

PLANTS AND FOSSILS:  
HOUSEHOLD FUEL CONSUMPTION IN HAMPSHIRE AND THE WEST RIDING OF  
YORKSHIRE  
1750-1830

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## Abstract

The price and availability of different fuel sources shaped the material lives of English people during the Industrial Revolution. Fuel prices affected the location of industries, population growth and whether poorer people could afford to cook their own food. Fuel supplies were highly regionalized in this period and few people had access to wood, peat and coal at comparable prices. Depending on the community, people consumed wood, peat, local coal or non-local coal, the prices of which always differed. National averages or price-wage series do not reflect these diverse experiences. This dissertation offers a new perspective on living standards of the labouring poor by examining the role of regional environments and emphasizing their impact. It does so with a comparative analysis of Hampshire and the West Riding of Yorkshire, two of the most geographically diverse English counties. Evidence is derived from fuel purchases of Overseers of the Poor and sales records of collieries, along with contemporary observations, the 1831 Census, court records of fuel theft prosecutions and the heights of prisoners in the West Riding House of Correction. These sources indicate that wood prices tripled in inland northern Hampshire between 1750 and 1830 and made cooking prohibitively expensive for most households. Purchased wheat bread increasingly became the staple food in that region. Meanwhile, coal was very cheap where it was mined and fuelled industrial expansion on the Yorkshire coalfield. Population growth was higher in this manufacturing region and residents continued to cook their own food but came to suffer from the smoke arising from such fires. The regional perspective of this dissertation indicates that living standards declined for most labouring poor English people during the Industrial Revolution, but for regionally different reasons.

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### Note on Units

I refer to various measures of fuel throughout this dissertation. These are generally explained in the text with further detail in Appendix D. I left currency in the original, pre-decimalized units.

#### Abbreviations

d - pence  
s – shilling  
£ - pound

#### Ratio

12d = 1s  
20s = £1

## Introduction

In 1834 a parliamentary inquiry into poor relief across England and Wales asked Overseers of the Poor about the wages, living conditions and diets of labourers in their communities. Respondents at Hipperholme with Brighouse, a textile-manufacturing township with 5,000 inhabitants in the Pennines of western Yorkshire, reported year-round employment for local labourers. Typical households earned 20s a week. Labouring people could afford sufficient coal to cook their food and subsisted “on oatmeal porridge, wheat and oatmeal bread, milk, potatoes, and occasionally a little beef or mutton, bacon or herrings.”<sup>1</sup> Far to the south, things were very different in Bentley, an agricultural parish in northern Hampshire with 728 inhabitants. Work was less plentiful here, with ten adult men generally out of work in the summer and 25 in the winter. Wages were lower and fuel prices higher, so that even families in which children also worked for wages could find only 9s a week to spend on bread after paying for rent and clothing.<sup>2</sup> Poor and labouring people lived different lives in Hipperholme and Bentley.

National statistics don't reflect these differences.<sup>3</sup> Labourers' living standards in these two English communities differed in 1834 and both had changed substantially in the previous eighty years. Both villages contained more people. In particular, Hipperholme's population had nearly doubled since 1801, when it contained 2,879

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<sup>1</sup> *Report from His Majesty's Commissioners for Inquiring into Administration and Practical Operation of the Poor Laws* (1834) 618a and 618b.

<sup>2</sup> *Poor Law Report* (1834) 412a and 412b.

<sup>3</sup> Julian Hoppit, “Understanding the Industrial Revolution” *The Historical Journal* 30 (1987) 217.

residents.<sup>4</sup> Hipperholme was 2.5 miles east of Halifax and by the early eighteenth-century was at the centre of a woollen-textile manufacturing region. Yarn was spun and then woven by hand, and the dense concentration of villages was already notably different than other English regions.<sup>5</sup> This industrial region between Manchester and Leeds specialized in the production of cotton, woollen and worsted textiles. It was filled with single-industry manufacturing villages like Hipperholme. By 1831, there were more than forty manufacturing villages with populations between 3,000 and 8,000 residents in the Yorkshire part of this industrial belt.<sup>6</sup> Such a dense concentration of manufacturing villages was unprecedented anywhere. Their prolific expansion, along with the larger towns and the fabrics they produced, were central to the Industrial Revolution.

Bentley's population growth was slower, having increased from 504 inhabitants in 1801 to 728 three decades later.<sup>7</sup> It also occurred under very different economic circumstances. Bentley was flatter and more fertile than Hipperholme. In the mid eighteenth-century, its residents and those of nearby villages had combined their agricultural employment with small-scale domestic manufacturing. However, such occupations declined as northern-English industrial products undersold their southern equivalents. Northern Hampshire largely deindustrialized in the late eighteenth-century and its economy was increasingly focused on arable agriculture. Northern Hampshire lacked the growing towns of the Pennines; Hipperholme was larger than any of its communities.

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<sup>4</sup> E.A. Wrigley, *Early English Censuses*, (Oxford: Oxford University Press, 2011) Table A1.5

<sup>5</sup> Daniel Defoe, *A Tour Thro' The Whole Island of Great Britain: Divided into Circuits or Journies, Volume II*, (London: Frank Cass & Co, 1968, original 1724) 600-601.

<sup>6</sup> *1831 Census*.

<sup>7</sup> Wrigley, *Early English Censuses*, Table A1.5

The changes brought about by the Industrial Revolution were experienced very differently across England. They have also generated considerable debate amongst historians interested in industrialization's impact upon the living standards of labouring people. Living standards cannot be understood through the calculation of national averages because these represent neither the experiences of those in Hipperholme nor Bentley. Living standards need to be understood through regional studies. These are intimately tied to the economic fortunes of their constituent villages, sub-regions and industries. Clearly, living standards were centrally affected by the availability of employment and changes in its nature. Other scholars have dealt with many aspects of these changes. In what follows, I will focus on the fuel consumption of labouring and poor households because this offers a new avenue for understanding their changing living standards. Fuel was one of the main items labouring people purchased or collected in the eighteenth and early nineteenth centuries. It influenced the foods they ate and whether they could afford to cook for themselves. When the fuel consumption of poorer households declined so did their standard of living. Changing patterns of household fuel use were also connected to industrialization. The scale of coal-use and the pollution it caused were two of the Industrial Revolution's main components. This too had serious consequences for the standard of living and will be investigated here.

English energy consumption quadrupled between 1750 and 1830.<sup>8</sup> The population more than doubled and national per capita energy use increased substantially during the early Industrial Revolution. However, as this dissertation will demonstrate, increased energy consumption did not improve the lives of most people.

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<sup>8</sup> Paul Warde, *Energy Consumption in England & Wales 1560-2000*, (Napoli: Consiglio Nazionale delle Ricerche, 2007) 115-122.

Regionally-concentrated manufacturing used most of the new energy and many people could not benefit from increased employment. By the early nineteenth-century, people in those industrial communities also suffered from the pollutants in industrial smoke and the clouds that began to block sunlight. Meanwhile, the middle and upper-classes came to own a greater share of the national wealth and most English households burned less fuel in 1830 than their eighteenth-century grandparents.

### **Types of Fuel Use**

Communities burned wood, peat, local coal or non-local coal. These four types of fuel shaped the economies, population growth and diets of English people. Each of these fuel types involved fundamentally different relationships between humans and the non-human environment. As a non-renewable subterranean resource, coal mining increased with population growth. Coal also contained sulphur and other chemicals which created smoke pollution when burnt in large quantities. Meanwhile, wood is renewable but photosynthesis limits annual growth and could not increase as population grew. Peat is a semi-renewable fuel. English deposits were sufficiently large that peat collection could increase to meet the needs of a growing population. The different environmental relationships involved in each fuel source led living standards to fall for different reasons across most of England.

The cost of coal rose steadily with distance shipped and higher prices meant that people in non-coalfield regions burnt less of it. Industrialization occurred where coal was cheap. Meanwhile, fuel consumption fell in wood-burning inland southern England. It declined less drastically in the coal-burning regions and least in both peat-burning and manufacturing ones. By 1800, regional living standards differed such that residents of

the Yorkshire coalfield were taller than those from the agricultural regions east of it.

Living standards declined in this period for various reasons. In agricultural regions it was because fuel had become too expensive for labouring people to afford cooking anything but the occasional cup of tea. Meanwhile, in industrial districts high fuel consumption created sufficient smoke to negatively affect residents after 1810.

Fuel consumption fell especially in inland southern England, where purchased bread replaced home-cooked grains and homes were unheated more often than before. That same region also lost long-standing manufacturing industries to competitors in northern England. Changing living conditions were related to the local availability and price of fuel. Coal, peat, wood, furze and dung were all burnt in various locations and subject to their own dynamics. Of these fuels, only coal could be transported economically but its price varied greatly over short distances. It remained cheap near where it was mined. Elsewhere, prices were higher and fairly stable. Most peat-burning households collected peat themselves and came to do so from more distant deposits during this period. This made peat somewhat more expensive but, like coal, it remained cheap where it was found and normal household consumption there did not decline much. Wood prices rose significantly, to the point that most southern English households stopped cooking. Population grew more slowly in wood-burning regions, but even so the fuel supply could not increase to meet its needs. The varying abilities of different fuels to supply growing populations led to rising prices and reduced consumption, so regional differences in fuel consumption, already strong in 1750, became significantly more pronounced by 1830.

I argue in this dissertation that historians need to rethink how we understand changing energy consumption in this period. E.A. Wrigley famously defines the Industrial Revolution as a transition in energy sources from an 'organic' to a 'mineral' economy.<sup>9</sup> This distinction between coal and traditional land-intensive fuels takes into account important differences in the renewability of fuel sources, the construction of transport infrastructure, competition with agriculture and the ability to increase production. Coal's share of English fuel use, both household and industrial, increased between 1750 and 1830. A simple understanding of the developing 'mineral economy' would suggest that the domestic fuel source in many communities changed during these eighty years. But that was not the case. Coal was the predominant northern English fuel source in 1750 and already burnt in the coastal towns of southern England. Equally, it was not consumed in most of inland southern England or peat-rich regions in the 1820s. The American historian Christopher Jones argues that the geographic separation of production and consumption was a key transition in energy use. Towards this he emphasizes the transformative role of canals.<sup>10</sup> This observation is a broad one that does not apply to Industrial Revolution England. In 1750, coal was burnt wherever river navigations and coastal shipping allowed it to be economically shipped but not elsewhere. Moreover, although the new canals and extended rivers of the late eighteenth-century reduced the price of coal in some communities they did not radically alter the locations in which it was burnt. Industrial development remained concentrated on coalfields and residents of such communities burnt much greater amounts of fuel.

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<sup>9</sup> E.A. Wrigley, *Energy and the English Industrial Revolution* (Cambridge: Cambridge University Press, 2010) and *Continuity, Chance & Change: The Character of the Industrial Revolution in England*, (Cambridge: Cambridge University Press, 1988).

<sup>10</sup> Christopher F. Jones, "Energy Landscapes: Coal Canals, Oil Pipelines, Electricity Transmission Wires in the Mid-Atlantic, 1820-1930" (PhD Dissertation, University of Pennsylvania, 2009)

The evidence presented in the following chapters shows that instead of an 'energy transition', the essential change in household fuel consumption in this period was an ever-growing contrast between wood-burning regions and those with cheap coal. The mineral fuel became a more important fuel source for English households because the population of coal-burning regions, particularly manufacturing districts, grew at a faster rate than the rest of the country. Meanwhile, peat was an important fuel source that is difficult to classify as either 'organic' or 'mineral' as it is produced by millennia of plant decomposition. Peat was the second most frequently used household fuel across the combination of Hampshire and the West Riding throughout this period. It was also burnt in many other communities across England as David Davies' household budgets indicate.<sup>11</sup> Davies collected evidence from 122 labouring families in 20 different English communities during the 1780s. His sample omitted London and East Anglia and so overrepresented wood-burning regions, but the households in six of twenty communities burnt peat, while another six burnt coal, six burnt wood, one burnt wood and coal and one household burnt dung.<sup>12</sup> Wood was the main fuel source in northern Hampshire and other regions of inland rural southern England. However, most English

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<sup>11</sup> For regional histories that describe peat consumption see: Sara Birtles, "Common Land, Poor Relief and Enclosure: The Use of Manorial Resources in Fulfilling Parish Obligations, 1601-1834," *Past and Present*, 165 (1999) 74-106, J. M. Neeson, *Commoners: Common Right, Enclosure and Social Change in England, 1700-1820*, (Cambridge: Cambridge University Press, 1993), Angus J.L. Winchester, *The Harvest of the Hills: Rural Life in Northern England and the Scottish Borders, 1400-1700*, (Edinburgh: Edinburgh University Press, 2000), and "Upland Commons in Northern England," *The Management of Common Land in North West Europe, c. 1500-1850*, Martina De Moor, Leigh Shaw-Taylor & Paul Warde Eds. (Turnhout: Brepolis, 2002), Michael Williams, "The Enclosure of Waste land in Somerset, 1700-1900," *Transactions of the Institute of British Geographers* 57 (1972): 99-123, Samantha Williams, "Earnings, Poor Relief and the Economy of Makeshift: Bedfordshire in the early years of the New Poor Law" *Rural History* 16 (2005) 21-52, Enid Porter, "Fenland Peat" *Studies in Folk Life: Essays in Honour of Iorwerth C. Peate*, Geraint Jenkins ed (London: Routledge & Kegan Paul, 1969) and Robert Sydney Dilley, "Agricultural Change and Common Land in Cumberland, 1700-1850" (PhD Thesis, McMaster University 1991) 309-310.

<sup>12</sup> David Davies, *The Case of the Labourers in Husbandry Stated and Considered*, (Bath: R. Cruttwell, 1795) 176-231.



people did not live in wood-burning inland southern regions.<sup>13</sup> Peat-burning communities were less likely to shift fuel sources and household consumption declined less than in wood-burning ones during this period. As a result, peat overtook wood as the second most frequently burned household fuel across England in the late eighteenth century. The essential division in this period was between fuel-rich regions with abundant peat or cheap coal and fuel-poor regions with declining wood supplies. Such a definition better explains English experiences than the distinction between organic and mineral economies.

### **Regional Study**

Because English fuel use was highly localized and subject to different environmental dynamics, it is best approached through a regional study. This study considers enough communities to understand both broad trends and local distinctiveness to a much greater degree than is possible with a national or global history. Furthermore, national studies have a tendency to overemphasize the experiences of those in and around London while missing dynamics that were important to the rest of England. I have chosen to study two counties, Hampshire and the West

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<sup>13</sup> This is seen in the regional distribution of population from the *1801 Census*. 24% were in Yorkshire, Lancashire and the four northern counties. There is minimal evidence for wood consumption in those counties, while this dissertation and the regional studies note many peat-burning regions in addition to coal. A further 11.5% was in coal-burning London, Southwark and Surrey's Brixton Hundred. Meanwhile, the regional studies emphasize the presence of peat in eastern England, with Lincolnshire, Cambridgeshire, Norfolk, Suffolk and Essex being home to over 12% of England's population. Moreover, for the remaining half of England, coal was the fuel source in the expanding manufacturing regions of Warwickshire, Staffordshire, Cheshire, Derbyshire, Nottinghamshire, Shropshire and Gloucestershire. The core industrial regions of those counties account for a further 8% of England's population. Coal was also burnt in many other Midland communities due to the quality of their canals and river navigations and the remainder of those counties accounted for another 8% of the English population. Amongst the remaining counties, much of Cornwall, Devon, Somerset, Dorset, Hampshire, Sussex and Kent's populations were coastal and coal-burning. The above sources and this dissertation note that peat was burnt in parts of Northamptonshire, Berkshire, Hampshire, Somerset, Dorset and Cornwall. Wood was thus not universally consumed in southern England. There were not enough people in the wood-burning regions for more of it to have been consumed than peat, especially as individual peat-burning households consumed more fuel than wood-burning ones by 1800.

Riding of Yorkshire, for this project. These large counties contained 8% of the English population in 1750 and 10% in 1830.<sup>14</sup> In 1801, the West Riding had a similar population to both the East and West Midlands.<sup>15</sup> Hampshire and the West Riding were also the two most geographically diverse English counties. Along with its coal-producing industrial region, the West Riding of Yorkshire included fenlands, pastoral uplands and a region of arable agriculture. Hampshire had minimal coal mining, but included a coastal region, a large port, an inland agricultural region and extensive peat deposits. With the exception of London's metropolitan economy and that of the west coast industrial ports, these two counties included each type of English regional economy. In terms of fuel use, however, Hampshire and the West Riding included all of the various environmental relationships affecting the rest of England. For coal they included regions where it was mined locally and ones where it arrived both through inland navigations and ocean-going ships. These counties also included regions that burnt upland peat, lowland peat, wood, furze and dung. Their diversity captures the range of English fuel experiences in the Industrial Revolution better than any other two counties would.

The boundaries of neither Hampshire nor the West Riding of Yorkshire corresponded to the geographical divisions of fuel relationships, economies or the experiences of most eighteenth- and early nineteenth-century inhabitants. Both counties were created centuries earlier as the administrative hinterlands of Winchester and York. Neither town was an important regional centre by the eighteenth century. However, the arbitrariness of the county boundaries makes them well-suited for this project. Both

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<sup>14</sup> Wrigley, *Early English Censuses*, Table A2.6

<sup>15</sup> Wrigley, *Early English Censuses*, Table A2.6. The West Riding had a population of 590,518 in comparison to 616,068 residents in Warwickshire, Worcestershire and Staffordshire or 588,825 people in Derbyshire, Nottinghamshire, Leicestershire and Northamptonshire.

counties contained more diverse experiences than any homogenous region because they were not confined to areas of similar economies, agricultural possibilities, fuel types or even watersheds. This diversity of experience is central to understanding changing living conditions and makes counties a good unit for the study of fuel consumption. A county study also has the advantage that courts, parliamentary committees, censuses and the work of earlier historians fall within these boundaries. The geographical scope of this project relies upon the county boundaries as they existed at the time and not the ones which have been in use since 1974. In short, the diverse geography of both counties allows me to discuss many more experiences than if an environmentally coherent region had been studied.

**Map I-1: Hampshire and the West Riding of Yorkshire in England and Wales**



Until 1974, the West Riding of Yorkshire was the largest English county with 1.7 million acres. In 1750, its 323,482 inhabitants made it the second most populous

county, after Middlesex. In subsequent decades, it was among the fastest growing counties and by 1831 it was the third most populous county with 996,199 people.<sup>16</sup> In 1788, John Aikin claimed that “Yorkshire, in this wide compass, contains an abstract of the whole kingdom with respect to soil, products, and face of country.”<sup>17</sup> The elevation of the West Riding slopes upwards from east to west. The easternmost section of the Riding consisted of flat wetlands around the confluence of the Rivers Dun, Aire, Ouse and Humber, which were drained to varying degrees. To the west were the fertile agricultural lands of the Vale of York. At their western edge began a series of hills that rose and continued to the Riding’s western boundary. The southern part of these hills contained a large coalfield that annually produced half a million tons in 1750 and 2.8 million tons in 1830.<sup>18</sup> Some vegetable crops and oats were grown on the coalfield and livestock grazed. However, it was primarily a manufacturing region, whose northern portion specialized in woollen and worsted textiles and its southern portion in cutlery. This manufacturing district was at the forefront of the Industrial Revolution and was one of the world’s most industrialized regions throughout this period.<sup>19</sup> The coalfield

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<sup>16</sup> Wrigley, *Early English Censuses* Tables A2.1 and A2.6. The faster growing counties were Lancashire and Surrey while the larger ones in 1831 were Lancashire and Middlesex.

<sup>17</sup> John Aikin, *England Delineated; Or, a Geographical Description of Every County in England and Wales: With a Concise Account of its most Important Products, Natural and Artificial. For the Use of Young Persons*, (London: T. Bensley, 1788) 51.

<sup>18</sup> Michael W. Flinn, *The History of the British Coal Industry Volume 2: 1700-1830, The Industrial Revolution*, (Oxford: Clarendon Press, 1984) 26. West Riding fuel regions are more fully demonstrated in map 2-1.

<sup>19</sup> For Yorkshire industrialization see: Pat Hudson, *The Genesis of Industrial Capital: A Study of the West Riding Wool Textile Industry c1750-1850*, (Cambridge: Cambridge University Press, 1986), Derek Gregory, *Regional Transformation and Industrial Revolution: A Geography of the Yorkshire Woollen Industry*, (London: Macmillan, 1982), M Barke, “The Population of Brighouse, West Yorkshire, in 1851,” *Yorkshire Archaeological Journal* 48 (1976): 135-146, Gary Firth, “The Origins of Low Moor Ironworks, Bradford, 1788-1800,” *Yorkshire Archaeological Journal* 49 (1977): 127-139, W.P. Hartley, “Involvement in Coal Mining by the Wool Textiles Industry: Some West Yorkshire Examples” *Yorkshire Archaeological Journal* 65 (1993) 169-174, E.J. Connell and M. Ward, “Industrial Development 1780-1914,” *A History of Modern Leeds*, Derek Fraser ed. (Manchester: Manchester University Press, 1980), Pat Hudson, “Capital and Credit in the West Riding Wool Textile Industry c. 1750-1850” *Regions and Industries: A Perspective on the Industrial Revolution in Britain*, Pat Hudson ed (Cambridge: Cambridge University Press, 1989),

contained the two major towns of Sheffield and Leeds, along with rapidly growing Halifax, Huddersfield, Wakefield, Saddleworth, Bradford and Barnsley. North-west of the coalfield was a damp, upland region well-suited to raising sheep with a small manufacturing sector.

Hampshire was also a relatively large county with over one million acres. Its 144,633 inhabitants in 1750 made it the fifteenth largest in population. By 1831, its 320,587 people ranked fourteenth.<sup>20</sup> While the main Yorkshire divisions were between the east and the west, the key ones in Hampshire were between the north and the south. Northern Hampshire was a fertile inland region specializing in arable agriculture. It was separated from southern Hampshire by the hills of the South Downs. Southern Hampshire was agricultural in part but its economy was primarily connected to coastal trade and the navy.<sup>21</sup> It included the county's two largest towns, Southampton and Portsmouth, and the Isle of Wight. To the southwest, the New Forest, once a royal

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Maxine Berg, "Technological Change in Birmingham and Sheffield in the Eighteenth Century," and Pat Hudson and Steve King, "Rural Industrialising Townships and Urban Links in Eighteenth Century Yorkshire," *Industry and Urbanisation in Eighteenth Century England*, Peter Clark and Penelope Corfield eds, (Leicester: Centre for Urban History, 1994), Fred Singleton, *Industrial Revolution in Yorkshire*, (Clapham: Dalesman Publishing, 1970) Sidney Pollard, *Marginal Europe: The Contribution of Marginal Lands since the Middle Ages*, (Oxford: Clarendon Press, 1997), D.T. Jenkins and K.G. Ponting, *The British Wool Textile Industry 1770-1914* (Edinburgh: Heinemann Educational Books, 1982). For work on Yorkshire coal see: Flinn, *History of the British Coal Industry Volume 2*; Alfred Fletcher, *The Development of Management in the South Yorkshire Coal Mining Industry, 1770-1835: A Study of Management at the Fitzwilliam and Norfolk Collieries*, (Dissertation submitted as part of the requirements of the M.A. Course in the Industrial Revolution, Department of Economic History, University of Sheffield, 1973), Ian R. Medlicott, "The Development of Coal Mining on the Norfolk and Rockingham-Fitzwilliam Estates in South Yorkshire 1750-1830" *Yorkshire Archaeological Journal* 59 (1987) 103-118, David S. Cross, "Yorkshire Estates and Mineral Exploitation, 1750-1830" *Yorkshire Archaeological Journal* 81 (2009) 221-255, Graham Mee, *Aristocratic Enterprise: The Fitzwilliam Industrial Undertakings 1795-1857*, (Glasgow: Blackie, 1975), Pat Hudson, "From Manor to Mill: The West Riding in Transition," *Manufacture in Town and Country Before the Factory*, Maxine Berg, Pat Hudson and Michael Sonenscher eds., (Cambridge: Cambridge University Press, 1983). The occupational structure maps produced by the Cambridge Group for the History of Population and Social Structure emphasize that the West Riding coalfield, along with eastern Lancashire, were the most industrialized English region in 1817. <http://www.hpss.geog.cam.ac.uk/research/projects/occupations/englandwales1817/> (accessed December 12, 2012)

<sup>20</sup> Wrigley, *Early English Censuses* Tables A2.1 and A2.6

<sup>21</sup> For a better illustration of Hampshire's fuel regions, see Map 2-3.

hunting preserve, remained a primarily pastoral region managed by the crown for naval timber.

This dissertation covers the period between 1750 and 1830. Contrary to initial expectations, these eighty years did not mark a fundamental transition from wood to coal consumption, which took place either earlier or later in most communities. However, these eighty years included major changes in the amounts of fuel consumed and this had a larger impact on the lives of most people than fuel type. Choosing a starting date of 1750 also reveals fundamental changes in living conditions. Mid-century was a relatively prosperous period for English labourers in which manufacturing was already prevalent but employment plentiful and fuel available. In many ways it captures pre-industrial Britain at its peak before population growth and industrialization radically changed living conditions. Moreover, Accounts of Overseers of the Poor, which record the fuel, pensions and other poor relief provided locally, are one of the main sources for this project. They are preserved in greater number and detail for the second half of the century, thereby offering more local evidence for this period.

1830 is an effective date at which to end this study for a number of reasons. Firstly, fuel disbursements by Overseers of the Poor became less frequent in the 1820s and were curtailed by the Poor Law Amendment Act of 1834. Thus, one of the key sources for this project is eliminated. This dissertation is also fundamentally about living conditions during the early Industrial Revolution, which ended with the development of railways. The world's first intercity railway opened between Manchester and Liverpool in January 1831. While railways did not immediately reach all of England or initially transport coal, their arrival eventually made coal cheaper and easier to buy. One of my

key arguments is that living conditions diverged as population growth unequally strained fuel supplies. That divergence did not end in 1830 but subsequent decades saw a greater integration of regions and an improved ability to ship coal to inland southern England. Finally, the November 1830 riots across Hampshire and parts of the West Riding signify a key moment in changing rural social relationships and declining living conditions.<sup>22</sup>

## Historiography

Changing energy use and living standards during the early Industrial Revolution are two of the more contentious topics in English history. This dissertation combines the two fields in an unprecedented manner. Historians continue to debate whether English living standards improved or declined during the Industrial Revolution.<sup>23</sup> This debate has often been between historians who rely upon written observations and those who base their arguments on wage-price series or national income statistics. The first group of historians emphasizes the many contemporary accounts of poverty and unemployment along with the more limited evidence of working-class consumption. Meanwhile, the second group emphasizes evidence that total national consumption increased and makes calculations about the ability of consumers to purchase baskets of goods using evidence from unskilled male occupations which provide long-run wage series. The first

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<sup>22</sup> "Editorial" *The Times* 29 November 1830, "State of the Labourers" *The Times* 18 December 1830, Harry Hopkins, *The Long Affray: The Poaching Wars, 1760-1914*, (Basingstoke: Macmillan, 1985) 182, E.J. Hobsbawm and George Rudé, *Captain Swing*, (London: Unwin, 1969), Peter Jones, "Swing, Speenhamland and Rural Social Relations: The 'Moral Economy' of the English Crowd in the Nineteenth Century," *Social History* 32 (2007) 271-290, A.M. Colson, "The Revolt of the Hampshire Agricultural Labourers and its Causes, 1812-1832," M.A. Thesis (London) 1937. Katrina Navickas "Changing Landscapes in Northern England: Popular Protest in Urban-Rural Hinterlands, 1812-34" *Anglo-American Conference* 2010 found evidence of riots that resembled the Swing ones in the West Riding during the same weeks of November 1830.

<sup>23</sup> For a summary of the waves of scholarly thought on this matter into the early 1980s see: David Cannadine, "The Present and the Past in the English Industrial Revolution," *Past and Present* 103 (1984) 131-172.

group of historians generally finds that living conditions declined while the second group argues that they were high or improving. There is a surprising continuity in this debate in which the early 1960s exchange between E.J. Hobsbawm and R.M. Hartwell resembles the 2010s disagreements of Jane Humphries and Robert C. Allen.<sup>24</sup> Currently, Allen and various collaborators are collecting wage-price series from across the world between 1350 and 1900. They are creating wage-price series for many countries using a comparable basket of goods. These are central to Allen's arguments that England's was a relatively high-wage economy in the eighteenth century and that these high wages contributed to the Industrial Revolution.<sup>25</sup>

A number of historians have criticized aspects of the wage-price scholarship on living standards. These include E.P. Thompson's observations that such series did not record the actual goods consumed and the regularity of employment or account for

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<sup>24</sup> R.M. Hartwell, "The Rising Standard of Living in England, 1800-1850," *Economic History Review* 13 (1961) 397-416, E. J. Hobsbawm, "The Standard of Living during the Industrial revolution: A Discussion" *Economic History Review* 16 (1963-1964) 119-134 and R.M. Hartwell, "The Standard of Living during the Industrial Revolution: A Discussion," *Economic History Review* 16 (1963-1964) 135-146, Jane Humphries, "The Lure of Aggregates and the Pitfalls of the Patriarchal Perspective: A Critique of the High Wage Economy Interpretation of the British Industrial Revolution," *Economic History Review* 66 (2013) 693-714.

<sup>25</sup> Examples of publications based on these include: Robert C. Allen, *The British Industrial Revolution in a Global Perspective* (2009), "The Great Divergence in European Wages and Prices from the Middle Ages to the First World War," *Explorations in Economic History* 38 (2001) 411-447, "Real Wages in Europe and Asia: A First Look at the Long-Term Patterns" *Living Standards in the Past: New Perspectives on Well-Being in Asia and Europe* Allen, Bengtsson and Dribe eds (Oxford: Oxford University Press, 2005) 111-130, Allen, Jean-Pascal Bassino, Debin Ma, Christine Moll-Murata and Jan Luiten van Zanden, "Wages, Prices and Living Standards in China, 1739-1925: In Comparison with Europe, Japan and India" *Economic History Review* 64 (2011) 8-38, Allen and Jacob Weisdorf, "Was there an 'Industrious Revolution' Before the Industrial Revolution? An Empirical Exercise for England, c.1300-1830" *Economic History Review* 64 (2011) 715-729, Allen, Tommy E. Murphy and Eric Schneider, "The Colonial Origins of Divergence in the Americas: A Labour Market Approach," *Journal of Economic History* 72 (2012) 863-894. Other wage-price based articles include: Gregory Clark, "Farm Wages and Living Standards in the Industrial Revolution: England, 1670-1869," *Economic History Review* 54 (2001) 477-505, Joel Mokyr, "Is There Still Life in the Pessimists Case? Consumption During the Industrial Revolution, 1790-1850," *Journal of Economic History* 48 (1988): 69-92, and N.F.R. Crafts and Terence C. Mills, "Trends in Real Wages in Britain, 1750-1913," *Explorations in Economic History* 31 (1994): 176-194.



increasingly regimented work routines.<sup>26</sup> E.J. Hobsbawm criticizes wage-price series for not representing labourers' consumption, suggesting that "the most fruitful way of getting at real wages is probably through the study of actual consumption."<sup>27</sup> Christian Petersen claims that the goods which labouring people consumed changed in this period so "the notion of a fixed 'basket of commodities', though often used in the standard-of-living debate, is a counter-factual."<sup>28</sup> Jane Humphries criticizes Allen's methodology for exclusively relying upon urban male wages, not accounting for the numerous single-parent families, assuming atypically small families and significantly underestimating the nutritional requirements of women and children.<sup>29</sup> Keith Snell reassesses the debate using the perceptions of agricultural labourers and suggests this perspective is generally lacking from wage-price series.<sup>30</sup> Meanwhile, Roderick Floud, Robert Fogel, Bernard Harris, and Sok Chul Hong find that wage-price series are a problematic method for understanding living standards.

The principal drawbacks of the method were that – being based entirely on monetary income – it could not incorporate such issues as changes to the length of human life, that it did not adequately reflect the advent of new 'comforts and luxuries,' that it was difficult to incorporate new occupations, and that it was always difficult to ensure that the whole, or even a majority, of the population was considered.<sup>31</sup>

Allen's wage-price series also fail to reflect living standards in Hampshire or the West Riding because neither his wages nor prices are the ones labourers experienced.

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<sup>26</sup> E.P. Thompson, *The Making of the English Working Class*, (London: Penguin Books, 1991, first edition 1963) 347, "Time, Work-Discipline and Industrial Capitalism" *Past and Present* 38 (1967) 95-97

<sup>27</sup> Hobsbawm, "Standard of Living during the Industrial revolution" 121.

<sup>28</sup> Christian Petersen, *Bread and the British Economy, c1770-1870*, Andrew Jenkins ed. (Aldershot: Scholar Press, 1995) 6.

<sup>29</sup> Humphries, "Lure of Aggregates and the Pitfalls of the Patriarchal Perspective" 693-714.

<sup>30</sup> K.D.M. Snell, *Annals of the Labouring Poor: Social Change and Agrarian England, 1660-1900* (Cambridge: Cambridge University Press, 1985) 2-10.

<sup>31</sup> Roderick Floud, Robert W. Fogel, Bernard Harris, and Sok Chul Hong, *The Changing Body: Health, Nutrition and Human Development in the Western World since 1700*, (Cambridge: Cambridge University Press, 2011) 7-8.

Wages, food and fuel prices varied considerably across both counties and England generally. Allen's coal prices are much higher than those paid on the West Riding coalfield and do not represent just how cheap coal was in that industrializing region. Meanwhile, his fuelwood prices are lower than the ones paid in wood-dependent northern Hampshire after 1793. Grain prices also varied between locations so that national averages are not necessarily indicative of regional purchasing power. For example, in October 1772 wheat that cost 6s 1d per bushel in Hampshire was selling for 4s 11d in Cornwall, 6s 5d in London and 6s 10d in Gloucester.<sup>32</sup> These discrepancies between the prices actually paid and those used in wage-price series create arguments based on imaginary labouring families. The discrepancies cause Gregory Clark to argue erroneously that southern English agricultural labourers had slightly higher living standards in the 1820s than in the 1750s and that these improved considerably after 1815.<sup>33</sup> Wages and incomes varied greatly across Hampshire and the West Riding in this period, as evidenced by those reported in the 1834 Rural Queries. This diversity is not reflected in Allen's wage data, which underestimate adult male wages in Hampshire for that year. Diversity in wages was particularly high on the West Riding coalfield in the early 1830s, where impoverished hand-loom weaving villages contrasted with prosperous factory ones. Women's wages are absent from his series, although women were more likely to be employed on the West Riding coalfield than in other parts of England. As a result, Allen's northern English wages might capture the average wage of *male* labourers in the West Riding while representing the actual living conditions of very

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<sup>32</sup> *Hampshire Chronicle*, 5 October 1772, 1.

<sup>33</sup> Clark, "Farm Wages and Living Standards" 496. Clark and Allen use the same wage and price data, although they have very different methodologies for calculating wage-price series from them.

few.<sup>34</sup> In short, the standard of living debate has largely occurred in the context of English national history and does not often account for the strong regional differences that shaped most people's experiences.<sup>35</sup> By seeking a more regional perspective on living conditions, this dissertation seeks better to explain why living standards declined for so many individuals despite a growth in national output and the apparent ability of nominal wage rates in some trades to purchase more goods.

Alan Albery is another scholar who overestimates the fuel consumption of labouring households. In a well-researched and otherwise informative article on woodland management in northern Hampshire between 900 and 1815, he claims that typical wood consumption in 1792 "for a cottager's family is twenty-five to fifty tons a year."<sup>36</sup> His estimate comes from the observation in a report on Pamber Forest that cottage households required from a quarter to half an acre of coppiced wood annually.<sup>37</sup> As those trees appear to have been cut every twenty years, Albery assumes that such a family had the use of five to ten acres on such a rotation. Given the high cost of wood in northwestern Hampshire, his Pamber households more likely had access to less than half an acre, of which they cut one-twelfth each year.<sup>38</sup> Albery's estimate is also based upon higher yield assumptions for coppiced trees than those used by Warde or

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<sup>34</sup> Poor Law Report (1834), <http://www.nuffield.ox.ac.uk/People/sites/Allen/SiteAssets/Lists/Biography%20Sections/EditForm/Labourers.xls.xls> (accessed 3 January 2012)

<sup>35</sup> For more on the regional nature of the Industrial Revolution, see: Berg and Hudson, "Rehabilitating the Industrial Revolution".

<sup>36</sup> Alan Albery, "Woodland Management in Hampshire, 900 to 1815," *Rural History* 22 (2011) 164.

<sup>37</sup> *Eleventh Report of the Commissioners appointed to Enquire into the State and Condition of the Woods, Forests and Land Revenues of the Crown* (1792) 35.

<sup>38</sup> Albery "Woodland Management in Hampshire" 173 notes that trees for fuel were cut every 12 years in Pamber earlier in the century. Chapter one also indicates that Hampshire coppice-cycles were typically 12 to 14 years at this time, and not 20.

Wrigley.<sup>39</sup> Thus, Albery estimates typical fuel consumption in Pamber as twenty to forty times higher than it actually was, so that northern Hampshire is misrepresented as one of the world's most fuel-rich regions during years of severe deprivation.

Increasing energy consumption and the rise of coal was another major feature of eighteenth-century England. E. A. Wrigley emphasizes this in describing the transition from an 'organic' to a 'mineral' economy.<sup>40</sup> The first relied upon living materials for its food, energy, shelter and was limited by annual photosynthesis, while the latter was not limited by plant growth because it had access to fossil fuels. This provided more energy and eventually both new materials and fossil fertilizers. Wrigley's argument is broad, national and difficult to dispute as a general characterization of developments between 1600 and 1850. That said, Wrigley does not deal with the process of coal's adoption, its various prices, its impact on cooking or regional differences in its use. English peat consumption is also absent from his work.

Another important contribution to English energy history is the multi-volume *History of the British Coal Industry*. In the eighteenth-century volume, Michael Flinn argues that coal consumption increased due to improved transportation and industrialization. Flinn summarizes many of the developments in mining and manufacturing while offering the most extensive estimates of regional coal output.<sup>41</sup> Paul Warde quantifies the entirety of English and Welsh energy consumption between

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<sup>39</sup> Albery, "Woodland Management in Hampshire" 164 suggests that annual growth of usable fuelwood was more than 4 tons/acre. Warde, *Energy Consumption in England and Wales* 34-36 estimates that coppices produced 3.3 cubic metres/hectare of usable wood. Even for denser tree species, the resulting annual growth is barely over 1 ton/acre. Meanwhile, Wrigley *Energy and the English Industrial Revolution* 16 estimates that woodlands could produce 1-2 tons/acre of sustained annual growth.

<sup>40</sup> Wrigley, *Continuity, Chance & Change* 9-12, *Energy and the English Industrial Revolution* 9-16.

<sup>41</sup> Flinn, *History of the British Coal Industry Volume 2*. See John Hatcher, *The History of the British Coal Industry Volume 1: Before 1700, Towards the Age of Coal*, (Oxford: Clarendon Press, 1993) for important background on earlier coal production.

1560 and 2000. His calculations for the years prior to 1853 are based upon evidence presented in the *History of the British Coal Industry*, along with estimates of wind, food, wood and animal energy. Like Wrigley, he does not include peat in his work because its use is difficult to quantify and by the eighteenth century it was “probably not amounting to much more than 1-2 percent of total energy consumption,” something I dispute in this dissertation.<sup>42</sup> Warde’s findings largely reinforce the work of Flinn, John Hatcher and Wrigley. His numbers suggest a greater precision than is possible from the source material but, aside from the absence of peat or a regional perspective, represent the main developments in national energy use. This dissertation builds upon the work of Flinn, Warde and Wrigley by connecting the broad national trends in energy use to individual lives. Such a perspective helps to explain how living standards for the labouring poor could decline while national energy consumption and economic output grew.

### **Structure of Dissertation**

This dissertation focuses on local differences in domestic fuel consumption and how they changed between 1750 and 1830. Chapter one discusses the various environmental relationships involved in the production and transportation of each fuel source. It emphasizes that mining coal required less labour than digging peat, cutting or gathering wood, so coal was considerably cheaper at pitheads than fuel sources in other locations. However, coal was not present everywhere and its transportation relied upon the construction of canals and straightening of rivers. These required large-scale investment and were disrupted on occasion by floods, droughts, frozen canals or the direction of winds. As an underground source of energy, coal mining put fewer limits on

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<sup>42</sup> Warde, *Energy Consumption in England and Wales, 1560-2000* 22.

agricultural land use than other fuel sources but did rely upon the management of woodlands to produce pit props. Meanwhile, wood and peat had more extensive relationships with local landscapes. Trees were coppiced to maximize the growth of firewood and were cut more frequently in Hampshire than in the West Riding. Wood, coal, peat, furze and dung ashes were all used as fertilizer through this period and helped to transfer nutrients to fields and gardens. Overall, chapter one describes the human manipulations of various environments that allowed fuel to be consumed in English households.

Chapter two builds upon the environmental relationships described in chapter one to examine which fuels were burnt where and how much was paid for them. This chapter distinguishes the twelve fuel regions of the two counties, including the types of fuel consumed, their relative prices and their relationship to local economies. It also includes a fuel price series for more locations than those used by other scholars. The prices used in that series are mainly derived from the amounts paid by local overseers to purchase fuel for poor households. This more detailed regional price series finds an eight-fold difference in the price of coal across the West Riding in 1800. Coal prices doubled on the West Riding coalfield between 1775 and 1815 but remained significantly cheaper than any fuel source in any other place. The cheapness of fuel partially accounted for the coalfield's prodigious industrialization and it is telling that throughout this period the easternmost limit of the manufacturing district and the coalfield was the same.

