because of a revival of mining in these areas after about 1825 thanks to a growing demand for their steam coal and coking coal reserves. A very small number of the coal miners had been born in east Durham. The recency of much of the mining on the east Durham plateau which, apart from in the Hetton area, largely post-dated 1830, was the probable reason for only fourteen of the coal miner heads of households originating here.

Of the nineteen coal miners born in extra-coalfield locations, it is possible that some at least of the seventeen born in the Pennine dales were examples of lead miners moving on to the coalfield as a result of the depression of

lead-mining in the 1830's. In the light of this possibility it can be seen that very few of the Durham-born miners originated from purely rural backgrounds and that the overwhelming source of labour for this newly exploited section of the east Durham coalfield after 1820 was provided by a short-range movement of miners from other parts of the coalfield which were at the time subject to a decline in coal production and hence a reduction in employment opportunity.

The distribution of birthplaces in Northumberland

One hundred and eighty two coal miners were born in fifty eight identifiable locations in Northumberland. The majority of these men had been born in the south east of the county, east of Newcastle and south of the fault known as the Ninety Fathom dyke. This area had reached a peak of coal production in the early part of the nineteenth century and a subsequent decline had led to emigration particularly in the 1820's and 1830's to both east Durham and to the newly developing section of the Northumberland coalfield to the north of the Ninety Fathom dyke. Only nine miners living in Hetton in 1851 had been born in the mining settlements such as Cramlington, Seghill and Dudley which had grown in response to this northerly spread of mining, but a much more frequent movement occurred from the older communities closer to the Tyne such as Benton, Longbenton and Wallsend, in which 31, 15 and 13 miners respectively had been born. The fact that migrants to Hetton from Benton in particular in some cases lived in adjacent blocks of miners' cottages at Hetton Downs does suggest something akin to an organised movement of certain mine workers, perhaps in response to advertisement by the Hetton coal company.

Newcastle had been the birthplace of twenty three of the Hetton miners. In the majority of cases the named locations in the Newcastle area such as Fawdon, Kenton and Coxlodge, coincided with the sites of working collieries at the dates of the births of the miners. In contrast to the pattern of origin of the Durham-born miners, twenty of the Northumberland-born had

originated in rural locations, particularly in Tynedale and rural mid-Northumberland. It is probable that this small group represent some of the few actual examples of occupational mobility amongst the total North East-born mine labour force at Hetton in 1851.

An analysis of the distribution of the birthplaces of the miners alone, however, gives no positive proof of detailed migration patterns. In order to gain an insight into this family mobility, a study of the birthplace patterns of children in five-year age groups has been made. The following table indicates the overall pattern of birthplaces for each of the age groups. Figs. 23 and 24 illustrate the birthplace distribution for Northumberland and Durham.

Children of Coalminers and Widows of Coalminers: Locations of birthplaces in relation to age

Birthplace	0-4	5-9	10-14	15-19	20-24	Age Group
Hetton	414	150	121	69	23	777
Co Durham	223	176	127	89	34	649
Northumberland	63	81	73	45	19	281
North	0	4	9	8	4	25
Rest of England	1	3	5	5	5	19
Scotland	1	2	1	1	0	5
Ireland	0	1	1	1	1	4
Not known	0	0	1	0	0	1
	702	417	338	218	86	1761

The children of the coal miners were born overwhelmingly in Northumberland and Durham, with only 3% originating in the remainder of the British Isles. The proportion of children born at Hetton diminishes with increasing age and only in the youngest age group does this category actually form an overall majority. This pattern could be anticipated as simply reflecting the residential pattern of the years immediately prior to 1851, but even in this 0-4 year age group, 40% of the children were born outside Hetton.

This probably underwrites the extent to which immigration into the Hetton area in the later part of the 1840's contributed towards the demographic revival after the decline noted in 1841. It is also evident that the proportion of children born outside the North East is higher amongst the older age groups. This may provide local illustration of the longer-range migration that characterizes the movement of workers on to the coalfield particularly during the 1830's. However, it is necessary to be cautious when interpreting these figures as the families with older children represent only the remnant of a population, some of which had emigrated from Hetton before 1851.

The distribution of the birthplaces of the children in the mining households is illustrated by two maps, Figs. 23 and 24, and tables 8, 9 and 10. Fig. 23 simply indicates the origins in Northumberland and Durham of the oldest group of children, aged between 20-24, whilst Fig. 24 shows the birthplace distribution of the two age groups, 0-9 and 10-19 years. The tables give greater detail as they name each birthplace and indicate the number of children born there within each of the five year age groups, for each regional subdivision of the two counties.

County Durham birthplace distribution

Fig. 23 shows that the distribution of the birthplaces of the oldest age group of "children" was restricted to the mid-Wear valley and Lower Tyneside. The movement of their families to Hetton represented the last stage of a pattern of mobility that took them away from these long-established mining areas towards expanding sections of exploitation between 1827 and 1831. The birthplace pattern of the eighty nine children in the 15-19 age group is also dominated by locations in the mid-Wear valley and on Lower Tyneside, but a few had been born on the east Durham plateau. This latter category must represent the children of miners attracted to the nascent mining communities established on the concealed coalfield during the period 1831-1836. The birthplace distribution of the 127 children in the age group

10-14 shows that whilst most had been born either close to Hetton in the mid-Wear valley, or on Lower Tyneside, increasing numbers had been born in the newly established mining settlements of east Durham at places such as Haswell, Sherburn Hill, Shotton, Thornley and Wingate. The beginnings of coalminer mobility between the villages of the newly-exploited concealed coalfield is suggested by these entries and is confirmed by the evidence of the distribution of the birthplaces of the children in the 5-9 year age category, in which these new communities occurred as the birthplaces of large numbers of young children whose parents must have moved to Hetton to find work during the 1840's. The short range of the most recent migration to Hetton in the five years preceding 1851 is again emphasised by the distribution of the birthplaces of the children in the youngest age group. 60% had been born in Hetton, but of the remainder the great majority came from the adjacent villages in the mid-Wear valley and from the mining villages of east Durham; very few had been born in upper Tyneside, in North West Durham or in the rural parts of the county. Analysis of the birthplace distribution of the different age groups of children reveals a strikingly mobile population. Residence in one mining village for ten consecutive years appears to have been exceptional amongst the coalmining families at Hetton in 1851. Even amongst the newly-established large colliery villages of east Durham the Hetton evidence would suggest that much movement by miners occurred in response to the short term economic vicissitudes of the various collieries and their dependant settlements.

Northumberland

Two noteworthy facts emerge from an analysis of the distribution of the birthplaces of the children born in Northumberland. Firstly, one mining community alone, Benton, was the source of 96 of the 284 children born north of the river Tyne. As they are represented in every age group, this would suggest a sustained movement of families to Hetton from Benton from at

least as early as the late 1820's. Secondly, the distribution of the oldest age group of children is more restricted than that of the younger children. The nineteen Northumberland-born children aged between 20-24 all originated close to the Tyne, whereas the pattern of the birthplaces of the younger children widens in temporal association with the expansion of coal field exploitation during the 1830's and 1840's. Several of the younger children were born in villages such as Cramlington, Seghill, Seaton Delaval and Seaton Burn, all mining communities that had come into existence as a result of the successful exploitation of the deeper seams found to the north of the Ninety Fathom Dyke between 1830 and 1850. However, even in the case of the youngest age group, the majority of the children had been born in the declining older colliery districts to the south of the Dyke such as Benton and Wallsend, and there is an almost total lack of children born in rural locations. Therefore, the evidence of the distribution of the birthplaces of the children born in Northumberland reinforces the thesis that the workforce of the Hetton collieries was drawn almost exclusively from the existing sections of the North East coalfield (28).

Migration patterns in the fifty households of the Downs Lane sample

Examination of the birthplaces of each of the heads of the resident families and their children, tends to confirm the temporal variations in the sources of mining labour which has been demonstrated by the plotting of the children's birthplaces by age group. By noting the birthplaces and the ages of the children in the sample households, several distinct migratory "trails" can be distinguished, and these are evident in fig.25. Some caution is necessary when attempting this analysis however: one cannot always assume that the family was living at the child's birthplace. In a few cases a child's birthplace was the same as the mother's, suggesting that the mother returned to her parents' house to have the child, but in the great majority of cases it can safely be assumed that the child was

born at its parent's house, and that the pattern of birthplaces reflects family mobility with reasonable accuracy. Table 12 lists the 44 households which contained coal miners as heads of the household and sufficient birthplace evidence to enable a pattern of family mobility to be plotted, and indicates the likely pattern of movement for each of these families. In fig.25 the desire lines indicate the patterns of movement which emerge from the plotting of this birthplace evidence.

Analysis of family migration patterns

Two migration paths dominate the mobility patterns of the families in the sample. Firstly, a frequent movement from the mid-Wear section of the Durham coalfield occurred either as an apparently direct move to Hetton or as a movement to Hetton with an intermediate sojourn in that part of the mid-Wear coalfield in which exploitation had occurred in the years immediately prior to the opening of the Hetton collieries. Secondly, there is frequent exemplification of mobility between Lower Tyneside and Hetton, again either as a direct move, or as the culmination of a more complicated pattern of mobility involving in some cases short periods of residence at villages in the Northumberland coalfield north of the Ninety Fathom Dyke. Other families had moved into the new mining settlements of the east Durham plateau in the 1830's and 1840's and then moved to Hetton as part of a migratory pattern amongst the large mining villages of the concealed coalfield. There are a few examples of longer-range migrants residing at the Downs in 1851. One miner had moved from the Durham lead dales in the 1840's, another had moved from the Cumberland coalfield to Hetton before 1844; a Somerset-born coalminer had assumed residence in Hetton before 1838 and there is one example of a Derbyshire-born miner who seems to have arrived at Hetton before 1834, possibly as a strike-breaker. Only two of the families were headed by a Hetton-born coal miner.