Improvements in transportation meant that coal prices increased less in the eastern regions of Yorkshire or in coastal Hampshire. These prices were never low

enough to encourage fuel-intensive industries but the steady cost prevented growing populations from being priced out of fuel in these coal-burning regions. Hampshire's coal supply was also vulnerable to privateers in wartime, which made it more sporadic and the increased insurance costs raised its price. In 1750, fuelwood in northern Hampshire cost the same as coal in Portsmouth. However, its prices tripled in the ensuing eighty years as the size of woodlands or the rate of their growth could not increase to meet the needs of a larger population. Peat was often collected but changes in the amount of labour required to do so can be determined by the wages Overseers of the Poor paid to have it dug and transported. In south-western Hampshire, overseers came to pay more for peat between 1775 and 1815 as deposits further away from villages were harvested. Where it was available, Hampshire peat remained significantly cheaper than any other fuel in the county. This chapter emphasizes the regional variations and timing of changes in fuel prices. Subsequent chapters will show that these had large impacts on consumption.

Chapter two relies heavily upon Accounts of Overseers of the Poor because these offer unparalleled evidence of the fuel sources burnt in English communities and their cost. Moreover, these disbursements to poor households can also give an indication of the amounts of fuel typically burnt in those communities. In Yorkshire, the fuel disbursed by overseers resembled the costs and amounts that labouring households told commentators Arthur Young and David Davies that they burnt. Chapter three traces the amount of fuel given to individual households, and shows that much more fuel was burnt where it was cheap. In fact, overseers gave individual poor households in Thurstonland, on the Yorkshire coalfield, coal which included fifteen times

the energy of that available in the wood disbursed to similar households in Bentley, Hampshire. Wood disbursements also declined heavily in northern Hampshire throughout this period, though the decline in coal and peat consumption elsewhere after 1805 was less pronounced. Reduced fuel consumption negatively affected the lives of poorer residents by leaving them colder in winter and reducing their ability to cook. The timing and geography of these declines thus indicate an important decrease in living conditions for many English families.

The Poor Laws have themselves been subject to extensive historical research, particularly the extent to which relief changed after the passing of the Poor Law Amendment Act of 1834. This chapter argues that in terms of fuel, poor relief had already become less generous in the 1820s before legislative change. This was due to the influence of Thomas Malthus upon Overseers and declining conditions for employed labourers in many communities. As such, this chapter supports the work of historians who argue that the New Poor Law was part of a gradual process of change that began at least a decade before its enactment rather than an abrupt introduction of harsher relief practices.

Chapter three demonstrates that very little fuel was consumed in most northern Hampshire households after 1815. An expected consequence of reduced fuel consumption would be an increase in the occurrence of and prosecution for fuel theft. Accordingly, chapter four examines the rates of prosecution for fuel theft across both counties between 1757 and 1830. Fuel theft accounted for a higher proportion of theft indictments at the Hampshire Quarter Sessions than at those of the West Riding after 1760. Fuel theft also increased as a proportion of all Hampshire theft prosecutions while



declining as a proportion in Yorkshire. The increase in fuel theft prosecutions was especially pronounced after 1815. These prosecutions were concentrated in north-western Hampshire, where fuel prices were highest and poor law disbursements lowest. The timing and location of fuel theft prosecutions reinforces other evidence of fuel poverty in northern Hampshire after 1815.

Chapter five focusses on the relationship between fuel and regional diets. Rising fuel prices led most Hampshire households to cease cooking their own food between 1750 and 1830. The alternative was purchased wheat bread and the baking profession expanded in Portsmouth, Southampton and northern Hampshire by 1830. In Yorkshire, bakers were also more prevalent in the eastern agricultural regions than in the manufacturing districts where coal was cheap. Inhabitants of manufacturing communities like Hipperholme continued to cook their own food, ate a more varied diet and the fires used in its cooking continued to heat their homes. Meanwhile, purchased wheaten bread became increasingly consumed in non-coalfield regions, particularly northern Hampshire. One of the major changes in English diets during this period was the gradual spread of potato consumption. In both Hampshire and the West Riding, the tubers were first grown in peat-burning communities where the slower fires were well suited to cooking them. Although most people ate them on occasion, their consumption was least frequent in northern Hampshire. In that wood-burning region, most people lacked the fuel needed to cook daily and chose not to eat cold potatoes.

Chapter five also includes an anthropometric comparison of inmates in the West Riding House of Correction in 1801-3 and 1842-3. The comparable Hampshire registers have not been preserved. At the earlier date, male inmates from manufacturing regions

were half an inch taller than those from the Riding's eastern agricultural regions. Female inmates from manufacturing communities were 0.8 inches taller than their equivalents from agricultural regions. The extent to which this was caused by their access to more nutritious food, warmer houses or their ability to afford more food thanks to higher-paid industrial employment is unclear but all were connected to cheap coal. By the later date, the average male prisoner was three-quarters of an inch shorter than his earlier counterparts, while the female prisoners were slightly taller. The height decline was most pronounced on the coalfield, and its male inmates in the 1840s were a quarter of an inch shorter than those from the agricultural regions. Although the price of coal had doubled it remained considerably cheaper on the coalfield than in other regions. Residents of communities like Hipperholme still enjoyed the increased employment, warm houses and varied diets that came with cheap coal. However, population and industrial growth led to a severe smoke problem in many coalfield communities after 1805, with detrimental consequences for living standards. The smoke problem is also briefly discussed in chapter five. The large amounts of cheap coal which were burnt created the smoke problem and contributed to a decline in living conditions with different causes than that in northern Hampshire.

Environments limited the fuel available to English households before 1830. Coal required significantly less labour to mine than was needed to dig peat or cut wood. Coal production could also increase to meet the needs of an expanding population in a way that wood could not. However, shipping coal required extensive canal and river navigations. The expense of building these prevented coal becoming easily available in

northern Hampshire while also making coal more expensive the further it travelled from the pithead. This price difference contributed to a growing divergence in lifestyles. Fuel – or the lack of it - was central to the deteriorating living conditions of English people between 1750 and 1830. Cheap coal contributed to Yorkshire industrialization and allowed inhabitants of coalfield communities to cook their own food. As an abundant but non-renewable resource, coal production increased to meet the needs of a growing population. This allowed them to live in unprecedented numbers on the coalfield and to create the vast amounts of smoke that came to impair their health. Meanwhile, wood production could not increase with population growth. The result was that wood-burning regions lost their manufacturing industries and residents were no longer able to cook. The experience of people in peat-burning communities and those in coastal Hampshire lay between the extremes of northern Hampshire and the Yorkshire coalfield. These areas did not industrialize but household fuel consumption declined less and peat-burning people ate more potatoes. They also did not suffer from the growing smoke problem. As a result, the differences between fuel-rich and fuel-poor English regions grew between 1750 and 1830, to the increasing detriment of both the fuel-poor and the most fuel-rich regions.

## Chapter One: Fuel Relationships, 1750-1830

On April 7, 1827, the King's Worthy Overseers of the Poor purchased £3 worth of coals from Mrs Richardson.<sup>1</sup> This was the first occasion on which overseers in this wood-burning central Hampshire village of 343 residents purchased the mineral fuel.<sup>2</sup> Fuel use was quite different in the town of Winchester, two miles south of King's Worthy. Coal was frequently consumed by its 4000 residents in 1740.<sup>3</sup> Winchester's coal was mined on Tyneside, loaded onto ships in Newcastle and travelled over 400 nautical miles by sea to Southampton, before being transferred onto smaller barges and pulled up the River Itchen by horses.<sup>4</sup> Despite the long journey, coal was cheaper in Winchester than wood from two miles away. Coal transport depended upon a 1665 Act of Parliament which allowed a private company to transform the river into the effective transportation corridor shown in Figure 1-1.<sup>5</sup> The river navigation did not extend beyond Winchester and local wood remained the preferred fuel upstream due to the cost of transporting coal overland. Despite their proximity, fuel use differed between these two communities because of the underlying environmental relationships. Winchester's population was too large to be economically supplied with wood, while King's Worthy was too distant from the waterborne transport routes needed to burn coal.

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<sup>1</sup> "Kings-Worthy Overseers Accounts, 1825-1835" Hampshire Record Office 19M78/PO3.

<sup>2</sup> *1831 Census*. The Population had been 344 in the *1821 Census*.

<sup>3</sup> "Winchester St Michael Poor Book 1737-1754" HRO 71M81W/PO2. E.A. Wrigley, *The Early English Censuses*, (Oxford: Oxford University Press, 2011) Table A2.7.

<sup>4</sup> According to <http://sea-distances.com/> (accessed March 6, 2012) the distance from Newcastle to Southampton is 409 nautical miles, while from Sunderland it would be 400 nautical miles. For comparison, Amsterdam is 278 nautical miles from Newcastle and 374 from Leith.

<sup>5</sup> "Itchen Navigation Acts" HRO 18M54/C1/3/1.

**Figure 1-1: “Itchen Navigation and Tow Path between Bishopstoke and Winchester” Taken by author, February 20, 2011.**



Local environments shaped access to fuel and the prices paid for it across Hampshire and the West Riding of Yorkshire. The fuel sources did not change between 1750 and 1830 because the environmental relationships affecting them did not. Coal was the main fuel across most of the West Riding, with some peat consumed in the Pennines or the southeastern fenlands. Proximity to mines affected its price, but the shorter distances coal had to travel always made it cheaper in Yorkshire than in southern England. Coal was also the fuel of choice in Hampshire communities with access to water-borne shipments. Peat required less labour to collect than plant fuels

and was preferred in places with local deposits. Wood and furze were used in those Hampshire communities without ready access to coal or peat.

E.A. Wrigley describes the consumption of coal as part of a 'mineral economy' with other fuel sources as an 'organic economy'.<sup>6</sup> In these two counties, the distinction between locally produced fuels and those from further afield was equally important. In Hampshire, it was between the consumption of locally-produced land-intensive fuels and subterranean ones from other regions. Jason W. Moore argues that the transition to a modern capitalist economy involved the increasing exploitation of geographically distant 'commodity frontiers' for the benefit of the centre.<sup>7</sup> Hampshire's coal followed a reverse pattern, because production remained centred in the same north-eastern English communities while its consumption expanded in ever greater directions. The more important modernizing process was that by which dependence on local resources was replaced by distant ones, a consumption frontier for which Southern Hampshire was at the global forefront in the 1730s and 40s.

Nobody had access to every type of fuel at similar prices. Peat and coal consumption depended upon the location of deposits. Woodlands were managed in various manners to produce fuel. Furze is a woody bush that frequently grew on heathlands and other common wastes, but whose growth was limited by grazing animals. It is treated separately from other types of wood as it grew differently from oak or ash, was not managed in the same manner and burnt hotter. While humans did not create coal or peat, human actions affected their availability. Decisions to mine coal or allocate the right to cut peat affected their consumption. Similarly, transporting coal

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<sup>6</sup> Wrigley, *Continuity, Chance & Change*

<sup>7</sup> Jason W. Moore, "'Amsterdam is Standing on Norway': Part 1: The Alchemy of Capital, Empire and Nature in the Diaspora of Silver, 1545-1648," *Journal of Agrarian Change* 10 (2010) 39.

relied upon ocean shipping and large schemes to create navigable inland waterways.

Trees were managed to maximize the growth of desired wood. English people manipulated the environment to produce and supply fuel, while interacting with it to shape local availability.

## Coal Mining

Coal has been burnt in Yorkshire since at least the third century.<sup>8</sup> It had several fundamental advantages over other eighteenth-century fuel sources. Coal was concentrated in dense seams that required less labour to mine than was needed to cut the equivalent energy from trees or peat. In 1807, Yorkshire's Lawwood Colliery spent £1314 11s ¾d to mine 9200 dozens of coal (~19,322 tons), or 1s 4.3d/ton.<sup>9</sup> There were additional one-time costs in sinking shafts but this was not an unusually low extraction cost in the West Riding. For comparison, that June the Lyndhurst overseers in Hampshire paid Thomas Grant £1 15s to cut 14,000 turves (~14 tons), or 2s 6d/ton.<sup>10</sup> Existing records for wood only give the sale price, making it difficult to separate the cost of labour from the landowner's profit. Kimpton was a wood burning parish in north-west Hampshire, where 24 faggots (~0.24 tons) cost 4s, or 16s 8d/ton, in February 1807.<sup>11</sup> Vaclav Smil notes that bituminous coal has an energy density of 20-29 MJ/kg,

<sup>8</sup> A.V.H. Smith, "Provenance of Coals from Roman Sites in England and Wales," *Britannia* 28 (1997) 303.

<sup>9</sup> "Yearly Statement Lawwood Colliery 1798-1836" Sheffield City Council, Libraries Archives and Information: Sheffield Archives Wentworth Woodhouse Muniments F105. The Wentworth Woodhouse Muniments have been reproduced with permission from the Milton (Peterborough) Estates Company and the Director of Culture, Sheffield City Council. The Wentworth Woodhouse Muniments have been accepted in lieu of Inheritance Tax by HM Government and allocated to Sheffield City Council. The actual amount paid to colliers and labourers was £1120 13s 7.5d, or under 1s 2d/ton. The pithead price at the time was 8s/dozen or 3s 9d/ton, making the mine very profitable for the Fitzwilliams.

<sup>10</sup> "Lyndhurst Poor Book 1804-1813" HRO 25M84/PO5. The price quoted above is just for cutting the peat, since that is directly comparable to the pithead price of coal and relies on the assumption that 1,000 turves generally weighed one ton. The same month, others were also paid to cut peat while George Hoskins and William Hurdle were paid £2 8s for the carriage of 16,000 turves back to Lyndhurst. That would be an additional 3s/1,000 turves and the combined price of 5s 6d/1,000 turves is the one discussed in chapter 2.

<sup>11</sup> "Kimpton Poor Book 1791-1807" HRO 42M85/PO2.

hardwoods 16-19 MJ/kg and peat 6-8 MJ/kg.<sup>12</sup> If the above peat, wood and coal were in the middle of those ranges and the units of standard size, it would have taken 17s 11d to purchase wood in Kimpton with an equivalent energy to the peat cut by 6s 8d worth of labour in Lyndhurst or the coal mined for 1s in Yorkshire.<sup>13</sup> The pithead price of coal was sufficiently cheaper than other fuels to justify transporting it hundreds of miles by boat. The amounts mined from northern English coalseams could also be increased to meet rising demand in a way that was not possible for the annual growth of wood. Finally, the concentration of coal output in individual locations made it easier to build roads and canals to ship it than wood or peat from more geographically extensive plots.

Mining coal depended on its location. The West Riding coalfield was one of the largest in England, producing half a million tons in 1750 and 2.8 million tons in 1830.<sup>14</sup> Much has been written about the process of coal mining and its evolution, so it will not be treated in any detail, while its wood requirements will be discussed later.<sup>15</sup> Coal mines varied in size with many worked by fewer than five people. Meanwhile the largest mine in Yorkshire was the Middleton Colliery outside Leeds, which employed 230 in

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<sup>12</sup> Vaclav Smil, *Energy in World History*, (Boulder: Westview, 1994) 153, 219

<sup>13</sup> This also requires the assumption that the dozens, and turves mentioned were of the normal mass for those units. It is nearly impossible to make assumptions about the mass of faggots. This comparison is assuming that a hundred faggots weighed around one ton and will be discussed later. If these faggots weighed less, the contrast would be even starker. T.C. Smout, *Exploring Environmental History: Selected Essays*, (Edinburgh: Edinburgh University Press, 2009) 125-126 also compares the labour needed to produce each type of fuel in Scotland. He similarly observes that coal required less labour than peat and wood the most. However, Smout suggests larger differences in labour requirements than the ones I observed.

<sup>14</sup> Flinn, *The History of the British Coal Industry Volume 2*, 26.

<sup>15</sup> In particular see the multi-volume *History of the British Coal Industry*. Also: *Studies in the Yorkshire Coal Industry*, A.J. Benson and R.G. Neville Eds. (Manchester: Manchester University Press, 1976), John Benson, *British Coalminers in the Nineteenth Century: A Social History*, (London: Gill and Macmillan, 1980), T.S. Ashton and Joseph Sykes, *The Coal Industry of the Eighteenth Century*, (New York: Augustus M. Kelley, 1967, first published 1929), John Langton, *Geographical Change and Industrial Revolution: Coalmining in South West Lancashire, 1590-1799*, (Cambridge: Cambridge University Press, 1979), Trevor Raybould, "Aristocratic Landowners and the Industrial Revolution: The Black Country Experience c. 1760-1840," *Midland History* 9 (1984) 59-86, Peter Kirby, "Attendance and Work Effort in the Great Northern Coalfield, 1775-1864" *Economic History Review* 65 (2012) 961-983,



1803.<sup>16</sup> The depth of their shafts also varied, with the Lawwood Colliery going 100 yards underground in the 1790s.<sup>17</sup> Extraction costs were higher at deeper pits, such as the Sheffield Park Colliery. In 1773, its operators estimated such costs at 5s 4d/ton.<sup>18</sup> Differences between pits account for the large variation in the price and quality of coal at Yorkshire pitheads. Seams that outcropped near the surface were easier to mine and consequently cheaper. These tended to be concentrated on the western edge of the coalfield and fuel was cheapest in these locations. Meanwhile, eighteenth-century ventilation and pumping technology were not sufficient to mine the deeper coalseams east of Leeds. According to John Hatcher, the geographic pattern of Yorkshire coalmining did not change much between the thirteenth and eighteenth centuries.<sup>19</sup> The technology needed to mine the lower-lying portions of the Barnsley seam was not developed until the 1840s and there were no collieries east of Leeds before.<sup>20</sup> As such, many Yorkshire locations now associated with coalmining did not produce coal before 1830.

While the West Riding had extensive coal deposits, Hampshire did not. The only known coal seams were small ones on the Isle of Wight. At Freshwater, an exploratory shaft was sunk in the late eighteenth century but it was too thin to be commercially

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<sup>16</sup> John Rule, *The Vital Century: England's Developing Economy, 1714-1815*, (London: Longman, 1992) 157.

<sup>17</sup> "Plan of Low Wood Colliery, 1797" Sheffield Archives MD3586k.

<sup>18</sup> "Report Relative to Sheffield Park & Attercliffe Common Collieries, 7 April 1787" Sheffield Archives ACM S223, *ACM (Arundel Castle Manuscripts)* reproduced with permission from His Grace the Duke of Norfolk, DL and the Director of Culture, Sheffield City Council.

<sup>19</sup> John Hatcher, *The History of the British Coal Industry, Volume I, Before 1700: Towards the Age of Coal*, (Oxford: Clarendon Press, 1993) 123.

<sup>20</sup> Cross, "Yorkshire Estates and Mineral Exploitation, 1750-1830." This article discusses both the Earl Fitzwilliam and Duke of Norfolk's involvement in coal mining.

exploited.<sup>21</sup> In addition, there was a small mine at Newchurch in the 1820s.<sup>22</sup> Local residents may have mined the Freshwater seam for their own needs and gotten a little coal from Newchurch, but almost all of the coal sold in Hampshire came from northern England. Portsmouth's coal usually came from the Wearside Collieries of Durham while most of Southampton's came from Tyneside. Coal also arrived from Wales and the West Riding of Yorkshire or from Lancashire and Cumberland via Irish ports.<sup>23</sup> As was the case in larger towns, Lymington dealer Charles St. Barbe bought most of his coal from northeastern England in the 1780s. St. Barbe noted the different pits from which his coal came, demonstrating an understanding that there were different types of coal with their own unique properties.<sup>24</sup> Little of the evidence used in this dissertation distinguishes between types of coal so these distinctions will not be explored in depth.

### **Transportation of Coal**

Coal had a higher energy density than wood and peat, making this the cheapest fuel to ship and the only type transported over long distances. Coal was also concentrated in single mines in a manner that made it easier to build canals and roads than from geographically diffuse woodlands or peat-bogs. Moving coal relied upon the development of large-scale infrastructure for that purpose. These included the construction of roads to connect pitheads to water or wharfs to consumers. Some of

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<sup>21</sup> "Notes for a General History of Hampshire, Volume 9, Isle of Wight" HRO 16M79/9, Anthony Bell, "The Agriculture of the Isle of Wight, Drawn up for the Consideration of the Board of Agriculture," Museum of English Rural Life RASE/X/1/8.

<sup>22</sup> "Epiphany Sessions 1831 Indictments" HRO Q9/1/591. William Smith was indicted for saying things that incited a Newchurch mob to "set fire to and burn certain houses, stables, coach-houses, outhouses, warehouses, offices, shops, mills, malhouses, barns, granaries, buildings, erections, coal-mines, ships and stacks" on 30 November 1830. The list of things set fire to suggests that there was a small coalmine in the area.

<sup>23</sup> "Wharfage and Harbour Dues" Portsmouth Museum and Record Service CF16/1-36 and "Petty Customs and Wharfage Books" Southampton City Archives SC5/4/99-107.

<sup>24</sup> "Receipt Book, Charles St Barbe, Lymington" Hampshire Record Office 63M90/1.

England's earliest railways were constructed to connect West Riding coalmines to towns and rivers. Rails were expensive to build but reduced the friction on wheels. As a result, they made it more effective for horses to bring coal short distances to town. In 1758, a railway was built to help horses pull waggons 1.5 miles from the Middleton Colliery to Leeds and the River Aire.<sup>25</sup> In 1812, the Middleton Colliery employed 50 horses to pull coal to its staiths, where coal was sold, in town. That year, they began replacing the horses with steam-powered engines.<sup>26</sup> In Sheffield, a similar railway was built in 1774 to supply the town with coal. The Duke of Norfolk used its introduction to justify raising the price of coal. This led to a riot, which included "wilfully setting Fire to the new Coal Stage lately erected in the Park and breaking the windows and attempting to enter the House of Henry Howard Esq in Sheffield aforesaid, and also breaking the Windows of other Houses."<sup>27</sup> Shipping coal overland was expensive, especially in areas without sufficient traffic to benefit from railways. It cost 5s to transport a dozen coals (~2.1 tons) the five miles from Lawwood Colliery to Rawmarsh in 1797 and 1818. In 1797, this nearly doubled the pithead price of 6s/dozen.<sup>28</sup> Water has less friction so horses pulled barges more efficiently on canals and rivers than waggons on roads.

Longer-distance coal transport took place on canals, rivers and oceans. In the mid-seventeenth century, neither county had much navigable inland water. At that time,

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<sup>25</sup> J.T. Ward, "West Riding Landowners and Mining in the Nineteenth Century," *Studies in the Yorkshire Coal Industry*, J. Benson and R.G. Neville Eds. (Manchester: Manchester University Press, 1976) 48, Cross, "Yorkshire Estates and Mineral Exploitation," 238, R.W. Unwin, "Leeds becomes a transport centre" *A History of Modern Leeds*, Derek Fraser ed. (Manchester: Manchester University Press, 1980) 130.

<sup>26</sup> *Leeds Mercury*: 27 June 1812, 3 and *Leeds Mercury*: 1 August 1812, 3.

<sup>27</sup> "13 December 1774 Letter" British Library Additional Manuscripts 27,538/228-232.

<sup>28</sup> Rawmarsh prices from "Rawmarsh Overseers Accounts, 1792-1813" and "Rawmarsh Overseers Accounts, 1813-1828" Sheffield Archives PR80/150-151. Pithead prices from, "Lawwood Colliery Journal, 1789" and "Yearly Statement Lawwood Colliery, 1798-1836," Sheffield Archives WWM A1580b and F105. The years 1797 and 1818 were used as those are the ones in which the Rawmarsh Overseers specified the source of their coal. Pithead price for 1797 is assumed at 6s/dozen as that was the price in both 1789 and 1798. By 1818, the pithead price was 8s 6d/dozen, so it did not nearly double over its 5 mile journey.

the only navigable waterways were the Humber and Ouse along the West Riding's eastern border and the tidal reaches of some Hampshire rivers. Large-scale river navigation and canal schemes realized between 1660 and 1830 allowed bulky commodities to be shipped. These were instituted by corporations that received Acts of Parliament authorizing them to expropriate lands and charge tolls. Julian Hoppitt emphasizes the similarities between canal, turnpike, railroad and enclosure acts. He also notes that they were the product of a system in which parliamentary authority superseded individual landowners' property rights.<sup>29</sup> William Albert and others note that most canal corporations paid dividends and that by carrying bulk commodities, these made a major contribution to economic growth.<sup>30</sup>

The Aire and Calder Navigation was the most important waterway for shipping coal across the West Riding of Yorkshire. Its proprietors received an Act of Parliament in 1699. Under its jurisdiction, they paid to make the River Aire navigable from the Humber to Leeds and the Calder navigable from Castleford to Wakefield. In the 1720s, Daniel Defoe observed that "they carry Coals down from Wakefield (especially) and also from Leeds, at both which they have a very great Quantity." This navigation allowed

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<sup>29</sup> Julian Hoppitt, "Compulsion, Compensation and Property Rights in Britain, 1688-1833," *Past and Present* 210 (2011) 126-127. See also: Dan Bogart, "Did the Glorious Revolution Contribute to the Transport Revolution? Evidence from Investment in Roads and Rivers," *Economic History Review* 64 (2011) 1073-1112.

<sup>30</sup> William Albert, *The Turnpike Road System in England 1663-1840* (Cambridge: Cambridge University Press, 1972) 196, M. J. Daunton, *Progress and Poverty: An Economic and Social History of Britain 1700-1850*, (Oxford: Oxford University Press, 1995) 314, Hugh Malet, *Bridgewater: The Canal Duke, 1736-1803*, (Manchester: Manchester University Press, 1977), Eric Pawson, *Transport and Economy: The Turnpike Roads of Eighteenth Century Britain* (London: Academic Press, 1977) 22, Wrigley, *Energy in the English Industrial Revolution* 43-44, Rule, *The Vital Century*, 177, P.J. Corfield, *The Impact of English Towns 1700-1800*, (Oxford: Oxford University Press, 1982) 11, Peter Maw, Terry J. Wyke, and Alan J. Kidd, "Canals, Rivers and the Industrial City: Manchester's Industrial Waterfront, 1790-1850," *Economic History Review* 65 (2012) 1495-1523, and "Water Transport in the Industrial Age: Commodities and Carriers on the Rochdale Canal, 1804-1855," *Journal of Transport History* 30 (2009) 206.

West Riding coal to undercut and replace Newcastle coal in York.<sup>31</sup> By 1750, the Calder was extended west towards Halifax and Huddersfield, while a 1758 Act of Parliament created the Calder and Hebble Navigation. Its two mile route along the River Hebble connected the River Calder to Halifax.<sup>32</sup> From 1775 on, these operations of the Aire and Calder Navigation left detailed accounts. Coal was the largest single commodity. In 1775, dues were paid on 129,920 tons of coal to the Navigation's proprietors. Trade quadrupled over the next 45 years and by 1820, over half a million tons of coal paid dues. In many fiscal quarters that decade more than 130,000 tons of coals travelled down the navigation.<sup>33</sup> Table 1-1 notes the average annual tonnage of coal along the Navigation for each five year period from 1775-1830. The quarterly totals are in Appendix A. Grain was the main commodity that moved in the other direction. The Navigation primarily served to connect a densely populated coalfield badly suited to arable farming with productive grain-growing regions in eastern Yorkshire that lacked local coal supplies.

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<sup>31</sup> Defoe, *A Tour Thro' The Whole Island of Great Britain Volume II*, 615. Fears about the loss of the Ouse and Humber markets for north-eastern coal and the resultant reduction in the quantity of experienced English sailors motivated the following pamphlet. *Reasons Against the Bill for Making the Rivers Ayre and Calder in the West Riding of the County of York; Navigable*, (1699).

<sup>32</sup> Joseph Priestley, *Historical Account of the Navigable Rivers, Canals, and Railways, of Great Britain, As a Reference to Nichols, Priestley & Walker's New Map of Inland Navigation*, (London: Longman, Rees, Orme, Brown & Green, 1831) 120.

<sup>33</sup> "Aire & Calder Navigation Account Currant, 1775," and "Aire & Calder Navigation Abstract Accounts and Comparative Statements, 1820" West Yorkshire Archive Service Wakefield C299/1/3/1/1 and C299/1/3/1/10.

**Table 1-1: Average Annual Tons of Coal for which Dues Paid on Aire and Calder Navigation<sup>34</sup>**

Years	Average Annual Tons of Coal
1775-1780	151,169
1781-1785	166,900
1786-1790	216,309
1791-1795	222,141
1796-1800	297,315
1801-1805	403,324
1806-1810	450,981
1811-1815	470,875
1816-1820	470,382
1821-1825	467,192
1826-1830	512,096

The other major river navigation in the West Riding was the River Dun. In 1751, it was improved from Doncaster to Tinsley, two miles from Sheffield.<sup>35</sup> The final two miles required an 1815 Act of Parliament and were not completed until 1819.<sup>36</sup> A major impediment to the navigation's extension was the Duke of Norfolk, who owned the Manor of Sheffield. His Sheffield Park Colliery had high extraction costs but retained a local monopoly charging 8s 4d/ton as long as cheaper coal from Elsecar and Lawwood could not be economically shipped to the town.<sup>37</sup> For many years the Duke lobbied against the transportation improvements which would allow coal costing less than 6s/ton to reach Sheffield. In the late eighteenth century, he argued that such a canal from Tinsley would divert water away from mills used in refining metal for cutlery and damage

<sup>34</sup> "Aire and Calder Navigation Accounts Current, 1775-1816," and "Aire & Calder Navigation Abstract Accounts and Comparative Statements for the Aire & Calder Navigation, 1817-1830," WYAS Wakefield C299/1/3/1/1-13.

<sup>35</sup> Fletcher, *Development of Management in the South Yorkshire Coal Mining Industry*, 30-31.

<sup>36</sup> *An Act for Making and Maintaining a Navigable Canal from Sheffield to Tinsley, in the West Riding of the County of York* (7 June 1815). At the time, it was known as the River Dun Navigation but the river has come to be known as the Don.

<sup>37</sup> "Letter from Mr Wromeh to Fitzwilliam, 16 March 1819" Sheffield Archives WWM F107/101.

local industry.<sup>38</sup> The Duke eventually agreed to the canal in 1814 on the condition that it took a less direct route past his Darnall Colliery.<sup>39</sup> In 1822, his steward, Michael Ellison, lamented recent developments as “our Market for the sale of Coal is at home,” and “we shall be quite contented if we can prevent [other collieries] sending it here.”<sup>40</sup> Sheffield’s expensive coal is a reminder of transportation’s role in fuel consumption. The Duke’s influence in preventing the navigation for over 60 years reinforces the importance of social relations and political structures in shaping transportation.

**Figure 1-2: Leeds and Liverpool Canal, Skipton, Taken by the Author April 8, 2012**



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<sup>38</sup> BL ADD MS 27,538/465.

<sup>39</sup> *Leeds Mercury* 5 February 1814: 3. Fletcher, *Development of Management in the South Yorkshire Coal Mining Industry* 119.

<sup>40</sup> “Letter from Michael Ellison to James Harking 28 Feb 1822” Sheffield Archives ACM S607/348.

Along with the major Yorkshire River Navigation schemes, canals were built to ship bulky commodities, particularly coal. Canals created new waterways rather than straightening and dredging existing ones. They required greater engineering skill and more labour as is evident in Figure 1-2. This image is the Leeds and Liverpool Canal near Skipton, where it runs above the surrounding fields. This was the most significant Yorkshire Canal, and connected to the River Aire in Leeds. It followed the Aire Valley westward to Gargrave, before crossing the Pennines at Barnoldswick, and entering Lancashire. Coal was one of the main motivations of this large canal, begun in the 1770s and fully completed in 1816.<sup>41</sup> The three-mile long Bradford Canal was completed in 1774 to connect the growing manufacturing town to the Leeds and Liverpool.<sup>42</sup> Other Yorkshire canals include the Huddersfield and Rochdale Canals, which connected the Calder to Lancashire. Meanwhile, the Dearne and Dove and Barnsley Canals were completed in 1804 and 1823, serving to bring coal to the River Dun Navigation.<sup>43</sup> A final West Riding Canal was the Goole Canal, completed in 1826 by the Proprietors of the Aire & Calder Navigation. It created a more direct route between their navigations and the Ouse, thereby avoiding the Aire below Castleford.<sup>44</sup>

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<sup>41</sup> Priestley, *Historical Account of the Navigable Rivers, Canals and Railways*, 386-388, *A Summary View of the Proposed Canal, From Leeds to Liverpool; And of it's Importance to the Public*, (Leeds: Griffith Wright, 1768), J. Phillips, *A General History of Inland Navigation, Foreign and Domestic: Containing a Complete Account of the Canals Already Executed in England, with Considerations on those Projected. To Which are Added, Practical Observations. The Whole Illustrated with a Large Map Coloured, Shewing the Lines of All the Canals Executed, those Proposed, and the Navigable Rivers; with other Useful Plates. A New Edition Correction, with two Addendas, Which Complete the History to 1795*, (London: I and J Taylor, 1795) 250.

<sup>42</sup> Priestley, *Historical Account of the Navigable Rivers, Canals and Railways*, 85.

<sup>43</sup> Priestley, *Historical Account of the Navigable Rivers, Canals and Railways*, 55, 123, 185.

<sup>44</sup> Baron F. Duckham, "Selby and the Aire & Calder Navigation, 1744-1826," *Journal of Transport History* 7 (1965) 87-95



All of these canals carried coal, enabling, for example, no fewer than 137,329 tons to pass through the Goole Canal in 1829.<sup>45</sup>

Because Hampshire had only minimal coal deposits, the mineral fuel arrived on ships sailing from the north of England down the east coast. Coal was central to coastal trade in eighteenth-century England. John Rule claims that in the early 1780s, around 40 percent of the total tonnage of English coastal shipping served to transport coal.<sup>46</sup> Coal was similarly important in the surviving records of Hampshire ports. The Petty Customs and Wharfage book recorded the names and routes of boats that paid dues to enter Southampton Water in the 1750s. Between May 1750 and April 1753, 102 of the 258 boats were from the coal ports of Newcastle and Sunderland. Ships also arrived from the Channel Islands, Portugal, America, the Baltic and other southern English ports but the northeastern coal ports were the largest source of trading vessels.<sup>47</sup> Coal was also the single largest commodity to enter Hampshire Ports in the early nineteenth century. Of the 386 boats recorded as bringing commodities into Portsmouth Harbour between October 1803 and September 1804, 151 of them were brigs carrying coal. Not only was this substantially more than for any other good, but those brigs were larger than many of the sloops and smacks plying the South Coast food trades.<sup>48</sup> Coal's relative share of the boats paying Harbour Dues declined with the rise in the passenger and cross-channel egg trades following the end of the Napoleonic Wars. However, it remained the largest commodity to enter Portsmouth Harbour in the 1820s. Of the 1138

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<sup>45</sup> "Abstract Accounts and Comparative Statements Relative to the Aire and Calder Navigation for the Year 1829," WYAS Wakefield C299/1/3/1/12. Coal paying dues on the Goole Navigation has not been included in Table 1-1.

<sup>46</sup> Rule, *The Vital Century*, 229.

<sup>47</sup> "Petty Custom and Wharfage Book, 1750-1760" SCA SC5/4/99.

<sup>48</sup> "Wharfage and Harbour Dues," PMRS CF16/1-2.

boats whose contents are recorded between 30 September 1822 and 31 March 1824, 229 carried coal.<sup>49</sup>

When coal arrived in Southampton, Portsmouth, Lymington, Newport, Cowes or one of the other harbours, it was either sold locally or loaded onto smaller ships to travel inland upon smaller waterways. The south coast of Hampshire and the north coast of the Isle of Wight are studded with numerous inlets, of which the largest are Southampton Water and Portsmouth Harbour. These created many good harbours and contributed to Hampshire's maritime pre-eminence but few of the rivers were originally navigable beyond their tidal reaches. The River Avon, in the southwestern corner of the county and the River Medina on the Isle of Wight were made navigable before 1750.<sup>50</sup> Canal and river navigation schemes were essential before coal could be reasonably shipped to other parts of inland Hampshire. These include the aforementioned Itchen Navigation from Southampton to Winchester. The Andover Canal, connected the market town in northwestern Hampshire with Redbridge, following a Parliamentary Act in 1789 while the River Test was improved the two miles from Southampton to Redbridge after complaints in 1771.<sup>51</sup> These were the successful navigation schemes on the south side of the South Downs, where rivers flowed towards the Solent. On the north side of the Downs, the Basingstoke Canal was authorized by a 1778 Act of Parliament and built in subsequent years. Passing through the River Wey in Surrey, it connected the town and other places in northeastern Hampshire to the Thames, with the last section opened on 4 September 1794. In its early years the canal charged 12s/ton to convey goods from

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<sup>49</sup> "Wharfage and Harbour Dues," PMRS CF16/3-8.

<sup>50</sup> Vancouver, *General View of the Agriculture of Hampshire*, 7, "Notes for a General History of Hampshire, Volume 5 Isle of Wight" HRO 16M79/5.

<sup>51</sup> HRO 37M85/12/CA/1

London to Basingstoke, making coal more expensive in that region than in coastal areas.<sup>52</sup> The canal was expected to help with export and local trades, while supplying northeastern Hampshire with cheaper commodities. In 1783, the canal's proponents claimed that coal would be the most significant commodity to enter Hampshire via their venture.<sup>53</sup>

Two major navigation schemes were never accomplished. One was the oft-debated attempt to construct a canal from London to Portsmouth, through Sussex, in order to connect the two ports without threat from enemy ships.<sup>54</sup> Another canal from Southampton to Salisbury, Wiltshire, received parliamentary assent in 1800. It was to branch from the Andover Canal in Mitchelmersh before passing through Lockerly. However, "in consequence of meeting with an extensive quick-sand, it would not hold water, and was therefore abandoned."<sup>55</sup> This corporation hoped to profit from supplying coal to interior regions but its failure left many parts of Hampshire dependent upon dwindling local supplies of wood. Coal was transported short distances overland but the ability to ship it by water largely determined which parts of Hampshire consumed the mineral fuel.

Both the ocean and inland parts of the journey were dependent upon weather conditions. The ocean section depended on the co-operation of winds and a lack of

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<sup>52</sup> "Basingstoke Canal Navigation Notice, 1794" HRO 5M52/TR3/18.

<sup>53</sup> "Address to the Public in the Basingstoke Canal Navigation, 1783" HRO 5M52/TR3/14/2.

<sup>54</sup> "Prospectus for London, Arundel Bay and Portsmouth Grand Ship Canal Company", 4M69/G1/76, T. Davison, "Observations on the Intended Portsmouth and Arundel Canal, 1817" HRO 4M69/G1/76, John Rennie, *Report and Estimate of the Grand Southern Canal, Proposed to be Made Between Tunbridge and Portsmouth*: (London: E Blackader, 1810), J. Phillips, *A General History of Inland Navigation, Foreign and Domestic: Containing a Complete Account of the Canals Already Executed in England, with Considerations on those Projected*. (London: I and J Taylor, 1795) vii-viii, Joseph Priestley, *Historical Account of the Navigable Rivers, Canals, and Railways, of Great Britain*, (London: Longman, Rees, Orme, Brown & Green, 1831) 531, and more recently by P.A. L. Vine, *London's Lost Route to Portsmouth: An Historical Account of the Portsmouth and Arundel Canal Navigation including the Story of the ill-fated Portsea Ship Canal and the Chichester Ship Canal* (Chichester: Phillimore & Co, 2005)

<sup>55</sup> Priestley, *Historical Account of the Navigable Rivers, Canals and Railways of Great Britain*, 558.

storms. Strong easterly winds kept ships from leaving Newcastle or Sunderland, while westerlies made the Channel portion of the journey difficult.<sup>56</sup> Wind direction on the North Sea is affected by air masses over northern Eurasia, so easterly winds tend to bring cold weather in winter and were more frequent in cold winters. As such, the climatic fluctuations of the Little Ice Age made the coastal coal trade more difficult in those winters when it was most needed in southern England.<sup>57</sup> Storms also wrecked some coal boats most winters.<sup>58</sup> Flooding, droughts or freezing impeded canal and river transit for extended periods of time. In late 1799, the Basingstoke Canal was “interrupted nearly a Month, the first Part of the Time by the Floods, and afterwards by the Frost,” and the resulting backlog required the taking on of four extra barges.<sup>59</sup> The following summer, the canal was not able to work at full capacity, this time because of drought.<sup>60</sup> Other weather-related interruptions to traffic on the Basingstoke Canal occurred in December 1801, the autumn of 1802, winter of 1804, winter of 1813/4, winter of 1822/3, summer of 1825 and winter of 1829.<sup>61</sup> Wind power was cheap and relatively unpredictable, while horses were more expensive and consistent. The infrastructure that freed inland Hampshire and eastern Yorkshire from dependence on local land-intensive fuels was itself subject to new environmental limitations and seasonal shortages. However, the weather usually co-operated and the amounts of fuel available increased dramatically with the coal-trade.

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<sup>56</sup> Philip Bagwell, *Transport Revolution 1770-1985*, (London: Routledge, 1988) 50-51.

<sup>57</sup> Dagomar Degroot, “The Frigid Golden Age: Experiencing Climate Change in the Dutch Republic, 1560-1720” (PhD Dissertation, York University, 2014) 209.

<sup>58</sup> Between 1805 and 1810, *Leeds Mercury* mentioned shipwrecks involving coal on 26 January 1805, 25 January 1806, 26 December 1807, 30 January 1808, 4 February 1809 and 2 December 1809.