Judging from the Hetton Census returns it is apparent that the mining

population at mid-century was highly mobile both within and between the various sections of the Northumberland and Durham coalfield. Very few of the families appear to have lived in Hetton continuously since 1831, long-distance migrants were numerically insignificant and there is little evidence of occupational mobility. Hetton in 1851 was very largely peopled by coalmining folk with a family tradition of employment at the collieries in the oldest established parts of the North Eastern coalfield.

Chapter 5 : Notes

- 1 Census Enumerators' Books, 1851. The chapter draws heavily on this source, and where direct reference to the Enumerators' books is made in the text, it is proposed not to make a separate entry in the notes for this chapter
- 2 Durham C.R.O. Children's Employment Commission. Mines. Part 1 (1842), 134
- 3 G C Greenwell, A Glossary of the terms used in the Coal Trade of Northumberland and Durham (1888), 47
- 4 T S Ashton & J Sykes, The Coal Industry of the Eighteenth Century, Second Edition, Manchester (1964), 147, 148
- 5 Durham C.R.O. Children's Employment Commission. Mines. Part 1 (1842), 157
- 6 ibid, 157
- 7 G C Greenwell, A Glossary of the terms used in the Coal Trade, 5
- 8 Durham C.R.O. Children's Employment Commission. Mines. Part 1 (1842), 157
- 9 ibid, 87
- 10 ibid, 87
- 11 T H Hair, A series of views of the collieries in the counties of Northumberland and Durham (1844), reprinted in 1969, 43
- 12 G C Greenwell, A Glossary of the terms used in the Coal Trade, 5
- 13 ibid, 12
- 14 Census Enumerators' Books, 1851
- 15 G C Greenwell, A Glossary of the terms used in the Coal Trade, 60
- 16 ibid, 39
- 17 R T Jackson, 'Mining Settlements in Western Europe', 157
- 18 Census Enumerators' Books, 1851
- 19 W A Armstrong, 'The interpretation of the census enumerators' books for Victorian towns', 80
- 20 ibid, 72
- 21 ibid, 79
- 22 ibid, 72
- 23 ibid, 84
- 24 A E Smailes, North England, 166
- 25 ibid, 166

- 26 R T Jackson, 'Mining Settlements in Western Europe', 148
- 27 A E Smailes, North England, 162
- 28 J W House, North Eastern England. Population movements and the landscape since the early nineteenth century. University of Newcastle upon Tyne (1959), 51.

In a section of this monograph J W House discusses the nature of the migration patterns that occurred on the North Eastern coalfield during the nineteenth century. Two points in particular seem to run counter to the limited evidence of the Hetton census enumerators' books; these are firstly that during the period 1821-1871 a "virtually alien population grew up on the Durham coalfield", as a result of significant immigration into the coalfield: secondly the dating of the period of redistribution of people within the North East from 1871 to the beginning of the twentieth century also apparently contradicts the Hetton evidence. This suggests that either the Hetton experience is atypical or that it is only through a study of the enumerators' books rather than the statistical material of the Census reports, that a true impression of the volume of interdecennial migration can be formed.

Chapter 6

Hetton-le-Hole in 1851. Social structure and economic life

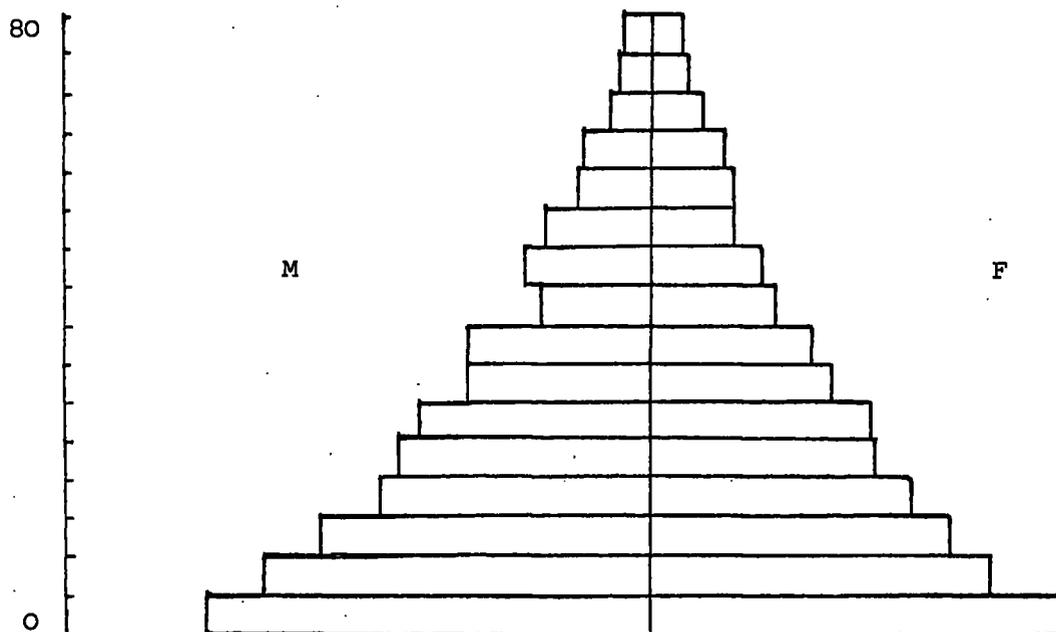
The aim of this chapter is to reconstruct the living community at Hetton; a community that had been created in the thirty years since the opening of the first collieries in the area. In order to achieve this aim, three aspects of the contemporary society will be examined from the material incorporated in the 1851 Census Enumerators' books (1). Firstly the social structure of the population will be analysed; then a survey of the overall occupational structure of the settlement will lead to a final consideration of the evidence of socio-economic zonation within the mining settlement. Since the analysis involves the use of data drawn from each household, no sampling techniques have been employed. This is a total reconstruction of a mid-nineteenth century coal-mining community.

1 The Social Structure of the Community

(a) Demographic characteristics

The 1851 population of the three townships totalled 5751 of which 51.7% was male. Ever since coal mining had begun the sex-ratio had consistently been male-dominated, but the 1851 ratio shows a considerable reduction in the degree of male domination compared with the pioneer stage of colliery settlement when, for example, in 1821 59.4% of the population had been male (2). J D Porteous in studying the new Company Town of Goole, similarly found that the male ratio had fallen to 51.28% in 1851 some twenty five years after the founding of the new settlement owing to the development of family life and the disappearance of groups of navvies and other constructional workers (3). This trend parallels the evolution of the sex-ratio at Hetton very closely. The sex-ratio was male dominated particularly in the age groups that coincided with employment at the coal mines. Only in the older age ranges does the age pyramid (over) show that females outnumbered males.

200 0 200



Age pyramid : Hetton-le-Hole 1851

The preponderance of females aged over 54 years probably reflects a differentially high death rate with a shorter life expectancy rate for men employed largely in a dangerous and unhealthy occupation. The somewhat unexpected majority of men found in the age groups between 45 and 54 might reflect the massive inflow of young men seeking work in the newly opened mines at Hetton between 1820 and 1830. Possibly, because of the sex imbalance at this time, a sufficiently large number of men remained single, thus influencing the sex-ratio. The masculinity of the population is unexpectedly emphasised in the youngest age group between 0 and 4 years, in which males outnumber females by 468 to 421; at the other end of the age spectrum amongst the population aged over 75, there are 30 males to 33 females, a significantly higher proportion than might be expected in this age group.

The population of Hetton in 1851 was youthful. Examination of the age pyramid shows that 49.5% of the population was under twenty years of age, 66.5% under thirty years, 87.6% under fifty years and that only 4% were sixty five or older. This distribution of age groups is closely paralleled

at Goole, where Porteous in 1851 found an identical percentage under thirty years of age (4). The population structure of Hetton strongly suggests, although the Census Returns do not give complete evidence, that both birth and death rates were high, although the former considerably exceeded the latter; that families were therefore large, and that the working population was augmented by the immigration of actively employed people. In 1851, Hetton, like first generation Goole, "was clearly tending towards Weber's rapid increase model". (5)

The mean size of the 1198 households at Hetton was 4.80. This figure is slightly larger than the 4.70 (± 0.18) calculated by Armstrong for York in 1851 using a 10% sample of the households in the Census Returns (6). The following table indicates the distribution of household sizes at Hetton and York in 1851

PERSONS PER HOUSEHOLD 1851 : PERCENTAGE DISTRIBUTION

PERSONS	1	2	3	4	5	6	7	8	9	10	11	12	13+
HETTON	3.5	13.2	16.4	15.3	14.4	14.3	9.5	5.0	2.2	1.8	1.5	0.4	0.8
YORK	5.1	15.0	16.0	17.7	13.6	13.3	6.6	4.5	2.9	2.3	1.2	0.6	1.2

An initial examination of the percentage distribution of the household sizes might suggest that only a small difference existed between the new, almost completely mono-functional mining community, and the ancient cathedral city with its wide range of economic and social groups. However, some significant contrasts become more apparent in the next table which shows the cumulative percentage distribution of persons per household in 1851

PERSONS PER HOUSEHOLD 1851 : CUMULATIVE PERCENTAGE DISTRIBUTION

PERSONS	1	2	3	4	5	6	7	8	9	10	11	12	13+
HETTON	3.5	16.7	35.1	50.4	64.8	79.1	88.6	93.6	95.8	97.6	99.1	99.5	100.3
YORK	5.1	20.1	36.1	53.8	67.4	80.7	87.3	91.8	94.7	97.0	98.2	98.8	100

The table shows that for both settlements approximately 80% of the households contained six persons or less, and that the incidence of very large households with ten or more persons was rare. However, the table does indicate some variation in the statistical distribution of household sizes between the two

places. In the first instance rather more of the York households contained a smaller number of residents than was the case at Hetton. Very small households with one or two inhabitants occurred more frequently at York, whilst fewer households, 64.8%, contained five or less people at Hetton compared with York, where the incidence was 67.4%. In contrast rather more of the Hetton households, 31%, held between six and ten occupants compared with a frequency of 27.3% at York. It is possible that the greater incidence of smaller households at York can be related to the greater frequency with which single elderly females might be found in such a long-established city compared with the new mining community. The greater frequency of Hetton households with between six and ten inhabitants, probably reflects the differentially large mean coal miner family size demonstrated in chapter 5.