<sup>59</sup> “Report of the Committee of Management, 30 January 1800,” HRO 8M62/131

<sup>60</sup> “Report of the Committee of Management, 16 August 1800” HRO 8M62/131

<sup>61</sup> “Report of the Committee of Management” from February 11, 1802, February 10, 1803, May 17, 1804, February 10, 1814, October 20, 1814, May 23, 1823, October 26, 1825 and May 16, 1829 HRO 8M62/131 and 5M52/TR3/8

The Aire and Calder Navigation was also subject to weather-related interruptions. Some of these interruptions were recorded by the Middleton Colliery, which sold much of its coal at the riverside Hunslet Staith. “No Coals [were] vended in January [1763] the River Aire being frozen during the said Month.”<sup>62</sup> Sales were also interrupted for a few weeks during the winters of 1776, 1780, 1784, 1784-5, 1795, 1796, 1799, 1804 and 1806.<sup>63</sup> Such unpredictable interruptions limited the short-term availability of fuel, usually in the first quarter of the year. Appendix A demonstrates that abnormally low coal traffic in the first quarter was usually followed by disproportionately high traffic in the second quarter. Seasonal freezing did not impact the annual tonnage of coal travelling along the navigation. Even when the river did not freeze completely, floating ice made transport more difficult and treacherous in winter.<sup>64</sup> Horses also have more difficulty pulling barges along muddy paths. As a result, there was less traffic in winter. Charts 1-1 and 1-2 highlight this. Chart 1-1 is the average quarterly tonnage of coal on the Aire and Calder Navigation from 1775 to 1830. The fourth quarter generally saw the largest volume of traffic and the first quarter the least. However, the variation between was fairly small as only 19% less coal travelled down the navigation in the first quarters.<sup>65</sup> This should be contrasted with Chart 1-2, which consists of the Middleton Colliery’s average monthly coal sales in Leeds for selected years. The Leeds sales show a stronger seasonal variation, being at their highest in November and December

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<sup>62</sup> “Middleton Colliery Hunslet Staith Coal Sales 1762-1765,” West Yorkshire Archive Service Leeds WYL 899/190.

<sup>63</sup> “Middleton Colliery Hunslet Staith Coal Sales, 1762-1765,” “Middleton Colliery Hunslet Staith Sales 1766-1777,” “Middleton Colliery Hunslet Staith Sales 1778-1785,” “Middleton Colliery Hunslet Staith Sales 1792-1800,” and “Middleton Colliery Hunslet Staith Sales 1801-1807,” WYAS Leeds WYL899/190-194.

<sup>64</sup> *Leeds Mercury*, 26 December 1807: 3.

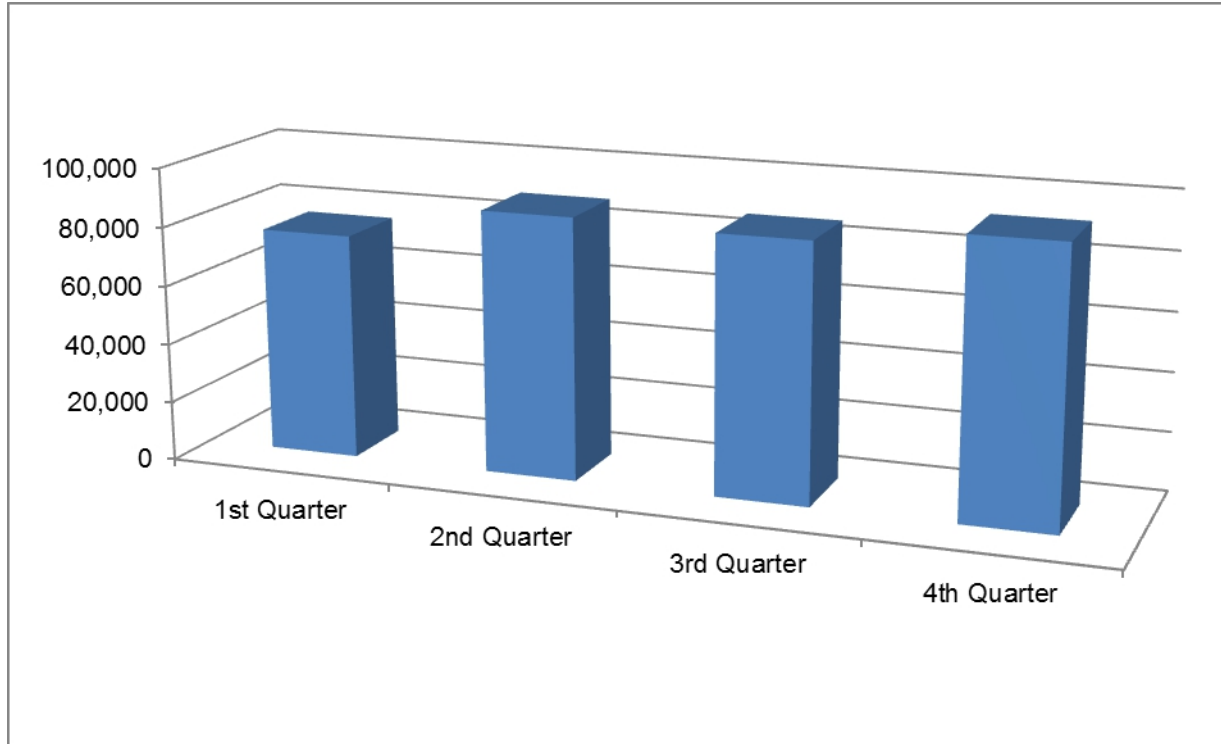
<sup>65</sup> “Aire and Calder Navigation Accounts Current, 1775-1816,” and “Aire & Calder Navigation Abstract Accounts and Comparative Statements for the Aire & Calder Navigation, 1817-1830,” WYAS Wakefield C299/1/3/1/1-13. Dues were paid for 76,369 tons of coal paid in the average first quarter and 92,585 tons of coal in the average fourth quarter.

and significantly lower in the summer. July sales were often as little as half of those in November or December, while in the early 1770s, 34% less coal was sold in the third quarter than in the fourth.<sup>66</sup> The Leeds sales only depended upon the weather not impeding mining or the short rail journey to town. As such, they indicate seasonal demand for coal and its sales. Waterways like the Aire and Calder allowed much greater amounts of energy to reach non-coalfield communities, while being dependent on weather in a different manner than locally sourced fuels. Cold weather also meant that households needed to either consume more fuel or have lower indoor temperatures. The sources consulted in this project do not indicate that more fuel was consumed in cold winters like 1816, so the only connections that can be substantiated between climate and fuel use relate to transportation.

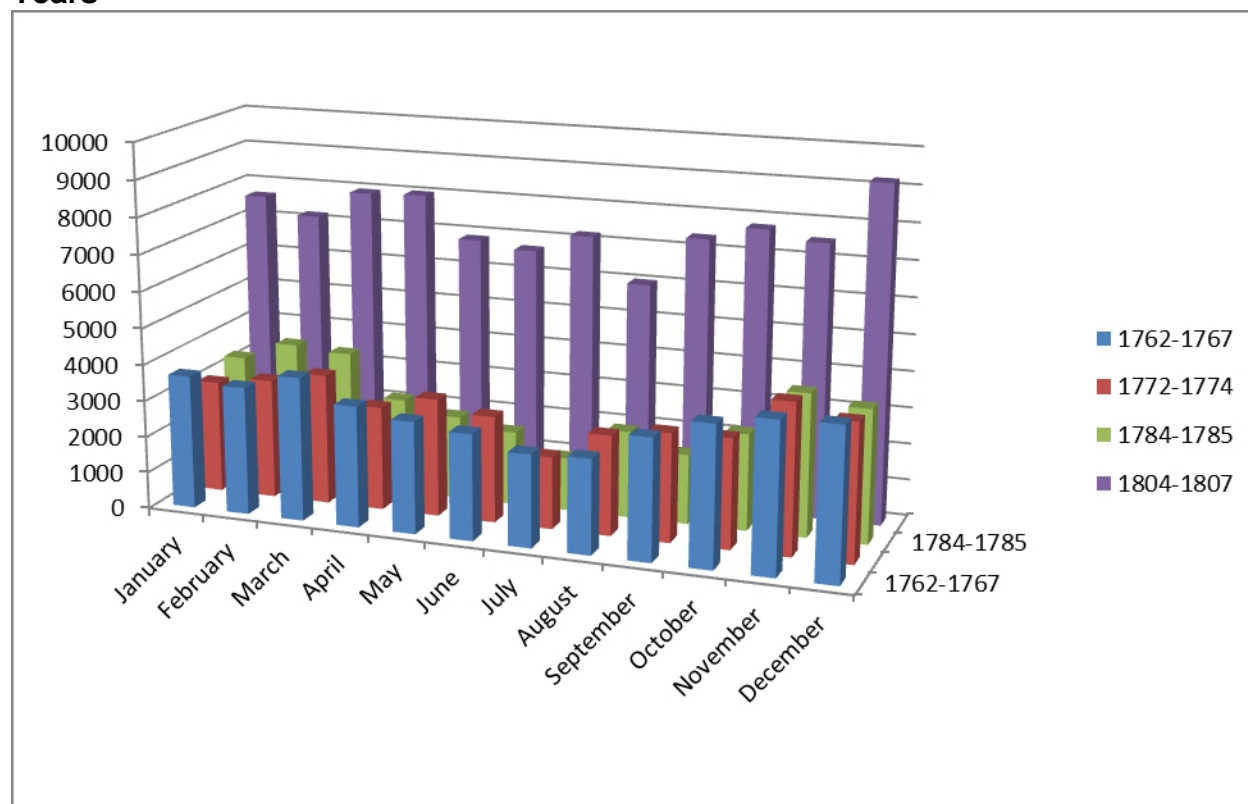
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<sup>66</sup> "Middleton Colliery Leeds Staith Sales January 1762-December 1767," "Middleton Colliery Leeds Staith Sales, January 1772-December 1774," "Middleton Colliery Leeds Staith Sales January 1784-December 1788," "Middleton Colliery Leeds Staith Sales, May 1803-June 1806" and "Middleton Colliery Leeds Staith Sales, July 1806-December 1808," WYAS Leeds WYL 899/185-189.

**Chart 1-1: Average Quarterly Tonnage of Coal on Aire and Calder Navigation, 1775-1830**



**Chart 1-2: Average Monthly Sales at Middleton Colliery's Leeds Staith in Selected Years<sup>67</sup>**



<sup>67</sup> "Middleton Colliery Leeds Staith Sales January 1762-December 1767," "Middleton Colliery Leeds Staith Sales, January 1772-December 1774," "Middleton Colliery Leeds Staith Sales January 1784-December 1788," "Middleton Colliery Leeds Staith Sales, May 1803-June 1806" and "Middleton Colliery Leeds Staith Sales, July 1806-December 1808," WYAS Leeds WYL 899/185-189. The actual numbers are in the chart that follows. The first three columns were originally in corves, while last were in waggons. They were converted to tons on the assumption that a corve was 2.7cwt, a waggon 65cwt and a ton 20cwt. The assumption on the size of waggons is based upon corves being 7d or 8d and waggons 16s or 18s at the Middleton Colliery's Hunslet Moor Pit. The only nice multiple of these numbers is 16s being 24 times 8d, suggesting that a waggon was two dozen corves. This also corresponds to the *Leeds Mercury*: 27 June 1812, 3, noting that a waggon was 3¼ tons. Totals below are annual averages for those years.

	1762-1767	1772-1774	1784-1785	1804-1807
January	3,670 tons	3,067 tons	3,361 tons	7,644 tons
February	3,507 tons	3,272 tons	3,876 tons	7,186 tons
March	3,934 tons	3,572 tons	3,767 tons	7,949 tons
April	3,316 tons	2,837 tons	2,606 tons	8,001 tons
May	3,063 tons	3,225 tons	2,290 tons	6,867 tons
June	2,901 tons	2,914 tons	2,022 tons	6,691 tons
July	2,533 tons	1,979 tons	1,454 tons	7,202 tons
August	2,589 tons	2,734 tons	2,372 tons	6,009 tons
September	3,318 tons	2,972 tons	1,909 tons	7,374 tons
October	3,846 tons	3,001 tons	2,648 tons	7,761 tons
November	4,114 tons	4,128 tons	3,912 tons	7,514 tons
December	4,148 tons	3,772 tons	3,653 tons	9,207 tons
Total	40,941 tons	36,132 tons	33,870 tons	89,369 tons



## Collection of Peat

Peat was the second most frequently consumed fuel across Hampshire and the West Riding of Yorkshire. The locations of its use are discussed in chapter 2 and Appendices C and D. While peat has been discussed in many local studies, it is absent from most national ones.<sup>68</sup> Ian Rotherham argues that peat was extensively cut for centuries across England but that historians have underestimated its importance because they do not recognize the ways that it transformed landscapes.<sup>69</sup> Peat had the lowest energy density of any major fuel source and was thus the most expensive to ship. In 1811, Lord Palmerston decided not to buy a peat-rich plot of land one-and-a-half miles from Romsey, Hampshire because the transport was too expensive for the peat to be profitably sold in town.<sup>70</sup> It was cheaper to burn northern English coal in Romsey than peat from such a short distance. Because it was expensive to ship, peat was rarely consumed in London and appears in few of the other records usually used by economic historians. They have been much more interested in wood and coal, and English peat is not included in the *Allen-Unger Global Commodity Prices Database*.<sup>71</sup> Peat is also absent from many discussions of national energy consumption, finding no

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<sup>68</sup> Birtles, "Common Land, Poor Relief and Enclosure" 74-106, Neeson, *Commoners*, Winchester, "Upland Commons in Northern England," and *The Harvest of the Hills*. Other examples include: Williams, "The Enclosure of Waste land in Somerset, 1700-1900," 99-123, Williams, "Earnings, Poor Relief and the Economy of Makeshift," 21-52, Owen, "Historical Aspects of Peat-Cutting in Wales" and Porter, "Fenland Peat."

<sup>69</sup> Ian D. Rotherham, David Egan and Paul A. Ardron, "Fuel Economy and the Uplands: The Effects of Peat and Turf Utilisation on Upland Landscapes," *Society, Landscape and Environment in Upland Britain*, Ian D. Whyte and Angus J.L. Winchester eds, (Birmingham: Society for Landscape Studies, 2004)

<sup>70</sup> "Letter from Thomas Warner to Lord Palmerston 12 May 1811" University of Southampton Archives Broadlands Estate Collection BR 112/2/12

<sup>71</sup> Their prices come from Gregory Clark, "The Long March of History: Farm Wages, Population, and Economic Growth, England 1209-1869," *Economic History Review* 60 (2007) 97-135. Prices attributed to either the Database, Allen or Clark are from <http://www.history.ubc.ca/faculty/unger/ECpdb/data.html>, on 3 January, 2012.

mention in E.A. Wrigley's *Energy in the English Industrial Revolution*.<sup>72</sup> Paul Warde argues that "we must give more attention to other fuels, whether bracken and furze, peat, straw, and even dried dung."<sup>73</sup> However, when it comes to calculating national energy consumption, he dismisses peat in order to focus on wood and coal.<sup>74</sup> Peat consumption demonstrates some of the difficulties of London-centred generalisations.

Peat is a water-logged soil that forms when there is insufficient oxygen for organic material to break down aerobically. Peat did not form everywhere. It was the preferred fuel in most places where it did, particularly low-lying Hampshire regions such as the New Forest or the Berkshire border. In Yorkshire, peat formed in both upland and fenland areas, especially in the northwestern and southeastern parts of the county. It was cut with a turf spade during the late spring, when soils were drier than during the winter. The cutting season is apparent in Ellingham, Hampshire. In 1819, its overseers hired able-bodied poor residents to cut peat for others. They paid for one day of cutting in mid-April, 58 days in May, 16 days between May 30 and June 20 and then Benjamin Dowden cut peat for four days from June 29 to July 3.<sup>75</sup> After being cut, the turves were left to dry through the summer months. The amount of earth which came out of the ground every time the spade entered was known as a turve. A typical turve was 0.5m long, with a width and depth of 16.5cm, and a thousand turves weighed approximately one ton.<sup>76</sup> Peat was measured either in multiples of a thousand turves or by the cart

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<sup>72</sup> Wrigley, *Energy and the English Industrial Revolution*; discusses early modern Dutch peat consumption but not English.

<sup>73</sup> Paul Warde, "Woodland Fuel, Demand and Supply," *Forests and Chases of England and Wales c. 1500 to c. 1850: Towards a Survey & Analysis*, John Langton and Graham Jones eds (Oxford: St John's College Research Centre, 2008) 86.

<sup>74</sup> Warde, *Energy Consumption in England and Wales*, 22.

<sup>75</sup> "Ellingham Poor Book 1817-1822" HRO 113M82/PO1.

<sup>76</sup> Rotherham, Egan and Ardron, "Fuel Economy and the Uplands" 104 and Porter, "Fenland Peat" 163-164.

load. Turf is a term that refers to a type of fuel similar to peat, but in which a layer of grass was included. However, the two terms were often used interchangeably and the documents which have survived make it difficult to determine the exact properties of the fuels being consumed.

As a land-intensive fuel, peat had many relationships with agriculture. Peaty regions were water-logged, often well-suited to grazing and could be drained for arable agriculture. The conflicting needs of grazing and peat-cutting were central to a 1768 legal dispute between William Watts and Nicholas Bailey, both of Yateley in northeastern Hampshire. Watts was a tenant farmer with common of pasture on the wastes of the Manor of Cove, who brought the case to stop others from digging peat on those wastes. His concern was that cutting peat on Elmore Common “made divers large holes and trenches in the said Common,” which impeded his cattle from walking as they grazed so he “could not have and enjoy his Common of Pasture in and upon the said Common.”<sup>77</sup> William Allen, in a deposition for the defence, disputed Watts’ claims and argued that cutting peat improved the quality of pasture on Elmore Common. “That the cutting drains for the purpose of cutting peat improves the other part of the Common.” Furthermore, “Mr. Bailey only cuts one peat deep and lays the surface level as he cuts forward which makes the pasture better.”<sup>78</sup> Cutting peat clearly changed the land. The defendant argued the right to cut peat on the following grounds.

To prove that the Sale of the peat cut in Hillmore is of great benefit to the neighbourhood on all sides. That it is the Fuel of the Country for many miles round. That it would be of the greatest Inconvenience if it could not be cut and sold as wood is extremely scarce. That many people if they could not have peat could procure no firing at all & must of necessity

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<sup>77</sup> “Draft Recognition of the Plaintiffs Right to Peat within the Manor of Cove,” Cove Estate Papers, Museum of English Rural Life Wellington 515, 2.

<sup>78</sup> “Draft Recognition of the Plaintiffs Right to Peat within the Manor of Cove,” MERL Wellington 515, 16.

starve. That the peat Ashes are the best manure the country produces and that the Want thereof would be very prejudicial and greatly injurious to the Farmers.<sup>79</sup>

As noted above, the nutrients in peat ashes made them a useful fertilizer.<sup>80</sup> Farmer John Thorp burned wood and coal but on at least two occasions travelled to other parts of northern Hampshire to purchase peat ashes as fertilizer.<sup>81</sup> Charles Vancouver's 1810 report on Hampshire agriculture also noted their benefits. He wrote that "in some parts of the county, the farmers bring [peat] home to the labourers, for so much of the ashes as the labourer may be able to afford, after manuring his garden, potatoe, or cabbage patch."<sup>82</sup> Peat supplied fuel and also served to transfer nutrients from boggy lands to the arable and gardens that produced most food.

## Peat and Enclosure

Between 1760 and 1830 the parliamentary enclosure of common lands radically transformed the ownership and character of many English parishes. Parliamentary Acts during these years affected 12.9 percent of Hampshire's surface area and 20.1 percent of the West Riding's.<sup>83</sup> Numerous historians describe the collection of fuel on some common lands prior to their enclosure. They usually refer to cutting peat and turf, harvesting furze or collecting dead wood, known as estovers.<sup>84</sup> Undrained peat-lands were ill-suited to arable agriculture and were often common wastes, as in Yateley.

<sup>79</sup> "Draft Recognition of the Plaintiffs Right to Peat within the Manor of Cove," MERL Wellington 515, 13

<sup>80</sup> Richard C. Hoffmann and Verena Winiwarter, "Making Land and Water Meet: The Cycling of Nutrients Between Fields and Ponds in Pre-Modern Europe," *Agricultural History* 84 (2010) 360.

<sup>81</sup> "Copy of John Thorp's Diary" HRO 65M82/2-3.

<sup>82</sup> Vancouver, *General View of the Agriculture of Hampshire*, 389.

<sup>83</sup> Michael Edward Turner, *English Parliamentary Enclosure: Its Historical Geography and Economic History*, (Folkestone: Archon Books, 1980) 186-189.

<sup>84</sup> Neeson, *Commoners* 158-169, See also the regional studies that mentioned peat above and Leigh Shaw-Taylor, "The Management of Common Land in the Lowlands of Southern England circa 1500 to circa 1850," *The Management of Common Land in North West Europe, c. 1500-1850*, Martina De Moor, Leigh Shaw-Taylor & Paul Warde Eds. (Turnhout: Brepols, 2002) 75, Jane Humphries, "Enclosures, Common Rights and Women: The Proletarianization of Families in the Late Eighteenth and Early Nineteenth Centuries," *Journal of Economic History* 50 (1990), 32-34.

However, not all communities had peat deposits and the ability to collect fuel from wastes was dependent upon there being peat, furze or trees upon it. It is known that fuel was collected from many common wastes, but relatively few well-detailed records survive and it is difficult to determine the specific times and places when this occurred. Occasionally, authors like David Davies mention the collection of fuel from commons. He observed that some families in Tuntington, Sussex had the right to collect furze from the local common and they spent less than others on fuel as a result.<sup>85</sup> The Acts and Awards produced during the process of enclosing and dividing a parish do not usually specify the uses of the land prior to enclosure.

Another source of evidence for common rights is lists created in preparation for enclosure bills in Royal Forests in the 1850s and 1860s. In Woolmer Forest, 961 houses claimed common rights of turbary, the right to cut turf, when it was enclosed in 1866.<sup>86</sup> The New Forest was never enclosed but most of its inhabitants and many of those in neighbouring parishes had turbary rights there.<sup>87</sup> The surviving correspondence of local landowners sometimes describes the collection of fuel in places where there is no other record. These include the 1766 observation that Portsmouth Common “has been so Ravag’d by some poor Fools, employ’d by People not belonging to your Lordship, in cutting the Turf (a most antient right of your Tenants, whom I hope you will Espouse) and Carrying it all from Them, much to their prejudice, and I presumed to say it will be hereafter a vast detriment to your Manour.”<sup>88</sup> The rarity of such surviving

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<sup>85</sup> Davies, *The Case of the Labourers in Husbandry* 183.

<sup>86</sup> “Woolmer Forest Enclosure Award” HRO Q23/2/139/2

<sup>87</sup> “New Forest Rights” HRO 21M57/E863

<sup>88</sup> “Letter from J.W. Eden to Reverend Thiftenwayte 17 March 1766” HRO 5M50/2221.

documentation undoubtedly underrepresents the collection of fuel from commons prior to enclosure.

Various commons provided every type of fuel. At Handsworth Common, on Yorkshire's South Coalfield, freeholders mined coal for their own personal use in the 1760s and 1770s.<sup>89</sup> However, most of the evidence about fuel gathered from common lands in these counties concerns peat. These include the aforementioned examples from Portsmouth and Yateley. Most disputes over access to fuel also involved peat. These include Samuel Russell's 1819 presentment for cutting turf on Colden Common in Twyford, Hampshire.<sup>90</sup> Lord Palmerston's tenants at Pouncefoot Hill in Hampshire collected peat from the common. In 1818 his steward attempted to restrict this practice to tenants who specifically leased the right.<sup>91</sup> Wealthier residents collected peat from the common between the townships of Manningham and Heaton, in Bradford Parish, prior to its 1822 enclosure. Forty-year old John Walker recalled that "his Father constantly got Turves upon the Common."<sup>92</sup>

Most residents who had collected fuel from commons lost this right with enclosure but some Enclosure Awards included a provision for poor residents to continue collecting fuel. These could take a variety of forms. The 1805 Award for Christchurch, Winkton and Hinton Admiral provided "for a Turf Common not exceeding in the whole five Acres or less than two Acres for each Cottage or Tenement within the said Liberty as are in the Judgement of the said Commissioners fit and proper for supplying Turves for fuel" for a total of 162 cottages each occupying less than one

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<sup>89</sup> BL ADD MS 27,538/292.

<sup>90</sup> "Twyford Manor Court Presentments 1798-1873" HRO 46M72/M32.

<sup>91</sup> "Letter from Henry Foot Junior to Lord Palmerston 18 May 1818" University of Southampton Archives BR112/12/36.

<sup>92</sup> "Deposition of John Walker" West Yorkshire Archive Service Bradford MMC57/19/5.

acre.<sup>93</sup> Some of the land allotted for the provision of fuel was arable or pasture land that was rented out with the proceeds used to purchase fuel for poor residents. One such award was the 1817 one for the Tything of Hawley in Yateley. Overseers were to

to make such Order and Directions for the Care and Management thereof, or to lease or demise the whole or any Part of such last mentioned Allotment or Allotments respectively to any Person or Persons whomsoever, for any Term of Years not exceeding Twenty-one Years, to commence in possession and not in Reversion, or by way of future Interest, as the said Trustees shall from Time to Time think proper, so that in every such Lease there be reserved and made payable to the said Trustees for the Time being, or the major Part of them, by Four equal Quarterly Payments in every Year, the best and most improved yearly Rent or Rents, or Produce of Fuel in Kind.<sup>94</sup>

The 1758 enclosure award for Calverley, Yorkshire, allotted the local overseers 20 acres of land on Calverley Moor for the support of the workhouse. It has not been included in Table 1-2 because the award did not explicitly state that the land was to be used for fuel.<sup>95</sup> Sara Birtles observes that over half of the Enclosure Awards in Norfolk included one of these clauses. She argues that they were cheaper than providing the poor with fuel using other means and were designed to reduce expenditure on poor relief.<sup>96</sup> Sylvia Pinches writes about similar provisions in Warwickshire, claiming that they were generally for furze-covered land.<sup>97</sup> She also suggests that the process of enclosure involved a transition from poor people having access to self-sufficient fuel

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<sup>93</sup> "Christchurch Enclosure Award" HRO Q23/2/25/2.

<sup>94</sup> *Act for inclosing Lands within the Tything of Hawley, in the parish of Yatley, in the County of Southampton*, HRO 10M79/8, 110.

<sup>95</sup> "Calverley Enclosure Award, 1758" WYAS Leeds BDP17/94.

<sup>96</sup> Birtles, "Common Land, Poor Relief and Enclosure" 100

<sup>97</sup> Sylvia Pinches, "Customary Rights and Charities" *Forests and Chases of England and Wales c. 1500 to c. 1850: Towards a Survey & Analysis*, John Langton and Graham Jones eds (Oxford: St John's College Research Centre, 2008) 34.

collection to its being often provided as cold charity.<sup>98</sup> Her main source is the 1786 parliamentary *Returns of Charitable Donations*, which included only one fuel charity in Hampshire and four coal charities in the West Riding.<sup>99</sup> The relative paucity of fuel charities in these counties is because parliamentary enclosure generally occurred later than in the midlands. Enclosure was especially late around the largest peat-deposits.

**Table 1-2: Enclosure Awards Providing Fuel Allotments for Poor Residents**

Enclosure	Region	Year	Type of Fuel Specified
Kirkby Malzeard	North-East (WR)	1789	Peat
Christchurch	South-West (H)	1805	Peat
West Wellow	South-West (H)	1811	Peat
Elling and Fawley	South-West (H)	1816	Peat
Hawley	North-East (H)	1817	Either Peat or To be let
East Woodhay	North-West (H)	1820	To be let
Christchurch and Milton	South-West (H)	1827	Peat
Crookham and Ewshott	North-East (H)	1835	To be let

In Hampshire, such provisions occurred in seven Enclosure Awards and are noted in Table 1-2. The region mentioned in the table corresponds to the fuel region discussed in chapter 2, with the county in parentheses. The final column specifies whether the land was to be used for cutting peat, rented to purchase fuel or if the specific use was unclear. All of the Awards with these provisions were either near the New Forest in the south-west corner of Hampshire or along the northern border with Berkshire. These correspond to the main Hampshire peat deposits. A similar provision was also made across the border with the 1811 Enclosure Act for Woolhampton,

<sup>98</sup> Sylvia Pinches, "From Common Rights to Cold Charity: Enclosure and Poor Allotments in the Eighteenth and Nineteenth Centuries," *Medicine, Charity and Mutual Aid: The Consumption of Health and Welfare in Britain, c. 1550-1950*, (Aldershot: Ashgate, 2007) 44-45

<sup>99</sup> *Abstract of the Returns of Charitable Donations for the Benefit of Poor Persons, Made by the Ministers and Churchwardens of the Several Parishes and Townships in England and Wales 1786-1788* (26 June 1816)



Berkshire.<sup>100</sup> Five of the seven provisions for fuel allotments occurred between 1816 and 1835, two decades in which there were a total of twelve Enclosure Awards involving common wastes in the entire county.<sup>101</sup> The concentration of fuel allotments in peat-consuming communities further emphasizes the importance of that fuel source to local residents. Most of the allotments occurred after 1805 because those were the years when peat-burning Hampshire regions were enclosed. They also evoke growing concerns about the effects of losing turbary rights on labouring families and the poor rates. Fuel allotments were generally for peat because it was the most commonly collected fuel. Its continued use was also free from the supply shortages affecting northern Hampshire wood.

### **Woodland Management**

Peat takes millennia to form, while wood is the recent growth of plants. Some fuelwood came from hedges, orchards, individual trees in pastures or parts of timber trees not needed for that purpose. For example, the overseers of Barton Stacey paid 1s 6d for 12 hedgewood faggots for Robert Lover in November 1768.<sup>102</sup> Humans were better able to manipulate the growth of wood than other fuel sources and it generally came from private lands managed for that purpose. Outside of the New Forest, most woodlands were intensively managed to produce wood of desired sizes, usually through coppicing. Most deciduous trees, especially oak, ash and elm, do not die when cut and will grow from the same roots with numerous new shoots coming out of the old stump. Increased exposure to sunlight and multiple stems makes annual growth of wood higher

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<sup>100</sup> *An Act for Inclosing Lands in the Parish of Woolhampton, and other Parishes and Places therein mentioned, in the County of Berks* HRO 10M57/A33.

<sup>101</sup> Turner, *English Parliamentary Enclosure*, 202.

<sup>102</sup> "Barton Stacey Overseers Accounts 1767-1789" HRO 60M70/PO1.

in the early years after cutting. Such sunlight is evident in figure 1-3 as the coppice enjoys much more light than a mature wood. The new shoots were then cut after a period of time and the entire process could continue indefinitely in a sustainable manner. Fairly young shoots were ideal for firewood or making charcoal but the construction of houses and ships required large timber. A number of trees were thus left to grow to full maturity in the same woods. Historical geographer Oliver Rackham has written extensively on coppicing and its evolution.<sup>103</sup> Figure 1-4 is a contemporary Hampshire coppice grown in a traditional manner. It shows the clumping of shoots and the size of wood often produced.

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<sup>103</sup> Oliver Rackham, *Trees and Woodland in the British Landscape: The Complete History of Britain's Trees, Woods & Hedgerows, Revised Edition*, (London: Orion, 2001) especially 5-10. See also Rackham, *The History of the Countryside*, (London: J.M. Dent, 1986), *Ancient Woodland: Its History, Vegetation and Uses in England*. (London: E. Arnold, 1980)

**Figure 1-3: Newman's Copse in Eling, photo taken by author, January 30, 2011**





**Figure 1-4: Coppice in Chilbolton, photo taken by author, March 20, 2011**



Until the mid-nineteenth century, woodlands in northern Hampshire were managed for a combination of fuelwood and building timber. Sales of wood sometimes left receipts and these are the main documentary evidence on early modern woodlands. These can be for individual sales, including those made at Shrubs Croft Coppice in Froyle in 1771: eight Oak, one Ash and two Beech trees were sold, along with 292 Tillers and 9 acres 1 rood of underwood. The underwood was worth £22 4s and the timber £16 14s 1d.<sup>104</sup> Occasionally, more comprehensive accounts survive, including those from the Duke of Bedford's woods in Micheldever, East Stratton and West

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<sup>104</sup> "1771 Survey of Woodlands and Coppices in Parish of Froyle" HRO 49M68/172.

Stratton. Their sales from the winter of 1768-1769 are representative of the general relationships between different types of timber on his estates. They have been added together in Table 1-3. Fuelwood accounts for 39 percent of the sales. Faggots and bavins are bundles produced either from the branches and tops of the larger timber trees or from fairly early growth in coppices. They were the main forms in which fuelwood was sold in Hampshire. They are of smaller diameter than either poles or timber, and a hundred faggots generally weighed around a ton. Wood for repairs included building timber used on the Duke's houses while poles were smaller wood used in construction or to support vines in hop plantations.

**Table 1-3: Wood Sales from Duke of Bedford's Estate near Micheldever, 1768-1769<sup>105</sup>**

Type of Wood	Value
Faggots (16,538)	£135 23s 6d
Bavins (14,265)	£30 7s 8d
Total Fuelwood	£165 11s 2d
Poles (4380)	£124 11s 5d
Wood for Repairs/Posts	£133 16s
Total	£423 18s 7d

It is rare to find extended series of records from the same woodlands. However, the various surviving receipts indicate that after 1815 building timber occupied a greater proportion of the wood grown in northern Hampshire. In 1821, the Nutley Coppice in Herriard sold £48 5s worth of faggots and cordwood, with £80 5s 8d of underwood for building purposes and £130 15s 5d of timber also sold.<sup>106</sup> Fuelwood accounted for over 18 percent of the wood sold in that lot and its production continued to shape woodland management.

<sup>105</sup> "Duke of Bedford's Hampshire Wood Accounts Winter 1768-Spring 1769" HRO 149M89/R5/6226

<sup>106</sup> "Accounts of Wood sold 1821" HRO 44M69/E13/5/29.

In a coppicing system, the number of years between cuts was adjusted to produce the desired size of wood. Oliver Rackham observes that coppice cycles in eastern England lengthened between the fourteenth and eighteenth centuries. He claims that “before 1500 it was unusual to fell a wood less often than every nine years, whereas by the eighteenth century rotations of nine years or less were rare, and those of 15-20 years not uncommon.”<sup>107</sup> Alan Albery claims that 12-year coppice-cycles were used at Pamber, northwestern Hampshire after 1720.<sup>108</sup> The evidence I have found suggests that Hampshire coppices were generally cut every 12 to 14 years in the late eighteenth and early nineteenth centuries. In a July 1782 letter, T Hooper, an employee on the Duke of Bolton’s Winslade estate in northeastern Hampshire, wrote that coppices were to be “cut in a gradual proportion and succession at 12 years Growth.”<sup>109</sup> The best evidence for the length of coppice cycles are maps produced by woodland owners noting the year in which each plot was cut. Those surviving in Hampshire suggest similar cycles to Hooper’s letter. At Herriard, the lands cut in 1770 previously had been cut in 1757 and 1758, giving coppice cycles of 12 and 13 years.<sup>110</sup> From Farringdon in north-east Hampshire, woods appear to have been cut on a 12-year cycle between 1798 and 1810, while an early-nineteenth-century map shows a wood called New Coppice divided into 14 plots and specifies that each one was cut every 13 or 14 years.<sup>111</sup> The size of wood burnt in northern Hampshire was larger than Rackham describes in earlier centuries but these coppices continued to produce faggots. The evidence from northern Hampshire suggests that Paul Warde’s observation of

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<sup>107</sup> Rackham, *Trees and Woodlands in the British Landscape*, 82.

<sup>108</sup> Albery, “Woodland Management in Hampshire” 173.

<sup>109</sup> “Letter from T Hooper to W Bushell, 3 July 1782,” HRO 10M57/E18.

<sup>110</sup> “Account of wood sold in Bushy Warren 1770,” HRO 44M69/E11/100.

<sup>111</sup> “New Coppices Farringdon” and “New Coppice Plan” HRO 39M89/E/B265 and 39M89/E/B269.

woodlands no longer being managed for fuel in the early nineteenth century does not apply to all of England.<sup>112</sup>

Yorkshire woodlands were coppiced for fuel in an entirely different manner than their Hampshire equivalents. For the last millennium, the West Riding's woodlands have been concentrated on the coalfield, where there was limited demand for faggots.<sup>113</sup> Meanwhile, coalmines required large amounts of wood. The rails on which carts of coal were pulled and the wheels of those carts were often made of beech and will be discussed later. The biggest requirement for wood was for the construction of frames to prevent debris from falling off the sides of shafts and as pit-props, wooden pillars that kept tunnels from collapsing. These were a fairly significant expense for collieries. The Duke of Norfolk's collieries purchased £166 13s worth of poles on August 29, 1801, while Elsecar New Colliery spent £122 6s on 488 poles from Knabbs Wood on 19 February 1812.<sup>114</sup> Table 1-4 summarizes the accounts from the Duke of Norfolk's Manor and Wood Collieries in the early 1760s. It indicates that these pits were very profitable and that wood accounted for between 7.5% and 10% of the annual operating expenses. These two pits produced over 10,000 tons a year of coal so this wood helped to create far greater amounts of energy than if it had been burnt.

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<sup>112</sup> Warde, "Woodland Fuel, Demand and Supply," 86.

<sup>113</sup> Melvyn Jones, "The Rise, Decline and Extinction of Spring Wood Management in South-West Yorkshire," *European Woods and Forests: Studies in Cultural History*, Charles Watkins ed, (Wallingford: CAB International, 1998) 57-58.

<sup>114</sup> "Accounts of Joint Colliery concerns of His race the Duke of Norfolk and the Executors of Vincent Eyre, 1801-1805," and "Copies of Vouchers Commencing January 1 1812 and ending December 31 1814," Sheffield Archives ACM S205 and WWM 1621.

**Table 1-4: Wood Purchases, Expenses and Sales and Manor and Wood Collieries, 1760-1762<sup>115</sup>**

Year	Wood	Total Expenses	Sales
1760/1	£139 8s	£1412 17s	£2514 10s
1761/2	£115 2s	£1479 18s	£2653 14s
1762/3	£120	£1538 2s	£2712 11s
3 Year Total	£374 10s	£4430 17s	£7880 15s

Coalmines' demand for wood shaped woodland management. Table 1-4 shows the different types of wood products sold from the Clifton Park Wood between Halifax and Huddersfield in three different years. Sales on other parts of the coalfield were similar, but Clifton Park has been selected because its surviving records are more extensive.<sup>116</sup> The proportions of each type of wood differ considerably from the Micheldever sales in Table 1-3. Bark was essential to the tanning industry, and while sold in small amounts in Hampshire, was a significant portion of woodland revenue in Yorkshire. Leaving aside the bark, the biggest difference from Hampshire is the importance of poles relative to trees or fuelwood. Many of the poles and trees were sold to coal mines while others were used in construction or manufacturing. The cordwood in these accounts was turned into charcoal for use in manufacturing processes where the sulphur and other chemicals in coal smoke were detrimental.

<sup>115</sup> "Manor & Wood Collieries 1758-1765", Sheffield Archives ACM S195b.

<sup>116</sup> "Copies of Vouchers," "Falls of Wood, 1816-1819," "Contracts for Sale of Wood, 1805-23," and "Smelters Letters, 1816" Sheffield Archives WWM A1622-1623, ACM S301, ACM S302 and ACM S298 and "Sale Notices" West Yorkshire Archive Service Calderdale Division STN 159.



**Table 1-5: Sales from Clifton Park Wood<sup>117</sup>**

	1779	1800	1822
Timber	183 Trees £227 5s	563 Trees £780 9s	220 Trees £284 7s
Poles	8,461 Poles £550 7s	10,565 Poles £1239 13s	5,232 Poles £360
Bark	£414 1s	£917 12s	£393 15s
Cord Wood	300 cords £127 10s	36 cords £26 8s	£50
Total Sales	£1324 3s	£3311	£1088 2s

The size of wood differed from southern England, but coppicing was also practiced in order to manage growth in West Riding woodlands. Geographers Melvyn Jones and Ian Rotherham find evidence in the growth patterns of still-existent trees and landscape features in woodlands. Jones writes extensively about its history in the southern parts of the West Riding.<sup>118</sup> While landscape and tree archeology demonstrate that coppicing was much more prevalent than the documentary records do, they do not indicate the frequency of cuts. One indication of the length of Yorkshire coppice cycles is a 1749 map produced for the Earl Fitzwilliam's Tinsley Park estate. This map indicates which plot was to be cut in each year until 1770, suggesting that it was to be coppiced on a 22-year cycle. Melvyn Jones also interprets it as such.<sup>119</sup> Meanwhile, the Duke of Norfolk's Treeton Wood near Sheffield operated on a 23-year coppice cycle in

<sup>117</sup> "Random Bundles" WYAS Calderdale KMA 1208/1.

<sup>118</sup> Ian D. Rotherham and Melvyn Jones, "The Impact of Economic, Social and Political Factors on the Ecology of Small English Woodlands: a Case Study of the Ancient Woods in South Yorkshire, England," *Forest History: International Studies on Socio-Economic and Forest Ecosystem Change: Report No. 2 of the IUFRO Task Force on Environmental Change*, M. Agnoletti and S. Anderson Eds. (CABI Publishing, 2000), Melvyn Jones, *Sheffield's Woodland Heritage: Fourth Edition*, (Sheffield: Wildtrack Publishing, 2009) and *Rotherham's Woodland Heritage: Aspect of Local History*, (Rotherham: Rotherham Press, 1995),

<sup>119</sup> "General Rental, 1730-1750," Sheffield Archives WWM A1273, Melvyn and Joan Jones, *Sheffield's Historic Woodlands: Past & Present*, (2006) 5-6.

the mid-eighteenth century.<sup>120</sup> As part of his 1799 *General View of the Agriculture of the West Riding of Yorkshire*, Robert Brown noted that around Wentworth House the trees were cut every 21 years and “mostly used in the collieries.”<sup>121</sup> An 1831 advertisement for the purchase of woodlands at Beauchief, noted that “the Underwood is strong and good, about 30 years growth, and adjoining to good roads, within four miles of Sheffield.”<sup>122</sup> This indicates a longer coppice cycle than the earlier ones from Tinsley, Sheffield and Wentworth. To meet the needs of coalmines, coppices grew wood that was larger than faggots but smaller than mature timber trees. Woodlands on the Yorkshire coalfield were coppiced for fuel into the mid-nineteenth century but in a very different manner from their northern Hampshire equivalents.