The households at Hetton contained 1270 families, a number not greatly in excess of the 1198 households, and some indication of the relative infrequency of the multiple occupancy of dwellings in 1851. For the purposes of this study the family has been defined as the nuclear unit consisting of father, mother and children, including step-children, but excluding all other relatives of the head of the household, as well as non-related residents such as lodgers, visitors and apprentices. The mean family size for Hetton was 4.03. As has been indicated in chapter five, the mean coal miner family size was 4.45, whilst the mean family size for the non-coal mining families was 3.60. This would appear to suggest the differentially large families in the coal mining households, a factor that contributed much to the provision of labour in the coal mines. The relatively large family size of the Hetton coal miners has already been compared with the mean family size at York, and was obviously a function of the greater mean number of children per family. In marked contrast, the mean size of the non-mining families of Hetton approximated closely to the mean family sizes of social and economic groups three, four and five at York in the same year, a mean family size of 3.60 at Hetton comparing with 3.70 for class three, 3.22 for class four and 3.65 for class five at York (8). As the

great majority of the non-mining population at Hetton fell into the lowest three social and economic groups as defined by the 1950 Classification of Occupations of the General Register Office, their similarity with the corresponding elements in the population of York, can be noted. The censal evidence would suggest therefore, that the overall demographic contrasts between Hetton and York were caused largely by the differential population characteristics of the coal miners; the non-mining population followed the demographic pattern of York much more closely.

(b) Household composition

The Census Enumerators' Books give evidence of the composition of the households within the entry column indicating Relationship to the Head of the Household. Apart from the members of the nuclear family, the most frequently found resident was the lodger. 194 lodgers lived at Hetton in 1851 in 92 or 7.7% of the households. This incidence of lodging was very low compared with York, where the figure was 21.3% (\pm 2.9), Nottingham, 21.8% (\pm 2.0%) and Radford in Nottinghamshire, 13.7% (\pm 2.1) (9). If the presence of lodging indicates that the payment for accommodation in the house of another was characteristic of an industrially developing society, then the low incidence of lodging at Hetton merits explanation. Probably the relative infrequency of lodgers resulted from the existence, in the decade prior to 1851, of a surplus of housing at Hetton produced by the large-scale net emigration in the late 1830's and early 1840's discussed in chapter 4. The 1841 census records the existence of 228 uninhabited houses, and it is reasonable to assume that much of the increased population of about 1500 between 1841 and 1851 could be accommodated in these empty houses, thereby reducing the pressure on the housing supply that produced the frequent occurrence of multiple occupancy in early and mid-Victorian industrial communities.

75% of the lodgers were male, and although some were the heads or other members of resident family groups, the majority were young single men attracted to Hetton by the possibility of work. They usually lived in the households of similarly

employed people and in some cases they had been born in the same places as the host head of household. Of the 131 gainfully employed male lodgers, 58 were coal miners. This 44.3% incidence is lower than for the whole labour force at Hetton, as many of the lodgers formed a discrete socio-economic group at Easington Lane where they found employment in a wide variety of craft and service occupations. The coal miner lodgers were almost invariably young men, under thirty years of age, and lodged almost exclusively in the coal miners' rows at Hetton Downs and Brick Garth. Although most had been born in Northumberland and Durham, sixteen had birthplaces outside the North East, and this small group provided a relatively high proportion of the long-distance coal miner migrants. Fig.26 shows that the coal miner lodgers had been most frequently born in areas that had experienced coal mining before 1851. The scattered and rather infrequent occurrence of lodgers in the coal mining households provides a contrast to the more concentrated grouping of lodgers in certain other parts of Hetton. In Easington Lane in particular, the Census Returns record a marked clustering of lodgers with very different social and economic characteristics. The east side of Easington Lane contained a group of households, each inhabited by up to fifteen lodgers both single and in family groups. The heads of the lodging households varied in origin and occupation from locally-born coal miners to Irish-born hawkers; the occupations and origins of the lodgers themselves were equally diverse, but few worked at the collieries. Many craft and service occupations were performed by the Easington Lane lodgers. For example one of these households contained a bookbinder, a weaver, an upholsterer, an optician, a seamstress, a labourer, a mason, a needlewoman and a family of three tramps. Other lodging houses sheltered tinnerns and hawkers. The inhabitants of the Easington Lane lodging houses tended to have been born much further afield than any other section of the population of Hetton. This was the "footloose" element of the colliery village community, the substratum that provided crafts and services for the coalminers and was also the part of the population that was most likely to emigrate long distances from Hetton. A nineteenth

century County History observed that,

"a marked disposition to emigrate prevails at Easington Lane" (10).

Some measure of the long-distance migratory habits of the non-coal mining lodgers at Easington Lane is demonstrated by the fact that of seventy three such male lodgers, forty four were born outside Northumberland and Durham. Of these, eleven originated in the four North of England counties excluding Northumberland and Durham, two had been born in the rest of England, six in Scotland, two abroad and twenty three in Ireland. When it is remembered that 85% of the coal miner heads of households had been born in the North East, the differentially varied origin of this lodging element can be appreciated.

As well as lodgers, 6.3% of the households at Hetton contained visitors. Of the 125 visitors, seventy were male and fifty five female; fifty nine of the males were gainfully employed and sixteen were coalminers, a much lower proportion than for the whole occupation structure of Hetton. The coal miner visitors, like the lodgers, were predominantly young and single, although unlike them they were more likely to have been born locally, ten originating from Northumberland and Durham, two from both Yorkshire and Derbyshire, one from Scotland and one from Ireland. They were almost invariably staying in a coal mining household, and there were some examples of both the head of the household and the visitor sharing a common birthplace, thus suggesting as might be expected a planned move on the part of the visitor to a known address at Hetton. Easington Lane sheltered many visitors as well as lodgers. Only three of the visiting coal miners lived in this southern part of the village, but the census records a wide range of crafts amongst the visitors crowded into the households usually adjacent to the lodging houses. Here lived stonemasons, Irish tanners and labourers, a calico printer from Richmond in Yorkshire, a Newcastle-born cabinet maker and a Liverpool French polisher. The visitors contributed to the much-travelled, non-coalmining structure of many of the households at Easington Lane.

8.2% of the Hetton households contained one or more servants. Of the 128

servants, 105 were female, young and almost invariably unmarried. Various descriptions as house servant, general servant, or simply servant, but sometimes more particularly as washerwoman or housekeeper, these women had usually been born either in Hetton itself, or in the neighbouring colliery villages. Clearly going into service was one of the few outlets for female employment in the mid-nineteenth century Durham pit village. The male servants were found chiefly working on the farms as labourers, or in retail premises where in some cases, apprentices were described as servants. The distribution of servants varied considerably in relation to the occupation and social class of the households, although in all cases the incidence of servants was much lower than at York. Surprisingly, only 25% of the professional households at Hetton contained servants. Not only was the professional class very small, only twenty households in all, but it was dominated numerically by school-teachers who headed eight of these households; in these households no servants were maintained. In marked contrast the incidence of York households with servants in the Social and Economic Groups 1 and 2, corresponding to the professional class, was 81% and 57% respectively (11). The most frequent incidence of keeping servants occurred at Hetton in the retailing households, with 33% of this group employing either a general female servant or a male shop assistant or apprentice. Coal mining households rarely contained a servant and this accounts for the low overall incidence in Hetton. Of the 605 mining households, excluding the colliery officials, only 4% recorded the existence of a servant and most of these lived in homes where the head was a widower with dependent children. In contrast, a little over a third of the official's households included a servant. The lowest social groups at Hetton, the labourers and the low-grade service workers, did not keep servants at all.

The composition of the households at Hetton was completed, in 20.9% of the cases, by the presence of resident relatives. In this instance, the incidence at Hetton was close to the York figure of 21.6% (± 2.9) (12). The relatives

were distributed very evenly throughout the settlement, both spatially and by social class. Eighteen relationships to the head of the household were recorded but by far the commonest was grandchildren, who totalled 114 of the 353 recorded relatives. In fifty three cases the relative was a sibling of the head of the household and in thirty four cases a son-in-law or daughter-in-law. In these cases there was a frequent similarity of occupation between the householder and the resident. The high incidence of households with resident relatives at Hetton appears to support W A Armstrong's findings for York and to be typical of the household composition of industrial communities in the middle of the nineteenth century. In contrast, P Laslett's research suggested that few pre-industrial households contained relatives (13). It is probable that the existence of both lodging and resident relatives in industrial communities was a response to population mobility with the housing supply being unable to adjust to rapid short-term fluctuations in population movement.

(c) The ethnic minorities

The Irish in Hetton-le-Hole.

The Irish-born element in the population of Hetton-le-Hole formed the largest single long-distance migrant group. Two hundred and one people, or 3.6% of the total Hetton population had been born in Ireland, and this Irish element was supplemented by the existence of ninety four English-born members of Irish families. The proportion of Irish-born residents at Hetton is not markedly greater than the national frequency for 1851: in England and Wales at mid-century 2.9% of the population had been born in Ireland, compared with 1.8% in 1841 as a result of the massive influx of destitute Irish into England and Wales, together with Scotland, which formed part of the post-famine emigration that reached a peak in 1851 (14). In the fifty households which were headed by a person born in Ireland, the average number of occupants was 5.80. When compared with the Hetton average of 4.80, the figures afford statistical

evidence of the reality of the Irish tending to live in overcrowded conditions, forming the least privileged section of mid-nineteenth century industrial communities. This impression is heightened through an analysis of the occupations followed by the Irish at Hetton.

A Redford indicated that the Irish in England in the first half of the nineteenth century frequently found employment in jobs which were avoided by many Englishmen because they were dirty, disreputable or of lowly status and income (15). He found that they engaged in petty trading, huckstering and in the keeping of lodging houses and beer houses. In Manchester, Redford found that three quarters of the market stall keepers in the late 1840's were Irish and that others sold mats, firewood chips and similar commodities. Table 13 gives the occupational pattern of the ninety three employed adult Irish males at Hetton in 1851; the table indicates a similar structure of employment to the general picture delineated by Redford. The Irish performed low-grade services and crafts, concentrating on the making of simple domestic utensils and the provision of a range of humble services such as rag collecting. There were very few Irishmen engaged in skilled occupations and the existence of nineteen labourers emphasises the depressed status of this group. Surprisingly few Irish worked at the collieries; only thirteen were recorded as coalminers, and these included only five heads of households. The evidence at Hetton does not support Redford's general observation that the dislike of the native English workers for coal-mining partly accounts for the large number of Irish immigrants who adopted that occupation (16). On the contrary, the censal data for Hetton strongly suggests that the Irish eschewed coal-mining as a means of gaining a livelihood. Writing on Mining Settlements in Western Europe, R T Jackson asserted that the Irish collier was common in the North East coalfield. He considered that the 5.4% Irish-born element in the population of the Houghton-le-Spring Registration District, which lay immediately to the north of Hetton, was proof of this Celtic penetration of the mining labour force (17). However, as has been demonstrated for Hetton, there is no

certainty that the overall birthplace percentages given in the census abstracts provide any firm evidence for occupation patterns, and it is quite possible that a detailed analysis of the Houghton census enumerators' books would reveal a similarly weak Irish penetration into the colliery labour force.

The residential pattern of the Irish element in Hetton was characterized by a pronounced concentration at Easington Lane, at nearby Murton Lane, and in that part of Brick Garth which fronted on to Easington Lane. 77% of the Irish-born population lived in this constricted southern part of Hetton parish where they formed 12% of the total population. In marked contrast only three of the Irish-born lived at Hetton Downs in the miners' rows amongst a total community of 1265 people. Elsewhere, the Irish were occasionally represented by nuclear families. Three out of the thirty six households at Bog Row were Irish, three out of seventy five in the Old Village, and five in the rows east of the Houghton road. At Easington Lane, however, the Irish concentration was more marked and the Irish were found in three social relationships. Firstly, some of the Irish lived in one-family households, composed of the nuclear Irish family, supplemented by occasional lodgers or visitors who were themselves almost invariably born in Ireland; secondly, large numbers of the Irish inhabited the lodging houses that fronted on to Easington Lane either in family groups or as single lodgers; thirdly, some other households at Easington Lane contained two or more Irish families, but none or only occasional lodgers. Irrespective of the household composition, however, there is no doubt that the significant Irish element in the population of Easington Lane had contributed to the creation of the footloose, mobile and 'non-industrial' character of that zone of the mining community.

The Scots.

A considerably smaller proportion of the population had originated in Scotland. Only sixty two people, 1.1% of the population, came into this category, with an additional seventy one people born outside Scotland but living in households headed by a Scot. In the thirty such households, a total of one hundred and thirty three residents gave a mean household size of 4.43, which was somewhat

below the mean household size for Hetton (4.80), and very much smaller than the 5.90 mean Irish household size. This contrast suggests that the Scots provided a contrasting social minority within the fabric of the community, a contrast which is further witnessed in Table 14 which shows the occupation structure of the thirty three Scottish-born adult males. The Scots made a relatively greater contribution to the colliery workforce than did the Irish, but even so the incidence of coalmining among the Scots was much less than in the population as a whole. The Scottish coal miners lived exclusively in the miners' rows, usually as the heads of households and apparently integrated into the mining community, but also as occasional single lodgers. The occupational pattern of the remaining Scotsmen reveals a wide range of pursuits with twenty job descriptions given by the Census enumerators. However, in contrast to the Irish, the Scots tended to be employed in work where there was an emphasis on skill, training and higher social status. Only three of the Scots were labourers and it was more characteristic for Scots to provide specialist skills, such as the two engineers, the printer's pressman, and the optician.

Furthermore, the residential pattern of the Scots within Hetton departs to a certain extent from the Irish example of concentration in a "ghetto-like" zone. The forty nine households containing Scots were rather more, although by no means completely, evenly spread throughout the mining community. Scots were found in every part of Hetton, although only nine of them lived at the Downs whereas forty four lived at Easington Lane, representing 3.4% of the population of that part of Hetton, and living to a large extent in the same or similar lodging houses as the Irish. With the exception of these two small distinctive groups, the overwhelming majority of the population was English, originating in most cases from either Northumberland or Durham.

2 The Occupation structure of the settlement

The occupation structure of Hetton in 1851 has been analysed by the use of the relevant data in the Census Enumerators' books for the whole population; sampling techniques have not been employed therefore in this study. Because of this, the

problems faced by other workers in the field of censal data analysis who have sampled the mass of information in the Enumerators' books, have not been met. R Lawton, in his study of the population of Liverpool in 1851 (18) selected seventeen sample areas as a means of overcoming the problem of dealing with the census information; more recently a detailed analysis of the 1851 census returns for York has been attempted by W A Armstrong who employed a statistical sampling technique, involving the use of 10% of the households (19). In contrast, the scope of the study of the Hetton census returns is such that the data can be handled in its entirety.

However, as other writers have found (R Lawton) difficulties did arise over the creation of a satisfactory system of classification for the great number of occupation descriptions included in the returns. The adopted classification is given in Table 15 and has been derived from an empirical judgement as to the best means of differentiating significant occupational categories in this mid-nineteenth century coal mining community. It therefore differs in detail from the occupational classification adopted by R Lawton in his study of Liverpool, in which a much wider range of commercial, trade and shipping occupations had to be accommodated (20). Furthermore, an attempt to reduce the occupation structure to the five Socio-Economic groups of the 1950 Registrar General's Classification of Occupations along the lines of W A Armstrong's work on the population of York, proved to be unsatisfactory. Apart from the problems inherent in the classification of obsolete occupation titles such as coal fitter or in the placing of occupations that have changed in status through time such as school teachers, the basic difficulty in any attempt to adopt Armstrong's method to Hetton concerns the placing of the coal miners. The 1950 classification of occupations distinguishes between those underground workers who are employed on coal cutting and power loading, and all other underground workers concerned with conveying the coal to the shaft, with developing underground workings and with repairing and maintaining roadways. The former are classed in Group III and the latter in Group IV together with other workers above ground (21). This modern occupational distinction bears

little relationship to the employment structure in mid-nineteenth century collieries, when the level of skill of an underground putter or even hewer is compared with an engineman working at the surface. Such problems would make valid comparisons with York difficult, and the adoption of such a means of social and economic classification would inhibit the central aim of this section, which is to analyse in detail the occupational structure of Hetton.

The Occupation Structure : Initial Analysis

The collieries in the area provided the economic lifeblood of the community. 56.1% of the working population were directly employed by the coal company, whilst other groups, particularly the metal workers and the transport workers, also depended more or less directly for employment on the collieries. In addition it could be considered that apart from the agricultural workers nearly all the working population of Hetton depended indirectly on the coal industry as they provided goods or services largely for the mining workforce. In 1851 agricultural workers were relatively insignificant in numbers, but it is notable that the total of those employed in agriculture had increased to ninety five from fifty two in 1801. Possibly the rapid growth of a large mining population created a great local demand for food and fodder crops which resulted in an intensification of the rural land use in the area.

The number of inhabitants employed in the secondary sector was swollen by the large proportion involved in the making of clothes and domestic goods, a finding similar to that of Porteous at Goole, where in 1851, of the 20.48% employed in manufacturing, many were members of the personal clothing trades (22). In this category craftsmen such as cordwainers and tailors worked on a domestic basis as did the numerically important category of fifty four dressmakers. The number of metalworkers was augmented by the existence of fifty blacksmiths many of whom must have been employed at the colliery; in the absence of firm evidence, however, it is not possible to distinguish them from general blacksmiths. Nearly half the workers who were employed in the service sector of the economic life of Hetton provided personal or domestic

services. Of these 119 were classed as general servants, the great majority of these being women. The service occupations also included the relatively significant group of retailers as well as non-productive craftsmen such as gardeners, plumbers and painters. The ninety five labourers formed the lowest social group. Owing to the lack of information concerning the nature of their employment they cannot be placed in any occupational group.

Detailed Analysis of the Occupation Structure.

1 PRIMARY (other than coalmining)

Agriculture

The following table gives the occupation descriptions of the ninety five agricultural workers

<u>Occupation description</u>	<u>Numbers</u>	<u>Occupation description</u>	<u>Numbers</u>
Agricultural servant	1	Farm servant	5
Agricultural labourer	42	Farrier & smith	2
Dairymaid	1	Husbandman	4
Farm agent	1	Haycutter	1
Farm labourer	14	Hind	2
Farmers & their sons	20	Limeburner and farmer	2

Whilst, with the exception of the two farriers and smiths, the whole group gained a living directly from the land, a clear social distinction can be made between the twenty farmers and their sons who generally lived at the farms in the parish as tenant occupiers, and the farm employees, such as the farm labourers and hinds. The latter in most cases did not live at the farms but frequently occupied households in the miners' rows, providing a distinct if numerically insignificant element in the population of the Downs, Brick Garth and the rows at the Old Village east of the Houghton road. As might be expected, the birthplaces of the agricultural workers showed a significant rural distribution pattern, with eleven originating in rural Yorkshire, nine in rural Northumberland, and five from both West Durham and Ireland. In general, the farmers and their sons were more local in origin, with nine of them having been born within Hetton parish and others in

neighbouring communities. This probably reflects the continuity of the occupance of farm holdings in contrast to the more footloose longer-range migrant agricultural labour force who had no atavistic connections with the community.