Woodland management was very different in the New Forest of south-western Hampshire. In the eighteenth century, the Forest’s 92,000 acres were managed to produce timber for the navy and revenue for the Crown. As such, they included numerous plantations of Scots pine, a species not traditionally present in Hampshire. Scots pine cannot be coppiced and does not produce good firewood.<sup>123</sup> Traditional coppices still produced a few faggots into the 1850s, but the Forest’s management focused on large naval timber.<sup>124</sup> The lack of interest in managing the Forest for fuelwood is apparent in the Duke of Bedford’s inquiries into its management in the 1750s and parliamentary investigations in 1789 and 1848. According to these sources, some houses in the Forest were given perpetual allotments of trees for fuel prior to

<sup>120</sup> “15 September 1769 Examination of Mr. Smilter” British Library Additional Manuscript 27,528/99.

<sup>121</sup> Robert Brown, *General View of the Agriculture of the West Riding of Yorkshire; Surveyed by Messrs. Rennie, Brown, & Shirreff, 1793; With Observations on the Means of its Improvement, and Additional Information Since Received*. (London: Richard Phillips, 1799) 31 of appendix.

<sup>122</sup> “Beauchief Muniments, 1784-1813,” Sheffield Archives BM 43/17.

<sup>123</sup> H.C. Darby, “The Preservation of the New Forest: The Historical Background,” *Geographical Journal* 112 (1948) 90.

<sup>124</sup> Colin R. Tubbs, *The New Forest*, (London: Collins, 1986) especially 73, 231.

1700. The initial intention was that the Surveyor or his deputy would allot decaying beech trees every year and those homes would burn them.<sup>125</sup> However, wood was not extensively used as fuel in this region after 1700 and other uses developed for the allotted trees. Surveyors frequently allotted their friends high-quality beech timber trees rather than decaying ones and did not always verify how many trees were cut. In November 1788, Thomas Jeans reported to a parliamentary committee that, "Most of the Fuel Wood is sold and applied to various Uses, the principal Part of it for Trucks and Rails for the Newcastle Coal Trade, and for Card Boards for dressing of Wool. The Wood is felled by the Parties, and commonly worked up for those Uses in the Forest."<sup>126</sup> Similar complaints about fuel allotments were made in 1720, 1749 and 1751.<sup>127</sup> They were also made in the 1840s, when favourable allotments were given to Southampton Timber Merchants who were paying off the Assistant Deputy Surveyor's personal debts.<sup>128</sup> Incidentally, coal from Newcastle was the primary fuel in the adjacent town of Southampton throughout this period. The fuelwood allotments helped supply nearby residents with fuel in a roundabout manner not envisioned by the Forest Administration. As such, the New Forest fuel allotments were a third manner in which woodlands were managed for the production of fuel.

Charcoal is wood in which all of the water and impurities are burned off to increase its energy density. This made it suitable for transporting and it had been the

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<sup>125</sup> *Fifth Report of the Commissioners Appointed to Enquire into the State and Condition of the Woods, Forests, and Land Revenues of the Crown, and to Sell or Alienate Fee Farm and other Unimproveable Rents.* (1789) 33.

<sup>126</sup> *Fifth Report of the Commissioners Appointed to Enquire into the State and Condition of the Woods, Forests, and Land Revenues of the Crown*, 58.

<sup>127</sup> "Letter from Charles Wither to Lord Harley 8 September 1720," "New Forest Affidavits and Reports," "Letter from S Miller to Duke of Bedford, 4 January 1751" HRO 87A09/2/2a, 149M89/R4/6139, 149M89/R4/6141.

<sup>128</sup> *Report from the Select Committee on the Woods, Forests, and Land Revenues of the Crown; Together with the Minutes of Evidence* (House of Commons, 1848) 145.

primary fuel in Southampton in the seventeenth century before the development of a sustained coal trade to the port. Charcoal lacked the sulphur and other impurities present in bituminous coals. As such, it did not react chemically with metals and was the preferred fuel-source for smelting iron until the 1740s. Its industrial uses declined in this period but the few occasions on which it was used will be discussed in later chapters.

### **Other Fuels**

**Figure 1-5: Furze bushes on heath, Lyndhurst, 17 April 2011, photo taken by author**



Another source of fuel in Hampshire was furze, a type of woody bush that grew on many common wastes. Furze was a fast burning, hot fuel, often used to heat kilns

and the ovens of bakers.<sup>129</sup> Furze production was not managed in the same way as peat, coal or wood and it produced less combustible matter per acre than wood. C.H. Gimmingham notes that the highest observed yield from furze bushes is 3060 kg/ha or 1.36 tons/acre. This was part of an experimental study in the 1960s and occurred exactly three years after a controlled burn on peat soils, with young shoots that had not been grazed by cattle or sheep. Such conditions were not standard on early modern commons.<sup>130</sup> This observation is also in the lower end of the 1-2 tons of dry wood that E.A. Wrigley claims a coppice could sustainably produce.<sup>131</sup> The needles of furze bushes were often burnt off prior to its being cut as this made collection easier. This should be clear from the two images. Figure 1-5 shows furze bushes in full bloom while 1-6 shows furze after its needles were burnt. Upon being cut, furze bushes were generally bundled into faggots, although they were often differentiated from wood bundles. For example, the overseers of Fawley paid 5s 4d for “two hundred furze faggots for the Poor” in April 1771.<sup>132</sup> Because furze was not burnt in London, extensively traded or used by wealthier households, historians underestimate its consumption. The sources used in the next chapter probably do so to a lesser extent. Furze was never the primary fuel in any Hampshire community but it appeared in the Overseers Accounts of 17 of the 78 Hampshire parishes discussed in chapter 2.

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<sup>129</sup> William Gilpin, *Remarks on Forest Scenery; and other Woodland Views, (Relative Chiefly to Picturesque Beauty) Illustrated by the Scenes of New-Forest in Hampshire, Volume II*, (London: R. Blamire, 1794) 41-42, Sir Frederic Morton Eden, *The State of the Poor: Or, An History of the Labouring Classes in England, from the Conquest to the Present Period; In which are Particularly Considered, Their Domestic Economy, with Respect to Diet, Dress, Fuel, and Habitation; And the Various Plans which, from Time to Time, have been Proposed, and Adopted, for the Relief of the Poor: Together with Parochial Reports Relative to the Administration of Work-houses, and Houses of Industry; the State of Friendly Societies; and other Public Institutions; in several Agricultural, Commercial, and Manufacturing Districts, Volume I*, (London: J. Davis, 1797) 510-511, Warde, “Woodland Fuel, Demand and Supply,” 85.

<sup>130</sup> C.H. Gimmingham, *Ecology of Heathlands*, (London: Chapman and Hall, 1972) 151-153

<sup>131</sup> Wrigley, *Energy and the English Industrial Revolution* 16.

<sup>132</sup> “Fawley Poor Book, 1770-1787” HRO 25M60/PO7.

**Figure 1-5: Burnt Furze Bush, Lyndhurst, 17 April 2011, photo taken by author**



Bracken is a type of fern that grew on commons and was sometimes burnt as a domestic fuel in southern England. In his 1722 *Botanicum Officinale*, Joseph Miller observed that it grew “upon Commons and Heaths, being used in Want of Wood by the Country-people, for heating their Ovens and other Uses.”<sup>133</sup> Donald Denman found that bracken was used for baking bread in Suffolk prior to the arrival of cheap coal.<sup>134</sup> However, the evidence from Yorkshire suggests that bracken was not consumed there even when it was available. Residents of the townships of Manningham and Heaton, in Bradford Parish, litigated the location of the dividing line after their shared common was

<sup>133</sup> Joseph Miller, *Botanicum Officinale* (London: E. Bell, 1722), 199.

<sup>134</sup> Donald R. Denman, *Five Crucial Years in the Destiny of Common Land, 1965-1970*, (London: Royal Society of Arts, 1965) 58.

enclosed. Numerous Manningham residents testified to both the growth of bracken and their use of the Common prior to 1822. Rather than collecting it for household consumption, Matthew Greenwood claimed “that he has helped to burn Brackens several Times upon the Common. They carried the ashes to Richard Tetley’s and they were sold to Richard Wilkinson.”<sup>135</sup> John Brown, John Walker, William Hill, John Binns, John Topham, Richard Wilkinson, John Wade, George Tetley, John Midgley, William Slingsley and John Waterhouse also remembered bracken being burnt on the common before the ashes were carted off. None of them mentioned its use as a domestic fuel.<sup>136</sup> However, a number of them noted that freeholders used the common to collect turves for fuel while poor residents collected dung to burn. Joseph Ward recalled that “all the poor people gether’d Dung there as far as the Ridge of the Hill.”<sup>137</sup> The choice to sell bracken ashes without first using them to cook, while some residents burnt dung, evokes bracken’s low position on the hierarchy of fuel types. Detailed evidence like the Manningham depositions is rare but it indicates that more fuel sources were used.

## Conclusion

Each fuel had unique properties and different environmental relationships shaping both its production and consumption. Fuels burnt differently so fast-burning furze was well suited to baking bread while slower-burning peat was better for cooking potatoes. These properties also enabled the development of various by-products, with ashes used as fertilizer or in soap-making. Fuel consumption produced various smokes and these will be discussed in chapter five. But the environmental relationships that had the biggest impacts on fuel consumption before 1830 related to its production and

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<sup>135</sup> “Manningham and Heaton Common Papers” WYAS Bradford MMC57/19/1.

<sup>136</sup> “Manningham and Heaton Common Papers,” WYAS Bradford MMC57/19/1-11

<sup>137</sup> “Manningham and Heaton Common Papers,” WYAS Bradford MMC57/19/4.

transportation. Wood, furze and bracken are the recent growth of plants, so the ability to increase production to meet rising demand was limited by the amount of land available. Using land for these purposes also competed with food production. Peat is semi-renewable, relying upon millennia of deposition, but its collection required the management of considerable surface land and affected agriculture in various ways. Coal mining required some specialized wood products but was geographically concentrated in underground locations. Mining had less impact on the amount of land available for agriculture, while its ashes increased agricultural productivity by raising the pH level of acidic soils.<sup>138</sup> Coal is non-renewable but production increased to meet demand in a way that was not possible for land-intensive fuels, given English population density.<sup>139</sup> However, most communities did not have their own coalmines and coal's transportation required large navigation schemes and the associated expropriation of numerous plots of land.

Very few residents of eighteenth-century Yorkshire or Hampshire had good access to every fuel. Instead, their choices were constrained by the interrelationship of humans and landscapes. Coal and peat formed without human intervention but decisions about which lands to drain, which mines to construct, the development of mining technology and the construction of river navigations all shaped access. Oak, beech and ash trees can all grow without human aid but were managed to maximize the production of desirable wood products. Similarly, the growth of bracken and furze

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<sup>138</sup> Arthur Young, *A Six Months Tour Through the North of England, Volume I*, (New York: Augustus M. Kelley, 1967, first published 1771) 306 describes that at Wentworth, Yorkshire 5-6 chaldrons of ashes were placed on every acre of farmland as fertilizer. Historical use of coal ashes as fertilizer is also described in Eric Kerridge, *The Agricultural Revolution* (London: George Allen & Unwin, 1967) 242. For a contemporary description of its effects, see Yong Bok Lee, Ho Sung Ha, Bum Ki Park, Ju Sik Cho and Pil Joo Kim, "Effect of a Fly Ash and Gypsum Mixture on Rice Cultivation," *Soil Science and Plant Nutrition* 48 (2002) 171.

<sup>139</sup> Wrigley, *Energy and the English Industrial Revolution* 16.



depended on the extent to which land was grazed. Access to all of these fuels and the lands on which they grew was also influenced by myriad social factors. Limitations remained that were beyond human control, like the River Aire freezing, the Southampton to Salisbury Canal's collapse, the location of coal deposits and the suitability of different soil types to specific trees. The next chapter examines how these environmental relationships combined to affect the types and prices of fuel consumed across the two counties. Chapters three, four and five will consider how social relationships combined with the geography of fuel to affect its consumption.

## Chapter Two: Fuel Regions of Hampshire and the West Riding of Yorkshire, 1750-1830

Thurstonland was a textile manufacturing village on the West Riding coalfield. On 23 October 1799 its Overseers of the Poor paid 2s for a half dozen coals (~1.05 tons) for Elizabeth Rowbottom.<sup>1</sup> Staveley was 40 miles to the northeast in a flatter agricultural region. One month later its overseers made a similar purchase for Elizabeth Jackson, although a half chaldron of coals (~0.65 tons) cost them 9s 9d.<sup>2</sup> Price differences such as this nearly eight-fold difference across the West Riding were standard throughout this period. Cheap coal contributed to the industrialization of villages like Thurstonland, while the area around Staveley increasingly specialized in arable agriculture.

Households also burnt more fuel where it was cheaper. Such price differences were caused by proximity to the coalmines and access to water-borne transportation. They are also indicative of an era in which there was as much geographic and fuel diversity inside the two counties as between them. This chapter describes the most important fuel relationships in each region of the two counties and their impacts upon its price.

E.A. Wrigley argues that this period was part of a fundamental shift from an organic to a mineral economy.<sup>3</sup> In so doing he emphasizes the greater consumption possibilities of a coal-burning society and its potential for industrial growth. However, between 1750 and 1830 the domestic fuel sources used in most communities did not change. The few Hampshire and West Riding ones that did are mentioned in Appendix C. A greater portion of the two counties burned coal in 1830 than in 1750 because population grew much faster in coal-burning areas, especially the West Riding

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<sup>1</sup> "Thurstonland town book 1796-1809," West Yorkshire Archive Service Kirklees Division KCZ271/2.

<sup>2</sup> "Staveley Poor Law Accounts," North Yorkshire County Record Office PR/SVL/14/5/6.

<sup>3</sup> Wrigley, *Energy and the English Industrial Revolution* 9-23.

manufacturing districts. There remained four main fuel consumption regimes across the two counties: local coal, wood, peat and non-local coal. Each of these fuels was subject to its own dynamics, as discussed in chapter one. Although the type of fuel used did not often change, population growth and war led to changes in their cost. Wood production could not increase to supply a growing population and its price tripled. Fuel prices had a large impact on the living standards of labouring and poor people, as will be shown in chapters three, four and five. This chapter describes the regional pattern of fuel types and the changing prices paid for them.

Hampshire and the West Riding both contained fast growing regions and slower growing ones dedicated to arable agriculture. Population expanded in coastal Hampshire and the Isle of Wight with the construction, provisioning and manning of naval ships during eighteenth-century wars. Meanwhile, the Yorkshire Coalfield housed the growing woollen textile and cutlery industries of the early Industrial Revolution. Neither of these fast growing regions was well suited to growing grain or self-sufficient in food. Both regions also contained the fastest growing towns in their counties. In 1821, the seven West Riding towns over 10,000 were on the coalfield, while the six Hampshire towns over 4,500 were south of the Downs.<sup>4</sup> Both northern Hampshire and the eastern regions of the West Riding increasingly specialized in arable agriculture, and their population grew less. It is difficult to group either the New Forest of south-western Hampshire or the Pennines of north-western Yorkshire with other regions. I have divided both counties into six fuel regions for the purposes of analysis and this

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<sup>4</sup> *1821 Census*. In Yorkshire, these were Leeds, Sheffield, Bradford, Wakefield, Halifax, Huddersfield and Saddleworth with Quick. Doncaster was the largest town east of the coalfield with 8,544 inhabitants in 1821 and over 10,000 in 1831. In Hampshire, these were Portsmouth/Gosport, Southampton, Winchester, Romsey, Christchurch and Eling. Andover, with 4,123 residents was the largest town in northern Hampshire at the time.

chapter is largely devoted to describing them. The regions were divided based upon their fuel relationships and the fuel prices paid. Hampshire and the West Riding could both have been divided into three regions instead of six, but the finer divisions better explain the regional differences described in chapters three, four and five.<sup>5</sup>

Fuel use varied considerably across both counties and was heavily influenced by cost. Coal was the main fuel source for most of the West Riding throughout this period but its price varied depending on distances from the pithead. Fuel-intensive industries thrived on the coalfield, which became one of the world's most industrialized regions. Peat was also consumed, particularly in the upland western areas and south-eastern fenlands. Prices increased at different rates across the county, with the eight-fold difference of 1800 dropping to a five-fold one in the 1820s, but the general relationship did not change.

Most Hampshire communities did not have easy access to all types of fuel so these varied across the county. Peat was considerably cheaper than wood or coal and was preferred in areas with local deposits, particularly in the New Forest and along the Berkshire border. Coal was consumed in coastal communities and along the expanding network of inland navigations. Wood was expensive, but along with furze was burnt in communities without ready access to peat or coal. While the types of fuel consumed did not change radically between 1740 and 1830, their relative prices did. Although prices were never uniform across Hampshire, wood became much more expensive. Coal prices fluctuated with war but peacetime prices were not much higher in the 1820s than

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<sup>5</sup> If the counties were divided into three instead of six regions, the West Riding would have Coalfield, north-west and Eastern regions, while Hampshire would be divided into South, south-west and North. This would involve combining the two coalfield regions and the three eastern ones in Yorkshire, while combining the two northern regions and the Isle of Wight, Coast and Inland regions in Hampshire.

they had been in the early 1750s. This chapter begins by describing the fuel regions of the West Riding, followed by those of Hampshire. The last part of the chapter deals with regional variation and changes in the price of fuel. Experiences were not uniform and fuel prices were a major component of this divergence.

The importance of increasing coal consumption to eighteenth-century England is such that economic historians argue about the extent of its contribution to the Industrial Revolution. In the *Great Divergence*, Kenneth Pomeranz argues that England industrialized first because of easy access to cheap coal and the importation of raw materials from sparsely populated North America.<sup>6</sup> Robert C. Allen considers new technology as the Industrial Revolution's main cause. He argues that a combination of cheap coal and high wages made early steam-engines and other new inventions profitable in northern England when they were not elsewhere.<sup>7</sup> E.A. Wrigley understands population growth, an increasing portion of the population working in manufacturing, and higher manufacturing output as the most important changes of the Industrial Revolution. His work looks at the various rates at which these occurred across England and emphasizes that they were primarily in coal-producing regions.<sup>8</sup> Meanwhile, Joel Mokyr acknowledges that coal was cheap in England but does not see this as a leading cause of the Industrial Revolution. Like Allen, he understands technology to have been the most important change but argues that it resulted from

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<sup>6</sup> Kenneth Pomeranz, *The Great Divergence: China, Europe and the Making of the Modern World Economy*, (Ewing: Princeton University Press, 2000) 207.

<sup>7</sup> Allen, *The British Industrial Revolution in Global Perspective*,

<sup>8</sup> Wrigley, *Energy and the English Industrial Revolution* is the most important of these works but he also makes the argument in other writings. E. A. Wrigley, "English County Populations in the Later Eighteenth Century," *Economic History Review* 60 (2007): 35-69,

improved education, new ideas and government institutions.<sup>9</sup> Deirdre McCloskey sees the Industrial Revolution as the beginnings of modern economic growth and argues that it was caused by innovation that was only possible in societies which valued commerce.<sup>10</sup>

The debate on coal and industrialization is not my main focus. This chapter contributes to it, however, by demonstrating both fuel prices and the extent to which they corresponded to the location of industries. Manufacturing requires a combination of heat and motive-power to transform raw materials. Most heat-intensive manufacturing was on the coalfield in 1750 and it became increasingly concentrated there in the subsequent eighty years. This is particularly evident with cutlery manufacturing as metals needed to be smelted and then heated at later stages of processing. Sheffield was the major producer of knives, forks and scissors throughout this period. The connections between coal and textile manufacturing are less apparent, but this industry also grew rapidly on the Yorkshire coalfield while declining elsewhere. Coal was used to boil dyes, heat wool-combing tools, and to dry both flax and yarn.<sup>11</sup> Yarns also spun better in well-heated rooms, making cheap coal beneficial to the process before the adoption of steam-powered jennies.<sup>12</sup> The importance of coal was such that woollen manufacturing declined in Romsey, Hampshire in the 1780s while it expanded around Thurstonland, Yorkshire where coal cost less than one-eighth as much.<sup>13</sup> Steam-

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<sup>9</sup> Joel Mokyr, *The Enlightened Economy: An Economic History of Britain, 1700-1850* (London: Yale University Press, 2009)

<sup>10</sup> Deirdre McCloskey, *Bourgeois Dignity: Why Economics Can't Explain the Modern World* (Chicago: University of Chicago Press, 2010)

<sup>11</sup> Hatcher, *History of the British Coal Industry, Volume I*, 443.

<sup>12</sup> G.N. von Tunzelmann, *Steam Power and British Industrialization to 1860*, (Oxford: Clarendon Press, 1978) 178.

<sup>13</sup> "Romsey Extra Overseers Accounts, 1774-1784" Hampshire Record Office 10M54/PO1 and "Thurstonland Town Book 1775-1787" West Yorkshire Archive Service Kirklees Division KC 271

engine's motive-power have received more historical attention than the use of heat in manufacturing. Eighteenth-century factories relied upon water-power, which was readily available in the hilly Yorkshire coalfield. Steam-engines were gradually adopted in the nineteenth-century. Both coal and water continued to power factories into the 1830s. By the end of that decade steam-engines generated somewhat more power than waterwheels in woollen, worsted and linen factories.<sup>14</sup> The heat generated by coal, along with water-power and the later adoption of steam-engines contributed to Yorkshire industrialization.

### Map 2-1: Fuel Regions of the West Riding of Yorkshire



### South Coalfield<sup>15</sup>

<sup>14</sup> A.E. Musson, "Industrial Motive Power in the United Kingdom, 1800-70" *Economic History Review* 29 (1976) 424 and Andreas Malm, "Fleeing the Flowing Commons: Robert Thom, Water Reservoir Schemes and the Shift to Steam Power in Early Nineteenth-Century Britain" *Environmental History* 19 (2014) 56.

<sup>15</sup> This region is understood as the coalfield communities in the wapentakes of Staincross and Strafforth and Tickhill, or the following places: Ardsley, Barugh, Barnsley, Monk Bretton, West Bretton, Carlton, Chevet, Cowthorne, Cudworth, Cumberworth, Darton, Denby, Dodworth, Gunthwaite, Kexbrough, High

The South Coalfield was a hilly region in the south-west corner of Yorkshire. It stretched from river valleys around Rotherham to grass-covered hills at the edge of the Peak District. Sheffield was the largest town in this region and one of the expanding manufacturing centres of the Industrial Revolution. In 1750, it was the fourteenth biggest town in England with 12,000 residents, before growing to become the seventh largest town with 46,000 residents in 1801 and 81,291 residents in 1831.<sup>16</sup> Sheffield had long been a major centre of cutlery manufacturing. Daniel Defoe noted that “they make all Sorts of Cutlery-ware, but especially that of Edged-Tools, Knives, Razors, Axes, &c and Nails.”<sup>17</sup> Cutlery production was generally performed in small independent workshops, taking advantage of local sandstone, iron, coal and the small streams that flow into the River Dun. The only other community with over 5,000 residents in this region was Barnsley. It had 5,014 residents in 1811 and 10,330 in 1831.<sup>18</sup> In the eighteenth century, Barnsley had coal pits and iron mines, along with the weaving of “some coarse linen for shirts and checks.”<sup>19</sup> Its later growth was connected to the increasing ability to mine its famous coal seam. The South Coalfield had a population density of one person

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Hoyland, Hoyland Swaine, Hunshelf, Ingbirchworth, Langsett, Notton, Oxspring, Penistone, Roystone, Silkstone, Stainborough, Skelmanthorpe, Tankersley, Thurlstone, Thurgoland, Woolley, Worsbrough, Wortley, Bradfield, Brampton Bierlow, Brightside Bierlow, Darfield, Greasbrough, Hoyland, Kimberworth, Rawmarsh, Wentworth, Wombwell, Aston, Attercliffe with Darnall, Brinsworth, Catcliffe, Ecclesall Bierlow, Ecclesfield, Nether Hallam, Upper Hallam, Handsworth, Orgreave, Rotherham, Sheffield, Tinsley, Treeton, Ulley, Wales and Whiston. While the wapentake boundaries are not the identical to the post-1974 counties, this region corresponds roughly to the western half of the current county of South Yorkshire.

<sup>16</sup> The earlier two populations are from Wrigley, *Energy and the English Industrial Revolution* 62-63, while the last is from the *1831 Census*. Unlike the other nine largest cities, the preface to the *1831 Census* xxiii, did not discuss Sheffield as a rapidly growing place or define the understood boundaries. As Wrigley used the townships of Sheffield, Ecclesall Bierlow and Brightside Bierlow and the parish of Ecclesfield, the same has been done to arrive at the 1831 number.

<sup>17</sup> Defoe, *A Tour Thro' The Whole Island of Great Britain Volume II*, 590.

<sup>18</sup> *1811 Census* and *1831 Census*.

<sup>19</sup> William Bray, *Sketch of a Tour Into Derbyshire and Yorkshire, Including Part of Buckingham, Warwick, Leicester, Nottingham, Northampton, Bedford, and Hertford-Shires, The Second Edition*, (London: B. White, 1783) 256.



for every two acres in 1801 and every 1.15 acres in 1831, which was more than double that of any non-coalfield region but significantly lower than in the textile-producing region to the north. The South Coalfield contained between 15 and 17% of the Riding's population.<sup>20</sup> Overall, this was a region with extensive coal deposits that had been mined for centuries and which supported small manufacturing, particularly cutlery.

There are some peat deposits in the hills west of Sheffield and Barnsley. At Woolley, north of Barnsley, Arthur Young described the turf lying "in an even stratum, about five or six feet deep" that locals cut and burnt.<sup>21</sup> However, coal was the predominant fuel and the only one purchased by Overseers of the Poor. The largest mines were the Earl Fitzwilliam's Elsecar and Lawwood pits and the local ones serving Sheffield. The Lawwood pithead prices are in Table 2-5 below. Elsecar's prices are not in the chart but between 1765 and 1780, they were 3s 6d for a dozen (~2.1 tons) soft coal and 4s for a dozen hard coal. The cheaper coal was a more bituminous grade better suited to households while manufacturers preferred the harder anthracite. Colliers paid a discounted rate of 13d for a dozen coals in 1766 but did not purchase enough coal to create a large resale market.<sup>22</sup> Mining costs increased and the pithead price rose to 7s 6d for a dozen coals in 1800.<sup>23</sup> The price of coal was determined by a combination of distance from the nearest mine and the local pithead price. Rawmarsh, mentioned in chapter one, was five miles from the Lawwood Colliery and its overseers were paying between 3s and 5s per dozen more than the nearby pithead price, with some of those

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<sup>20</sup> Calculations of population density are made from data in Wrigley *Early English Censuses* A1.5.

<sup>21</sup> Young, *Six Months Tour Through the North of England, Volume I*, 239-240.

<sup>22</sup> "Elsecar Colliery Journal 1765-1767" and "Elsecar Colliery Account, 1779" Sheffield Archives WWM A 1585-1586.

<sup>23</sup> Sheffield Archives WWM F100.

purchases coming from other pits.<sup>24</sup> Worsbrough's overseers purchased coal from multiple nearby pits and their prices are in Table 2-5. In 1785/6, their "Coals for the Poor" included 13 dozen and 2 pulls from Barnsley at 8s per dozen and 48 dozen from Westwood Colliery at 3s per dozen. Both prices include the cost of transporting the coal.<sup>25</sup> The willingness of the Worsbrough overseers to pay different rates reinforces that coal did not have uniform properties, even if the generic term was often used in written records.

Despite being a large manufacturing town with local coal, prices in Sheffield were consistently higher than elsewhere on the South Coalfield. Unlike other large towns, Sheffield continued to be governed as one of the Duke of Norfolk's manors. He owned the local Manor, Wood, Sheffield Park and Attercliffe Collieries, which produced 19,800 tons in 1773 and 99,840 tons in 1800/1.<sup>26</sup> As mentioned in Chapter One, these were deep capital-intensive mines with significantly higher extraction costs than Lawwood or Elsecar. The town was not connected to navigable water until the Sheffield Canal extended the River Dun in 1819. Sheffield operated a workhouse and records of the town's outdoor relief have not survived. In 1797 Sir Frederick Morten Eden claimed that coal cost 5d per cwt while an 1819 memo to Earl Fitzwilliam noted that "Coals in the Neighbourhood of Sheffield are selling for 5d per cwt or 8s 4d per Ton."<sup>27</sup> Coal became

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<sup>24</sup> "Rawmarsh Overseers Accounts 1792-1813" and "Rawmarsh Overseers Accounts 1813-1828" Sheffield Archives PR80/150-151.

<sup>25</sup> "Worsbrough Overseers Accounts, 1738-1792" Sheffield Archives EM 1002.

<sup>26</sup> Ian R. Medicott, "The Development of Coal Mining on the Norfolk and Rockingham-Fitzwilliam Estates in South Yorkshire 1750-1830" *Yorkshire Archaeological Journal* 59 (1987) 110. Janet Blackman, "The Food Supply of an Industrial Town. A Study of Sheffield's Public Markets, 1780-1900" *Business History* 5 (1963) 84.

<sup>27</sup> Sir Frederic Morton Eden, *The State of the Poor: Volume III*, (London: J. Davis, 1797) 873, "Letter from Mr Wromeh to Fitzwilliam, 16 March 1819" Sheffield Archives WWM F107/101. It should be remembered that in 1773, extraction costs at Sheffield Park were estimated at 5s 4d/ton.

cheaper in the 1820s, but was more expensive than in other industrial communities during the preceding 70 years.

### North Coalfield<sup>28</sup>

The North Coalfield is the region most associated with the West Riding of Yorkshire. From the 1780s on, it contained over half of the county's population, seven of the eight largest towns and most of the textile production.<sup>29</sup> The North Coalfield had the fastest growing population in each of the first three decades of the nineteenth-century and was the most densely populated, with one person per acre in 1811 and 1.6 people per acre in 1831.<sup>30</sup> The eastern end of this region began a few miles downriver from Leeds and Wakefield as a series of gentle hills rose from the flatter Vale of York.

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<sup>28</sup> This region is understood to include the following parishes and townships: Almondbury and North Crosland, Alverthorpe, East Ardsley, West Ardsley, Austonley, Batley, West Bretton, Carlton, Cartworth, Crigglestone, Crosland-Half, Cumberworth-Half, Dalton, Dewsbury, (Emley), Farnley Tyas, Flockton, Upper and Nether, Foulstone, Golcar, Hepworth, Holme, Honley, Horbury, Huddersfield, Kirkburton and Holmfirth, Kirkheaton and Whitley Over, Lepton, Lingarths, Linley, Linthwaite, Lockwood, Marsden, Meltham-Half, Middleton w Thorp, Mirfield, Morley, Ossett, Quick, Rothwell, Great Sandal, Scammonden, Shelley, Shipley, Shitlington, Slaighthwaite, Soothhill, Stanley, Nether Thong, Upper Thong, Thornhill, Thorpe, Thurstonland, Wakefield, Walton, Low Whitley, Wooldale, Allerton, Barkisland, North Bierley, Bolton, Bowling, Bradford, Calverley, Churwell, Cleckheaton, Clayton, Clifton, Drighlington, Eccleshill, Elland with Greetland, Farsley, Fixby, Gildersome, Gomersall, Halifax, Hartshead, Haworth, Heaton, Heckmondwike, Heptonstall, Hipperholm with Brighouse, Horton, Hunsworth, Idle, Langfield, Liversedge, Manningham, Midgley, Norland, Ovenden, North Oram, South Oram, Pudsey, Rastrick, Rishworth, Shelf, Shipley, Skircoat, Sowerby, Soyland, Stainland, Stansfield, Thornton, Todmorden, Tong, Wadsworth, Warley, Wike, Wilsden, Roundhay, Seacroft, Temple Newsham, Addle with Eccup, Allwoodley, Baildon, Bingley with Mickethwaite, Esholt, Guiseley, Hawkesworth, Horsforth, Rawdon, Wigton, Keighley, Leeds, Armley, Beeston, Bramley, Chapel Allerton, Farnley, Headingley, Holbeck, Hunslet, Potter Newtown and Wortley. This corresponds roughly with south-western two-thirds of the post-1974 county of West Yorkshire and includes the entirety of Leeds Parish and the wapentake of Morley, along with Keighley and coalfield communities in the wapentakes of Aberg and Skyrack.

<sup>29</sup> Populations come from Wrigley *Early English Censuses* Tables A1.5 and A2.7, along with *1821 Census* and *1831 Census*. The pre-1801 populations are by wapentake and those do not correspond exactly with the coalfield. It is clear that in 1791, over half the population was in the north coalfield while it is possible for 1781. In 1801, 107,300 of the 115,115 residents of the wapentake of Aberg were on the coalfield, along with 11,753 of the Skyrack wapentake's 29,010 people and the 5,745 residents of Keighley. In 1791, Morley and Leeds had 150,549 of the West Riding's 524,269 people. Aberg had 108,728 people, while Skyrack had 25,645. Given the large portions of each of those wapentakes on the coalfield in 1801, it is clear that more than 262,135 people lived in the North Coalfield in 1791. In 1781, Leeds and Morley had 128,557 of the West Riding's 451,960 inhabitants, while Aberg had 89,091, Skyrack 23,525 and the parish of Keighley is unclear.

<sup>30</sup> Wrigley *Early English Censuses* Table A1.5

Moving west, the hills get higher and the valleys narrower into the western parts of Halifax Parish and the Lancashire border. Figure 2-1 contains more buildings than existed in the early nineteenth century but demonstrates the narrow, damp valleys filled with manufacturing villages of a few thousand residents that characterized the north-western part of the coalfield. In the early 18<sup>th</sup> century, Daniel Defoe was struck by the density of these textile-manufacturing villages west of Halifax, which he attributed to their local coal and running water. Some vegetables and livestock were grown and raised in these villages, but “they must then necessarily have their Provisions from other Parts of the Country.”<sup>31</sup> The North Coalfield produced various types of woollen and worsted fabrics along with some cotton ones.<sup>32</sup> Leeds and Wakefield were along the two rivers at the eastern edge of the coalfield and grew as markets where grains from the east were exchanged with cloth and coal from the west.<sup>33</sup> Meanwhile, Halifax and Huddersfield were in the centre of textile manufacturing regions and included the cloth halls where fabrics from outlying villages were traded. Bradford, with 6,393 inhabitants in 1801, had some worsted manufacturing along with expanding ironworks, lime kilns and coal.<sup>34</sup> Its industries grew rapidly, with Low Moor Iron Works employing 1,200 families in 1814, along with the steam-powered textile mills after 1810.<sup>35</sup> It had over 34,000 residents in 1831 before becoming one of the ten largest towns in England by

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<sup>31</sup> Defoe, *A Tour Thro' The Whole Island of Great Britain Volume II* 600-610 on Halifax Parish, quotation from 606.

<sup>32</sup> For detailed studies of these industries, see Hudson, *Genesis of Industrial Capital* or Gregory, *Regional Transformation and Industrial Revolution*.

<sup>33</sup> The manner in which Leeds connected the different regions of the West Riding and became the county's main city is similar to the role of Chicago in Western North America in the second half of the 19<sup>th</sup> century, as described in William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W.W. Norton & Company, 1991)

<sup>34</sup> Gary Firth, “The origins of Low Moor Ironworks, Bradford, 1788-1800,” *Yorkshire Archaeological Journal* 49 (1977): 127-139

<sup>35</sup> *Leeds Mercury* 13 August 1814: 3.

mid-century.<sup>36</sup> This was a textile-manufacturing region that benefitted from cheap coal prior to the introduction of steam-powered mills in the early nineteenth century.

**Figure 2-1: Hebden Bridge and Heptonstall, 18 July 2010, photo by author.**



Leeds was the largest town in Yorkshire. In 1750, it was the eighth largest in England with 16,000 residents, growing to the sixth largest with 55,503 in 1801 and fifth largest with 125,885 in 1831.<sup>37</sup> Leeds was the county's commercial centre, with the largest merchants, lawyers and bankers, as well as cloth-dying and assorted other

<sup>36</sup> 1831 Census and Wrigley *Energy in English Industrial Revolution*, 62-63.

<sup>37</sup> Wrigley, *Energy and English Industrial Revolution*, 62-63 and *Early English Censuses*, Table A2.7. Also, 1831 Census.

industries, including pottery and leather.<sup>38</sup> When linen manufacturing was mechanized in the early nineteenth-century many of the largest factories were in Leeds and the town came to dominate that industry.<sup>39</sup> Many of these industries benefitted from local coal, as pottery and cloth dyeing burned considerable amounts.<sup>40</sup> The largest Yorkshire coal mine was the Middleton Colliery, 1.5 miles south of Leeds in the industrial suburb of Hunslet. The proximity of the pit and its rail connection kept prices low and they are noted in Table 2-5. The rail connection between the pit and riverside Hunslet Staith meant that Middleton coal also supplied many of the eastern regions of Yorkshire.<sup>41</sup>

Coal had been mined on the North Coalfield for centuries and was cheapest at the western edge of the coalfield, where the seams were closer to the surface and could be extracted from small shallow pits. The townships whose overseers paid the least for coal were Thurstonland, at the south-western edge of this region, and nearby Denby, at the northwestern edge of the South Coalfield. Here, a dozen coals (~2.1 tons) cost between 2s 4d and 2s 7d in the early 1780s.<sup>42</sup> Thurstonland's prices are in Table 2-5 and were consistently lower than those at larger pitheads further east. Prices generally doubled over the next twenty years but remained the lowest in either county. Coal was similarly cheap in Halifax Parish, where "in 1832 Anne Lister calculated that the pithead

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<sup>38</sup> R.G. Wilson, "Georgian Leeds", *A History of Modern Leeds*, Derek Fraser ed. (Manchester: Manchester University Press, 1980) 30, E.J. Connell and M. Ward, "Industrial Development 1780-1914," *History of Modern Leeds*, 145-146, E.M. Sigsworth, "The Industrial Revolution," *Leeds and Its Region*, eds M.W. Beresford and G.R.J. Jones, (Leeds: Leeds Local Executive Committee of the British Association for the Advancement of Science, 1967) 147-151 and R.J. Morris, *Class, Sect and Party: The Making of the British Middle Class, Leeds 1820-1850*, (Manchester: Manchester University Press, 1990) 32-33.

<sup>39</sup> von Tunzelmann, *Steam Power and British Industrialization*, 250.

<sup>40</sup> See Appendix B for more details.

<sup>41</sup> In April 1789, the Hunslet Staith sold coal to residents of Knottingley, Beverley, Wallingbro Ferry, Hull, Buterwicke, Rothwell, Rawcliffe, Woodhouse Hill, Northcave, Leeds, York, Brigg, Selby, Elekar, Louth, Aram, Lincoln, Brotherton, Newton, Holme, Lockington, Torkilsey, Woodhall, Hullbridge, Wonsford, Nabron, Driffild, Monk Weigton, Winterton, Barron, Standfordbridge and Esrick. "Middleton Colliery Sales 1789-1796," WYAS WYL899/197.

<sup>42</sup> WYAS Kirklees KC 271/1 and KC735/2.

cost of raising coal from her mines was around 3½d per two hundredweight corf,” or 2s 11d/ton. They also increased with the distance from pithead, so that Lister’s coals cost an extra 1d/corf or 10d/ton two miles away in Halifax.<sup>43</sup> There were peat deposits throughout this region, but coal was the predominant fuel due to its low cost. Not all peat deposits were consistently exploited and most use has not left documentary evidence, with Manningham discussed in chapter one. Table 2-1 notes the occasions when overseers in the upland townships of Halifax Parish purchased peat. Overall, the North Coalfield was a rapidly industrializing, coal-burning region where prices for fuel were variable but low.

### **North-West<sup>44</sup>**

The north-western part of the West Riding was an upland region stretching from the edge of the coalfield, through the Yorkshire Dales to the Westmoreland and Lancashire borders. This region included the upper valleys of the Rivers Wharfe, Nidd, Aire and Ribble, with the Leeds and Liverpool canal running through sections of the latter two. Otherwise, it was rugged, hilly, cool and damp, making it well suited to growing grass and grazing sheep. Grain did not grow well here and the north-west had

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<sup>43</sup> Cross, “Yorkshire Estates and Mineral Exploitation” 238.