2 SECONDARY

Manufacturing and Craft Industry

In 1851 manufacturing at Hetton employed 329 persons who represented 15.6% of the workforce (Table 16). This proportion is less than the 20.48% Porteous found at Goole in the same year (23), and the weak contribution to the overall economic life of the community made by manufacturing industry is further emphasised by the presence within this group of 144 persons employed in the clothing and domestic goods trades, chiefly female dressmakers working in their own homes. Throughout the whole of the Secondary employment sector, the means of production were overwhelmingly small-scale with very few of the workers being employed in large-scale works, or themselves employing much labour, other than a handful of journeymen and apprentices. It was a cottage-based craft manufacturing system in stark contrast to the highly capitalized, large-scale means of coal production that dominated the economic life of the parish.

The manufacturing and craft industries can be seen to fall into two basic categories, metalworkers and woodworkers. Table 16 shows the range of occupational descriptions used in the Census Enumerators' books for the metal workers, who can be classified in three reasonably discrete categories. Firstly there is a group of engineers, enginewrights, forgemen and puddlers; secondly there is a large number of tinnerns and tinplate workers, and thirdly there is a large group of blacksmiths. The skilled metal workers in the first group lived chiefly at the Lyons and worked at the small foundry and at the locomotive repair shops that had been established by the Hetton coal company at Hetton Lyons close to the Lyons Colliery. They were generally Durham-born, with the occasional one originating in Scotland. In marked contrast the tinnerns and tinplate workers lived almost exclusively in a separate 'colony' at Easington

Lane and had originated in many cases from Ireland. They formed a section of the long-distance migrant community that constituted a notable part of the community in this southern part of the settlement. The blacksmiths, many of whom must have been employed by the coal company, did not form a separate group within the village. They lived in all parts of the parish, at the Lyons, in the miners' rows and in the old village. Their origins also were widespread. Although many had been born on the Durham coalfield, a sufficient number had originated from rural areas to suggest that the colliery expansion in east Durham had acted as a focus for the movement of agricultural blacksmiths to colliery employment.

The table of woodworking occupations contains a predictable range of employment categories except for the presence of nineteen cabinet makers, whose existence comes as something of a surprise in a mid-nineteenth century coal mining settlement. With one exception they lived in or close to Easington Lane, in some cases as neighbours along the Easington road. They formed a very distinct element in the economic life of Easington Lane producing household furniture not only for the people of Hetton but also for the surrounding colliery villages (24). The remaining woodworkers, in particular the joiners, also frequently lived in or close to Easington Lane, although the widespread distribution of their birthplaces indicates that their movement to Hetton resulted from a series of individual decisions rather than from any overall planned move. Of the nine textile workers attracted to Hetton, seven were weavers, one was a dyer and the remaining one was a printer of calico. With one exception they all lived in close proximity at Easington Lane, and all except two had been born outside Northumberland and Durham. Three had originated from Ireland, one from Scotland, one from Leicestershire and one from Richmond in North Yorkshire, an area with a declining textile industry in the two decades before 1851 (25). Milling and brewing employed the eleven workers in food and drink preparation. This very low total must reflect the extent to which the mining community was dependent on outside sources for much of its food and beverage consumption. The four

millers, all born at Hetton, worked at two mills, the steam mill at Brick Garth which had been erected in the 1830's, and the older Hetton water mill on the Hetton burn at the northern boundary of the parish. The brewery workers concentrated in Barnes Street, one of the rows built to the east of the Houghton road where there was a small brewery before the construction of the larger Hetton brewery to the east of Barnes Street in 1855. It is most unlikely that this small brewery, employing apparently no more than seven men could supply beer for the thirty five public houses and inns listed at Hetton in 1856 (26), which would suggest that beer was imported into the settlement from outside.

The large numbers indicated in Table 16 as being employed in the manufacture of clothing and domestic goods does not indicate a correspondingly large scale of production. The table of occupations indicates a very wide range of craft production, to serve the needs of the large immediate market, but the place of manufacture was almost invariably the domiciliary household rather than the factory. The description of occupations in the Census Enumerators' books also demonstrates the survival of craft terms such as master, journeyman and apprentice, with all three in some cases living in the ^Smasters' households. For example, a master tailor lived at 37 Richard Street, with a journeyman and an apprentice; this address was presumably the place of both the production and the sale of their goods. The list of the makers of utensils and domestic goods shows the presence of widely contrasting skills; the four watch and clockmakers offering a considerably higher degree of skill than the basket, broom and matmakers, who originated chiefly from Ireland. The clothing and footwear trades were dominated by the boot and ^eshow makers of whom there were forty three, and by the twenty eight tailors. In the complete absence of evidence of any separate retail outlets for their product, it seems likely that they sold direct to the consumers who would depend heavily in the absence of public transport, upon these local sources. This group of workers was augmented by the presence of fifty six dressmakers together with their apprentices. They were entirely female, they worked at home and they were

most frequently the wives, daughters or widows of coal miners. Although workers in clothing, footwear and domestic goods manufacturing lived in virtually every street in Hetton, they tended like the other craft groups to concentrate in certain sections of the village, the Cordwainers at Four Lane Ends, the shoemakers at Easington Lane and Murton Lane and the tailors in the rows at the old village east of the Houghton road and also at Easington Lane.

In summary, the workers engaged in manufacturing and craft industry produced consumer goods for the local mining population in many small domiciliary bases. With the exception of some of the metalworkers employed by the Hetton coal company, most of the workers in this category were self-employed and worked alone or at most employed one or two people. Clearly these productive workers depended indirectly, but almost totally, on the colliery and its labour force as the market for their goods. Manufacturing in no sense provided an alternative support for the economic life of the community.

3 TERTIARY

Service Occupations

19% of the employed population of Hetton contributed to the provision of services for the rest of the community. Table 17 shows the six-fold division of this category which has been adopted to permit a detailed analysis of the service occupation structure. The village shared with many other mining settlements, the marked attenuation of the professional class; only 2% of the workforce falls into this category, which for the purposes of this study excludes the colliery managerial staff, since this section is concerned with occupation rather than with social structure.

Schoolteachers together with other specialist instructors totalled eighteen of the forty professional people. The majority of teachers were female and eight of these nine women lived in the miners' rows although only two of them were married to coalminers. The three schoolmasters all lived in the miners' rows and like the female teachers had all been born in North East England,

although only one of the twelve teachers originated from Hetton itself. They too, like the miners and most of the manufacturing and craft workers, had been attracted to this rapidly growing settlement in which several new schools had been established. For example a National School had been built at Hetton in 1834 (27), and Easington Lane contained three day schools each attended by between sixty and one hundred children (28). The Census returns indicate that seven of the twelve teachers lived in or close to Easington Lane and its three schools. In no other profession were there more than two members living at Hetton, thus emphasising the very limited development of, and employment opportunities for, educated and highly-qualified men in this mid-nineteenth century mining community.

The list of the retailing service occupations was dominated by persons employed in the sale of food and drink. The sixty three food retail employees were chiefly butchers and grocers, living and working in the same premises found principally in Front Street, in the rows east of Front Street, and along the main street at Easington Lane. No butcher and only one journeyman and one assistant grocer, both living in the same house, resided at Hetton Downs. Food retailing therefore seems to have been concentrated in 1851 close to the Easington to Houghton road, with early centres of shopping on the Front Street of the old village and along Easington Lane. This function survives in these zones to this day, but the present shopping sub-centre along Market Street on Downs Lane must post-date 1851 as the Census affords scant evidence of retail outlets at the Downs. The ten recorded retailers of beer represent only a small proportion of the thirty five inns and public houses listed in 1856. As thirty five public houses existed in Hetton in 1856, (29), it seems certain that the number of public houses was considerably under-recorded by the Census Enumerators in 1851, possibly because at a time of the unrestricted selling of alcoholic beverages, Hetton contained a considerable number of small beerhouses run by the occupants on a part-time basis as a supplement to income derived from other employment. For such households it is likely that the Census Enumerators recorded the extra-domiciliary employment in their

returns. Only seven clothing retailers are listed including five rather specialist milliners; this relative paucity must reflect the tendency already noted for tailors and dressmakers to sell direct to their customers.

Very few people were employed in wholesaling or commercial undertakings, but a larger and important group of workers were engaged in transport. Apart from two sailors, the transport workers were nearly all employed on the railways that linked the parish with the coal export ports on the River Wear and at Seaham Harbour. Skilled men such as engine drivers and the engine men who worked the stationary locomotives, were outnumbered by the seventeen railway labourers. The railway workers lived in railway cottages along the Durham to Sunderland line, and in a concentrated group in the rows to the east of Front Street; rows that were bisected by the Hetton waggonway. Several of the younger railway workers had been born in Hetton and were probably the children of some of the railway workers who had been attracted to Hetton during the period of the construction of the Hetton waggonway and its subsequent branch lines. Railway employment was further augmented by the opening of the Durham-Sunderland line in 1836 which bisected the parish.

The list of craftsmen shows that nineteen of the forty one men in this class of employment were stonemasons. Their presence probably reflects the demand for construction workers in the settlement, as well as the use of the local limestone for most building purposes at this time. In addition some of the masons could have been employed underground at the collieries although the Census Returns do not confirm this. The list also indicates the existence of five painters and five gardeners, but more unexpectedly an Edinburgh-born printer's pressman lived at Easington Lane, whilst a Felling-born plumber and gas fitter was also living at Easington Lane four years before the opening of the Lyons gas works by the Hetton coal company in 1855 (30). By far the most numerous type of service occupation was that connected with the provision of personal or domestic services, which included almost 9% of the working population. Although the Census Enumeration Books give a considerable range of occupational descriptions, this category is composed largely of house-

servants and housekeepers, invariably females who lived with their employers particularly on the farms, in the retail premises and in the few large middle class households such as at Hetton Hall and the Vicarage. Few coalminers kept house-servants; the mining households that did employ such labour were usually occupied by widowers with young children and in these cases the female employee was usually described as a housekeeper. The censal evidence suggests strongly that going into service was one of the few outlets for female employment in this mid-nineteenth century mining community. No large-scale alternative means of employment for women existed in the Durham mining village such as occurred in the textile industrial areas of Yorkshire and Lancashire. The proximity of the birthplaces of most of the servants to Hetton, if not in Hetton itself, underlines the large supply of local female labour prepared to take domestic employment.

The only other numerically significant group of personal/domestic service workers was the fourteen hawkers and rag collectors. Almost without exception they lived in or close to Easington Lane; the ragmen had all been born in Ireland whilst the hawkers had originated from a variety of locations as widespread as Switzerland, Kendal, Yetholm and Barnard Castle. It is possible that they were itinerants whose residence in lodging houses on the night of the Census merely records one sojourn in an otherwise mobile existence. The occupational structure was completed by the presence of ninety five labourers. The Census affords no evidence as to the nature of their employment, but it was not likely to have been at the collieries as colliery labourers are designated as such, as are agricultural and railway labourers. Possibly they provided manual labour for the building trades but one cannot be certain.

In general, the overall occupation structure of Hetton was typical of mining communities, with the employment in coalmining, at 56% of the total workforce, greatly outnumbering all other forms of employment; a small managerial and professional class, and the low incidence of female employment were also characteristic of the social and economic character of mining settlements.

However, detailed investigation does suggest that Hetton in 1851 did differ slightly from the generalized model of a mining community. Largely because the centre of the Hetton coal company "Empire" was located here, the employment opportunities in metalworking, locomotive repairing, and in the managerial organisation of the company's collieries were greater than might have been expected. Without the foundry and engine shops at the Lyons there would have been little employment for metallurgical workers, and the presence of the coal company's offices at the Lyons probably helps to explain the existence at Hetton of thirty six colliery officials which, as was noted in Chapter 5, was considerably more than the twelve recorded at South Hetton colliery two miles to the south, in 1835 (31).

3 Socio-Economic Zonation within Hetton

The aim of this section is to examine the extent to which the occupation groups formed identifiable residential patterns within Hetton. The method chosen to achieve this aim was an analysis of the employment of the head of every household in the village. This analysis has been restricted to the heads of households for each of the streets in the village as their occupational distribution in general reflects faithfully the economic life of their respective households. However, in Easington Lane, the nature of the occupation structure of the large multiply-occupied households is not always illustrated by reference to the head of the household, and in this exceptional locality additional evidence is presented in the form of a fifty household sample which shows the occupations of each gainfully employed person within the households. The framework for the economic analysis is the classification of occupations used in the previous section; the occupation structure of each street will be examined with reference to the Tables 18 to 22 in order, from the northern limits of the parish to its southern boundary. From this data, a reconstruction of the distribution of the employment patterns of the heads of households can be achieved. Fig.18 shows the proportion of the coal miner heads of households in each of the streets.

The Low Downs (Table 18)

Of the seventy two households at the Low Downs, fifty nine were headed by gain-

fully occupied workers, of whom fifty three or 90% were coal miners. This high degree of dependence for a livelihood on the colliery company was further heightened by the fact that many of the paupers and widows designated as heads of households were also of mining stock, having dependents in some cases who worked at the collieries. In no other occupation were more than three workers recorded; Low Downs can be seen therefore to represent an extreme example of two miners' rows almost totally devoid of alternative occupations.

High Downs (Table 18)

The cottages at the High Downs were disposed in a square, not in rows as at the Low Downs, but the economic structure of the two units of housing was very similar. The Census returns record eighty nine households at the High Downs of which eighty one were headed by an active worker. Only three had a worker in the manufacturing or service occupations as their head, and of these it is likely that the blacksmith probably worked at the colliery, whilst the ten year old son of the schoolmistress earned a living as a screenboy at the pit. Seventy two (89%) of the households were headed by coalminers whose children aged over ten years almost invariably also worked at the pits as trappers, drivers or putters depending on their age. Only in one eight-house section of the High Downs in which six households were headed by agricultural workers, was there any variety in the occupation structure. It is likely that some at least of the farm workers found employment at the nearby Hetton Downs farm, whilst the function of the limeburner and farmer might reflect the exploitation and subsequent agricultural use of the limestone taken from the nearby Hetton Downs quarry.

Downs Lane (Table 18)

Immediately to the south of the Eppleton branch of the Hetton railway, Downs Lane extended south towards the old village with two long rows of cottages fronting on to the former rural track leading from Hetton-le-Hole to the Hetton Downs estate, the alignment of which had been retained and incorporated into the plan of the mining settlement. Eighty three households existed at Downs

Lane in 1851 of which one was uninhabited and four were occupied by persons not gainfully employed. Of the seventy eight remaining households, seventy three (94%) sheltered coal miners' families.

It is clear that the northern section of Hetton parish contained a virtually mono-functional concentration of colliery workers. Of the two hundred and forty four households in the three units of settlement, one was uninhabited and twenty five were headed by non-gainfully employed people; of the remaining two hundred and eighteen households, one hundred and ninety eight had a coalminer as head. There was an almost complete absence of workers employed in manufacturing crafts or service occupations; only two school teachers lived here, and there was no school to serve the needs of a population of twelve hundred and sixty five. Even more starkly illustrated is the lack of retail outlets; only one retailer, a grocer and draper, lived and worked in this northern section of the settlement.

The settlement east of the Houghton road (Table 19)

South of Downs Lane and east of the Houghton road, two hundred and forty four houses had been built subsequent to the opening of the collieries in the parish. Apart from the two railway cottages located on the Durham-Sunderland line and occupied by railway employees, and the pre-mining Hemels farmstead, the houses were disposed in a dense pattern of rows extending from the Square as far south as the Anglican church. Homogeneity of occupations was not found however within these streets; the employment structure of the Square providing a marked contrast to the other streets. In the Square, twenty two of the twenty five households occupied by a gainfully employed person, were headed by coalminers, reflecting the economic composition of the nearby Downs. In the rows to the south of the Square, coal miners certainly formed a significant element in the occupation structure of the streets, but were not nearly so dominant numerically. In Union Street, close to the Square, coal miners still outnumbered all other gainfully employed heads of households, occupying 64% of the houses, but in Barnes Street only 48% of the households were headed by a coalminer and the

employment pattern was widened by the presence of a small group of brewery employees and a number of retailers who lived at the Front Street end of Barnes Street. The other streets in the vicinity displayed a greater measure of occupation variety. For example, of the forty four households in Pemberton Street which were headed by an active worker, only eleven (25%) were headed by coal miners, whilst seven were occupied by agricultural workers. The street was further characterized by the presence of a relatively wide range of workers particularly in the manufacturing of clothing and domestic goods, in which six were employed, as well as a wide range of thirteen service occupations. In Richard Street and John Street, coal miners were more numerous than in Pemberton Street, occupying 47% and 56% of the households respectively, but even these streets were characterized by a wider range of occupations, particularly in the retail trades, than obtained in either the Square or at the Downs. In Front Street, facing on to the Houghton road coal miners rather surprisingly occupied as many as 45% of the households together with service workers, although the number of retail premises (3) on the main street was considerably fewer than in the rows of Richard, John and Pemberton Streets. Three of the very small professional class also lived in the Front Street which, by 1851, had not yet become the most important retailing centre of the village, a function it had acquired by the end of the nineteenth century.

In terms of socio-economic zonation a distinct boundary can be drawn between a mono-functional mining zone that extended as far south as the Square, which embraced the three housing units of the Low and High Downs together with Downs Lane as well as the Square, and the multi-functional zone of parallel rows south of the Square together with the east side of Front Street. In this latter zone, although coalminers were by no means absent, they lived alongside workers engaged in a wide variety particularly of service occupations. The occupation structure of Pemberton Street represents the most extreme example of diversification with twelve manufacturing workers and thirteen service workers outnumbering the eleven coalminers. The most likely explanation of this zonal contrast is concerned with the patterns of landownership. The tithe plan and apportionment show that

the mono-functional miners' rows were built upon land owned by the Hetton coal company forming part of the company's Hetton Downs estate (32). Clearly the company erected cottages for its workforce on this land, the southern boundary of which extended to the dividing line between the Square and Barnes Street. The rows to the south of the Square were built on land owned by Richard John Pemberton, hence the street appellations and the lower incidence of coal-mining households.

The settlement west of the Houghton road (Table 20)

One hundred and twelve households were recorded by the Census Enumerators to the west of the Houghton road. Examination of the occupations of the heads of households enables an immediate division of this area into two contrasting units of employment structure, the old village and Bog Row. The latter consisted of several short terraces of cottages which were occupied in 85% of the cases by coal miners. No other occupation recorded more than one worker, so complete was the dominance of mining folk in the thirty seven households. In total contrast, the sixty one households in the old village which were headed by a worker, listed a coalminer on only eighteen occasions, 29% of the total. They were almost matched in numbers by the fourteen agricultural workers who included three of the tenant farmers of the parish, representatives of the relict agricultural economy of the pre-mining village community. Although not without a reasonably wide range of craft manufacturers, the occupation pattern of the old village was typified by the presence of the largest group of professional and service workers to be found in the whole of the settlement. The six workers of professional status included Nicholas Wood, coal owner of the Hetton coal company and the Anglican rector, whose rectory known as Hetton House contained a small private school with a resident tutor, as well as other men of professional and inspectorial status. The five retailing households included three inns, one of which was the commodious Colliery Hotel whilst the nine other service workers filled a variety of craft roles, some of whom, such as the two gardeners and the coachman were probably employed by Nicholas Wood at Hetton Hall. As well as

contrasting in socio-economic structure, the two zones of settlement differed in the patterns of landownership. Whilst the plots into which the old village was divided were owned by a wide range of people such as farmers, professional men, the lady of the manor and the coal company, the land on which Bog Row had been built was owned in its entirety by the lady of the manor who had leased it to the company for the purpose of building mineworkers' cottages (33).