<sup>44</sup> This region is understood to include all of the Staincliffe and Ewcross wapentake with the exception of Keighly, and the western portions of the Skyrack wapentake. That is the following places: Arthington, Bramhope, Burley (Wharfedale), Carleton, Harewood, Ilkley, Menstone, Morton, Otley, Pool, Weardley, Wike, Yeadon, Addingham, Appletreewick, Banknewton, Barden, Barnoldswick, Bolton Abbey, Bracewick, Bradleys, Brockton, Broughton, Buckden, Burnsall with Throp, Calton, Carleton, Coates, Cold Coniston, Coniston in Kettlewell, Cowling, Craco, Droughton, Elslack, Emslesey with Eastby, Eshton, Fearnhill with Conaldley, Flasby with Winterburn, Gargrave, Gluzburn, Grassington, East Halton with Bolton, Hartlington, Hebden, Hetton with Bordley, Kettlewell, Kildwick, Lawkland, Linton, Marinsboth, Rilstone, Salterforth, Skipton, Scarbuonton, Steeton, Stirton with Thorlby, Sutton, Thornton, Thorpe, Threshfield, Airton, Arncliffe, Austwick and Lawkland, Bentham, Bottom by Bowland, Bowland Forest, Clapham, Dent, Easington, Garsdale, Giggleswick, Gisburn and Tosside, Gisburn Forest, Grindleton, Haltongill, Haltongill West, Hanleath, Hakswick, Hellifield, Horton near Gisburne, Horton in Ribblesdale, Ingleton, Kirkby Malhamdale, Lancliffe, Litton, Long Preston, Malham, Malham Moor, Middop, Mitton with Bashall, Nappa, Newsholme, Newton, Otterburn, Paythorne, Rathmell, Rimington, Sawley with Soffide, Scofthrop, Sedbergh, Settle, Slaidburn, Stainforth, Swinden, Thornton and Burton Waddington and Wigglesworth.

the lowest population density in the West Riding, with over eight acres per person in 1811 and 6.67 acres per person in 1831. This region had some small water-powered textile mills but not on the same scale as in the North Coalfield. By 1800, its population was less than that of Leeds. The northwest grew from 50,000 inhabitants in 1801 to over 70,000 in 1831 but its share of the Riding's population declined from nine to seven percent over the same period.<sup>45</sup> The largest town in this region was the ancient market and manufacturing centre of Skipton, with 2,305 inhabitants in 1801 and 4,181 residents in 1831.<sup>46</sup> Compared to the coalfield, the north-west was hillier, more isolated, much less densely populated, less industrial and slower growing.

The fuel use of the north-western region is more difficult to determine as it attracted less attention from contemporary writers like Young, Aitkin or Defoe and fewer of its parishes have surviving Overseers Accounts. The evidence that exists suggests that coal and peat were the main fuels of this region. In Gisburn, coal was the only fuel purchased by overseers between 1811 and 1830.<sup>47</sup> There were extensive peat deposits in the Pennines and most townships' overseers purchased both fuels on occasion. These include Burnsall, where 15s worth of turves and a cart load of coals were purchased for Margaret Knowles in 1825/6. Meanwhile, Ann Hebden received three cart loads of a differing combination of the two fuels each year between 1822 and 1828.<sup>48</sup> Townships whose overseers purchased peat in this and other regions are noted in Table 2-1, along with their fuel region and years. Fuel disbursements were less common in upland regions of Yorkshire so the list underrepresents peat's importance as

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<sup>45</sup> Wrigley *Early English Censuses* Table A1.5.

<sup>46</sup> *1801 Census* and *1831 Census*.

<sup>47</sup> "Gisburne Township Book 1811-1825," "Gisburne Township Book 1825-1829," and "Gisburne Township Book 1829-1839" Yorkshire Archaeological Society MD335/1/10/1/8-10.

<sup>48</sup> "Burnsall Overseers of the Poor," NYCRO PR/BNS/12.



a fuel source. Gentry households in this region also used both coal and peat, but more of the mineral fuel. Over the course of 1773, Matthew Wilson's household purchased 288 loads of coal and one cart load of peat on July 17<sup>th</sup>, while in 1779 he purchased 140 loads of coals for £5 and no peat, and in 1782, "264 loads coals [and] 2 horse cart loads of turf."<sup>49</sup> Like Wilson, north-western overseers generally purchased coal by the load. As this is a vague unit whose price varied considerably, I do not feel I can make assumptions about its size. No north-western communities are included in Table 2-5 because of the lack of parishes with long series of fuel disbursements.

**Table 2-1: West Riding Parishes Whose Overseers Purchased Peat<sup>50</sup>**

Parish	Fuel Region	Years
Midgley	North Coalfield	1770/1
Barkisland	North Coalfield	1774
Heptonstall	North Coalfield	1788
Langfield	North Coalfield	1793/4
Malham	North-West	1772/3, 1788/9
Burley	North-West	1774/5, 1779/80
Burnsall	North-West	1795/6, 1822-8
Staveley	North-East	1804/5
Denton	North-East	1810

### North-East<sup>51</sup>

<sup>49</sup> "Household Accounts of Mathew Wilson, 1772-1786" YAS MD335/2/1/3/7.

<sup>50</sup> West Yorkshire Archive Service Calderdale RIP 227, HPC/A/23, MISC 86/2/1 and MISC165/10/1-2, West Yorkshire Archive Service Bradford MM81/12, MM81/23 and BDP/33/13/6/1, NYCRO ZFW 13/3/3, PR/BNS/12 and PR/SVL/14/6. Barkisland, Midgley, Langfield and Heptonstall are all townships in Halifax Parish, west of the Town. They were also west of the coalmines, but the complexities of parish boundaries and their rapidly expanding, textile-based economies have led them to be included in the North Coalfield.

<sup>51</sup> This region is understood to include the Liberty of Ripon, the Wapentake of Claro and a few communities in the Wapentake of Barkstone Ash or the following places: Cawood, Ryther and Ozendike, Wistow, Arkendale, Aldborough, Aldfield, Azerley, Beverley, Bilton and Harrogate, Birstwith, Blubberhouses, Boroughbridge, Brearton, Burton Leonard, Clifton, Clint, Copgrove, Dacre and Beverley, Denton, Farnham, Felliscliffe, Ferrensby, Fewston, Fountain's Earth, Grewelthorpe, Hampsthwaite, Hartwith with Winsfrey, Havrah Park, Hazlewood, Humberton and Milby, Killinghall, Kirkby Malzeard, Kirby-Hall, Knaresbrough, Laverton, Lindrick, Menwith with Darley, Minskip, Pannall, Roccliffe, Scotton, Scriven, Stanley and Clayton, Staveley, Stonebeckdown, Upper Stonecheck, Studley, Thornwaite and Padside, Thornville, Thorp Underwood, Thurscross, Great Timble, Great Ouseburn, Winksley, Allerton, Askwith, Beamsley in Skipton, Beamsley in Addingham, Cassley, Cattal, Coneythorpe, Cowthorpe,

The north-eastern region slopes downward from a hillier western section towards the flat, low-lying lands near York. Figure 2-2 is from York, at the eastern end of the region and contrasts the flat eastern parts of the Riding from the hillier western ones. Towards York, the land became suitable to grain cultivation and the north-east had previously been the most influential region in the county. It contained four of the West Riding's five parliamentary boroughs, while the coalfield had none until 1822.<sup>52</sup> This was the slowest growing region in each of the first three decades of the nineteenth century, declining from 7.5% to under 6% of the county's total. With five acres per person in 1831, it was much less-densely populated than the coalfield.<sup>53</sup> The largest town in the north-east was Knaresbrough, with 3,388 residents in 1801 and 5,296 in 1831.<sup>54</sup> In the late eighteenth century, it had a vibrant linen-spinning industry. Linen declined by 1819 as steam-powered mills were built around Leeds.<sup>55</sup> Ripon was of a similar size to Knaresbrough, with 3,211 residents in 1801 and 5,080 in 1831.<sup>56</sup> In 1788, John Aikin noted that it "had once a manufactory of hardware, now almost extinct."<sup>57</sup>

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Dunkeswicke, Low Dunsforth, Upper Dunsforth, Farnley, Flaxby, Follyfoot, Goldbrough, Greenhammerton, Hunsingore, Kirby with Netherby, Kirk Deighton, Kirkby Overblow, Kirk Hammerton, Leathley, Linley, Linton, Marton and Grafton, Middleton and Stockhill, Nestfield and Langbar, Newhall with Clifton, North Deighton, Nun Monkton, Little Ouseburn, Plumpton, Little Ribston, Ribston and Walshford, Rigton, Ripley, Sicklinghall, Spofforth, Stainburn, Little Timble, Weeton, Weston, Wetherby, Whixley, Alsmunderby with Bondgate, Bishop Monkton, Bishop Side, Bishop Thornton, Clothierholm, Eaveston, Feliskirk, Givendale, Grantley, Hewick Copt and Bridge, Inglethorp, Kilburn, Markington with Wallerthwaite, Martin with Moxby, Nidd with Killinghall, Nunwick with Hewgrave, Rippon, Sawley, Sharrow, Skelton, North Stainley with Steningford, Sutton, Westwick, Whitcliffe with Thorpe.

<sup>52</sup> W.E. Tate and F.B. Singleton, *A History of Yorkshire: With Maps and Pictures*, (Beaconsfield: Darwen Finlayson, 1967) 60-62. The boroughs were Knaresbrough, Ripon, Aldborough and Boroughbridge. The county's other borough was Pontefract, while Leeds received parliamentary representation in 1822.

<sup>53</sup> Wrigley, *Early English Census* Table A1.5.

<sup>54</sup> *1801 Census and 1831 Census*.

<sup>55</sup> *Report of the Knaresbrough Rail-Way Committee*, (Leeds, 1819) 19 and Connell and Ward, "Industrial Development 1780-1914," 148. Poor Law Report (1834) 263H of the Town Queries noted unemployment amongst Knaresbrough linen weavers in the 1830s.

<sup>56</sup> *1801 Census and 1831 Census*.

<sup>57</sup> Aikin, *England Delineated* 58.

The prevalence of old towns, arable agriculture and proximity to York made the north-east distinct from the three western regions.

**Figure 2-2: University of York, 11 April 2012, Photo Taken by Author**



Coal was more expensive in the north-eastern region than in other parts of the county. This was partly because it was further from a coalfield. More importantly, its rivers did not originate in the coalfield and were not subject to major navigation schemes, making it more expensive to ship the mineral fuel. The highest observed prices were in Staveley and nearby Burton Leonard, along the North Riding border between Knaresbrough and Ripon. The 23s that a chaldron of coal (~1.3 tons) cost in Staveley between 1815 and 1822 or the 18s it cost in Burton Leonard in 1822 were

closer to the 31s 6d that a chaldron cost in Portsmouth in June 1820 than the prices being paid on the coalfield.<sup>58</sup> Staveley's prices are the most expensive in Table 2-5. Prices were lower closer to the coalfield. In Kirk Deighton, a corve of coal (~0.135 tons) cost 1s in 1776/7, 1s 3d in 1794/5, 1s 6d between 1802 and 1808 and 1s 9d in 1817/8.<sup>59</sup> These are between two-thirds and three-quarters of the Staveley prices. Meanwhile, in Kirkby Overblow, a corve of coal cost between 1s and 1s 2d from 1760 to 1785.<sup>60</sup>

There were also some peat deposits in the north-eastern region. Many residents of Dacre dug turves from Dacre and Hartwith Moors, and in 1762 a manorial bylaw was proposed to separate lands on which fuel was gathered from those where livestock grazed.<sup>61</sup> Meanwhile, residents of Kirkby Malzeard had collected turves from the local moor for generations. In 1760, some residents became concerned when the local lord, John Cundall threatened this practice and they petitioned to retain this right being "afraid of spending their small Substance they have for fuel."<sup>62</sup> The 1789 Enclosure Award for moors in Kirkby Malzeard left 115 acres unenclosed "for the sole and only purpose of getting Peat ling turves and stones and depasturing of cattle in the same Manner as they now hold."<sup>63</sup> Overseers of the Poor also purchased peat on a few occasions. On 16 October 1804, Staveley's overseers paid 12s to transport "12 load of

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<sup>58</sup> NYCRO PR/BTD10/3/7 and PR/SVL/14/7-8 and Portsmouth Museum and Record Service PL/32.

<sup>59</sup> NYCRO PR/DEK/14/1. Corves contained 270lbs at Leeds and 350lbs at Elsecar and Lawwood. The assumption of a Kirk Deighton corve being 270lbs is because its Overseers occasionally purchased coal by the bushel. In 1797/8 they paid 1s 6d for 4 bushels of coals, or 4.5d/bushel. The same year they paid 15s for 12 corves, or 15d per corve. As they were the same year, this suggests that a corve contained 3.33 bushels. In other regions a bushel of coal was 80lbs, which multiplied by 3.33 is very close to 270lbs, making this a reasonable assumption.

<sup>60</sup> "Kirby Overblow, Account Book 1741-1785" WYAS Leeds RDP49/67.

<sup>61</sup> "About a Bye Law to prevent graving turves, Dacre, 5 July 1762" WYL Leeds WYL230/1578.

<sup>62</sup> WYAS Leeds WYL150/65/1.

<sup>63</sup> "Copy Kirkby Malzeard Enclosure Award" YAS MS884/47.

peats” “for Buckle,” while on 14 July 1810, Denton’s paid 6s to dig four cart loads of peat and 10s to transport them.<sup>64</sup> As a slow-growing area with expensive coal and some peat consumption, the north-eastern region was more similar to north-eastern Hampshire than to the Yorkshire coalfield.

### **Central<sup>65</sup>**

The central region was low-lying, mostly in the Vale of York and well-suited to grain cultivation.<sup>66</sup> In 1771, Arthur Young described “a noble view of a tract of fertile fields bounded by distant hills” in the southern part of this region.<sup>67</sup> The rivers Aire, Calder and Dun flowed through the central region, giving it access to the coalfield and allowing its surplus grain to be shipped west. With four acres for each of its 58,000 residents in 1801 and over three acres for the 83,000 in 1831, the central region had a

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<sup>64</sup> “Staveley Accounts and Vouchers, 1801-1810,” and “Denton Parish Overseers’ Account Book 1804-1843” NYCRO PR/SVL/14/6 and ZFW 13/3/52.

<sup>65</sup> This region consists of the Soke of Doncaster and those parts of the Barkstone Ash, Osgoldcross, Skeyrack, Stafforth and Tickhill, Staincross and Aybrigg wapentakes that were not on the coalfield or belonging in the south-east. That would be the following places: Ackton, Altofts, Crofton, Methley, Normanton, Oulton, Sharleston, Snydall, Wamfield with Heath, Whitwood, Birkin, Burn, Burton Salmon, Byrom cum Poole, Chapel Haddlesey, Gateforth, West Haddlesey, Hambleton, Hillam, Hurst Courtnay, Monk Fryston, Sutton, Temple Hurst, Thorp Willoughby, Barkston, Bramham, Brotherton, Clifford, Fairburn, Fenton and Biggin, Grimston, Huddleston and Lumby, Kirk Fenton, Kirkby and Milford, Ledsham, Lotherton with Aberford, Micklefield, South Milford, Newthorpe, Newton and Toulston, Saxton, Sherburn, Stutton with Heaslewood, Tadcaster, Towton, Beaghall, Cudling Stubs, Eggborough, Kellington, Little Smeaton, Walden Stubbs, Whitley, Womersley, Ackworth, Badsworth, Burghwallis, Castleford, Darrington, North Emsal, South Emsal, Featherstone, Ferry Fryston, Glass Houghton, South Kirkby, Kirk Smeaton, Knottingley, Pontefract, Pontefract Park, Purston Jaglin, Shelbrooke, Stapleton, Tanshelf, Thorp Audling, Upton, Aberford, Allerton Bywater, Anstrop, Bardsey, Berwick in Elmet, Collingham, Garforth, Kippax, East Keswick, Farlington, Great Preston, Scarcroft, Shadwell, Sturton Grange, Swillington, Thorpestapleton, Thorner, Wothersome, Brierley, Clayton, Havercroft, South Hiendley, Hemsworth, Ryhill, Shafton, Winterset, Adwick upon Dearne, Barnburgh, Billingley, Bolton upon Dearne, Brodsworth, Cadeby, Clayton cum Frickley, Hempel with Stubbs, Hickleton, Hooton Pagnell, Great Houghton, Little Houghton, Langthwaite with Tilts, Marr, High Melton, Sprotbrough, Swinton, Thurnscoe, Wath upon Dearne, Anston, Braithwell, Bramley, Brompton en le Morthen, Conisbrough, Dalton, Dennaby, Dinnington, Edlington, Firbeck, Harthill, Hooton Levett, Hooton Roberts, Laughton en le Morthen, Letwell, Maltby, Mexborough, Ravenfield, Stainton, Stotfold, Thorpe Salvin, Thrybergh, Tickhill, Todwick, Wadworth, Wickersley, Woodsetts, Warmsworth, Doncaster, Awkley with Blaxton, Hextrop with Balby, Loversall, Rossington and Wheatley with Landall.

<sup>66</sup> For a more complete treatment of this region see Brodie Waddell, *Landscape and Society in the Vale of York, c1500-1800* (York: Borthwick Institute, 2011)

<sup>67</sup> Young, *Six Months Tour Through the North of England, Volume I*, 112-113.

smaller, less dense, and slower growing population than the coalfield while being larger, denser and faster growing than the other non-coalfield regions.<sup>68</sup> Its largest town was Doncaster, with 5,697 residents in 1801 and 10,801 in 1831.<sup>69</sup> Thanks to its position along the Great Northern Road, Doncaster had long been an important trading and market town. In the early eighteenth century, Daniel Defoe considered it “a great manufacturing Town, principally for Knitting.”<sup>70</sup> Such industries grew at a slower rate than on the coalfield, and this region was becoming increasingly specialized in arable agriculture by the early nineteenth century.

Coal was the only fuel purchased by overseers in the central region as it lacked peat deposits. By the 1750s, the three main rivers had all been made navigable. Proximity to the coalfield allowed the mineral fuel to be shipped for lower prices than further east. Swinton is along the River Dun in the western part of this region, an area where extensive coalmines developed after 1830, but whose deep seams could not be exploited with 1820s technology.<sup>71</sup> Its prices have been included in Table 2-5, and were similar to others in this region. Swinton was six miles overland from Lawwood and its prices were generally 6s per dozen (~2.1 tons) higher than at the pithead.<sup>72</sup> Birkin is on the River Aire, at the eastern edge of this district and its coal travelled downriver from the Middleton Colliery. This meant that its prices were similar to those at Swinton despite the longer distance from the pithead. Here, coal cost 9s 6d per dozen from 1755

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<sup>68</sup> Wrigley *Early English Censuses* Table A1.5.

<sup>69</sup> *1801 Census* and *1831 Census*.

<sup>70</sup> Defoe, *Tour Through the Whole Island, Volume II*, 588.

<sup>71</sup> Swinton had its own pit and glass-making industry in the latter part of the nineteenth century, while the adjacent parish of Dennaby had one of the largest mines in the country.

<sup>72</sup> “Swinton Overseers Accounts, 1805-1815” and “Swinton Overseers Accounts, 1815-1822” Doncaster Archives P59/6/B2/1-2. Medicott, “Development of Coal Mining on the Norfolk and Rockingham-Fitzwilliam Estates” 113 notes the distance from Lawwood and its effect on price in the 1760s.

to 1790, before the price rose as high as 14s in 1802/3.<sup>73</sup> Badsworth was in the western part of this region but lacked navigable water. Here, a dozen coals cost between 15s and 16s from 1813 to 1828.<sup>74</sup> The central region was thus a coal-burning one in which coal was significantly more expensive than on the coalfield but where effective transport kept it cheaper than in areas further east.

### **South-East<sup>75</sup>**

The south-eastern corner of the West Riding was a flat region around the confluence of the Rivers Aire, Dun, Ouse and Humber. It mostly consisted of fenlands at the northern edge of the eastern English lowlands and bore many similarities to other regions along the North Sea Basin.<sup>76</sup> In the eighteenth century these were at various

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<sup>73</sup> "Parish of Birkin Accounts of Churchwardens, Overseers, and Constables from A.D. 1729 to A.D. 1783," and "Parish of Birkin Accounts of Churchwardens, Overseers, and Constables from 1782 to 1905," Borthwick Institute for Archives, University of York PR/BIRK/16-17. The claim that Swinton and Birkin had similar prices for coal relies upon the assumption that a dozen was a comparable unit in both places. For Swinton, a dozen is understood as 42cwt because Sheffield Archives WWM F100, F107 both include correspondence from mine management that makes this clear, although the number and size of corves in a dozen varied. For Birkin, coal was alternatively bought by the load or dozen, which appear interchangeable as in April and May 1787, numerous loads were purchased for 10s 6d, while in September 1.5 dozen cost 15s 9d. At other points, the occasional year in which dozens were the unit, give the same price as when loads were. A dozen here appears to be 12 corves, as a dozen coals were purchased for Elizabeth Archer in December 1797 for 12s, while in March 1798, 14 corves for her cost 14s. The real question for the size of a dozen in Birkin is the size of the corve used, which the evidence from Middleton discussed in chapter 1 suggests might have been 2.7cwt rather than the 3.5cwt further south. The Birkin Accounts end in 1803, while the Swinton ones begin in 1805, with the prices of a dozen in those years similar. If the smaller corve were used in Birkin, the prices would be nearly 1/3 higher than in Swinton.

<sup>74</sup> "Badsworth Overseers Accounts, 1810-1828" WYAS Wakefield WDP19/71.

<sup>75</sup> This region contains parts of the Osgoldcross, Barkstone Ash and Strafforth and Tickhill wapentakes. It is understood to include the following places: Barlow, Brayton, Camblesforth, Carlton, Drax, Long Drax, Newland, Selby, Adlingfleet, Armin, Balne, Cowick, Fockerby, Goole, Gowdall, Haldenby and Eastoft, Heck, Hensall, Hooke, Ousefleet, Pollington, Rawcliffe, Reenness, Snaith, Swinefleet, Whitgift, Bramwith, Campsall, Carleton, Fenwick, Moss, Norton, Owston, Skellow, Sutton and Askern, Adwick le Street, Austerfield, Bentley with Arksey, Bilham, Armthorpe, Barnby upon Dun, Bawtry, Cantley, Fishlake, Hatfield, Kirk Sandall, Stainforth, Stancel with Wellingley and Wilsick, Sykehouse, Thorne and Thorpe Balne.

<sup>76</sup> Greg Bankoff, "The 'English Lowlands' and the North Sea Basin System: A History of Shared Risk" *Environment and History* 19 (2013) 3-37.

states of drainage and malaria was likely present in the 1790s.<sup>77</sup> Some residents, especially wealthier landowners, sought to drain these fens to improve their agricultural productivity. As such, most enclosure awards included provisions for drains, while a 1769 Act of Parliament authorized draining 4,000 acres around Adlingfleet and Whitgift.<sup>78</sup> In an 1818 report, engineer William Smith argued that one of the main advantages of a canal between the Rivers Aire and Dun was to help drain the wetlands it would pass through.<sup>79</sup> This region of “dikes and embankments, small Dutch-looking edifices, little windmills, and people bearing Dutch names” grew some grain.<sup>80</sup> In terms of population and land mass, the south-east was the smallest fuel region, with less than 4% of the population. Its 22,000 residents in 1801 grew to 32,000 by 1831, while its six acres per person became 4.5 over the same period.<sup>81</sup> Its only community with more than 2,500 inhabitants was Selby, with 2,861 in 1801 and 4,600 in 1831.<sup>82</sup> Selby is on the Ouse River, and the Selby Canal, completed in 1778, connected it with the Aire and Calder Navigation. Until the Goole Canal was built in the 1820s, Selby was the port for goods travelling between the North Sea and the North Coalfield.<sup>83</sup> With its proximity to

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<sup>77</sup> John Aikin, *A Description of the Country from Thirty to Forty Miles Round Manchester*, (London, 1795) 92.

<sup>78</sup> *Act for Draining and Preserving Certain Low Grounds in the Parishes of Adlingfleet and Whitgift, in the West Riding of the County of York, 1769*, can be seen at Borthwick Institute YM/AP/7. Enclosure Awards with provisions for drains include: Adlingfleet (1769), Barnby Dun (1807), Bentley with Arksey (1830), Campsall, Askern and Norton (1817), Fenwick (1780), Finningley (1778) and Hatfield, Thorne and Fishlake (1825) Doncaster Archives P27/9/A1, PR/Bar/1/3, UD/BEN/7/2, PR/NOR/4/1, DZMZ/89, DZMZ/67/1 and PR/FISH/1/5/2.

<sup>79</sup> William Smith, Engineer, *Report on the Plan for Draining the Low Ground North and South of the River Went, Between the Rivers Aire and Dun, In Conjunction with the Proposed Aire and Dun Canal, and Went Branch* (Pontefract: 12 September 1818)

<sup>80</sup> Sir George Head, *A Home Tour Through the Manufacturing Districts of England in the Summer of 1835, Second Edition* (London: Frank Cass & Co, 1968) 219.

<sup>81</sup> Wrigley *Early English Censuses* Table A1.5.

<sup>82</sup> *1801 Census* and *1831 Census*.

<sup>83</sup> Duckham, “Selby and the Aire & Calder Navigation,” 87-95, Unwin, “Leeds becomes a transport centre” 127 and Singleton, *Industrial Revolution in Yorkshire*, 62.



Lincolnshire, water-borne connections and extensive wetlands, the south-east was quite distinct from other parts of the West Riding.

There was some peat and other combustible materials in the wetlands of this region. In 1752 depositions were taken towards an Exchequer Court dispute between the residents of Hatfield and Thorne over whether changes in the River Dun's course affected the border between the parishes through the common. Amongst others, John Hodgson of Thorne claimed that all Inhabitants of the Manor had been "getting Turfs therefrom on such part thereof as were proper for that purpose."<sup>84</sup> Brodie Waddell notes that turves were collected in wetland parishes.<sup>85</sup> However, coal was also a significant fuel source in this part of the county and the only one purchased by its overseers. It arrived by river from the coalfield, relying upon the navigation schemes that had been cut through its fens and continued to be made into the Pennines.<sup>86</sup> As it was further from the coalfield, the mineral fuel cost more in this region than in the central one. In Camblesforth, coal cost between 15s and 18s per dozen (~2.1 tons) from 1795 to 1822, and over 17s per dozen from 1807 to 1813.<sup>87</sup> Rawcliffe's prices were slightly lower and have been included in Table 2-5. While prices in this region were higher than in most others, they increased less than in other parts of the Riding. This was because improvements in river navigation systems allowed coal to be shipped at consistent

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<sup>84</sup> "Depositions in Case between William Simpson Esquire Thomas Morris Joshua Lewis Thomas Hill Edward Forster Richard Middlebrook Thomas Middlebrook and Samuel Meggett Tenants Freeholders of the Manors of Hatfield and Thorne in the County of York on the behalf of themselves and the rest of the Tenants freeholders and copyholders of the same Manors Complainants and the Right Honourable Henry Lord Viscount Irwin John Robinson and Mary his wife Administrators of Robert Jennings her late Husband deceased and Mordecai Cutts Executor of Thomas Canby deceased by Bill of Revisor Defendants," The National Archives E134/26Geo2/Mich11.

<sup>85</sup> Waddell, *Landscape and Society in the Vale of York* 31.

<sup>86</sup> T.S. Willan, "Yorkshire River Navigation, 1600-1750," *Geography* 22 (1937) 195 notes that the River Dun had not been navigable until the draining of Hatfield Chase, partial diversion of the River into the Trent and construction of the Dutch River in the 17<sup>th</sup> century.

<sup>87</sup> "Camblesforth Overseers Accounts 1792-1833" Borthwick Institute PR/CAM/2.

prices and the pithead price was a smaller portion of the final cost than further west.

The steady cost of coal in the south-eastern corner of the Riding was different from other regions and resembled the situation in coastal Hampshire, albeit with lower prices and no wartime spike.

Map 2-2: Map of Hampshire Published by J. Carey, 1 Jan 1793, reprinted with permission of Hampshire Record Office, 110M89/P71.



Hampshire's terrain helped to shape the availability of different fuels. The hills of the South Downs bisect the middle of the county. In the chalk soils north of those hills, streams and rivers flow towards Berkshire and the Thames, while in the sandier south water heads towards the Solent.<sup>88</sup> The Isle of Wight, Coast, South-West and Inland regions all lay south of the Downs and had access to coal via the south coast, while the north-east and north-west are north of the Downs and did not. Across Hampshire, long-standing local manufacturing declined in the face of competition from northern England. Meanwhile, the south coast of Hampshire and the Isle of Wight were heavily involved in ocean-going trade. This region also had a large naval presence, particularly around Portsmouth and the Isle of Wight. While the county is not usually associated with the major changes of the late-eighteenth century, construction, provisioning and staffing of naval ships led to significant population growth. Southern Hampshire grew by 75 percent between 1771 and 1801, making it one of the fastest growing regions in England.<sup>89</sup> The coastal towns also grew quickly, with Portsmouth and Southampton both sextupling in size between 1750 and 1830. The increasingly large towns of southern Hampshire were part of diverging fortunes across the county.

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<sup>88</sup> *The Victoria History of the Counties of England: Hampshire and the Isle of Wight, Volume I*, H. Arthur Doubleday ed, (Folkestone: Dawsons of Pall Mall, 1973, original 1900) 1.

<sup>89</sup> Wrigley, *Early English Censuses* Table A2.7. South Hampshire is defined as the divisions of New Forest East, Fawley, Southampton, Winchester, Portsdown, Portsmouth and the Isle of Wight. Hampshire as a whole grew by 41% over those 30 years. The only sub-county regions with greater growth were south-western Lancashire and central-western Nottinghamshire. The central part of the East Riding of Yorkshire grew at a similar rate.



**Map 2-3: Fuel Regions of Hampshire**

Meanwhile, the fertile northern part of the county was mostly dedicated to agriculture. Its population grew more slowly and it had little access to coal until the Basingstoke Canal connected north-eastern Hampshire to the Thames in the 1790s. The consumption frontier of coal did not penetrate significantly into northern Hampshire and was part of the contrast between the rapidly growing coast with its increasingly large city and the slower growing inland areas. Map 2-2 is a 1793 map of Hampshire, while Map 2-3 identifies the fuel regions, along with Southampton and Portsmouth.

### **Isle of Wight<sup>90</sup>**

<sup>90</sup> The Isle of Wight is geographically self-contained, it includes the following parishes: Arreton, Binstead, Bonchurch and Shanklin, Brading, Godshill, Newchurch, Niton, St Helens, St Lawrence, Whippingham,

The Isle of Wight has approximately 100,000 acres and is between two and four miles off the south coast of Hampshire.<sup>91</sup> It was home to eight percent of Hampshire's population in 1761 and 11 percent in 1831, but physically separated from the rest of the county.<sup>92</sup> With almost seven acres per person in 1761 and 2.6 acres in 1831, it became more densely populated than most other non-coalfield regions.<sup>93</sup> Along with the aforementioned naval presence, the Isle of Wight engaged in extensive trade. Much of the rice, tar, deerskin, indigo and turpentine imported to Britain from Georgia passed through Cowes prior to 1775.<sup>94</sup> Salt was also manufactured, while Bingley described its trade in the early nineteenth century as follows.

The exports from the Isle of Wight are, wheat, flour, barley, malt, and salt; large quantities of grain and flour are shipped for France, Spain, Portugal and the ports in the Mediterranean: and a considerable inland and coasting trade to Ireland, and all the English ports in the channel, is carried on, in wheat, flour, barley and malt; which, after paying for linen and woollen goods, Indian commodities, Grocery, the various articles of building, Coals from Wales and Newcastle, leaves a considerable balance in favour of the island; and, it being naturally fertile, well cultivated and not over populous, even the thinnest crops afford a surplus of corn for the supply of foreign and other markets.<sup>95</sup>

The largest town was Newport, with 4,398 residents in 1831, but the island's population was relatively concentrated along the River Medina, with 38 percent of them living in Cowes, Northwood, Carisbrook and Newport.<sup>96</sup>

The Isle of Wight's maritime locale and the siting of most of its communities on the tidal reaches of small rivers created easy access to coal arriving from north-east

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Whitwell, Wootton, Yaverland, Brixton, Brook, Calbourn, Carisbrook, Chale, Freshwater, Gatcombe, Kingston, Mottiston, Northwood and Cowes, St Nicholas, Shalfleet, Shorwell, Thorley, Yarmouth and the Town of Newport.

<sup>91</sup> Bingley "Notes for a General History of Hampshire, Volume 9, Isle of Wight" HRO 16M79/9.

<sup>92</sup> Wrigley *Early English Censuses* Table A2.7.

<sup>93</sup> Wrigley *Early English Censuses* Tables A1.5 and A2.7.

<sup>94</sup> "Notes for a General History of Hampshire, Volume 5 Isle of Wight" [1810s] HRO 16M79/5.

<sup>95</sup> "Notes for a General History of Hampshire, Volume 9, Isle of Wight" HRO 16M79/9.

<sup>96</sup> 1831 Census. The parishes of Northwood, Carisbrook and Newport had 13,602 of the island's 35,431 residents.

England, which became the main fuel source by the 1730s. Bingley estimated that the island consumed 5000 chaldrons of coal (~6500 tons) in the early nineteenth century, when the 1811 Census recorded 24,120 inhabitants.<sup>97</sup> This aligns with evidence from Overseers Accounts in which coal was the main, though not the only, fuel consumed on the island. Poor relief on the Isle of Wight was unique in England as a large workhouse opened in 1771 to support up to 900 of the poor residents of its 29 parishes; relief was not provided outside it. Overseers in the parishes whose accounts were used for this study ceased purchasing fuel in 1774.<sup>98</sup> Overseers Accounts survive for 13 island parishes, of which seven were consulted for this project. All purchased coal. Even in Brading, a predominantly wood-burning parish along the eastern shore, coal purchases were made in 1733/4.<sup>99</sup> The cost of coal on the Island is well illustrated in Table 2-4, with the evidence from Godshill. It generally fluctuated with war, so that a chaldron (~1.3 tons) cost 25s in 1750 before rising to 37s or 38s in 1760 and returning to 32 or 35s in later years.<sup>100</sup>

Coal from south Wales and northern England, along with whatever was extracted from local seams, was the main fuel on the Isle of Wight. Overseers also purchased peat, wood and furze at various times. Wood was the only fuel purchased by Brading overseers in the early 1740s, and its price was similar to those in Table 2-3.<sup>101</sup> Wood

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<sup>97</sup> "Notes for a General History of Hampshire, Volume 9, Isle of Wight" HRO 16M79/9, 1811 Census 303.

<sup>98</sup> "Arreton Overseers Accounts, 1758-1786," "Bonchurch Overseers Accounts, 1750-1843," "Brightstone Overseers Accounts, 1756-1841" and "Godshill Overseers Accounts, 1759-1780" Isle of Wight County Record Office ARR/APR/1B/3, BON/APR/1A/1, BRI/APR/1A/4 and GDL/APR/1A/2. The Account Books from Brading and Carisbrook do not survive for the 1770s. *Report from the Select Committee on the Poor Laws: With the Minutes of Evidence Taken before the Committee, and An Appendix, Ordered by the House of Commons, to be Printed, 4 July 1817* 96 noted that there were 841 residents of the poorhouse at the time and it could support more.

<sup>99</sup> "Brading Overseers Accounts 1723-1745" IWCRO BRA/APR/1A/1.

<sup>100</sup> "Godshill Overseers Accounts, 1737-1759" IWCRO GDL/APR/1A/1.

<sup>101</sup> "Brading Overseers Accounts 1723-1745" IWCRO BRA/APR/1A/1.

was also the only fuel purchased in the 1740s by Carisbrook overseers, who made coal their preferred choice after 1754.<sup>102</sup> Even in the otherwise coal-burning parish of Bonchurch, overseers paid 13s for a cord of wood during the Seven Years War in 1761/2.<sup>103</sup> Meanwhile, Overseers in the predominantly coal-burning parishes of Godshill, Arreton and Brightstone all purchased peat, wood and furze on different occasions, especially during the Seven Years' War. From April 1761 until July 1765, Godshill's overseers stopped buying coal altogether, preferring to supply the local workhouse and poor residents with peat and furze. Prices between 12s and 16s for a thousand turves and 10s or 11s for a hundred furze faggots were considerably higher than the mainland ones in Tables 2-2 and 2-3.<sup>104</sup> Wood, furze and peat generally commanded high prices when they were purchased on the island, with the overseers of Brightstone paying 6s "for a half hundred of furze faggots and carriage to the poorhouse," 9s 6d "for half a hundred of wood faggots and carriage for the Widow Drake" and 9s "for half a thousand of peat and carriage for Widow Law" in 1756/7.<sup>105</sup> As such the Isle of Wight can best be understood as a maritime region where coal was the predominant fuel but traditional ones were also consumed, especially during the Seven Years' War, despite being more expensive than on the mainland.

### **South West<sup>106</sup>**

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<sup>102</sup> "Carisbrooke Overseers Accounts 1745-1757" "Carisbrooke Overseers Accounts, 1761-1765" IWCRO CAR/APR/1A/5-6.

<sup>103</sup> "Bonchurch Overseers Accounts, 1750-1843" IWCRO BON/APR/1A/1.

<sup>104</sup> "Godshill Overseers Accounts, 1759-1780" IWCRO GDL/APR/1A/2.

<sup>105</sup> "Brightstone Overseers Accounts, 1756-1841" IWCRO BRI/APR/1A/4.

<sup>106</sup> South-West Hampshire is understood to include the following parishes or tythings in south-west Hampshire: Beaulieu, Dibden, Lymington, Boldre, Brockenhurst, Burley, Exbury and Leap, Lyndhurst, Minsted, Bramshaw, Eling, Breamore, Bure and Hinton, Christchurch, Hordle, Hurn, Iford, Tuckton, Milford, Milton, Sopley, Winkton, Burton, North Charford, South Charford, Ellingham, Fordingbridge, Hale, Ibsley, Rockbourn, Harbridge, Ringwood, Holdenhurst, and the extra-parochial regions of Woodgreen, Godshill and Linwood.



Southwestern Hampshire is dominated by the New Forest, whose legal jurisdiction covered much of the region. Created as a royal hunting preserve in the eleventh century, the Forest maintained many of the unique legal structures serving that purpose and the Crown's more direct relationship to it. The Forest itself was undulating land covered with bogs and heaths. Its sandy and gravelly soils were poorly suited to arable farming, and were one reason that it had the lowest population density in either county in 1761, with almost 10 acres per person.<sup>107</sup> In addition to the large reserves of naval timber, local residents grazed some sheep, cattle and the characteristic New Forest ponies.<sup>108</sup> Apart from the Forest, south-western Hampshire resembled other coastal regions. It had a smaller naval presence than Portsmouth Harbour or the Isle of Wight, and its main port of Lymington was not expanding at the same rate. John Rule claims that in 1760, Lymington was the largest Hampshire port for English coastal shipping and one of the most important on the south coast. Over the next 20 years, other ports expanded and its relative importance declined substantially.<sup>109</sup> Its centuries-old salt industry was also vibrant at mid-century before disappearing in the face of competition from regions with cheaper coal, notably Liverpool and Cheshire.<sup>110</sup> However, the situation was different at Beaulieu, where some naval ships began to be built at Buckler's Hard during the American War and helped to replace an iron industry

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<sup>107</sup> Darby, "Preservation of the New Forest" 88. Wrigley *Early English Censuses* Tables A1.5 and A2.7.

<sup>108</sup> C.R. Tubbs, "The Development of the Smallholding and Cottage Stock-Keeping Economy of the New Forest" *Agricultural History Review* 13 (1965) 23-39.

<sup>109</sup> Rule, *The Vital Century* 228.

<sup>110</sup> "General Notes Arranged from the Collections for the History of Hampshire, part 1" HRO 16M79/1, and Rev Richard Warner, *Topographical Remarks, Relating to the South-Western Parts of Hampshire: To which is Added a Descriptive Poem, In Two Volumes. Volume I*, (London: R. Blamire, 1793) 39-40 both note its decline while "Thomas Cathside Collections for Hants, 1778" HRO 10M91W/1 praised the salt industry.

undercut by cheaper coal-smelted metals from northern England.<sup>111</sup> As Lymington's prominence waned, Christchurch and Eling became the largest towns in this region, with 5,344 and 4,624 residents respectively by 1831.<sup>112</sup> Christchurch grew as the harbour on the Avon's mouth, along with its local glove, stocking and watch-chain manufactories.<sup>113</sup> Southwestern Hampshire was thus a region with small manufacturing, coastal trade and pastoral farming that lacked the larger farms or growing cities of other regions.

Despite the New Forest's name and its extensive wood cover, peat was the primary fuel in and around the Forest throughout this period. Furze was also consumed. These two fuel sources complemented each other well as peat was harvested in the summer to facilitate drying while furze was cut in the winter.<sup>114</sup> As table 2-2 reveals, the cost of transporting peat increased in this period, but it was still cheaper than wood. Continued common rights meant that able-bodied people were still harvesting the amounts they required after 1830. This was also evident in the Overseers Accounts for the numerous parishes that paid able-bodied poor residents to cut peat or furze for elderly poor people. Breamore was one such parish and its overseers paid to cut and transport peat every year between 1740 and 1759 for which Accounts have survived, along with most later years. These include the 6s paid in August 1746 "to George White

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<sup>111</sup> Rule, *The Vital Century* 127.

<sup>112</sup> 1831 Census 574.

<sup>113</sup> John Bullar, *A Companion in a Tour Round Southampton; Comprehending Various Particulars, Ancient and Modern, of New Forest, Lymington, Christchurch, Romsey, Bishop's Waltham, Titchfield, &c, And a Tour of the Isle of Wight; With Notices of the villages, Gentlemen's Seats, Curiosities, Antiquities, &c, Occurring in the different Roads Described*, (Southampton: T Baker, 1799) 61.

<sup>114</sup> "Ellingham Poor Book 1817-1822" HRO 113M82/PO1. Peat was collected every summer and furze paid for most winters.

for cutting and carriage of a thousand of turf for the widow Mouday.”<sup>115</sup> Other parishes in this region whose overseers paid to have peat cut include Ellingham, Holdenhurst, Hordle, Lyndhurst, Hale and the coastal parishes of Fawley and Titchfield on Southampton Water.<sup>116</sup> The prices paid for peat are well illustrated in Table 2-2 and were consistently cheaper than coal in the inland communities of this region.

As was the case with peat, overseers sometimes paid for furze to be cut, as when Holdenhurst’s parish officers paid 2s 6d on 5 May 1816 “for Cutting furze for Poor House.”<sup>117</sup> Overseers could also purchase a set amount of furze, as in Ellingham on 19 March 1825, when 2s 3d was paid “for a hundred of turf and 30 furze faggots to S Bush.”<sup>118</sup> Wood was also purchased on at least one occasion in every predominantly peat-consuming parish in this region except Ellingham. This includes one-time exceptions such as the January 1817 payment of 8s for “a hundred of faggots for Jn Harrison” by Hale’s overseers.<sup>119</sup> Although this is the only wood purchase recorded in Hale, its price was considerably lower than in other regions of Hampshire. Other evidence confirms that peat was the primary fuel in the New Forest while some wood and furze were also consumed. According to Colin Tubbs 7400 faggots and 597,000 turves were cut in Boldrewood and Castlemalwood Walks in 1855.<sup>120</sup>

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<sup>115</sup> “Breamore Overseers Accounts 1729-1768” HRO 20M83/PO14. Later accounts include: “Breamore Poor Book, 1806-1819” and “Breamore Poor Book, 1819-1833” HRO 20M83/PO15-16.

<sup>116</sup> “Ellingham Poor Book 1822-1828,” “Holdenhurst Poor Book, 1771-1813,” “Holdenhurst Parish Book 1813-1830,” “Hordle Poor Book, 1786-1797,” “Hordle Poor Book, 1804-1809,” “Lyndhurst Poor Book, 1765-1776,” “Lyndhurst Overseers Rates and Accounts 1776-1786,” “Lyndhurst Poor Book, 1794-1800,” “Lyndhurst Poor Book 1800-1804,” “Lyndhurst Poor Book 1804-1813,” “Hale Overseers Accounts 1769-1803,” “Hale Poor Book 1803-1836,” “Fawley Poor Book 1794-1800,” “Fawley Poor Book 1800-1809,” “Fawley Poor Book 1820-1828,” “Titchfield Overseers Accounts 1775-1787,” and “Titchfield Overseers Accounts 1798-1802” HRO 113M82/PO2, 9M75/PO12-13, 26M79/PO13-14, 25M84/PO1-5, 13M80/PO1-2, 25M60/PO8-10 and 37M73/PO2,5.

<sup>117</sup> “Holdenhurst Parish Book 1813-1830” HRO 9M75/PO13.

<sup>118</sup> “Ellingham Poor Book 1822-1828,” HRO 113M82/PO2.

<sup>119</sup> “Hale Poor Book 1803-1836,” HRO 13M80/PO2.

<sup>120</sup> Tubbs, *New Forest* 230.

Some parishes in the region do not fit this pattern, but these were outside the Forest. Wood and furze were the only types of fuel to appear in Overseers Accounts in Martin, along the Dorset border, between 1793 and 1820.<sup>121</sup> Coal was the main fuel in the port of Lymington. Wood was also consumed here and was cheaper than in other parts of the county, with 100 faggots costing 8s in 1780 or 12s in 1797.<sup>122</sup> Overall, south-western Hampshire differed from the rest of the county due to the abundance of peat, limited arable agriculture and the particular character of the New Forest. Local peat was considerably cheaper than other fuels and the Forest's abundant deposits kept inland residents from purchasing the coal available in Lymington. This region contained one-eighth of Hampshire's population so county-level generalisations that do not account for its peat-consumption are problematic.<sup>123</sup>

### **Coast<sup>124</sup>**

The coastal region east of Southampton Water included Portsmouth and Southampton, the two largest towns in Hampshire. Their coastal locations facilitated coal shipments while population grew with increasing naval requirements. The royal dockyards at Portsmouth were amongst the largest employers in England throughout

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<sup>121</sup>"Martin Overseers Accounts 1793-1804" and "Martin Poor Book 1813-1820" HRO 9M66/PO1-2.

<sup>122</sup>"Lymington Parish Book 1774-1782" and "Lymington Poor Book 1795-1800" HRO 42M75/PO16 and 42M75/PO19.

<sup>123</sup>Wrigley *Early English Censuses* Table A2.7. I have combined the districts of New Forest East and New Forest West, which combined accounted for between 11.93% and 13.41% of the Hampshire population at each 10 year interval between 1761 and 1831.

<sup>124</sup>This region is understood to include Portsmouth, Southampton, Godshfield, Itchin Abbas, Itchin Stoke, Swarraton, Chilbolton, Crawley, Houghton Drayton, Hunton, Hursley, Littleton, Millbrook, Nursling, Sparsholt, Stoke Charity, Week, Wonston, Avington, Beaworth, Bishop Stoke, Hinton Ampner, Kilmiston, Medsted, Morestead, Ovington, Privett, Tichbourn, Weild, Winnal, Worthy Martyr, Brown Candover, Brown Chilton, Woodmancote, North Baddesley, Botley, Chilworth, Hamblance, Hound, North Stoneham, South Stoneham, Alverstoke, Gosport, Bishops Waltham, Bursledon, Droxford, Durley, Fawley, St Mary Extra, Upham, Horth Hayling, South Hayling, Warblington, Fareham, Hambledon, Havant, Corhampton, Meonstoke, Soberton, Westbury and Peak, Bedhampton, Boarhunt, Farlington, Portchester, Portsea, Southwick, Widley, Wymering, Rowner, Titchfield and Wickham.

this period. Beginning in the 1770s, naval ships were also constructed at Bursledon.<sup>125</sup> Meanwhile, there was substantial naval provisioning and other shore-trades in Portsmouth and its growing suburb of Gosport, across the harbour. Portsmouth was one of the fastest growing cities in this period, having gone from being the 18<sup>th</sup> largest town in England with around 10,000 people in 1750 to the 8<sup>th</sup> largest with 43,461 residents in 1801 and the 9<sup>th</sup> largest with 63,026 in 1831.<sup>126</sup> Southampton was considerably smaller than Portsmouth but grew more rapidly, as its less than 4,000 residents in 1761 increased to 19,324 by 1831. It continued to be an important port with considerable trade to the Channel Islands, France and Iberia.<sup>127</sup> This was the largest region in Hampshire, containing its two largest towns and the other sizeable communities along Portsmouth Harbour and Southampton Water. It contained 35 percent of Hampshire's residents in 1761 and 42 percent in 1831. It was the most densely populated non-coalfield region in either county with 2.5 acres per person in 1801 and 1.7 acres in 1831.<sup>128</sup> The growing importance of coastal Hampshire is evident, as after 1791 Portsmouth and its suburb of Gosport had a larger population than the entirety of each of the other five Hampshire fuel regions.<sup>129</sup>

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<sup>125</sup> Rule, *Vital Century* 126-127.

<sup>126</sup> Wrigley, *Energy in Industrial Revolution* 62-63 for 1750, 1801 Census and 1831 Census used for later dates. There is a discrepancy between Wrigley's urban hierarchy and that arising from the census. This is because the 1831 census notes Gosport was a suburb of Portsmouth in the same manner as Salford to Manchester, Toxteth Park to Liverpool, Gateshead to Newcastle, Sculcoates to Hull or Davenport and Stonehouse to Plymouth. Wrigley includes those suburbs for Plymouth and Newcastle but not Portsmouth. The same discrepancy in the urban hierarchy is evident in the University of Southampton historian John Rule *Albion's People: English Society, 1714-1815*, (Harlow: Longman, 1992) 12-13.

<sup>127</sup> Populations come from Wrigley *Early English Censuses* Table A2.7 and 1831 Census, while evidence of trade comes from "Petty Custom and Wharfage Book 1750-60," "Petty Custom and Wharfage Book, 1756-1759," "Petty Custom and Wharfage Book 1762-1765," "Petty Custom and Wharfage Book 1760-1766," and "Petty Custom and Wharfage Book 1769-1773," Southampton City Archives SC/4/99-100, 102-105.

<sup>128</sup> Wrigley *Early English Censuses* Table A1.5

<sup>129</sup> The coastal fuel region consists includes the boroughs of Southampton and Portsmouth along with most of the census districts of Portsdown and Fawley. South Hampshire is defined as this region along

Easy access to coastal shipping and increasingly large populations meant that coal was the main fuel in both Southampton and Portsmouth by the 1730s. Its prices appear in Table 2-4 below. However, overseers in both towns purchased some wood while peat collection on Portsmouth Common in the 1760s was discussed earlier. Portsmouth's overseers purchased wood along with coal from 1752 to 1823. They received a good price in the 1750s, as James Littlefield only charged 8s for a hundred faggots in 1752/3 and 11s in 1758/9.<sup>130</sup> Charcoal was occasionally purchased, with overseers in the Southampton parish of Holy Rood purchasing six bags of charcoal in 1740/1 and "a sack charcoal for Samsons wife" on 22 October 1742.<sup>131</sup> The Churchwardens of St Mary bought charcoal in October 1813, while the overseers of South Stoneham purchased single bags in June 1802 and May 1803. These were the only occasions when Hampshire overseers purchased charcoal.<sup>132</sup> Coal was cheaper in the two towns than in other parts of the county. Table 2-4 illustrates that the price generally increased in wartime and declined in peacetime. On a number of occasions, wartime price increases and difficulties in shipping caused other fuels to be substituted for coal in these cities. The charcoal purchased in Southampton during the Napoleonic Wars are an example. Such purchases in the Overseers Accounts of otherwise coal-burning parishes are noted in Appendix C.

While coal was the main fuel in Southampton and Portsmouth before 1740, the situation was more varied in the smaller communities of this region. South Stoneham

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with the remainder of Portsdown and Fawley and the census districts of New Forest East, Winchester, and the Isle of Wight. Hampshire as a whole grew by 41% over those 30 years.

<sup>130</sup> Portsmouth Museum and Record Service PL1/7-32.

<sup>131</sup> "Southampton Holy Rood, 1732-1751" SCA SC/AG8/6/1.

<sup>132</sup> "Southampton St. Mary Poor Law," and "South Stoneham Overseers Accounts" SCA PR5/11/16 and PR9/15/12

was immediately north of Southampton along the Itchen and divided into the tythings of Allington, Barton and Eastleigh, Bittern and Pollack, Shamblost and Portswood. Each had its own overseers. Coal was purchased in the tythings closer to town by 1746, while turf and wood were the only fuels purchased further north before the 1790s.<sup>133</sup> Coal became the predominant fuel at various times, as noted in Appendix C. Shipments depended on good weather and a lack of enemy privateers. Supply was often disrupted in wartime and prices rose, at which point other fuels occasionally replaced coal. These occasions are noted in Appendix C and wood was then expensive. In October 1810, the parish of Bishops Waltham paid Mr. Patten £7 10s for five hundred faggots, which at 30s per hundred was the highest bulk price for wood in all the Overseers' Accounts examined.<sup>134</sup> Similarly, the parish of Titchfield paid 27s per hundred faggots as part of a bulk order in 1809.<sup>135</sup> Like the Isle of Wight, this region was predominantly coal-burning and depended upon coastal shipping to meet its energy needs.

### **Inland<sup>136</sup>**

The next region is an inland area between the coastal one and the South Downs. It included the county town of Winchester, home to an ancient Cathedral, a castle, a large military barracks and the County Bridewell. Winchester had been slightly larger than Southampton in 1761, while its 8,767 inhabitants in 1831 made it the most populous non-coastal town.<sup>137</sup> The town of Romsey was also in this region. Its shalloon

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<sup>133</sup> SCA PR9/15/7-11.

<sup>134</sup> "Bishops Waltham Overseers Accounts 1810-1816" HRO 30M77/PO8.

<sup>135</sup> "Titchfield Overseers Accounts, 1802-1809" HRO 37M73/PO6.

<sup>136</sup> This region is understood to consist of Winchester, Exton, Old Alresford, Cheriton, Chilcomb, Owslebury, Twyford, West Meon, Michelmersh, Easton, North Ambersnam, South Ambersnam, East Meon, Froxfield, Steep, Blendworth, Buriton, Catherington, Chalton, Clanfield, Idsworth, Petersfield, Sheet, Headbourne Worthy, King's Worthy, Romsey Extra, Romsey, Sherfield English, Ropley, Bishops Sutton, West Tisted and Bramdean.

<sup>137</sup> 1831 Census.

textile industry employed 500 people in the 1760s and 1770s, before declining in the face of northern English competition in the last decades of the eighteenth century.<sup>138</sup> However, the population of this market town grew from 4,274 residents in 1801 to 5,432 inhabitants in 1831.<sup>139</sup> This inland region contained nine percent of Hampshire's population in 1831 and had over three acres per person, making it considerably smaller and less densely populated than the coastal one south of it.<sup>140</sup>

Fuel relationships in this inland region differed slightly from the coast. Although many communities had access to coal shipped along waterways from the coast, prices were higher and the population increase began later. Coal arrived in Winchester via the Itchen Navigation mentioned earlier. Although wood was purchased in Saint Mary Kallendar, adjacent to the town, until 1783, coal had become the main fuel in Winchester by 1770 and its prices are well illustrated in Table 2-4.<sup>141</sup> In other towns of this region, coal arrived later, appearing first in the Overseers Accounts of Romsey Extra in 1777, but not becoming the main fuel there until after 1786.<sup>142</sup> Coal was only purchased by parishes along navigable waterways, while many others, including West Meon, purchased wood throughout the period.<sup>143</sup> The predominant fuel source varied over small distances, as exemplified by wood and furze-burning King's Worthy two miles north of Winchester. Compared to other parts of Hampshire, this region had few peat deposits, with wood and furze the most commonly burnt traditional fuels. Prices

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<sup>138</sup> "General Notes Arranged from the Collections for the History of Hampshire, part 1" HRO 16M79/1. Arthur Young, *A Six Weeks Tour Through the Southern Counties of England and Wales*: (Dublin: J. Milliken, 1768) 149-150.

<sup>139</sup> 1801 and 1831 Census. Wrigley *Early English Censuses* Table A1.5.

<sup>140</sup> Again populations come from 1831 Census. This region includes the entire Census Divisions of Alton South and Winchester along with small parts of those of Portsdown, Fawley, Alton North and Andover

<sup>141</sup> "Winchester St Mary Kallendar Poor Book 1768-1787" Hampshire Record Office 1M82W/PO31.

<sup>142</sup> "Romsey Extra Overseers Accounts, 1774-1784," and "Romsey Extra Overseers Accounts, 1816-1817" HRO 10M58/PO1-2.

<sup>143</sup> "West Meon Overseers Accounts 1764-1803" HRO 67M81/PO1.



followed the general patterns for each type of fuel, but coal was more expensive and wood cheaper than along the coast. Thus, in this inland region of Southern Hampshire, communities along navigable waterways experienced similar fuel relationships to Southampton or Portsmouth, while others consumed local wood in a manner more reminiscent of north-western Hampshire.

### **North-East<sup>144</sup>**

Northeastern Hampshire differed from the southern parts of the county. It was better suited to grain cultivation, located further from the coast, and water connected it to London and the Thames via Berkshire and Surrey. The most populous town in this region was Basingstoke, home to large corn and malt markets, along with the manufacture of light woollen cloths. In 1831 its population was 4,684 or one-thirteenth that of Portsmouth.<sup>145</sup> There were a few smaller towns in this region including Odiham and Alton, where some satin and worsted cloths were manufactured.<sup>146</sup> While the population grew after 1801, its share of the county total declined from almost 17 percent in 1761 to less than 14 percent by 1831.<sup>147</sup> Many of the textile industries that had complemented agriculture prior to 1790 declined due to competition from cheaper northern English cloths, while the agricultural depression that followed the Napoleonic

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<sup>144</sup> This region is understood to include the following places. New Alresford, Alton, Binstead, Bramshot, Chawton, Dockenfield, Froyle, Greatham, Hartley Maudit, Holybourn, Kingsley, Neatham, East Worldham, West Worldham, Empshot, Farringdon, Hawkley, Newton Valence, Selbourn, East Tisted, Bighton, Headley, Basing, Basingstoke, Eastrop, Up Nately, Newnham, Sherborn St John, Steventon, Timworth, Winslade, Preston Candover, Herriard, Hoddington, Nutley, Upton Grey, South Warnborough, Weston Corbitt, Bentley, Aldershot, Cove, Crondall, Farnborough, Hawley, Long Sutton, Yateley, Hartley Westpall, Hazleheath, Heckfield, Mattingley, Silchester, Stratfield Saye, Stratfield Turgis, Abbots Worthy, Northington, Popham, Bentworth, Little Bramshill, Dogmersfield, Elvetham, Grewell, Hartley Wintney, Lasham, Odiham, Rotherwick, Shalden, Sherfield, North Warnborough, Patrick Weston, Winchfield, Bramley, Cliddosden, Mappedurwell, Nately Scures, Dummer, Ellisfield, Farleigh-Wallop, Micheldever, East Stratton, Lyss Turney, Eversley,

<sup>145</sup> "General Notes arranged from Collections for the History of Hampshire, Part 2" HRO 16M79/2.

<sup>146</sup> "General Notes Arranged for the History of Hampshire, part 3" HRO 16M79/3.

<sup>147</sup> Wrigley *Early English Censuses* Table A2.7 and the 1831 Census. This region corresponds with the entire Census Division of Basingstoke and most of the division of Alton North.

Wars limited employment for labourers. It is this more agricultural region of Hampshire that Alice Colson described as having low wages and “plentiful proof of unemployment” in 1830.<sup>148</sup>

Many parishes in this region had extensive peat deposits, particularly places along the Berkshire border like Eversley, Elvetham and Yateley. The conflicts over peat collection in Yateley were discussed in chapter one. Table 2-2 shows the changing amounts Eversley’s Overseers of the Poor paid to have it collected for poor households. These costs increased less than in other peat-consuming regions between 1740 and 1815, as there was less depletion of deposits and the peat did not have to be taken further from the village. However, most communities lacked peat deposits so wood was their main fuel source; most of the coppices discussed in chapter one were in northeastern Hampshire. Occasionally, both fuels were consumed in the same community, as when the otherwise wood-burning parish of Long Sutton recorded paying £8 10s “for faggots and peat for the Poor” in 1773/4.<sup>149</sup> Table 2-3 demonstrates changes in the price of wood in this region, which generally doubled between 1750 and 1815.

Coal was occasionally purchased after 1790, as shown in Appendix C. Previously some wealthy residents brought coal by wagon from Winchester or Berkshire. John Thorp was a generally wood-burning farmer whose purchases of peat ashes were mentioned in chapter one. He travelled to Winchester on four occasions between 1773 and 1776 to pick up coal for himself and others in the area near Herriard.<sup>150</sup> Unlike southern Hampshire, this coal was not shipped via the South Coast

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<sup>148</sup> A.M. Colson, “The Revolt of the Hampshire Agricultural Labourers and its Causes, 1812-1832,” (M.A. Thesis, University of London, 1937) 42.

<sup>149</sup> “Long Sutton Poor Book 1766-1826” HRO 78M72/PO7.

<sup>150</sup> “Copy of John Thorp’s Diary” HRO 65M82/2.

but came through the Port of London, the Thames and the River Wey to the Basingstoke Canal. It was more expensive to ship coal by inland water than by ocean as horses pulling barges cost more than wind-powered sails and canal proprietors needed to recoup their capital costs. When the full distance of the Basingstoke Canal was completed in 1794, tolls of 12s per ton, or 15s per chaldron, were advertised for goods travelling from London.<sup>151</sup> Coal cost more here than along the South Coast and the highest recorded Hampshire price was in Bentley. On 14 December 1807 their overseers purchased a half chaldron of coals (~0.65 tons) for £1 17s and a further 2s 6d for its transportation.<sup>152</sup> The purchase of coal by some local residents was likely a response to rising wood prices and limited woodlands. However, the mineral fuel could not be shipped cheaply enough to replace other sources. While it was consumed by some people near the Canal, most residents of north-eastern Hampshire continued to burn local peat and wood after 1830.

### **North West<sup>153</sup>**

North-western Hampshire was similar to the northeast but further from London and less integrated into its trade. The largest community in this region was Andover, a market town with 4,843 residents in 1831. Its manufacture of shalloons and other woollen goods declined in the late eighteenth century but the malt trade remained

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<sup>151</sup>“Basingstoke Canal Navigation Notice, 1794,” HRO 5M52/TR3/18.

<sup>152</sup> “Bentley Overseers Accounts 1805-1827” HRO 1M80/PO3.

<sup>153</sup> This region is understood to consist of Abbots Ann, Andover, Amport, Appleshaw, Knights Enham, Foxcott, Fifield, Grateley, Kimpton, Monxton, Penton Mewsey, Penton Grafton, Quarley, Thruxton, Upper Clatford, Barton Stacey, Pamber, Priors Dean, Ashley, Farley Chamberlayne, Houghton, Leckford, Longstock, King’s Sombourn, Little Sombourn, Stockbridge, Timsbury, Bossington, Broughton, Dean, East Dean, Frenchmore, Lockerly, Mottisfont, , Shipton, East Tadderly, West Tadderly, Over Wallop, Nether Wallop, East Wellow, Bullington, Goodworth Clatford, Long Tufton, Wherwell, Tidworth, Colemore, Laverstock, Church Oakley, Hannington, Monk Sherbourn, Wootton, Wootton St Lawrence, Ashmansworth, Baughurst, Burghclere, Freefolk, Highclere, Hurstbourne Prior, Itchingswell, Newtown, St Mary Bourne, Whitchurch, East Woodhay, Ash, Bradley, Dean, Ewhurst, Kingsclere, Litchfield, Overton, Sidmonton, Tadley, North Waltham, Woolverton, Coombe, Crux Easton, Faccombe, Hursbourne Tarrant, Linkenholt, Tangle, Vernhams Deane and Woodcot.

prominent in the early nineteenth.<sup>154</sup> Overton's population was less than 1,600 but it had some manufacturing in the early nineteenth century, with silk and a mill that made paper for the Bank of England. Bingley also observed that near Overton "the females are much employed in the braiding or platting of straw for hats and bonnets."<sup>155</sup> Otherwise the region was predominantly agricultural, with small market towns like Kingsclere. This region had the slowest population growth in Hampshire and its relative share of the county's total dropped from one-sixth in 1761 to one-eighth in 1831. With almost six acres per person in 1831, it had become the least densely populated region in the county.<sup>156</sup>

Fuel relationships in north-western Hampshire resembled those in the north-east but its peat deposits were less extensive. Those that existed were either along the Berkshire border towards Basingstoke, or around Lockerley on the Wiltshire border. Tadley was one such parish and its overseers paid to have peat cut for numerous local households. Records survive from 1760 through 1781, when it cost them between 4s 6d and 5s 6d per thousand turves, of which its carriage back to the village was half the expense.<sup>157</sup> As fewer communities had peat deposits than in the north-east, local wood was generally the fuel of choice despite high prices. For example, the parish of Kimpton paid £3 12s 6d for 260 faggots, or £1 7s 10d per hundred, in March 1790, and 3d per faggot (25s per hundred) through the 1810s, but continued to only purchase wood.<sup>158</sup>

Table 2-3 shows that the cost of wood in Leckford did not increase as quickly as in other

<sup>154</sup> 1831 Census and "General Notes Arranged from the Collections for the History of Hampshire, part 1" HRO 16M79/1

<sup>155</sup> "General Notes arranged from Collections for the History of Hampshire, Part 2" HRO 16M79/2.

<sup>156</sup> This region comprised the entire census Division of Kingsclere and most of the Andover Division. Populations are again from Wrigley *Early English Census* Table A1.5 and the 1831 Census.

<sup>157</sup> "Tadley Overseers Accounts 1760-1782" HRO 39M75/PO1

<sup>158</sup> "Kimpton Poor Book 1763-1791" and "Kimpton Poor Book 1807-1821" HRO 42M85/PO1 and 42M85/PO3.

parts of the county. Wood was more expensive in the north-west in the eighteenth century so the price rose to levels similar to the north-east. It was possible to ship coal to places along the Andover Canal, but the failure of the Southampton and Salisbury Canal made it difficult to bring the mineral to others. Lockerley was along the failed canal and wood remained the main fuel purchased by their overseers until 1828.<sup>159</sup> North-western Hampshire was the least connected to waterborne trade and local fuel supplies were almost exclusively used until 1830, even as pressure upon woodland resources increased. Appendix C shows the few occasions on which coal was purchased by overseers in this region.

As a county, Hampshire had diverse regions and the fuel consumption of each was governed by unique relationships. In 1803, Anthony Bell claimed that the “Standard Fuel is coals brought from Newcastle and other parts of the North to Southampton, Portsmouth and Christchurch.”<sup>160</sup> The larger populations of coal burning regions would support his observation and coal was likely the most frequently consumed fuel across the county. However, coal was not ubiquitous and to repeat such generalizations would ignore the experiences of the peat-consuming communities and the many rural people in northern Hampshire who burnt wood.

### **Price of Fuel**

Fuel prices reflected supply, demand and the labour involved in both processing and transportation. Changing prices also impacted the consumption of poorer residents. Accounts of Overseers of the Poor often specified the amount of fuel received for the

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<sup>159</sup> “Lockerly Poor Book, 1824-1832” HRO 47M66/2.

<sup>160</sup> Anthony Bell, *General View of the Agriculture of the County of Southampton, with Observations on the means of its Improvement Drawn up for the Consideration of the Honorable Board of Agriculture* (1804) 135.

money paid. As a result, they provide direct evidence of prices in more communities than are otherwise available. This chapter relies upon the records of 78 Hampshire parishes and 54 West Riding townships or parishes that left sufficient documentation of their overseers' fuel purchases. The main concern in using them to determine the price of fuel is the possibility that overseers were paying a different price than other local residents. The administration of poor relief will be discussed in detail in Chapter three. Overseers' Accounts record the rates collected from local tenants and the money spent on the relief of poor residents in the parish. They were shown to ratepayers at least once a year and the local collection of rates created considerable pressure to keep costs down. Reducing the poor rates was a major concern of pamphleteers and political economists after 1780, including Thomas Malthus, J. Howlett, Frederic Morton Eden, John Duthy and most of the authors of the General Views of Agriculture.<sup>161</sup> It was also the inspiration for the 1817 *Poor Law Report*. In Hampshire, Abraham and William Driver complained of the comparatively high poor rates.<sup>162</sup> Because accounts were shown annually to local ratepayers familiar with current prices, overseers were unlikely to pay inflated prices for fuel. Some overseers paid unemployed labourers to collect fuel for non able-bodied poor people. It is possible that they paid slightly inflated prices for this as the overseers were also expected to provide employment to those labourers.

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<sup>161</sup> T.R. Malthus, *An Essay on the Principle of Population*; (Cambridge: Cambridge University Press, 1992, first published 1803) especially 89, Rev J. Howlett, *Enclosures, A Cause of Improved Agriculture, of Plenty and Cheapness of Provisions, of Population, and of both Private and National Wealth*; (London: W. Richardson, 1787) 25, Morton Eden, *The State of the Poor: Volume I*, especially iv-vii, John Duthy, *A Short Address to the Inhabitants of Hampshire on the Subject of the Corn Trade of the Kingdom, and the Present Situation of the British Farmer*, (Winchester: William Jacob, 1815) 15, and *Poor Law Report* (1817), Some County Views of Agriculture that express this include: John Billingsley, *General View of the Agriculture in the County of Somerset*, (Bath: R. Cruttwell, 1797), Nathaniel Kent, *General View of the Agriculture of the County of Norfolk*; (Norwich: Crouse, Stevenson, and Matchett, 1796),

<sup>162</sup> Abraham and William Driver, *General View of the Agriculture of the County of Hants, with Observations on the Means of its Improvement*. (London: Colin Macrae, 1794) 15.

This practice mainly occurred in the collection of peat and furze. It was most prevalent in the 1820s, a decade of high unemployment, and was particularly frequent in south-western Hampshire. As peat was considerably cheaper than any other Hampshire fuel, many labourers and better-off residents also consumed it when available.

The other potential risk in using Overseers Accounts to determine the price of fuel is the possibility that they were paying considerably less than most residents. Overseers could purchase the lowest grades for poor households. Wood, peat and coal all varied in quality and the evidence in Overseers Accounts makes it impossible to determine which grades were bought. Transport was a small component of wood prices and Hampshire overseers might have purchased the very lowest grades. For coal, those were not worth the expense of shipping south. The price of faggots also varied. In 1780, at Goderfield Coppice in Northern Hampshire, short faggots cost 14s 6d per hundred and long faggots 13s per hundred, with an additional 5s for carriage.<sup>163</sup> Overseers Accounts did not generally specify the quality of the faggots or bavons purchased and the occasional references to 'large faggots', 'lop faggots', 'hedgewood faggots' or 'ash faggots' are not consistent enough to develop price series. Sometimes, they either purchased lower quality wood or received a discount. In 1761, George Rumbold sold Robert Smith four hundred faggots "for the poor" from a Coppice at Compton for £2 with a further 12s for carriage, while others paid 14s/hundred faggots without carriage.<sup>164</sup> The prices paid by Hampshire overseers in the early nineteenth century in Table 2-3, were lower than those charged by some woodlands whose accounts have survived. In 1813, oak lop faggots sold for 30s per hundred at Herriard,

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<sup>163</sup> "Cordwood and Faggots 1779-1786" HRO 28M64/1.

<sup>164</sup> "George Rumbold's Account Book," HRO 2M37/153

while underwood faggots cost 27s and fir faggots 24s per hundred.<sup>165</sup> These prices are slightly higher than those in Table 2-3 and do not include the labour needed to transport the wood to homes. In 1821, oak lop and beech faggots still cost 30s per hundred at Herriard, while fir faggots cost 24s per hundred.<sup>166</sup> These few woodlands did not experience the small post-war drop in prices suggested by Table 2-3. Overseers Accounts likely underestimate the price of wood, but they offer unparalleled local detail on the types of fuel consumed and suggest the prices paid for it. The standard source on fuel prices is the *Allen-Unger Global Commodity Prices Database*. Despite Hampshire overseers sometimes receiving discounts on wood, the Allen-Unger southern English wood prices are consistently lower than those in in Table 2-3 after 1793.<sup>167</sup>

Other prices that survive for coal in Hampshire are consistent with what overseers were paying. Lymington coal merchant Charles St. Barbe's purchased coal in bulk from ship's captains for between 30s 9d and 35s a chaldron (~1.3 tons) in 1782, and for between 22s and 24s 6d a chaldron in 1783.<sup>168</sup> The differences in price during each year are due to the differing properties of coal in northern English pits and possible short-term weather impacts. The drop in price between the two years was caused by the end of the American and Fourth Anglo-Dutch Wars. St. Barbe's receipt book demonstrates a more abrupt peacetime drop in prices than surviving Overseers Accounts but is consistent with those in Table 2-4. Meanwhile, Arthur Young observed

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<sup>165</sup> "Accounts of Wood Sold 1813" HRO 44M69/E13/5/22

<sup>166</sup> "Accounts of Wood sold 1821" HRO 44M69/E13/5/29.

<sup>167</sup> <http://www.history.ubc.ca/faculty/unger/ECPdb/data.html>, and accessed on 3 January, 2012.

<sup>168</sup> "Receipt Book, Charles St Barbe, Lymington" HRO 63M90/1. The 1782 accounts were for coal received between May and September while the 1783 ones were for coal that arrived between March and November.



that coal cost 9d/bushel in Winchester in the 1760s, a similar price to the 9½d/bushel paid by overseers in St. Mary Kallendar in 1769.<sup>169</sup>

The concerns with Yorkshire coal are slightly different, as its grades varied to a greater extent than those shipped south. In 1765, the Elsecar Colliery sold coal at 3s 6d, 4s and 4s 6d per dozen, depending on its hardness. Most customers purchased 4s coal, with some industries preferring the more anthracitic varieties at 4s 6d. Some households, including the Marquis of Rockingham, burnt the more bituminous soft coals that cost 3s 6d/dozen.<sup>170</sup> These accounts offer more detail on the various grades of coal than other sources and indicate that households often consumed cheaper grades than industry. Meanwhile, it appears unlikely that overseers paid a different price than others. Both Swinton and Rawmarsh's overseers purchased coal from Lawwood, whose pithead price is also known. Both cases have been mentioned earlier, and they were consistently paying 1s/mile more than the pithead price for a dozen of coal (~2.1 tons). The consistency of the transport costs and their similarity between the two parishes suggest that they were not getting special deals at the pithead. Also, the price is within the range of 5-6.7d/ton mile that John Hatcher claims it cost to ship coal overland in the 17<sup>th</sup> century.<sup>171</sup>

The larger concern in determining the price of coal in the West Riding is the many units by which it was sold. Units are more fully explained in Appendix D. At different points coal was sold by the dozen, corf, pull, load, horse load, cartload, wagon, peck, bushel, sack, chaldron, ton and hundredweight. Each of these units is a multiple

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<sup>169</sup> Young, *Six Weeks Tour Through the Southern Counties*, 152, "Winchester St Mary Kallendar Poor Book 1768-1787" HRO 1M82W/PO31. The Overseers were paid 7s 11d for 10 bushels on two separate occasions and 15s 10d for 20 bushels on one occasion that year.

<sup>170</sup> "Elsecar Colliery Journal" SA WWM A1585.

<sup>171</sup> Hatcher, *History of the British Coal Industry Volume I* 13.

or fraction of some but bears no relationship to others. People purchasing coal understood the normal value of a unit in their location. Unlike Hampshire coal, units could vary greatly between communities. This is most apparent with the load, which was a synonym for the dozen in Birkin but cost less than 1s in eighteenth-century Burley.<sup>172</sup> Meanwhile, chaldrons were the main unit in the London-Newcastle coal trade, and were known to have different values at either end.<sup>173</sup> I assume that the chaldrons used in the north-eastern part of the Riding were the size of London ones, because of the few years in which Staveley and Burton Leonard's overseers purchased both chaldrons and bushels.<sup>174</sup> Tables 2-4 and 2-5 have been created on the assumption that a dozen was 42cwt, a Leeds corf 2.7cwt, a Leeds wagon 64cwt, a chaldron 26cwt, a bushel 0.72cwt, a sack 2.2cwt and a ton 20cwt.

Another concern is that the amount of coal in a given unit was sometimes manipulated by people involved in its trade. Joseph Lawson grew up in Pudsey, a textile-manufacturing village between Leeds and Bradford. Looking back on his 1820s youth, he recalled,

Those who get a cartload of coal at a time seldom know what weight they get. Some of the 'coal-leaders', as they are called, have carts made small to make a little load appear a big one. Others have bags of coal on the top, which they sell to customers on the road, and, it is said, do not deduct

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<sup>172</sup> "Burley Overseers Accounts 1762-1813," WYAS Bradford BDP/33/13/6/1.

<sup>173</sup> Brian Dietz, "The North-East Coal Trade, 1550-1750: Measures, Markets and the Metropolis," *Northern History* 22 (1986) 284 shows that a Newcastle Chaldron was generally 46.2cwt while a London one was 25.7cwt.

<sup>174</sup> "Burton Leonard Overseers Accounts" NYCRO PR/BTD10/3/7. In April 1823, they purchased a half chaldron of coals for 9s and a half-bushel for 5d, giving prices of 18s/chalder and 10d/bushel. That would make a chalder 21.6 times more expensive than a bushel, and is consistent with a chaldron no more than 36 times the size of a bushel. There is similar evidence for other years in Burton Leonard. Unless a Yorkshire bushel was double the size of a southern one, this price relationship makes it easier to assume a chaldron of 26cwt than of 42cwt.

them where they deliver the rest, though all are weighed together at the pit.<sup>175</sup>

Another example of units being manipulated comes from the Lancashire side of the Leeds and Liverpool Canal in the 1770s. Canal dues were charged by the ton, and the proprietors of barges began to increase the mass of coal in a hundredweight. A July 1775 report complained that “the Hundred Weight being from 140 to near 200 and twenty of these to a Ton.”<sup>176</sup> Later in the decade, Parliament capped the price of coal in Liverpool. By 1780 the amount of coal in a hundredweight had been reduced to 112lbs from its customary 120lbs.<sup>177</sup> Evidence of these manipulations and the differing energy content of coal from various pits make it impossible to make exact calculations of the price paid per unit of energy. The following tables, especially 2-5, should thus be read with a significant margin of error. They remain the best indication of the regional energy regimes affecting the consumption described in chapters three, four and five.

Shown below are tables with the price of fuel in a few parishes that predominantly burned each source. Coal was the predominant fuel across the West Riding and parishes with long series of records that exemplify the prices in their regions have been selected. In Hampshire, parishes whose accounts offer particularly long series of prices for the same fuel have been selected. These had less volatile prices than ones in which the fuel source changed so these charts under-represent trends. Years that best illustrate the price trends for each fuel have been selected. Prices for both peat and wood increased throughout this period, but the timing and actual price at

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<sup>175</sup> Joseph Lawson, *Letters to the Young on Progress in Pudsey During the Last Sixty Years*, (Stanningley: J.W. Birdsall, 1887) 22-23.

<sup>176</sup> “19 July 1775 Report of Field, Lead and Jowett” WYAS Bradford JOW/11/a/2.

<sup>177</sup> WYAS Bradford JOW/11/a/2. This comes out of an unnamed and undated report in a fond of papers from the Leeds and Liverpool Canal that also included the previously mentioned 1775 Report.

any one time varied greatly between parishes. Prices for wood fluctuated annually. In Bentley and Binstead, overseers responded to rising wood-prices by purchasing the inferior-grade and smaller unit of bavins instead of faggots. Meanwhile, prices for peat were more stable than those for wood in the medium term. In Hale, peat and its carriage cost between 4s and 5s for 1000 turves from 1770 to 1801, before rising to 8s, which it cost from 1811 through 1830.<sup>178</sup> In many cases, the cost of transporting the fuel was specified separately. These are treated as part of the price because transport was a necessary component of supplying fuel and of its cost. Indeed, for both coal and peat, transportation accounted for most of the price and especially of its fluctuations. In Fawley, 1s 6d was paid to cut 1000 turves from 1770 through 1800. However, peat deposits near the village were depleted and it began to come from further away so the cost of transporting those 1000 turves tripled from 2s to 6s.<sup>179</sup> Eversley's peat deposits were less-depleted and the cost of carting fuel to the village did not increase as much, so the overall price was less inflationary. With coal, the importance of transport can be seen by comparing prices at northern English mines with those in Hampshire. Coal cost between 2s and 2s 4d per ton at the Earl Fitzwilliam's Yorkshire collieries in the 1760s and 1770s, and only rose to 4s 3d per ton in the 1810s.<sup>180</sup> Those prices are much lower and more stable than the Hampshire ones in Table 2-4.

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<sup>178</sup>“Hale Overseers Accounts 1769-1803” and “Hale Poor Book 1803-1836” HRO 13M80/PO1-2.

<sup>179</sup>“Fawley Poor Book, 1770-1787,” “Fawley Poor Book 1794-1800” and “Fawley Poor Book 1800-1809,” HRO 25M60/PO7-9.

<sup>180</sup> “Elsecar Colliery Journal 1765-1767,” “Lawwood Colliery Journal, 1776,” “Lawwood Colliery 1803” and , “Lawwood Colliery 1807” Sheffield Archives WWM A1577, 1582, 1583 and 1585.

**Table 2-2: Price of a thousand Turves in predominantly peat-burning Hampshire parishes**

Year	Eversley (NE)	Lyndhurst (SW)	Hale (SW)	Fawley (Coast)
1755	1s 6d	-	-	-
1770	-	1s 10d (1772)	4s 6d (1773)	3s 6d
1785	-	2s 6d	4s-4s 6d (1786)	5s 6d
1800	2s-2s 6d (1803)	5s	5s	7s 6d (1798)
1815	2s-2s 6d (1816)	6s 6d (1811)	8s	9s 6d (1820)
1830	-	-	8s	Amount not specified

**Table 2-3: Price of a hundred faggots or hundred Bavins in Predominantly wood-burning parishes**

Year	Beauworth (Inland)	Bentley (NE)	Binstead (NE)	Leckford (NW)	Bramley (NE)
1740	-	12s (faggots, 1742)	11s (faggots, 1742)	-	10s (faggots)
1750	11s (faggots, 1753)	13s (faggots)	11-12s (faggots)	-	11s 6d (faggots)
1760	-	14s (faggots), 5s (bavins)	12s (faggots)	17s 6d (faggots, 1761)	12s (faggots)
1770	10s (faggots, 1766)	15-17s (faggots), 5s 6d (bavins)	14s (faggots), 5s 6d (bavins)	17s 6d (faggots)	14s (faggots, 1766)
1775	-	18s (faggots)	14s (faggots)	11-14s (faggots)	-
1785	8s (faggots, 1780)	18s (faggots), 7s (bavins, 1784)	7s (bavins, 1786)	17s 6d (faggots, 1784)	-
1795	-	8s (bavins)	9s (bavins)	12s 6d (faggots, 1792)	20s (faggots) 10s (bavins)
1805	16s 8d (faggots)	11s (bavins) £3/ton of coal(1807)	-	-	22s 6d (faggots, 1804)
1815	25s (faggots)	12-16s (bavins)	-	-	25s (faggots, 1810)
1822	20s 10d (faggots)	12s (bavins)	-	-	25s (faggots)
1830	-	-	-	-	25s (faggots, 1829)

Unlike peat and wood, the price of coal did not increase steadily during this period. Rather, it rose as shipping was disrupted during wartime and fell with the cessation of hostilities. Between 1740 and 1830, England fought five wars: the War of Austrian Succession (1742-8), the Seven Years War (1756-63), the American War (1775-83), the Fourth Anglo-Dutch War (1781-82) and the Revolutionary/Napoleonic Wars (1792-1815 with a brief peace in 1802-3). The price of coal was not only higher but also more volatile in wartime. A quarter chaldron of coals cost 11s in South Stoneham in May 1813, before rising to 16s 9d in March 1814 and dropping to 9s 6d in February 1816.<sup>181</sup> Whether due to increased price, disruption of supply or both, wood and peat were sometimes substituted for coal during periods of hostilities and high prices were paid for them, as illustrated in Appendix C. Table 2-4, below, shows the price of coal in five places where it was the main fuel and in which there is a long series of prices. In Bishop's Waltham, wood was occasionally purchased as well with those prices included in this table.