Hetton Lyons

Threequarters of a mile south east of the old village, a discrete group of fifty two households had grown up since 1820 located close to, or in some cases, actually in the pityard of the Lyons colliery. The socio-economic character of these households differed from those parts of the settlement analysed so far in being dominated by two categories of worker, namely colliery officials and metal workers (Table 21). Men with colliery occupations such as the master wasteman, overman, viewer, coalminers' agent and heap inspector, lived close to such skilled workers as the engineer, the forgerman and the boilersmith. Hetton Lyons was the "Quality Row" of the village, a zone of superior two-storeyed commodious stone-built houses occupied by key workmen. Although as R T Jackson says

"the class division may have been small in general terms, but it is virtually an unbridgeable gap" (34),

no clearer proof of this can be offered than this concentration of skilled and supervisory employees located well away from the rows of miners' cottages found elsewhere in the parish.

Four Lane Ends

The remaining units of housing lay in the southern part of Hetton parish. At Four Lane Ends coalminers occupied thirty seven of the sixty two households which were headed by an actively employed person (Table 21). Twelve households were headed by men employed in manufacturing and seven by workers in service activities. The employment structure of Four Lane Ends was intermediate between the extreme concentrations of mining families at Hetton Downs, and the much more broadly-based economic pattern found at Easington Lane. In this most southerly part of the settlement, a society had evolved in the thirty years following the opening of the first colliery, which had a distinctive and unique structure.

Easington Lane

The occupation tables of both sides of Easington Lane, but particularly the east side, show that although coal miners formed the largest single occupation group, the economic character of this zone was flavoured by the existence of a wide range of workers in craft manufacturing and service occupations, particularly retailing (Table 22). Furthermore, the true socio-economic structure of the households at Easington Lane is not really indicated by the tables of the occupations of the heads of households, because of the frequency of multiple-occupance and lodging. In order to illustrate the complexity of the occupational structure in this part of Hetton, a detailed sample of fifty households on the east side of the road has been analysed by listing the employment of each resident by household rather than by occupation group in order to reconstruct the true social and economic composition of the sample houses (Table 23). Of the ninety six employed males living in the fifty households, only thirty two (31%) worked at the collieries, and this low incidence contrasts very markedly with the employment pattern in the miners' rows at Hetton Downs. The remaining sixty four male employees worked at thirty nine separate crafts and occupations with small but significant emphasès on weaving, cabinet making and the working and repairing of metal utensils, particularly those made of tin. Eleven females were recorded as employed by the Census Enumerators chiefly in the personal clothing trades and in service. Many of these workers lived in large multiple-occupance households and lodging houses, and were long-distance migrants to Hetton where they had sought and found a market for their wares and specialist services. If the Lyons was the "Quality Row" of Hetton, then Easington Lane was the cosmopolitan "ghetto" zone, in which the Irish and to a lesser extent the Scots shared overcrowded accommodation with other long-distance migrants, and also shared a lack of direct dependence on coal-mining as a means of gaining a livelihood. Some indication of the mobility of the sample population at Easington Lane is given in Fig.27 in which the lines show clearly the generalized pattern of movement from the birthplace evidence. Compared with the mobility pattern of the sample Downs Lane households, those from Easington Lane can be seen to have travelled from further afield before assuming

residence at Hetton, and they were less likely to have lived in either the mid-Wear valley or on Tyneside.

Murton Lane

The social and economic characteristics of the Easington Lane households were also found in the households along Murton Lane, just to the east of Easington Lane. Here, of the eighty households headed by a gainfully employed person, thirty two (40%) were occupied by coalminers, an incidence similar to that found on the east side of Easington Lane. Table 22 shows that the other heads of households found employment in a wide range of craft and service trades which resembled the occupation pattern in Easington Lane. Murton Lane was clearly an extension of the multiple-occupation zone at Easington Lane to which it was contiguous.

Brick Garth

In complete contrast, the equally contiguous zone of housing at Brick Garth was inhabited overwhelmingly by coalminers and their families. One hundred and forty six (81%) of the households headed by an employed person were occupied by coalminers; this frequency is almost as great as was found at Hetton Downs, and Brick Garth shared with the Downs a paucity of men employed in craft and service occupations. The rows of cottages at Brick Garth were inhabited largely therefore by miners originating in most cases from Northumberland and Durham, who had been housed in close proximity to Elemore colliery, which was opened in 1826 at the time that Brick Garth was being built.

On the basis of the analysis of the occupational structure of each of the streets in Hetton in 1851, it is possible to construct a zonal pattern characterized by differing frequencies of employment. Firstly, a series of almost mono-functional miners' rows have been distinguished in which over 80% of the households, and in some cases over 90%, were headed by a coalminer. The largest concentration of such streets occurs in the northern part of Hetton parish and includes the High Downs, the Low Downs, Downs Lane and the Square, all built on the estate of the Hetton coal company. Two enclaves dominated by mining folk lay at Bog Row and at Brick Garth. In each case the miners' cottages had been built on land leased to the mining company for that purpose.

Secondly a zone characterized by having between 45% and 60% of the households headed by coalminers can be distinguished. This zone includes the streets east of the Houghton road at Hetton, except for Pemberton Street, the Four Lane Ends and the west side of Easington Lane. In these streets coalminers clearly dominated the occupation structure, but an intermediate level of employment diversification is evident in the craft and service sectors.

Thirdly there was a zone of minimum coal miner penetration, where less than 45% of the households were headed by miners. This zone, which was scattered in three discrete units, included the east side of Easington Lane together with Murton Lane, the old village and Pemberton Street. If the zone was characterized by a relative infrequency of coalminer heads of households, it was not characterized by a similarity of socio-economic structure: Easington Lane contained a multiplicity of crafts and trades followed by many long-distance migrants living in high density conditions; the economic structure of the old village was dominated by agricultural workers and by craft and service employees, whilst the economic structure of Pemberton Street was characterized by employment in the manufacture of clothing and domestic goods and a wide range of service occupations.

The settlement at Hetton Lyons provided a fourth distinct socio-economic zone in which colliery officials and skilled metal workers resided at what has been described as the "Quality Row" part of the mining community. Clearly as early as 1851, the mining community at Hetton had in the first thirty years of its existence evolved into a series of zones of contrasting social and economic structure which was quite pronounced considering the overwhelming importance of coalmining to the economic life of the community.

Chapter 6 : Notes

- 1 Census Enumerators' Books, 1851. This source has provided the bulk of the data from which the following threefold analysis of the settlement in 1851 has been made. In view of the great frequency of direct use of the Enumerators' Books in the text, it is not proposed to make separate references to the source in the notes.
- 2 Census Abstract, 1821
- 3 J D Porteous, The Company Town of Goole, 24
- 4 J D Porteous, The Company Town of Goole, 24
- 5 ibid, 24
- 6 W A Armstrong, 'The interpretation of the census enumerators' books for Victorian towns', 69
- 7 ibid, 79
- 8 ibid, 80
- 9 ibid, 72
- 10 W Fordyce, History of Durham, Vol. 2, 580
- 11 W A Armstrong, 'The interpretation of the census enumerators' books for Victorian towns', 79
- 12 ibid, 72
- 13 ibid, 70
- 14 R Lawton, 'Irish Immigration to England and Wales in the mid-nineteenth century', Irish Geography, Vol. 4, No. 1 (1959), 38
- 15 A Redford, Labour Migration in England 1800-1850, Second Edition (1964), Manchester, 154
- 16 ibid, 59
- 17 R T Jackson, 'Mining Settlements in Western Europe', 148
- 18 R Lawton, 'The population of Liverpool in the mid-nineteenth century', in Geographical Interpretations of Historical Sources, (eds) A H R Baker et al (1970), 383
- 19 W A Armstrong, 'The interpretation of the census enumerators' books for Victorian towns', 67-85
- 20 R Lawton, 'The population of Liverpool in the mid-nineteenth century', 389
- 21 General Register Office, Classification of Occupations (1950), 3
- 22 J D Porteous, The Company Town of Goole, 25
- 23 ibid, 25
- 24 W Fordyce, History of Durham, Vol. 2, 580

- 25 A E Smailes, North England, 166
- 26 W Whellan, Directory of Durham, 622-623
- 27 ibid, 619
- 28 W Fordyce, History of Durham, Vol. 2, 580
- 29 W Whellan, Directory of Durham, 622-623
- 30 W Whellan, Directory of Durham, 619
- 31 R T Jackson, 'Mining Settlements in Western Europe', 157
- 32 U.D.D.P. & D. 'Tithe plan and apportionment of the township of Hetton-le-Hole' (1839)
- 33 ibid
- 34 R T Jackson, 'Mining Settlements in Western Europe', 160

Chapter 7

Conclusion

The aim in this final chapter is to evaluate the extent to which the initial objectives of the thesis have been achieved. The first problem was concerned with the identification of the factors that influenced the initial establishment, growth and morphology of the early mining village. Evidence has been introduced which demonstrates how the sinkings in Hetton parish that led to the first successful winning of coal in 1822, can be seen as the culmination of fifty years of exploration to prove the existence of commercially viable reserves of household coal under the Magnesian Limestone of the east Durham plateau. Coal mining was extended eastwards therefore from the adjacent section of the exposed coalfield in the Rainton-Pittington area in the face of contemporary opinion which was sceptical about the likelihood of proving household coal under the overlying limestone. The pioneer sinkings at Hetton and Elemore remained the sole collieries on the plateau for almost ten years, when shafts were sunk in 1831 at South Hetton and Haswell, immediately to the south of Hetton (1).