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<sup>181</sup> Southampton City Archives PR9/15/14, PR9/15/16, PR9/15/18.

**Table 2-4: Price of Ton of Coal in Predominantly coal-burning Hampshire Communities**

Year	Southampton (Coast)	Winchester (Inland)	Godshill (Isle of Wight)	Portsmouth (Coast)	Bishop's Waltham (Coast)
1753	23s	-	23-24s	16s	23s (1749/50)
1760	30s (1758/9)	-	28-29s	23s (1757/8)	12s 6d/100 faggots
1765	41s 6d	22s (1768/9)	24s 6d	-	13s/100 faggots (1766/7)
1773	-	23s	27s	20s	21s 6d/ton or 12-16s/100 faggots
1780	-	30s (1778/9)	-	22s 4d (1776/7)	30s 6d (1783/4)
1785	-	27s 6d	-	-	13s/100 faggots
1790	-	25s 6d (1792/3)	-	-	16s/100 faggots
1795	-	41s 6d (1800/1)	-	-	40s
1803	-	41s 6d	-	-	-
1808	41s 6d- 44s (1810/1)	46-51s	-	-	30s/100 faggots (1810/1)
1814	35s	-	-	-	34s
1820	-	-	-	24s	-

The most notable aspect of the price of coal in Hampshire between 1740 and 1830 is that it rose in wartime and fell during the intervals of peace. This is evident in Charles St. Barbe's accounts from 1782 and 1783. The Overseers Accounts consulted for this chapter do not offer sufficient evidence to make any conclusions about the War of the Austrian Succession but the pattern is clear for the Seven Years War, the American War, the Revolutionary and Napoleonic Wars. Since the price increases in Hampshire were much larger than those at the pit-heads in the same years, developments in northern England were not the cause. Understandably, war increased

the demand for fuel in coastal Hampshire because Portsmouth Harbour and the Isle of Wight both had a large military presence. The wartime population growth of these areas reflects this.<sup>182</sup> However, most of the price fluctuations were due to the greater difficulties of shipping coal along the eastern and southern coasts of England in wartime. Sailors' wages rose in wartime and contributed to the higher costs of transporting coal.<sup>183</sup> Shipping was also made more difficult by the occasional attacks of French, Dutch or American privateers on merchant vessels. French privateers were especially active in the Channel, and were able to interfere more with the Hampshire coal trade than that to London.<sup>184</sup> The threat to shipping was such that the British Navy instituted convoys to protect merchant vessels in most eighteenth-century wars.<sup>185</sup> Even when enemy privateers did not directly impede trade, their threat raised the cost of insurance. Kevin O'Rourke has shown that these added costs affected the price of wheat during the Napoleonic Wars, while they also made coal more expensive in Hampshire during that conflict.<sup>186</sup> T Davison observed these trends in 1817. To promote the canal between London and Portsmouth, he noted that "in time of war" such

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<sup>182</sup> The Portsmouth and Portsdown divisions combined grew by 57% between 1771 and 1781, with a further 15.6% and 17% growth in the 1790s and 1800s. The population of the Isle of Wight grew by 48% in the 1790s.

<sup>183</sup> *Leeds Mercury*: 21 May 1814, 3 noted that with the peace, the wages of sailors in the coal trade declined from £9/month to £4/month. H.V. Bowen, *War and British Society 1688-1815*, (Cambridge: Cambridge University Press, 1998) 74.

<sup>184</sup> Patrick Crowhurst, "The French War on Trade 1793-1801: Commercial Venture or Patriotic Endeavour?" *Britain and the North Seas, Some Essays: Papers Presented at the Fourth Conference of the Association for the History of the Northern Seas, Dartington, Devon, 16-20 September 1985*, Walter Minchinton ed (Pontrfract: Lofthouse Publications, 1988) 140.

<sup>185</sup> J.R. Jones, "Limitations of British Sea Power in the French Wars, 1689-1815" *The British Navy and the Use of Naval Power in the Eighteenth Century*, Jeremy Black and Philip Woodfine editors, (Leicester: Leicester University Press, 1988) 41, Robert C. Ritchie, "Government Measures Against Piracy and Privateering in the Atlantic Area, 1750-1850," *Pirates and Privateers: New Perspectives on the War on Trade in the Eighteenth and Nineteenth Centuries*, David J. Starkey, E.S. van Eyck van Heslinga and J.A. de Moor eds, (Exeter: University of Exeter Press, 1997) 19.

<sup>186</sup> Kevin H. O'Rourke, "The Worldwide Economic Impact of the French Revolutionary and Napoleonic Wars, 1793-1815," *Journal of Global History* 1 (2006): 123-149. See also Ritchie, "Government Measures Against Piracy and Privateering," 19-20, Bowen *War and British Society* 74,



a canal “must be of the greatest public importance, thereby offering a short and certain communication, unattended with delays or danger from the elements or the enemy.”<sup>187</sup>

**Table 2-5: Price of a Ton of Coal in Selected West Riding Communities**<sup>188</sup>

Year	Lawwood Pithead (SC)	Worsbrough (SC)	Leeds (NC)	Thurstonland (NC)	Swinton (C)	Staveley (NE)	Rawcliffe (SE)
1765	-	3s	2s 11d	-	-	-	9s 3d (1764)
1775	2s 4d (1776)	2s 11d	2s 11d	1s 5d – 1s 11d	-	-	10s (1773)
1785	2s 10d (1787)	3s 9d	3s 5d	1s 3d (1784)	-	-	10s (1784)
1795	2s 10d (1798)	4s (1794)	4s 2d – 4s 7d	1s 8d – 1s 11d (1796)	-	11s 6d (1796)	10s 9d – 11s 6d
1805	3s 4d – 3s 9d	6s 8d (1806)	4s 11d	2s 10d (1806)	5s 2d – 6s 8d	16s 8d	11s 6d – 12s 3d (1806)
1815	4s 3d	5s 8d (1814)	-	3s 8d (1813)	6s 8d – 7s 10d	17s 8d	-
1825	4s	-	-	3s 2d	7s 5s (1821)	17s 8d – 18s (1822)	11s 6d – 12s 3d

Despite concerns about units, the coalfield prices in Table 2-5 are significantly lower than any which appear in the *Allen-Unger Global Commodity Prices Database*.<sup>189</sup> Throughout this period, their figures for the pithead price of coal are double that charged at Lawwood and significantly higher than at Middleton. The Allen-Unger Database also states that coal was significantly more expensive in northern England than it actually was on the coalfield. At between 4s 10d and 6s 4d per ton of coal from 1760 to 1795, their northern English price most resembles Birkin’s, while at between 10s and 15s a

<sup>187</sup> T Davison, “Observations on the Intended Portsmouth and Arundel Canal,” HRO 44M69/G1/75.

<sup>188</sup> Sheffield Archives WWM A1577, WWM A1580, WWM F105, EM 1002, PR3/13 WYAS Kirklees KC271/1-4, WYAS Leeds RDP 49/67, WYL899/185-199, NYCRO PR/SVL/14/5-8 and Doncaster Archives P60/6/2/35-81 and P59/6/B2/1-2.

<sup>189</sup> <http://www.history.ubc.ca/faculty/unger/ECPdb/data.html>, and were accessed on 9 June 2012.

ton after 1795, Rawcliffe's. As such, the database misses the great regional diversity of fuel prices in northern England and overestimates the prices paid on the coalfield. In *British Industrial Revolution in a Global Perspective*, Robert C. Allen uses the prices from this database to argue that a combination of cheap fuel and high wages in northern England encouraged innovation and contributed to its Industrial Revolution.<sup>190</sup> Allen is trying to explain the growth of woollen textile manufacturing in places like Kirkburton Parish, of which Thurstonland was a township, or the rapid growth of Leeds. However, his prices reflect those in the Yorkshire fens, which were not industrializing. Table 2-5 indicates that fuel was much cheaper in industrializing Yorkshire than Allen claims. In fact, the connection between cheap coal and the location of expanding industries was much stronger than Allen believes.

## Conclusion

Local environmental factors affected the type of fuel consumed and the price paid for it across Hampshire and the West Riding of Yorkshire. The types of fuel did not change in most communities between 1740 and 1830. Coal was consumed across the West Riding, in the towns of southern Hampshire and the Isle of Wight before 1740. It only became the predominant fuel in other communities as inland transportation improved after 1830. Local coal was consumed on the coalfield, while peat was preferred where it was available and coal had to be shipped in. Both fuels required less labour to collect than wood or furze and were generally cheaper. Although the type of fuel did not usually change, their prices did. Wood became much more expensive, peat and northern coal somewhat more expensive and the price of southern coal fluctuated with war.

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<sup>190</sup> Allen, *British Industrial Revolution in Global Perspective*,

Fuel prices interest economic historians. Robert C. Allen, J.L. Weisdorf and Gregory Clark have included fuel in their wage-price series for southern English agricultural labourers. They assume uniform prices for coal and wood across southern England. The prices paid by Hampshire overseers were usually lower than those assumed by Clark and Allen prior to 1793 and higher after.<sup>191</sup> They were also more volatile, especially in Bishop's Waltham. For coal, Allen and Clark's Southern English prices are less volatile than those observed in Hampshire and are usually lower than those paid in Southampton or Portsmouth until 1813, let alone places further inland. Comparing wages to prices from the same location would impact standard of living calculations. Gregory Clark assumes that labourers spent 5% of their income on fuel and uses changing prices in his cost of living series.<sup>192</sup> As such, fuel prices have a limited impact on his calculations and for most decades using local Hampshire prices would affect Clark's cost of living index by less than 2%. Meanwhile, Allen and Weisdorf calculate the number of days labour required to purchase a basket of goods, including 16.25 million BTUs of fuel for a family, between 1310 and 1830.<sup>193</sup> If they were to use the price paid for coal in Bentley in 1807 rather than the assumed price of wood, their hypothetical labourer would have needed to work 14.8 additional days to purchase the same goods. If they used the Bishop's Waltham overseers price of wood in 1740, their worker would have needed to work 6.8 fewer days. Their calculations thus ignore important local differences in changing conditions for rural labourers and severely underestimate the price volatility of fuel in southern England between 1740 and 1830.

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<sup>191</sup> <http://www.history.ubc.ca/faculty/unger/ECPdb/data.html>, accessed on 3 January, 2012.

<sup>192</sup> Clark, "The Long March of History" 107.

<sup>193</sup> Allen and Weisdorf, "Was there an 'industrious revolution' before the industrial revolution?" 718. They assume that a ton of coal has 24 million BTUs while a ton of wood has 17.2 million BTUs.

As a result, they miss major economic changes in this period they are trying to explain and risk inventing 'representative' labourers who never existed.

This chapter has dealt with the geography of fuel use and emphasizes continuity in the type consumed. If one were to calculate the overall amounts of each fuel used in Hampshire in 1740 and 1830, coal would occupy a larger share at the later date. Coal's consumption frontier extended slightly further north, although most of its increasing importance was due to the Isle of Wight, Southampton, Portsmouth and the rest of coastal Hampshire growing faster than inland regions. Meanwhile, peat consumption declined much less than wood consumption in the areas where it was burnt. The increasing importance of coal would be even more pronounced in a comparison of fuel types across the two counties because the West Riding had over twice Hampshire's population in 1750: Hampshire's population doubled while the West Riding's tripled between 1750 and 1831.

Although the type of fuel generally did not change, the prices paid for it did. The Hampshire price of coal fluctuated with war but it did not rise substantially between the 1740s and 1820s. As a subterranean source of fuel, increasing extraction in northeastern England did not result in land shortages or compete with agricultural uses. Gradual improvements in mining and shipping technology allowed ever greater amounts of coal from deeper below ground to make it to Hampshire at stable prices in a way that was not possible for woodlands or peat. As such, price was less likely to cause household consumption to decline in coal-burning regions. Wood-dependent north-western Hampshire had a population density less than a third that of the coast and

barely one-tenth that of Yorkshire's North Coalfield and could not support its population without severe fuel shortages.

With its large coalfield, regional differences in the West Riding were between places with local coal and those without. The cost of coal rose across most of the county between 1760 and 1815, but its coal did not travel by ocean and thus avoided Hampshire's wartime price spikes. However, there were large and consistent differences in price. The price of coal also affected the economies of the various regions and contributed to the growing economic divergence between Yorkshire regions. Whatever coal's role as a cause of the Industrial Revolution, rapidly expanding manufacturing industries were on the coalfield. Even before steam-powered textile mills began to appear, fuel was required to smelt metals, heat wool-combing instruments, boil dyes or bake pottery. Combined industrial and domestic energy consumption was thus much higher on the coalfield. This is evident in contrasting the above-mentioned two tons of coal burnt per Sheffield resident in 1799 with the quarter ton per person annually consumed on the Isle of Wight in the following decade. Meanwhile, the eastern regions of the West Riding were expanding more slowly and becoming increasingly specialized in agricultural production to sell to coalfield communities. Coalmining was also able to expand to meet the needs of growing populations and industries. Prices remained low despite the coalfield's population more than tripling between 1760 and 1830. These price differences are essential to understanding the locations of fuel theft discussed in chapter 4. They also had a large impact on cooking habits, health and the fuel disbursements of overseers, which are discussed in chapters 3 and 5.

### Chapter Three: 'Poor Widows Coals': Fuel Disbursement Under the Old Poor Law

Thurstonland and Staveley were Yorkshire parishes with very different fuel relationships. The previous chapter compared the price of coal across the West Riding and emphasized the eight-fold difference in 1799. Coal was much cheaper in Thurstonland because there were local seams close to the surface. Cheap coal supported its growing textile industry, residents burnt more of it and overseers provided larger amounts to the households they supported. Meanwhile, Staveley was an agricultural parish removed from waterways in the Riding's northeastern corner. In 1797/8, Elizabeth Jackson received the most coal from Staveley's overseers with one chalder (~1.3 tons).<sup>1</sup> Thurstonland's Hannah Nash received four dozens of coal (~8.4 tons) in September and October, in addition to her weekly pension of 2s. She was ill that winter and overseer John Sedgewick purchased a further three dozens (~6.3 tons) for her in early January.<sup>2</sup> Even without this extraordinary January purchase, Thurstonland's overseers gave considerably more coal to individual households and paid less for it. Jackson's chalder cost 19s while 16s was paid for Nash's four dozen. Jackson and Nash exemplify the impact of fuel prices on individual households' consumption.

This chapter examines the fuel consumption of labouring and poor households between 1750 and 1830. It focusses on recipients of poor relief because the many surviving Accounts of Overseers of the Poor offer significantly more local evidence of the consumption of non-elite households than any other source. Eighteenth- and early

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<sup>1</sup> "Staveley Overseers Accounts" NYCRO PR/SVL/14/5.

<sup>2</sup> "Thurstonland town book 1796-1809" WYAS Kirklees KCZ 271/2.

nineteenth-century poor relief has been the subject of considerable scholarship but this is the first study to focus explicitly on fuel disbursements. In so doing, it contributes to the two main debates in poor law historiography. Firstly, it complements the work of Steve King and Steve Hindle in emphasizing the large regional differences in relief. Meanwhile, Poor Law historians debate the extent to which the 1834 Poor Law Reform Act broke sharply with existing practices or continued a gradual evolution. Fuel disbursements declined in the early nineteenth century due to rising prices, local poverty and Malthusian attitudes. As these declines were not connected to legislative changes, this chapter supports Derek Fraser's argument that the New Poor Law involved a gradual change in relief.

This chapter traces fuel disbursements by Overseers of the Poor because these indicate the consumption levels of a broader socio-economic spectrum. In order to understand their representativeness, this chapter first looks at the labouring family budgets collected by eighteenth-century social commentators Arthur Young and David Davies. Davies' household budgets are best understood as local poverty lines, or the minimum level of consumption needed to maintain tolerable living standards for labouring families.<sup>3</sup> As such, they likely represent the consumption of many labouring households with the very poorest falling below those amounts. In Yorkshire, Young and Davies' observations are similar to the amounts of fuel disbursed by overseers and suggest disbursements to the poor were similar to the amounts being burnt by many labouring households. In wood-burning regions of northern Hampshire, fuel disbursements were generally lower than those recorded in Davies' budgets. The higher

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<sup>3</sup> Ian Gazeley and Nicola Verdon, "The First Poverty Line? Davies' and Eden's Investigation of Rural Poverty in the late 18<sup>th</sup>-century England," *Explorations in Economic History* 51 (2014) 102.

cost of fuel in wood-burning regions likely led to greater differences in the amounts that households in a given community burnt. Thus, it is likely that some poorer households in northern Hampshire also consumed similar amounts but they represent the consumption habits of a smaller proportion of society than their Yorkshire equivalents.

After discussing Young and Davies, this chapter proceeds with a brief discussion of fuel charity, the role of the poor law and a regional comparison of fuel disbursements. The fuel given to individual poor households generally declined between 1760 and 1830, although the timing varied. This was due to a combination of increased poverty in parts of both counties, rising prices and changing attitudes to poor relief. The chapter then considers these changes in fuel disbursements and their implications for understanding both the Poor Law and living standards. It demonstrates both that significantly more fuel was consumed where it was cheaper and that regional differences in fuel consumption increased between 1750 and 1830.

### **Amount of Fuel Consumed by Labouring Households**

The changing living standards of English labourers during the Industrial Revolution have long been controversial among historians. As an essential component of material lives, fuel is included in the wage-price series that comprise much of that scholarship.<sup>4</sup> These involve assumptions about the amounts of fuel labouring people consumed. Their relationship to past realities is dependent upon the quality of those assumptions and the representativeness of the wages and prices used. More recently, some historians have found long series of heights and used the changes in them to

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<sup>4</sup> Examples include: Allen and Weisdorf, "Was there an 'industrious revolution' before the industrial revolution?" 715-729, Clark, "Farm Wages and Living Standards in the Industrial Revolution" 477-505, Mokyr, "Is There Still Life in the Pessimists Case?" 69-92, Crafts and Mills, "Trends in Real Wages in Britain, 1750-1913," 176-194.



trace food consumption.<sup>5</sup> Yorkshire heights are discussed in chapter 5 but the long-term bodily effects of fuel consumption in the houses of infants and pubescent children are less clear than those from food. As such, we need evidence on the actual consumption of plebeian families. Eighteenth-century political economists were interested in the living conditions of the labouring poor and their regional variation. Arthur Young was an agricultural commentator who asked local labourers about their wages and the cost of provisions they purchased. David Davies asked Overseers of the Poor to provide him with household budgets of specific labouring families and received these for various parishes. Both authors mentioned the price of fuel and sometimes the amounts purchased. These were one-time surveys with small sample sizes but taken with the intent of understanding regional differences. Sir Frederic Morton Eden also wrote about the condition of poor English people in the mid-1790s and will be discussed later, but he did not include the local details of Young and Davies.

Arthur Young was an agricultural commentator who travelled extensively around England and France. In the 1760s, he made numerous journeys across England, writing about agricultural practices and living conditions. In his *Six Weeks Tour Through the Southern Counties of England*, Young noted the cost of coal in Winchester but not how much was consumed. He visited the West Riding in the *Six Months Tour Through the North of England*, where he recorded labouring families' annual expenditure on 'firing' in nine locations. Young noted that they burnt turf at Woolley, but did not specify the fuel

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<sup>5</sup> Stephen Nicholas and Richard H. Steckel, "Heights and Living Standards of English Workers During the Early Years of Industrialisation, 1770-1815," *Journal of Economic History* 51 (1991): 937-957, Roderick Floud, Kenneth Wachter, & Annabel Gregory, *Height, Health and History: Nutritional Status in the United Kingdom, 1750-1980*. (New York: Cambridge University Press, 2006) and John Komlos, "The Secular Trend in the Biological Standard of Living in the United Kingdom, 1730-1860" *Economic History Review*, 46 (1993) 115-144 are the most applicable to the debates about living standards during the Industrial Revolution.

source in other locations.<sup>6</sup> They were likely consuming peat in Thorne, while coal was the fuel in other locations. Young's observations for the nine communities are in Table 3-1 below. He was mainly interested in the relationship between local agricultural wages and the price of provisions so he did not mention the amount of fuel consumed. From the table, readers will observe that West Riding labouring families in the 1760s typically spent between 12s and 20s on fuel and that this amount varied considerably between communities. The amounts of fuel these households consumed can be estimated by comparing Table 3-1 to the coal prices in Table 2-5. Thus, it appears that Conisbrough labourers were consuming similar amounts to those in Wentworth, but paying twice as much for it. In other cases, they were spending similar sums on different amounts of fuel.

**Table 3-1: Arthur Young's Observations of Expenditure on Firing by West Riding labourers c 1768<sup>7</sup>**

Location	Fuel Region	Annual Expense on Firing	Likely Fuel Source
Woolley	South Coalfield	12s	Peat
Thorne	South-East	12s	Peat
Wentworth	South Coalfield	12s	Coal
Cantler	South-East	20s	Coal
Wakefield	North Coalfield	20s	Coal
Leeds	North Coalfield	20s	Coal
Ecclesfield	South Coalfield	20s	Coal
Kiddel	Central	20s	Coal
Conisbrough	Central	24s	Coal

During the bad harvests and economic downturn of the mid-1790s, much was written about the living conditions of labouring people. For his *Case of the Labourers in Husbandry*, Reverend David Davies of Berkshire collected household budgets from families across England and Wales, including two communities in both Hampshire and

<sup>6</sup> Young, *A Six Months Tour Through the North of England, Volume I*, 239-240.

<sup>7</sup> Young, *A Six Months Tour Through the North of England, Volume IV*, 287.

the West Riding. At Crawley, in north-west Hampshire, he collected budgets from six families who spent between 8s and 30s on fuel. He observed that “Fuel at the lowest estimation must be reckoned at £1; to make a family comfortable, it ought to be double of this.”<sup>8</sup> In Longparish, also in north-west Hampshire, fuel was scarce and expensive, and households spent at least as much as in Crawley.<sup>9</sup> Davies noted that these Hampshire families did not collect fuel from commons, unlike those he mentioned in neighbouring Dorset, Berkshire and Sussex.<sup>10</sup> Davies also collected budgets from families in the Yorkshire coalfield townships of Chapel Allerton and Thorner. He estimated that they spent £1/year on coals, which would have purchased 27 horse-loads of three bushels each or slightly less than three tons. He also found that they consumed more fuel than in places where it was more expensive. “Although coals are plentiful, yet it is an observation, that the habit of making large fires makes the expence of fuel greater than in places where it is much scarcer.”<sup>11</sup> Chapel Allerton and Thorner were in Leeds and Wakefield parishes respectively, and these expenditures were identical to those observed by Young in the town centres 25 years earlier. These coalfield families’ annual fuel budgets were in the lower end of the range for their Hampshire equivalents, but they burned significantly more coal. Davies and Young are among the few sources detailing the consumption of eighteenth-century labouring households and suggest that many Yorkshire overseers disbursed similar quantities of fuel to those consumed by local labouring families.

### Poor Law

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<sup>8</sup> Davies, *The Case of the Labourers in Husbandry* 165.

<sup>9</sup> Davies, *The Case of the Labourers in Husbandry*, 167.

<sup>10</sup> Davies, *The Case of the Labourers in Husbandry*, 165-167.

<sup>11</sup> Davies, *The Case of the Labourers in Husbandry*, 187.

Another source on the fuel consumption of some plebeian households is the Accounts of Overseers of the Poor. Parishes were mandated to relieve poor inhabitants and the expenses were justified to local ratepayers every year. Eighteenth-century overseers thus left considerable documentation. The English, Scottish and Belgian Poor Laws were unique in comparison to other systems of poor relief, as every parish was mandated to provide it.<sup>12</sup> In most of continental Europe, poor relief was administered by religious charities, barely existed in some regions, and was not mandated by legislation.<sup>13</sup> English Poor relief was administered at the parish or township level and relied upon the collection of local taxes for the purpose of relieving local poor people. Parish ratepayers were obliged to support the deserving poor and overseers' decisions could be appealed to magistrates. On a number of occasions in both counties, overseers were ordered to provide relief for poor individuals they had refused. Some were also indicted for the cost-saving measures of not providing the ordered relief, removing legally settled paupers, or arranging the marriages of infirm poor women to paupers in other parishes.<sup>14</sup> In one incident, on 30 September 1801, William Birks and

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<sup>12</sup> R.A. Cagge, *The Scottish Poor Law 1745-1845*, (Edinburgh: Scottish Academic Press, 1981) 84-86, Anne Winter and Thijs Lambrecht, "Migration, Poor Relief and Local Autonomy: Settlement Policies In England and the Southern Low Countries in the Eighteenth Century" *Past and Present* 218 (2013) 102-104.

<sup>13</sup> Larry Patriquin, *Agrarian Capitalism and Poor Relief in England, 1500-1860: Rethinking the Origins of the Welfare State*, (Basingstoke: Palgrave Macmillan, 2007) 79, 191, Peter M. Solar, "Poor Relief and English Economic Development Before the Industrial Revolution," *Economic History Review* 48 (1995) 1-5, David R. Green, *Pauper Capital: London and the Poor Law, 1790-1870*, (Farnham: Ashgate, 2010) 1-2. For Early Modern European comparison: Linda Martz, *Poverty and Welfare in Habsburg Spain: The Example of Toledo*, (Cambridge: Cambridge University Press, 1983), Olwen H. Hufton, *The Poor of Eighteenth-Century France 1750-1789* (Oxford: Clarendon Press, 1974), Joan Sherwood, *Poverty in Eighteenth-Century Spain: The Women and Children of the Inclusa*, (Toronto: University of Toronto Press, 1988) and Thomas Max Safley, *Children of the Laboring Poor: Expectation and Experience among the Orphans of Early Modern Augsburg*, (Leiden: Brill, 2005).

<sup>14</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/33/1-QS4/62/140. Between the Easter Sessions of 1757 and the Epiphany Sessions of 1831, the West Riding Quarter Sessions saw 18 different incidents, in which 39 individuals were indicted for removing legally settled paupers. There were also 65 individuals indicted for 18 different forced marriages and 38 overseers were indicted for not fulfilling their office. "Quarter Sessions Indictments" HRO Q9/1/307-591. The Hampshire Quarter Sessions were

John Latham of Sykehouse, Yorkshire, removed “a pauper of the name of Thornton, from thence to Doncaster, and leaving him in the street in so infirm a state as occasioned his death in a few weeks.” They were convicted. Birks was fined £40 while Latham was sentenced to six weeks in the House of Correction and fined £5.<sup>15</sup> Such judicial oversight created a system in which elderly and ill poor people could expect some form of relief through local rates.<sup>16</sup> Because relief was administered locally, its generosity varied between parishes and depended upon local social relations. Matthew Tomlinson was overseer in Lupset, West Riding, in 1807, and wrote in his diary that his impression of different local poor people affected his decisions to relieve them.<sup>17</sup>

The Elizabethan Poor Laws were controversial amongst contemporary political economists and later scholars. Beginning in the late 1770s, increasing poverty and an expanding population led to higher rates being levied for poor relief in most English parishes.<sup>18</sup> Rates were particularly high during the dearths of the mid-1790s, when the condition of English labourers and the causes of increasing poverty became a major subject of debate.<sup>19</sup> Reverend T.R. Malthus was the most influential writer on the Poor

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consulted for the same years, with the few exceptions mentioned in chapter 4. Fifteen individuals were indicted for 10 incidents of removing legally settled paupers, three individuals indicted for marrying two paupers in 1823, and 17 overseers indicted for not fulfilling their office.

<sup>15</sup> *Sheffield Iris*: 11 February 1802, 2. For the indictment see “Quarter Sessions Indictment Books” WYAS Wakefield QS4/46/423-425.

<sup>16</sup> Solar, “Poor Relief and English Economic Development” 6.

<sup>17</sup> “Journal of Matthew Tomlinson of Doghouse Farm, Lupset, Volume 5, From 30 Nov 1806 to 25 Oct 1812” Wakefield Local Studies Library 920 TOM W. See in particular the entry for 17 May 1807, pages 859-860.

<sup>18</sup> *Poor Law Report* (1817) 156-157.

<sup>19</sup> Some examples include: Davies, *The Case of the Labourers in Husbandry*, Morton Eden, *The State of the Poor*, Patrick Colquhoun, *An Account of a Meat and Soup Charity*, (London: H. Fry, 1797), Edmund Burke, *Thoughts and Details on Scarcity, Originally Presented the Right Hon. William Pitt, in the Month of November, 1795*, (London: F. and C. Rivington, 1800), Edmund Poulter, *Address and Report on the Enquiry into the General State of the Poor. Instituted by Order of the last Epiphany General Quarter Sessions for the County of Southampton*, (Winchester: 1795), Arthur Young, *An Inquiry into the Propriety of Applying Wastes to the Better Maintenance and Support of the Poor* (Bury: J Rackham, 1801), James Nasmyth, *The Duties of Overseers of the Poor, and the Sufficiency of the present System of Poor Laws considered*, (Wisbech: John White, 1799)

Laws, arguing that they increased poverty by encouraging poor people to have more children than food could be grown to feed.<sup>20</sup> In 1817, a parliamentary *Poor Law Report* recommended reforming the system along Malthusian principles and the *Poor Law Reform Act* of 1834 did so. In the last 50 years, many historians investigated the shift from the old system to the new. Some have argued that the New Poor Law was an abrupt change that signalled the triumph of political economy over older social values.<sup>21</sup> Others argue that poor relief changed in a more gradual manner, emphasizing earlier developments towards workhouses and Poor Law Unions, along with changing attitudes of overseers and the New Poor Law's patchy application.<sup>22</sup> Steven King and Steve Hindle have written about the role of poor relief in family economies, arguing that its generosity varied regionally and it was often only one component of subsistence.<sup>23</sup>

<sup>20</sup> Malthus, *An Essay on the Principle of Population*, 15-23.

<sup>21</sup> Anthony Brundage, *The Making of the New Poor Law: The Politics of Inquiry, Enactment and Implementation, 1832-39*, (London: Hutchinson, 1978) 182-184, Thomas Nutt, "Illegitimacy, Paternal Financial Responsibility, and the 1834 Poor Law Commission Report: The Myth of the Old Poor Law and the Making of the New," *Economic History Review* 63 (2010) 335-361, Anna Clark, "The New Poor Law and the Breadwinner Wage: Contrasting Assumptions," *Journal of Social History* 34:2 (2000) 261-282, Peter Mandler, "Tories and Paupers: Christian Political Economy and the Making of the New Poor Law," *The Historical Journal* 33 (1990) 81-103, Peter Mandler, "The Making of the New Poor Law Redivivus" *Past & Present* 117 (1987) 131-157, William Apfel and Peter Dunkley, "English Rural Society and the New Poor Law: Bedfordshire, 1834-47" *Social History* 10 (1985) 37-68, Mark Blaug, "The Myth of the Old Poor Law and the Making of the New" *Journal of Economic History* 23 (1963) 151-184, Mark Neuman, *The Speenhamland County: Poverty and the Poor Laws in Berkshire 1782-1834*, (New York: Garland Publishing, 1982), John E. Archer, *By a Flash and a Scare: Incendiarism, Animal Maiming, and Poaching in East Anglia 1815-1870*, (Oxford: Clarendon Press, 1990) 48-52, Nicholas C Edsall, *The Anti-Poor Law Movement, 1834-1844*, (Manchester: Manchester University Press, 1971), J.R. Poynter, *Society and Pauperism: English Ideas on Poor Relief, 1795-1834*, (Toronto: University of Toronto Press, 1969) and Snell, *Annals of the Labouring Poor*, 105-137.

<sup>22</sup> Derek Fraser, "Introduction", *The New Poor Law in the Nineteenth Century*, Derek Fraser Ed. (London: Macmillan 1976) 17-21, David Ashforth, "The Urban Poor Law," Derek Fraser Ed. (London: Macmillan 1976) 133-141 and Gary Howells, "Emigration and the New Poor Law: The Norfolk Emigration Fever of 1836," *Rural History* 11 (2000) 158-159.

<sup>23</sup> Steve King, "Poor Relief and English Economic Development Reappraised," *Economic History Review* 50 (1997) 360-368, Steve Hindle, "'Not by Bread Only'? Common Right, Parish Relief and Endowed Charity in a forest Economy, c. 1600-1800," *The Poor in England, 1700-1850: An Economy of Makeshifts*, Steven King and Alannah Tomkins eds (Manchester: Manchester University Press, 2003) 41-47, Steve Hindle, *On the Parish? The Micro-Politics of Poor Relief in Rural England c.1550-1750* (Oxford: Oxford University Press, 2004) See also: Williams, "Earnings, Poor Relief and the Economy of Makeshift" and John Broad, "Parish Economies of Welfare," *Historical Journal* 42 (1999) 985-1006.

Overseers provided various kinds of relief to poor families but in most communities weekly pensions for the elderly and cash payments for the temporarily distressed formed the bulk of these provisions. In *Poverty and Welfare in England*, Steven King studied regional differences in the amounts of relief provided. He observed that relief was more generous in the arable regions of southeastern England than in upland industrializing regions. Hampshire was one of the most generous counties and the West Riding one of the least.<sup>24</sup> His general pattern cannot be disputed as Hampshire parishes typically relieved a greater portion of their inhabitants than those on the Yorkshire coalfield. However, West Riding fenland agricultural parishes like Arksey relieved many more residents than coalfield townships like Midgley and so resemble King's southeastern England.<sup>25</sup> Few accounts remain from parishes in north-west Yorkshire and poor relief appears to have been less extensive in that region. A further regional difference is that male-headed households formed a greater portion of those receiving relief in the arable regions of northern Hampshire and eastern Yorkshire than on the coalfield or around the New Forest. Samantha Williams associates the greater portion of men receiving relief with rising unemployment in arable Bedfordshire parishes.<sup>26</sup> While the administrative structure of state-legislated poor relief was similar across England, the pattern of fuel disbursement demonstrates that the provision of poor relief itself varied with local economic conditions, both within and between

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<sup>24</sup> Steven King, *Poverty and Welfare in England, 1700-1850: A Regional Perspective* (Manchester: Manchester University Press, 2000) 262-265 in particular but this comparison is made throughout the book.

<sup>25</sup> "Arksey Overseers Accounts" DA P14/6/B1/2-6, "Midgley Overseers Accounts" WYAS Calderdale MISC 86/1-2.

<sup>26</sup> Samantha Williams, *Poverty, Gender and Life-Cycle Under the English Poor Law 1760-1834*, (Rochester: Boydell Press, 2011) 131.

counties. More households were relieved in arable parishes than in pastoral or industrial ones.

### **Fuel Charity and Poor Law Fuel Disbursements**

Poor Relief, purchase and collection were not the only source of fuel for the poor. On the 23<sup>rd</sup> of February 1805, the *Leeds Mercury* reported that “Benj Atkinson of Manston, with his usual liberality, distributed last Saturday, to each of the poor families in the villages of Halton and Seacroft, near this town, a quantity of coals to cheer their cottages during this inclement season.”<sup>27</sup> Such gifts were made either at times of widespread distress or as an annual gift, often tied to holidays. One such example was the December 1814 gift of “two large fat oxen, and a large quantity of coals” from Richard Thompson to poor Yorkshire residents.<sup>28</sup> Poor residents were sometimes bequeathed annual gifts of fuel. Southampton resident Elizabeth Bird’s 1810 will provided £1200 in bank annuities, to help six poor Anglican unmarried women over the age of 60 in the parish of All Saints. They were to receive £5 per annum and the remaining £2 17s in interest was to be spent “every New Year in Coals to be distributed annually amongst the said Poor Women.”<sup>29</sup> Such forms of charity helped some households but do not leave systematic records and did not come with the expectation of relief provided by the Poor Law.

In most parishes without workhouses, poor relief largely consisted of cash pensions and payments. In addition, overseers often paid rents and provided clothing and fuel to some poor residents. The provision of fuel has been mentioned by numerous

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<sup>27</sup> *Leeds Mercury* 23 February 1805, 3.

<sup>28</sup> *Leeds Mercury* 31 December 1814, 3.

<sup>29</sup> “Bird’s Charity” SCA SC11/9.



Poor Law historians but has not previously been the specific focus of any study.<sup>30</sup> Fuel was sometimes provided for individuals in short term distress, as in September 1825, when Robert Farringdon of Doncaster was provided with 2d/day for coals as he was “still very ill & requiring fire night & day.”<sup>31</sup> Such provisions for the sick are further discussed in chapter 5. Overseers also made annual or semi-annual purchases of fuel for households. These purchases allow the amounts of fuel consumed by a few specific households and their change over time to be analyzed. The rest of the chapter will be devoted to these regular disbursements and the insights they offer for both fuel consumption and the changing nature of poor relief.

Sometimes overseers hired able-bodied poor residents to collect fuel for elderly and infirm paupers. This was most common in the peat and furze consuming regions of Hampshire. One such example is Fawley, on the south coast. In December 1829, its overseers paid William Head, Henry Cotton and Richard Heat 9s 9d for Cutting 650 furze faggots. Throughout 1830, they were also paying poor residents to cut turf and to transport both types of fuel back to the village by cart.<sup>32</sup> Fawley’s overseers did not always treat the cart workers well and the November 1830 riots “can be traced to the degrading practice of harnessing a pauper, in this case an idiot woman, to the parish

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<sup>30</sup> Petersen, *Bread and the British Economy*, 136, Steve King, “Reconstructing Lives: The Poor, the Poor Law and Welfare in Calverley, 1650-1820” *Social History* 22 (1997) 325-326, and *Poverty and Welfare*, 48, R.P. Hastings, *Povety and the Poor Law in the North Riding of Yorkshire c1780-1837* (Leeds: Borthwick Papers, 1982) 3, L.A. Botelho, *Old Age and the English Poor Law, 1500-1700* (Woodbridge: The Boydell Press, 2004) 47, Paul Slack, *Poverty and Policy in Tudor and Stuart England*, (New York: Longman, 1988) 82, E.M. Hampson, *The Treatment of Poverty in Cambridgeshire, 1597-1834* (Cambridge: Cambridge University Press, 1934) 184, Cage *Scottish Poor Law* 32, Williams *Poverty Gender and Life-Cycle*, 45, Snell, *Annals of the Labouring Poor* 105, Shirley Wittering, *Ecology and Enclosure: The Effect of Enclosure on Society, Farming and the Environment in South Cambridgeshire, 1798-1850* (Oxford: Oxbow Books, 2013) 31.

<sup>31</sup> “Doncaster Poor Law Memo Book 1825-1830” DA PL/D/2/2/14.

<sup>32</sup> “Fawley Poor Book 1828-1835” HRO 25M60/PO11.

cart.”<sup>33</sup> Most fuel provisions, especially in coal and wood-burning communities, consisted of purchasing fuel. In some parishes, such as Winchester St. Bartholomew in January 1804, coal or wood was purchased but local poor residents were again paid to transport it.<sup>34</sup> Not all parishes provided fuel to poor residents and in those that did, not all of those receiving relief received fuel. However, most parishes provided fuel in various forms according to their circumstances. Such disbursements were recorded in myriad terms in Overseers Accounts. This chapter relies upon the records of 17 Hampshire parishes and 26 West Riding townships or parishes that recorded fuel purchases with amounts of fuel and the names of those receiving it. Many entries, including the Hambledon Overseer’s 1801/2 purchase of “a Load of Faggots” for £1 5s, cannot be used for the purposes of this chapter.<sup>35</sup> They demonstrate that the community burned wood and that fuel was a component of poor relief but do not give any indication of the quantities of fuel provided to individual households

The types of households receiving fuel disbursements varied regionally. On the Yorkshire Coalfield, most of those receiving fuel were widows or other female-headed households. The overseers of Handsworth, near Sheffield, were explicit about this practice and referred to the fuel they purchased on 7 January 1822 as “Widows Coales.”<sup>36</sup> In Thurstonland, Denby and South Crossland, most recipients of coal were women, some of whom were referred to as widows.<sup>37</sup> Swinton was a few miles east of the coalfield and in most years of the early nineteenth century, three-quarters of the

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<sup>33</sup> Colson, “The Revolt of the Hampshire Agricultural Labourers” 59-60.

<sup>34</sup> “Winchester St Bartholomew Poor Book 1794-1814” HRO 55M81W/PO3.

<sup>35</sup> “Hambledon Overseers Accounts 1801-180” HRO 46M69/PO8.

<sup>36</sup> “Handsworth Notebooks of Daily Receipts and Payments 1821-1823” SA 19/4.

<sup>37</sup> WYAS Kirklees KC735/2, KC271/1-4, CP/SC/1-4.

households receiving fuel were headed by women.<sup>38</sup> These industrializing communities where coal was relatively cheap also tended to provide fuel to fewer residents than in the more agricultural districts of both counties. Recipients were evenly split between male and female headed households in most parishes providing fuel east of the Yorkshire coalfield and across Hampshire, reflecting greater underemployment of working-age men. In 1783/4, the overseers of Abbott's Ann, north-western Hampshire, purchased fuel for Widows Cully, Gale and Hains, along with William Main and William Cully.<sup>39</sup> In Tadley, north-west Hampshire, overseers provided turf for eight male and eight female headed households between April and October 1773, with the female headed households generally receiving more turves.<sup>40</sup> At Rawcliffe, in the south-eastern region of the West Riding, 15 of the 33 households receiving coal in the winter of 1789/90 were headed by men.<sup>41</sup> In Burton Leonard, north-eastern part of the West Riding, eight female-headed and 12 male-headed households received coal in 1828/9.<sup>42</sup> The more equal gender balance of household heads receiving fuel disbursements in these regions was a further distinction between industrializing regions of cheaper fuel and agricultural ones where it cost more. Agricultural parishes also disbursed fuel to more households, as adult men in those communities suffered from greater underemployment than did those in industrializing coalfield communities.