In addition to representing an areal extension of the coalfield, the sinkings through the limestone represented a considerable development in mining technology as well. Faced with considerable geological problems, such as the depth of the sought-after Hutton seam, and the presence of aquiferous sands at the base of the Permian limestone, as well as the problems of transport to tidewater, mining operations had to be large-scale, highly-capitalised speculative ventures. The ultimate pattern of coalmining on the east Durham plateau was characterized by the presence of large, well-spaced collieries, each mining very considerable underground workings and employing large workforces of 1000 or more men. These features are certainly found at Hetton. Because of difficulties experienced owing to flooding from the basal sands at both Hetton and Eppleton collieries and because of the large-scale investment involved in these sinkings, the extent of the underground workings of the two

collieries, which totalled 2288 acres in 1825, nearly the whole area of the parish, was correspondingly large (2). Coal was extracted from beneath both Great and Little Eppleton townships by the two collieries and only the opening of Murton Colliery, three miles east of Hetton in the 1840's, limited the eastward extension of Hetton coal workings. As a consequence of the development of such large, deep mines, a large workforce was necessitated; in Hetton almost 1147 coalminers were recorded in 1851, and although there is no evidence to suggest that they all worked at the collieries in the parish, it is likely that the great majority did, as many lived in Hetton coal company houses. A large workforce meant a large community and the growth of population and the physical extension of the settlement in the first few years after 1822 was extremely rapid. The plan of the growing village did not, however, disregard the influence of the pre-mining landscape. In Chapter 4 it has been demonstrated how the patterns of landownership, the policies of the different landowners, the patterns of fields and rural communications all exercised control over the emerging morphology of the village.

The second problem to be examined concerned the nature of the workforce that had been attracted to the parish after the opening of the collieries. The analysis of the occupation structure of the colliery employees living at Hetton in 1851 can only be considered to be partially successful. Because of the lack of direct evidence from any secondary source, recourse has been made to the Census Enumerators' Books which unfortunately describe the great majority of colliery workers as simply "coalminers". This has resulted in an under-recording of the numbers employed in the various occupations both underground and at the surface. A comparison between the numbers employed in the underground occupations at Hetton in 1851 with the neighbouring colliery at Haswell in 1850, in which fewer men worked, demonstrates the degree of under-recording. For example the twenty three deputies at Haswell clearly outnumber the eight recorded at Hetton, whilst the twenty nine putters at Hetton compare with forty four at Haswell (3).

More certainty attaches to the results of the analysis of household structure for which the Census Returns proved to be much more valuable. The survey of the 641 households headed by a coal miner indicated that the dwellings were inhabited in most cases by a nuclear family with few examples of multiple-occupance and surprisingly few lodgers; the lodgers themselves being invariably employed at the collieries as well. Within these households the coal miners' families were appreciably larger than in the non-mining element of the population, whilst the mean family size for the whole of Hetton was considerably greater than that of York in the same year. In almost every case the children of the coalminers, on reaching a working age, found employment at the pits also; it seems probable if the Hetton evidence is typical, that the bulk of the workforce required in the expanding Durham coalfield after the middle of the nineteenth century, was provided by the product of a differentially high birth-rate rather than by large-scale immigration. Census evidence of the birthplaces of the mining folk at Hetton also tends to confirm the generalized patterns analysed by A E Smailes for the whole coalfield (4). 85% of the miners had been born in Northumberland and Durham with most of the remainder coming from the contiguous counties of Cumberland and the North Riding. Of the Northumbrian miners, 93% had originated from those parts of the two counties in which coalmining was in operation at the time of their births, the rural contribution to the mining population was negligible and was probably not truly rural in the cases of the men born in the Pennine lead-dales. Within the coalfield, two sections, the Mid-Wear area and Lower Tyneside provided the birthplaces of many of the Hetton coalminers. This again accords closely with the known generalized pattern of coalfield migration with the emphasis on short-range movements from declining sections to those parts with expanding opportunities for employment. The children of the coalminers, who formed some 30% of the total population of the village, had originated overwhelmingly from Northumberland and Durham, with only 3% coming from the remainder of the British Isles. The distribution of birthplace origins in relation to the ages of

the children, despite the incomplete nature of the evidence, does reveal a kaleidoscopic pattern of family mobility within the coalfield in sympathy with the economic vicissitudes of the various sections of exploitation. From the Hetton evidence, it would appear that the mining population in the thirty or so years prior to 1851 was exceedingly mobile over short distances within the coalfield, but that the contribution of non-mining labour was negligible.

The analysis of the third problem, the attempted social and economic reconstruction of the whole community thirty years after the opening of the collieries, was achieved by using the 1851 Census Returns in conjunction with the almost contemporaneous cartographic evidence of the First Edition Ordnance Survey 6" and 25" maps and plans surveyed in 1856. In broad terms, the demographic analysis of the community confirmed the generalizations commonly stated about mining villages, but in a few instances Hetton appears to have deviated from this generalized model. The population was slightly male-dominant, as might be anticipated in this male labour-intensive industry, although the sex-ratio was much more evenly balanced than it had been in the early pioneer days of the community. The youthful nature of the population, with 2/3rds under thirty years of age, the large mean family size and the low incidence of servants were all typical features of a coal-mining village. Rather less expected was the low rate of lodging at Hetton where the frequency of 7.7% of households was only about 1/3rd of that at York in the same year. The small scale contribution of long-distance migrants from Ireland and Scotland to the total population was also rather unexpected, particularly in the case of the former. The Irish formed only 3.6% of the population of Hetton, a figure little above the national average for 1851 (5). Their contribution to the coalmining labour force was negligible; instead, living in overcrowded conditions and concentrating in certain parts of the settlement, they performed a wide variety of low-grade crafts and services for the mining population.

In terms of the overall occupation structure, the Enumerators' Books indicate

how Hetton was, as expected, dominated by employment in coalmining. The collieries of the Hetton coal company provided the only large-scale highly capitalized source of employment in the parish, and provided work for not only coalminers but also a small number of metallurgical workers and a larger group of surface transport workers. Goods and services were provided for the miners by people engaged in a surprisingly wide range of occupations, the least expected of which was the group of cabinet makers which was concentrated at Easington Lane. However, in virtually all cases, the provision of goods and services was carried on on a domestic basis, with few wage-earning employees, and the place of work frequently being the household (6).

The spatial analysis of the occupation structure brought to light a socio-economic zonation, which if not complete and sharply defined, did enable a somewhat tentative division of the settlement into distinctive zones. Despite the apparent social homogeneity of mining communities, Hetton displayed as early as 1851 the small but interesting social divisions noted in the North Eastern coalfield at this time and in other coalfields at a rather later date by writers such as Zola and D H Lawrence (7). If the miners themselves were largely housed in rows or in squares of cottages or in some cases in two-storeyed houses on land either belonging to the Hetton coal company, or leased from the landowners, the superior workmen and officials tended to live apart. In the miners' rows 80% or more of the households were occupied by mining families, with an incidence of 90% at Hetton Downs which was built entirely within the company's estate. By way of contrast, Hetton Lyons was the "Quality Row" of the village, where colliery officials and other skilled workmen lived in more substantial housing. The old village represented the rural core with the surviving agricultural workforce living amongst craftsmen and some of the highly attenuated professional class. Finally, two separate sections of the village, Pemberton Street and Easington Lane, were zones of minimum coal-miner penetration. In the former lived a wide range of craft and service workers, whilst in the latter a concentration of far-travelled non-coalmining low grade craft and service workers constituted a distinctive

"footloose" zone in marked contrast to the rest of the village.

In conclusion it remains to consider the problems created by the use of the source material in this essay in Historical Geography. As the period under review extended no earlier than the latter part of the eighteenth century, few of the problems of the geographical analysis of historical evidence dating from earlier periods were encountered. A H R Baker has succinctly summarized the central dilemma of the Historical Geographer concerned with the analysis of medieval material, namely to build from and into his source material the necessary spatial dimension (8). This crucial task is rendered difficult by a variety of limitations imposed by the very nature of the evidence. The surviving information may not be representative owing to the chance nature of document construction and survival, the location and size of the areal units may be unknown, as might be the units of weights and measures, and as Baker says,

"an immense amount of scholarship and time must be spent in understanding the nature of the source material before a start can be made in analysis" (9).

Whilst always bearing those constraints on the geographical analysis of historical source material in mind, it is probably more accurate to contend that in the case of this work two other sets of problems have been more relevant. Firstly, the study of only one parish has slanted the study towards an ideographic approach which has limited the opportunities for an analysis of spatial patterns viewed temporally. In addition it has not been possible to consider the extent to which the settlement and coal-mining landscape which evolved at Hetton was typical of east Durham or was endowed with unique qualities donated as a result of the pioneer venture which produced the industrial landscape. A logical extension of this study would involve an analysis of the coal-mining settlement which had been extended over the east Durham plateau by the middle of the nineteenth century. This is a critical date as only four new collieries were sunk on the plateau during the second half of the century (10). By 1851 the nascent coal-

mining landscape had become firmly established but by using Tithe, Censal and Ordnance Survey evidence together with documentary evidence, a detailed study of the genesis of the coal-mining landscape that had come into existence in less than two decades before 1851 would be feasible. However, with the enlarging of the area under examination it would be no longer possible to analyse the mass of data in the Census Enumerators' Books. By 1851 the population of the colliery villages on the plateau totalled some 30,000, which although much less than the later population, would be sufficiently large to necessitate the use of sampling techniques with appropriate statistical safeguards. This study, though a pioneer study of a pioneer mining community, was concerned simply to attempt the detailed reconstruction of the growth of settlement in one parish in all its aspects.

Chapter 7 : Notes

- 1 W A Moyes, Mostly Mining, 76
- 2 N.E.I.M. & M.E. 'Hetton Colliery reports', Watson Coll. Vol. 45
- 3 W A Moyes, Mostly Mining, 88
- 4 A E Smailes, 'Population changes in the colliery districts of Northumberland and Durham', Geographical Journal 91 (1938), 220-232
- 5 R Lawton, 'Irish Immigration to England and Wales', 38
- 6 We are reminded by R Lawton of the existence as late as 1851 of many workers in the British Isles who worked on a domestic basis and who still outnumbered the operatives in factories. For instance, in the middle of the nineteenth century tailors outnumbered woollen workers and blacksmiths outnumbered iron workers. See R Lawton, 'Historical Geography; the industrial revolution', in J W Watson and J B Sissons (eds), The British Isles; a systematic geography (1964), 238
- 7 R T Jackson, 'Mining Settlements in Western Europe', 160, 161
- 8 (eds) A H R Baker et al, Geographical Interpretations of Historical Sources, 14
- 9 ibid, 17
- 10 A E Smailes, North England, 173