### **Fuel Disbursements in Hampshire and the West Riding of Yorkshire**

The accounting methods used by some overseers allow us to determine the amounts of fuel consumed by individual poor families. This is only possible where they

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<sup>38</sup> "Swinton Poor Book from 1805 to 1815" DA P59/6/B2/1.

<sup>39</sup> "Abbots Ann 1773-1786" HRO 24M68/PO3.

<sup>40</sup> "Tadley Overseers Accounts 1760-1782" HRO39M75/PO1.

<sup>41</sup> "Rawcliffe Overseers Accounts" DA P60/6/2/55.

<sup>42</sup> "Burton Leonard Overseers Accounts" NYCRO PR/BTD10/3/7.

recorded both a name and a specific amount of fuel. Entries like “paid for Fuel for the Widow Curtis 6s” from 22 March 1807 in Breamore, Hampshire offer no useful evidence of the amount consumed.<sup>43</sup> Even when the amount of fuel was specified in the disbursement, there were situations in which overseers did not provide all the fuel needed for the year. Occasional provision of fuel for the sick was not considered in the following analysis because it does not tell us how much fuel was typically consumed. Supplies to the sick will be further discussed in chapter five, but were generally small amounts provided on a few occasions during months when others were not receiving it. Instead, the following analysis uses the annual or semi-annual purchases of fuel for multiple residents, especially those who received fuel for consecutive years. In most parishes, various residents received different amounts of fuel. I have focused on individuals receiving the higher end of the range because they were less likely to be acquiring fuel by other means. However, it is possible that these individuals required more fuel because they were elderly or chronically ill. As in Thurstonland, disbursements were typically higher where fuel was cheaper. Prior to 1790, overseers typically spent between 8s and 15s on fuel for the households they supplied. In the West Riding this was close to the amounts recorded in Young and Davies labourers’ budgets. In wood-burning northern Hampshire overseers appear to have been disbursing somewhat less fuel than Davies’ labourers consumed.

West Riding Overseers’ Accounts demonstrate that fuel disbursements declined gradually as one moved from the west to the east. Fewer households received fuel disbursements in the western parts of the coalfield but overseers were the most generous in the amounts they gave. Chapter two emphasized that coal was especially

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<sup>43</sup> “Breamore Poor Book, 1806-1819” HRO 20M83/PO15.

cheap near the Lancashire border. Denby, a township in Penistone parish, was one such location. In 1779/80, only three residents received any coal from the local overseers, of which the largest sum was the 14s spent on Elizabeth Williamson. Two years later, she again received 14s worth of coals, consisting of six deliveries of one dozen each (~2.1 tons) in May, September, December, February, and twice in March.<sup>44</sup> The 14s spent on her coal is not particularly notable but the six dozens (~12.6 tons) she received is. Table 3-3 reinforces this regional pattern, with its evidence coming from Thurstonland, four miles north-west of Denby.

Deeper seams meant that coal was more expensive in the eastern parts of the Yorkshire coalfield and overseers provided somewhat less to poor families. In 1783, the overseers of Worsbrough, purchased a total of 52 dozens of coal from two collieries. Six specific recipients are mentioned, with Widow Lockwood, Mary Horbury and Edmund Parkin each receiving two dozen (~4.2 tons) of Barnsley coals costing 10s.<sup>45</sup> The amounts disbursed were less than further west but considerably more than in non-coalfield regions. Worsbrough is the only coalfield community in Table 3-2, and its overseers provided more fuel to individual households while spending less money on it than their non-coalfield equivalents.

Fuel disbursements were even less east of the coalfield. Wadworth was south of Doncaster in the central region and a dozen coals (~2.1 tons) cost 19s in 1776/7. That year seven households received coal, with Widow Eyre, Widow Wirral and Joseph Roebuck receiving three-quarters of a dozen (~1.6 tons) each and Jeremy Sharp,

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<sup>44</sup> "Denby Overseers Accounts, 1772-1801" WYAS Kirklees KC735/2.

<sup>45</sup> "Worsbrough Overseers Accounts 1738-1792" SA EM1002.

Widow Archer, William Barber and Elizabeth Bower a dozen (~2.1 tons) each.<sup>46</sup> Coal was more expensive in the north-eastern region of the West Riding and overseers typically distributed smaller amounts of it. For example, on 24 November 1772, the overseers of Kirkby Overblow, purchased 10 corves of coal (~1.35 tons) each for Mary Dickenson, Jonathan Richardson and Ann Derrick. Each of those 10 corves cost 10s 6d, the same as two dozen in Worsbrough.<sup>47</sup> South-eastern West Riding overseers provided smaller amounts of coal to more households than in other parts of the Riding. As mentioned earlier, Rawcliffe's overseers provided coal to 36 households in the winter of 1786/7. Each of those households received one sack (~0.11 tons) of coal on seven different occasions, at a cost of one shilling per sack.<sup>48</sup> Aside from Rawcliffe, the above overseers spent similar sums on coal but purchased vastly different amounts. They were typically spending similar amounts on fuel to those of Arthur Young's labouring families, so their disbursements to poor households were likely representative of the fuel consumed by labouring ones. The climate was cooler and damper in the western parts of the Riding but this extra coal implies different cooking regimes and higher indoor temperatures in winter.<sup>49</sup>

Tables 3-2, 3-3 and 3-4 demonstrate the regional diversity of fuel disbursements across Hampshire and the West Riding. In these tables, the county has been included in parentheses after the fuel region, with H for Hampshire and WR for the West Riding. These are the fuel regions described in chapter 2. In Hampshire these are the Isle of Wight (IoW), South-West (SW), Coast (C), Inland (I), North-East (NE) and North-West

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<sup>46</sup> "Wadworth Overseers Accounts 18<sup>th</sup> century" DA P21/6/B1/1.

<sup>47</sup> "Kirby Overblow, Account Book 1741-1785" WYAS Leeds RDP49/67.

<sup>48</sup> "Rawcliffe Overseers Accounts" P60/6/2/49. A sack was 1/12 of a chaldron or three bushels.

<sup>49</sup> Aikin, *Description of the Country Round Manchester*, 92.

(NW), while for the West Riding, they are the South Coalfield (SC), North Coalfield (NC), North-West (NW), North-East (NE), Central (C), and South-East (SE). All three tables begin with peat-burning Hampshire parishes, followed by wood-burning ones and then coal-burning West Riding communities. The amount of fuel and the money paid for it in columns 3 and 5 come from the Overseers Accounts as discussed above. Column four is an estimate of the amount of energy in the fuel disbursed with its methodology described in the footnote.

**Table 3-2: Amount of Fuel Customarily Disbursed to Individual Recipients in Selected Parishes in Hampshire and the West Riding of Yorkshire, c 1760<sup>50</sup>**

Parish	Fuel Region	Amount of Fuel	Estimated Energy in Tons of Coal <sup>51</sup>	Cost
Eversley	NE (H)	4000 turves	1.16 tons	6s <sup>52</sup>
Heckfield	NE (H)	60 faggots and 50 bavins	0.6 tons	13s 6d
Binstead	NW (H)	100 faggots	0.7 tons	12s
Bentley	NE (H)	50 faggots and 150 bavins	0.9 tons	14s 6d
Kirk Deighton	NE (WR)	1 load (10 sacks) coal	1.1 tons	10s
Kirkby Overblow	NE (WR)	8-10 corves coal	1.4-1.75 tons	8-10s
Braithwell	C (WR)	6 pulls of coal	1.1-1.8 tons <sup>53</sup>	12s
Worsbrough	SC (WR)	1-2 dozen coal	2.1-4.2 tons	3s – 6s 6d

None of the Hampshire parishes where Overseers' Accounts specify the amounts disbursed to individual households were along the coal-burning South Coast. Hampshire households receiving fuel disbursements were also typically given less than their Yorkshire equivalents. Prior to 1790, overseers in peat-consuming regions provided more fuel than those in wood-burning ones but spent less on it. Eversley was a peat-burning parish in north-eastern Hampshire. Its overseers generally specified only

<sup>50</sup> "Eversley and Bramhill Overseers Accounts 1738-1762" HRO 43M48/2026, "Heckfield Overseers Accounts 1741-1772" HRO 27M79/PO1, "Binstead Overseers of the Poor Accounts, 1742-1783" HRO 1M67/PO1, "Bentley Overseers Accounts 1727-1780" HRO 1M80/PO1, "Kirk Deighton Overseers Accounts" NYCRO PR/DEK/14/1, "Kirby Overblow, Account Book 1741-1785" WYAS Leeds RDP49/67, "Braithwell Overseers of the Poor Accounts 1760-1768" DA P71/6/B1/3, "Worsbrough Overseers Accounts 1738-1792" SA EM 1002.

<sup>51</sup> The following column is an estimate and intended only to enable broad comparisons between parishes. Exact conversions of early modern units or assessments of the energy density of specific coal, hardwood or peat purchases cannot be made. For this column, I have assumed that a dozen coals contained 2.1 tons, a chaldron 1.3 tons and a sack 0.11 tons, while for peat I assumed that 1000 turves was 1 ton. Wood is more problematic, but I treated 100 faggots as one ton and 100 bavins as 0.5 tons for this column. In Bramley both were purchased in 1792/3, 1793/4 and 1795/6 and half as much money was paid for the bavins. The price ratio was different in other places but treating bavins as half the size of faggots allows comparisons. As in chapter 1, I have used the middle of the ranges provided by Vaclav Smil for each type of fuel. I thus assume that wood had an energy density 71% that of coal while peat provided 29% the energy per ton. The column enables a comparison of the amounts disbursed but does not provide exact measurements.

<sup>52</sup> This price was likely only for cutting the turves and the transportation does not appear to have been paid for.

<sup>53</sup> A pull was a fraction of a dozen and synonym for a corve. While a dozen was 42 cwt on the South Coalfield, the number of pulls that composed it varied from 7 to 12. The range given is between ½ and 6/7 of a dozen. Given the price and its proximity to Lawood, this is more likely 6/7 of a dozen.



the amounts spent on cutting and delivering the entirety of the peat but in September 1759 they provided 4000 turves each to Dames Pursey, Mitchell and Fielden. Cutting each of these 4000 turves cost 6s.<sup>54</sup> Cutting and transporting peat cost more at Hale, in south-western Hampshire. In 1769/70, their overseers spent 8s-9s for 2000 turves for each of four households.<sup>55</sup> However, they were still providing more fuel for less money than their equivalents in wood-burning parishes like Lockerley. In 1776/7, its overseers purchased a hundred faggots for the households of Widow Curtis, Widow Woods and Benjamin Boner at a cost of 10s each.<sup>56</sup> Prices for wood were higher when Davies wrote in 1795, but these hundred faggots were still less than he estimated as the minimum requirement for a labouring household. Table 3-2 illustrates the amounts of fuel typically disbursed in parishes across the two counties in 1760, while Table 3-3 does the same for the mid-1780s. The expense per household was often similar but the amounts of fuel it purchased were not. These tables emphasize that the changing prices described in chapter 2 affected the amounts individual households consumed. They also demonstrate that although Young and Davies' labourers were spending comparable sums on fuel across the two counties, the amount of fuel this purchased varied significantly.

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<sup>54</sup> "Eversley and Bramhill Overseers Accounts 1738-1762" HRO 43M48/2026.

<sup>55</sup> "Hale Overseers Accounts 1769-1803" HRO 13M80/PO1.

<sup>56</sup> "Lockerley Poor Book, 1771-1794" HRO 47M66/1.

**Table 3-3: Amount of Fuel Customarily Disbursed to Individual Recipients in Selected Parishes in Hampshire and the West Riding of Yorkshire, c 1785<sup>57</sup>**

Parish	Fuel Region	Amount of Fuel	Estimated energy in tons of coal	Cost
Lyndhurst	SW (H)	2000 turves	0.6 tons	7s – 8s
Holdenhurst	SW (H)	3000 – 6000 turves	0.87 -1.74 tons	8s – 17s
Heckfield	NE (H)	60 faggots	0.43 tons	10s 6d
Lockerley	NW (H)	50-100 faggots	0.35-0.7 tons	5s 6d – 12s
Long Sutton	NE (H)	150-200 bavins	0.53-0.7 tons	9s 9d – 13s
Bentley	NE (H)	200 bavins	0.7 tons	14s
Rawcliffe	SE (WR)	6 sacks coal	0.67 tons	7s 2d
Birkin	C (WR)	1 -1.5 dozen coal	2.1-3.15 tons	11s – 16s 3d
Worsbrough	SC (WR)	1.5-2 dozen coal	3.15-4.2 tons	11s 3d -15s
Thurstonland	NC (WR)	5 dozen coal	10.5 tons <sup>58</sup>	13s

The price of coal in Yorkshire rose after 1790, that of Hampshire peat less so. Rising fuel prices and increasing poverty affected the ability of overseers to continue disbursing the same amounts of fuel. Table 3-4 illustrates the amounts of fuel typically disbursed in 1810, which was generally less than the amounts provided 25 years earlier. Few parishes left uninterrupted accounts of their fuel disbursements. However, from Table 3-4 and the other Accounts consulted, Yorkshire overseers generally disbursed similar amounts of coal in 1810 as they had done earlier, despite paying more

<sup>57</sup> All amounts used in this table come from evidence for years between 1783/4 and 1786/7, with 1785/6 used when possible. "Lyndhurst Overseers Rates and Accounts 1776-1786" HRO 25M84/PO2, "Holdenhurst Poor Book, 1771-1813," HRO 9M75/PO12, "Heckfield Overseers Accounts 1782-1791" HRO 27M79/PO3, "Lockerley Poor Book, 1771-1794" HRO 47M66/1, "Long Sutton Poor Book 1766-1826" HRO 78M72/PO7, "Account of the Parish of Bentley Poor Rates, 1781-1805," HRO 1M80/PO2, DA P60/6/2/49, "Parish of Birkin Accounts of Churchwardens, Overseers, and Constables from 1782 to 1905" BIA PR/BIRK/17, "Worsbrough Overseers Accounts, 1738-1792" SA EM1002, "Thurstonland Town Book 1775-1787" WYAS Kirklees KC271.

<sup>58</sup> The amounts of coal disbursed to individual poor households in Thurstonland and nearby Denby were considerably higher than in other communities but remained locally consistent until 1810. For 1784-5, the Thurstonland overseers provided three households with fuel disbursements of roughly 10 tons each, which is a substantial amount. These did not include extra fuel provided to ill paupers, as was mentioned on page 133. Most Thurstonland residents worked in domestic textile manufacturing and consequently spent more time indoors than those in agricultural communities and were likely accustomed to heating houses more often and to a greater extent. The *1801 Census* records 115 inhabited houses in Thurstonland and only three were receiving large fuel disbursements in 1784-5, leaving the possibility that some of this coal was being shared with others in a manner that was less likely in communities with smaller disbursements. Thurstonland had between 600 and 650 inhabitants in the mid-1780s and spent a total of £135 17s 4.5d on poor relief, or less than 5s/resident. That is not a particularly generous expenditure on poor relief, so their coal disbursements are likely the product of a manufacturing community with exceptionally cheap coal.

for it. Overseers in the peat-burning regions of north-east and south-west Hampshire also tended to maintain the amounts of fuel given to poor households, despite the greater distance that peat had to be transported to villages. Meanwhile, fuelwood in northern Hampshire became steadily more expensive after 1760 and overseers gradually distributed less of it. Between 1760 and 1810, fuel disbursements increasingly diverged between areas of cheaper and more expensive fuel. This is evident by comparing Tables 3-4, 3-3, and 3-2.

**Table 3-4: Amount of Fuel Customarily Disbursed to Individual Recipients in Selected Parishes in Hampshire and the West Riding of Yorkshire, c 1810<sup>59</sup>**

Parish	Fuel Region	Amount of Fuel	Estimated Energy in Tons of Coal	Cost
Lyndhurst	SW (H)	2000 turves	0.6 tons	10s -13s
Eversley	NE (H)	4000 – 6000 turves	1.16 – 1.74 tons	10s – 15s
Kimpton	NW (H)	23 faggots	0.16 tons	5s 5d
Ellisfield	NE (H)	75 bavins	0.27 tons	9s 9d
Bentley	NE (H)	150 bavins	0.53 tons	15s
Staveley	NE (WR)	1.5 chaldrons coal	1.95 tons	33s 9d
Kirk Deighton	NE (WR)	1 dozen coal	2.1 tons	19s
Swinton	C (WR)	1.5 dozen coal	3.15 tons	21s
Badsworth	C (WR)	2 dozen coal	4.2 tons	30s
Thurstonland	NC (WR)	4.5 dozen coal	9.45 tons	29s 10d

### Changes in Fuel Disbursements, 1805-1830

Between 1785 and 1805, the amounts of fuelwood provided to poor households in northern Hampshire declined, while coal and peat disbursements in other regions did not. After 1806, the amounts of fuel disbursed across Hampshire generally declined. A similar decline in West Riding coal disbursements occurred after 1810. Only a few

<sup>59</sup> “Lyndhurst Poor Book 1804-1813,” HRO 25M84/PO5, “Eversley Overseers Accounts 1803-1825,” HRO 48M43/2027, “Kimpton Poor Book 1807-1821” HRO 42M85/PO3, “Ellisfield Poor Book 1758-1828,” HRO 10M57/PA16, “Bentley Overseers Accounts 1805-1827,” HRO 1M80/P03, “Staveley Overseers Accounts 1801-1810,” NYCRO PR/SVL/14/6, “Kirk Deighton Overseers Accounts” NYCRO PR/DEK/14/1, “Swinton Poor Book from 1805 to 1815,” DA P59/6/B2/1, “Badsworth Overseers Accounts, 1810-1828,” WYAS Wakefield WDP19/71, “Thurstonland town book 1796-1809” WYAS Kirklees KCZ 271/2. As coal was measured by the load in Thurstonland after 1807, the 1806/7 disbursements for Bett Roebottom have been used. With the exception of Thurstonland, disbursements are from 1809/10 or 1810/1.

parishes' accounts provide long series of fuel disbursements with the names required to determine how many households were receiving it. Most of those parishes showed declines in fuel disbursements, and have been included in Table 3-5. I have arranged this table chronologically and used the same units as the original documents. The drastic declines in each parish are thus apparent. One year is given if there was an extended series of records and an abrupt decline occurred, while a range of years is given if the accounts for some years are not currently available. Similar declines are apparent in other parishes. From 1777 until her death in 1794, Elizabeth Williamson of Denby received at least four dozen (~8.4 tons), and usually more than five dozen (~10.5 tons), coals every year.<sup>60</sup> No poor household received such volumes of coal from overseers after 1815. In Bramley, north-east Hampshire, many poor households received between forty and sixty faggots annually between 1793 and 1804. Their Accounts from the 1810s have not survived, but in the early 1820s fewer households received fuel disbursements and those that did were typically given between ten and twenty faggots through the winter.<sup>61</sup> Although the timing of the decline varied between fuel regions, Bramley exemplifies changes through which overseers provided less fuel to fewer households after 1815 than they had previously.

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<sup>60</sup> "Denby Overseers Accounts 1772-1801," WYAS Kirklees KC735/2.

<sup>61</sup> "Bramley Poor Book Easter 1792-Easter 1811" and "Bramley Parish Book 1821-1835" HRO 63M70/PO2-3.

**Table 3-5: Parishes in which the Amount of Fuel Disbursed Declined 1806-1830<sup>62</sup>**

Parish	Fuel Region	Years of Change	Typical Disbursement Prior	Typical Disbursement After
Burnsall	NW (WR)	1796-1822	6 loads of turf and 4.5 loads of coal	2 loads of turf or 2 loads of coal
Kimpton	NW (H)	1806	50-100 faggots	20-50 faggots
Hale	SW (H)	1807	2-3 loads turf	1-2 loads turf
Arksey	SE (WR)	1813	1-1.5 waggons coal	0.5-1 waggon coal
Kirk Deighton	NE (WR)	1813	12-20 corves coal	8-12 corves coal
Binstead	NE (H)	1807-27	£1 2s in peat	None
Staveley	NE (WR)	1817-19	1-1.5 chalders coal	0.75-1 chalders coal
Gisburn	NW (WR)	1818-25	25-30 loads coal	15-20 loads coal
Swinton	C (WR)	1820	1-1.5 dozen coal	0.5-1 dozen coal
Barton Stacey	NW (H)	1820-23	75-100 faggots	18-30 faggots
Ellingham	SW (H)	1823-25	2-3 loads turf	1-2 loads turf
Wadworth	C (WR)	1824	1 load coals	None
Thurstonland	NC (WR)	1826	36 loads coal	None

Fuel disbursements declined without major legislative changes to the Poor Law.

Overseers usually served a one-year term and had considerable discretion over which individuals received relief and how much they were given. As such, the widespread decline in fuel disbursements was the product of decisions by numerous individuals in economically varied communities. However, there appear to be three main causes for the declining fuel disbursements after 1806. One is local economic difficulties.

Thurstonland was in a textile manufacturing area that suffered with the decline of hand-loom weaving after 1825.<sup>63</sup> The 1826 decision of its overseers to stop purchasing coal for poor households was probably connected to there being more people seeking relief and wishing to maintain poor households at a standard comparable to the declining

<sup>62</sup> "Burnsall Overseers Accounts" NYCRO PR/BNS/12, "Kimpton Poor Book 1791-1807" HRO 42M85/PO2, "Hale Poor Book 1803-1836" HRO 13M80/PO2, "Arksey Overseers Receipts" DA P14/6/B1/5, "Kirk Deighton Overseers Accounts" NYCRO PR/DEK/14/1, "Binsted Overseers of the Poor Accounts 1783-1809," "Binstead Overseers Accounts 1827-1847" HRO 1M67/PO2,4, "Staveley Overseers Accounts, 1810-1820" NYCRO PR/SVL/14/7, "Gisburne Township Book 1811-1825" and "Gisburne Township Book 1825-1829" YAS MD335/1/10/1/8-9, "Swinton Poor Accounts 1815-1822" DA P59/6/B2/2, "Barton Stacey Poore Book 1808-1824" HRO 60M70/PO3, "Ellingham Poor Book 1822-1828" HRO 113M82/PO2, "Wadworth Overseers Accounts" DA P21/6/B1/3, "Thurstonland Townbook 1822-1836" WYAS Kirklees KCZ271/4.

<sup>63</sup> Thompson, *Making of the English Working Class*, 314-319.

ones of large segments of the community. Barton Stacey was a north-western Hampshire parish with notable unemployment in the 1820s.<sup>64</sup> Alice Colson claims that lack of opportunities for poor residents were a major cause of its November 1830 riots.<sup>65</sup> As more households sought relief and the living standards of labouring households declined, overseers may well have been inclined to provide fewer faggots for Widow Waters and others.<sup>66</sup>

Another cause of declining fuel disbursements was increasing pressure on overseers to keep local rates low. From the years of the American War (1774-1783) on, the total sums collected for poor relief increased steadily in every English county. In Hampshire they rose from £48,928 in 1776 to £58,956 in 1784, £129,121 in 1803 and £162,618 in 1815. The increase was larger in the West Riding, where the £50,688 spent countywide in 1776 rose to £66,695 in 1784 and £197,097 in 1803.<sup>67</sup> By the 1790s, concerns about rising poverty and Poor Rates led to more discussions about keeping rates down and increasing concerns about the effectiveness of relief. Thomas Malthus asserted that “the parish laws of England appear to have contributed to raise the price of provisions, and to lower the real price of labour. They have therefore contributed to impoverish that class of people whose only possession is their labour.”<sup>68</sup> Many overseers were likely affected by such suggestions and Malthusian influence was apparent in the 1817 *Poor Law Report*. Its authors claimed that

The gradual increase which has taken place both in the number of paupers, and in the assessments for their support, can hardly fail to have

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<sup>64</sup> Poor Law Report (1834) 303A-304A

<sup>65</sup> Colson 27-29.

<sup>66</sup> “Barton Stacey Poore Book 1808-1824” 60M70/PO3.

<sup>67</sup> *Poor Law Report* (1817) 156-157. The 1815 number in this appendix combined the three Yorkshire Ridings and thus has not been mentioned.

<sup>68</sup> Malthus, *Essay on the Principle of Population*, 101.

arisen from causes inherent in the system itself, as it does not appear to have depended entirely upon any temporary or local circumstance. Scarcity of provisions, and a diminished demand for particular manufactures, have occasioned, from time to time, an increased pressure in particular parishes, and at no former time in so great a degree as during the early part of the present year.<sup>69</sup>

The *Poor Law Report* did not mention fuel explicitly but was generally supportive of workhouses and critical of relieving poor people outside them.<sup>70</sup> Its recommendations were not passed by parliament but it was indicative of the hardening attitudes towards poor relief. This can also be seen in books and pamphlets published after 1810.

Reverend C.D. Brereton complained that Poor Law “decrees consign the peasantry, and their children after them, to a very low condition. Improvident habits, regardlessness of consequences, and despair of success, deprive them of all qualifications for any other situation in life.”<sup>71</sup> These all suggest a changing set of attitudes to poor relief in the decades before the New Poor Law was introduced. Fuel disbursements declined in the same decades when parliament and political economists were debating the elimination of outdoor relief, suggesting that new attitudes, growing pressure on rates and local economic decline contributed to this reduced generosity.

## Conclusion

In the 1780s, Poor Law fuel disbursements in the West Riding resembled Arthur Young and David Davies’ observations of a few labouring households in the 1760s and

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<sup>69</sup> *Poor Law Report* (1817) 8.

<sup>70</sup> *Poor Law Report* (1817) 20.

<sup>71</sup> Rev C.D. Brereton, *Observations on the Administration of the Poor Laws in Agricultural Districts, Third Edition* (Norwich: J. Hatchard and Son, 1825), 59. Other examples include, Edward Gibbon Wakefield, *Swing Unmasked: or, The Causes of Rural Incendiarism* (London: E Wilson, 1831), J.E. Bechino, *An Inquiry into the Poor Laws, Chiefly with a view to Examine Them as a Scheme of National Benevolence, and to Elucidate their Political Economy, Second Edition*, (London: R. Hunter, 1824), David Ricardo, *On the Principles of Political Economy, and Taxation* (London: John Murray, 1817) 110-111 and John Weyland, *A Short Inquiry into the Policy, Humanity and Past Effects, of the Poor Laws; Particularly as they are Connected with the Principle of Population*, (London: J. Hatchard, 1812).

1790s. Davies did not include peat-burning households in Hampshire, but in wood-consuming regions, his labouring families consumed more than was disbursed by overseers. As such, the fuel provided to poor households in the eighteenth century was often similar to that consumed by some other members of society. M.J. Daunton claims that recipients of poor relief had a similar standard of living to labouring families until the early nineteenth century.<sup>72</sup> Used judiciously, Overseers Accounts suggest typical fuel consumption amongst poorer households in many English parishes. In Hampshire and the West Riding of Yorkshire, they indicate that more fuel was consumed in places where it was cheaper. The declining fuelwood disbursements in northern Hampshire appear to have been driven by rising prices that caused similar decisions amongst labouring households. This is no surprise but offers greater insights into actual eighteenth-century English lives than calculations assuming households consumed 16.25 million BTUs of fuel.<sup>73</sup> It also complements the research of Komlos and Nicholas and Steckel, who found that food consumption varied regionally and declined across England between 1770 and 1815.<sup>74</sup>

Poor Law fuel disbursements were indicative of the consumption of labouring households prior to 1805 and their decline in the following decades probably was as well. The food supply of an expanding English population was limited by the amount of available land and general constraints of an organic economy. This was the same for

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<sup>72</sup> Daunton, *Progress and Poverty* 450.

<sup>73</sup> Allen and Weisdorf, "Was there an 'industrious revolution' before the industrial revolution?" 718. Their numbers come from Clark, "The Price History of English Agriculture, 1209-1914" <http://www.econ.ucdavis.edu/faculty/gclark/papers/Agprice.pdf> (accessed 3 January 2012) 10-11. He assumes one ton of coal contained 24 million BTUs and a ton of fuelwood 17.2 million BTUs. Thus, 16.25 million BTUs would be 0.68 tons of coal or 0.94 tons of wood.

<sup>74</sup> Nicholas and Steckel, "Heights and Living Standards of English Workers" 937-957, Komlos, "The Secular Trend in the Biological Standard of Living" 115-144 and David Meredith and Deborah Oxley, "Food and Fodder: Feeding England, 1700-1900" *Past and Present* 222 (2014) 211.



fuelwood and can be seen in its rising prices. Declining wood consumption in northern Hampshire resembled that in Denmark, where Thorkild Kjaergaard finds that average fuel consumption halved between 1500 and 1800, with a resultant increase in tuberculosis.<sup>75</sup> The coal consumed in coastal Hampshire and throughout the West Riding was part of a mineral economy, its availability was not limited by population growth and its prices were more stable.<sup>76</sup> Instead, the fuel consumption of poor households was related to their income and decisions about what to purchase. The documentary evidence for declining living standards is sparse but suggests that labouring households across both counties also consumed less fuel by the 1820s. Joseph Lawson, of industrial Pudsey, remembered the general poverty of the 1820s and noted that “few persons can afford to keep much coal by them.”<sup>77</sup> As mentioned earlier, E.P. Thompson and Alice Colson describe increasing poverty in many parts of Hampshire and West Riding textile villages in the 1820s. All of these suggest that labouring households were likely consuming less fuel in 1825 than in 1800 but whether this decline was as steep as those in Poor Law disbursements cannot be determined with the available evidence.

It seems reasonable to assume that overseers provided poor households with the amounts of fuel they thought necessary to maintain their survival and a minimum degree of comfort, within the pressures of keeping local rates low. Rising fuel prices, ratepayers' attitudes and the amount overseers thought it reasonable for poor households to consume probably caused the declining fuel disbursements. In the wood-

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<sup>75</sup> Thorkild Kjaergaard, *The Danish Revolution, 1500-1800: An Ecohistorical Interpretation*, David Hohnen trans. (New York: Cambridge University Press, 1994) 97-98, 185-191.

<sup>76</sup> Wrigley, *Continuity, Chance & Change*.

<sup>77</sup> Lawson, *Letters to the Young on Progress in Pudsey*, 22-23.

burning parishes of northern Hampshire, this decline began in the 1760s and was related to the cost of faggots. In other regions, there was less direct connection to rising prices. In these circumstances, declining fuel disbursements were also caused by changes in the overseers' beliefs as to how much fuel poor people should consume. Declining consumption amongst labouring households influenced overseers by reducing the conditions considered reasonable. Overseers' attitudes could also change for other reasons and the growing influence of T.R. Malthus, the rise of political economy and the *Poor Law Report* cannot be separated from the declining peat and coal disbursements in the same years. In this regard, they indicate an Old Poor Law that was gradually becoming less generous in the decades before 1834 without legislative changes. This also suggests that after 1806, coal and peat disbursements declined more than that consumed by labouring households and a greater disparity ensued between them and those receiving poor relief.

The regional pattern of fuel consumption and various declines are essential evidence for the arguments of subsequent chapters. Chapter five discusses the impact of fuel consumption on regional differences in diet and health. However, attention will next be directed to conflicts over access to fuel and particularly prosecution for its theft, which was most frequent after 1815 in northwestern Hampshire, a region of expensive wood and declining consumption.

## Chapter Four: Pilfered Coal and Lopped Timber: Fuel Theft in Hampshire and the West Riding of Yorkshire, 1757-1830

Fuel was always more expensive in Hampshire than in the West Riding of Yorkshire. Fuel-intensive industries only expanded where fuel was affordable and coal-fired industrialisation did not occur in Hampshire before 1830. In the early nineteenth century, wood-burning households in northern Hampshire consumed less than one-eighth as much energy as those on the Yorkshire coalfield while paying more for it. One consequence of these high prices and low consumption was that more fuel theft was prosecuted in Hampshire. In 1822, ten Hampshire men and two women were indicted for stealing firewood. Seven of them were from the northwestern part of the county, where wood was especially expensive. In addition, Henry Bull was convicted of stealing half a bushel of coals and at least ten people were summarily committed for unlawfully cutting trees.<sup>1</sup> Meanwhile, the West Riding County Quarter Sessions covered more than three times the population of Hampshire's Sessions but prosecuted only one fuel thief in 1822. William Walker of Pontefract pleaded guilty to stealing a peck of coals on 1 February.<sup>2</sup> In fact, regional fuel differences were such in 1822 that 58 proprietors of steam-engines and industrial furnaces on the Yorkshire coalfield were indicted for the nuisance caused by their emissions.<sup>3</sup> These cases and the pollution involved will be dealt with in chapter five. However, they contrast a Yorkshire coalfield in which court proceedings were needed to limit the noxious effects of large-scale fuel consumption

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<sup>1</sup> "Easter Sessions 1822 Indictments," "Midsummer Sessions 1822 Indictments," "Michaelmas Sessions 1822 Indictments" and "Epiphany Sessions 1823 Indictments" Hampshire Record Office QS9/1/566-569.

<sup>2</sup> "Quarter Sessions Indictment Books" West Yorkshire Archive Service Wakefield QS4/56/99.

<sup>3</sup> "Quarters Sessions Indictment Books" WYAS Wakefield, QS4/56/101-240

with northwestern Hampshire where the Quarter Sessions focused on the behaviour of fuel-poor residents.

Most fuel theft was not prosecuted and records do not remain for most proceedings. However, fuel theft was a larger component of criminal justice in Hampshire than in the West Riding. Such prosecutions were more frequent when fuel was more expensive. They increased as a proportion of Hampshire indictments after 1815, while declining as a share of Yorkshire indictments after 1800. This chapter examines the prosecution of fuel theft in Hampshire and the West Riding between 1757 and 1830. It begins with descriptions of fuel theft and a brief discussion of the relationship between fuel theft and enclosure. Most of this chapter looks at indictments presented at the County Quarter Sessions. That includes an examination of regional and temporal changes in Quarter Sessions indictments for all offences. Fuel theft prosecutions did not conform to the same patterns as other indictments. Their occurrence in both County Quarter Sessions, along with the Basingstoke and Newport Borough Quarter Sessions is then examined. The theft of living trees was prosecuted by summary conviction. Those proceedings have not left as much evidence but the final section of this chapter discusses those committed to gaol for such offences. All of the evidence in this chapter indicates that fuel theft was a much larger component of criminal justice in Hampshire than in the West Riding, particularly after 1815. As such, it is further evidence of fuel poverty in northern Hampshire during those years.

### **Observations of Fuel Theft**

Both eighteenth-century observers and current scholars associate fuel theft with poverty and unequal access. In 1797, William Morton Pitt claimed that one

consequence of high fuel prices was “that breaking down hedges, lopping trees, and plundering woods and coppices, prevail so generally amongst the poor.”<sup>4</sup> On 14 January 1831, *The Times* described “the severe privations occasioned by the scarcity and high price of fuel, and of the depredations to which plantations and palings are, in consequence, exposed.”<sup>5</sup> Karl Marx distinguished between the taking of living wood, fallen wood and felled wood. He objected to increasing the enforcement of rules against collecting wood as the expropriation of previous common property by the privileged classes. He claimed that “anyone who takes away felled wood takes away property. In the case of fallen wood, on the contrary, nothing has been separated from property.”<sup>6</sup> Peter Linebaugh followed up on Marx’s arguments, finding that in nineteenth-century Prussia the wood theft prosecution rate reflected varying levels of local poverty and types of land tenure.<sup>7</sup> Others note that rising wood prices led to more complaints about its collection and prosecutions for its theft. Jeremy Hayhoe argues that rising timber prices led eighteenth-century Burgundian lords increasingly to enforce forest boundaries and prosecute more wood theft.<sup>8</sup> Quebec historian Daniel Rueck finds that rising wood prices in the 1870s led to it being both taken from common land against local custom

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<sup>4</sup> William Morton Pitt, *An Address to the Landed Interest on the Deficiency of Habitations and Fuel, for the Use of the Poor*, (London: Elmsly and Bremmer, 1797) 2.

<sup>5</sup> *The Times* 14 January 1831

<sup>6</sup> Karl Marx, “Proceedings of the Sixth Rhine Province Assembly – Debates on the Theft of Wood” *Rheinische Zeitung*, 25 October – 7 November 1842, in *Karl Marx, Frederick Engels Collected Works, volume I* (New York: International Publishers, 1975) 226-227. The original was: „Wird ferner gefälltes Holz einem Dritten entwendet, so ist das gefällte Holz ein Produkt des Eigentümers. Gefälltes Holz ist schon formiertes Holz. An die Stelle des natürlichen Zusammenhanges mit dem Eigentum ist der künstliche Zusammenhang getreten. Wer also gefälltes Holz entwendet, entwendet Eigentum. Beim Raffholz dagegen wird nichts vom Eigentum getrennt. Das vom Eigentum getrennte wird vom Eigentum getrennt.“ Karl Marx, “Debatten über das Holzdiebstahls-gesetz” *Rheinische Zeitung* 298 (25 October 1842) 112.

<sup>7</sup> Peter Linebaugh, “Karl Marx, The Theft of Wood, and Working Class Composition: A Contribution to the Current Debate,” *Crime and Social Justice* 6 (1976) 14.

<sup>8</sup> Jeremy Hayhoe, *Enlightened Feudalism: Seigneurial Justice and Village Society in Eighteenth-Century Northern Burgundy*, (Rochester: University of Rochester Press, 2008) 188-189

and stolen from private land for further sale.<sup>9</sup> Meanwhile, Linebaugh also wrote about coal theft prosecutions in London, emphasizing that they arose out of a combination of poverty and coal's essential household functions.<sup>10</sup>

Robert W. Bushaway describes village traditions of gathering wood in Hampshire and neighbouring counties that were criminalized in the early eighteenth century. He focuses on the prosecution of Winchester College tenants who continued to collect wood from its lands at Eling, in southwestern Hampshire, despite attempts to turn the plot into a timber plantation.<sup>11</sup> Bushaway's work explains the local circumstances behind the conflict but does not account for regional variation or change as effectively as Linebaugh, Rueck and Hayhoe. As Bushaway deals with the only Hampshire wood theft case to result in transportation in this period, I decided to focus on a more quantitative analysis that better addresses regional variation and change.

Numerous Hampshire and West Riding residents referred to fuel theft in this period. In 1748, Joseph Hinxman of Christchurch, Hampshire complained that in the New Forest there were "idle people thereabout in Lopping Topping and cutting the Trees and stealing the Wood," with eleven of them tried at a Forest Court.<sup>12</sup> At Barnborough, in the central West Riding, the lord sought a legal opinion in 1791 to determine whether action should be taken over the cutting of three oak timber trees on

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<sup>9</sup> Daniel Rueck, "Enclosing the Mohawk Commons: A History of Use-Rights, Landownership, and Boundary-Making in Kahnawá:ke Mohawk Territory," (PhD Thesis, McGill University, 2013) 183,223.

<sup>10</sup> Peter Linebaugh, *The London Hanged: Crime and Civil Society in the Eighteenth Century*, (New York: Cambridge University Press, 1992) 304-305.

<sup>11</sup> Robert W. Bushaway, "From Custom to Crime: Wood-Gathering in Eighteenth- and Early Nineteenth-Century England: A Focus for Conflict in Hampshire, Wiltshire and the South" *Outside the Law: Studies in Crime and Order 1650-1850*, John Rule ed (Exeter: Department of Economic History, 1982) 65-72, Bob Bushaway, *By Rite: Custom, Ceremony and Community in England 1700-1880* (London: Junction Books, 1982) 207-231. The Eling case is discussed on pages 219-225.

<sup>12</sup> "Letter from Joseph Hinxman to Duke of Bedford 26 September 1748," HRO 149M89/R4/6141.

the common.<sup>13</sup> Bingley commented on the professional timber thieves of the New Forest in the 1810s. “In a night’s time they have been known to cut down, carry off, and lodge safely in the hands of some receiver one of the largest oaks in the forest.”<sup>14</sup> In the 1817 parliamentary report on poor relief in England, Joseph Sabine of Hertfordshire claimed that in his region “generally speaking, the women steal wood” in order to acquire fuel.<sup>15</sup> Joseph Lawson of Pudsey, on Yorkshire’s north coalfield, recalled 1820s coal theft. “It frequently happens that some neighbour whose coal ‘heap’ or pile is either used up, or getting low, helps himself or herself from others which are often in close proximity.”<sup>16</sup>

Newspapers also provide evidence of fuel theft by reporting on summary convictions or publishing advertisements warning against it. On 9 March 1805, the *Leeds Mercury* reported that “Abraham Ainsworth of Kirkstall, was convicted before the Magistrates,” “for cutting up, and carrying away a quantity of underwood, from Hawksworth wood.”<sup>17</sup> Because most summary convictions are not recorded, such newspaper stories are the only evidence of cases like Ainsworth’s that did not result in a prison sentence. Rewards were sometimes offered for information about wood theft and the printed copies of these occasionally survive. In July 1823, Lord Palmerston’s estate in Hampshire offered a reward of 10 guineas for information leading to convictions after 200 young trees were damaged in East Grove.<sup>18</sup>

These aforementioned examples all demonstrate that the theft of timber, underwood and coal were concerns for many people across England at various points

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<sup>13</sup> “Manor of Barnborough Correspondence” Sheffield Archives NBC 22.

<sup>14</sup> “Notes for a General History of Hampshire, Volume 7, Forests” HRO 16M79/7.

<sup>15</sup> Poor Law Report (1817) 73.

<sup>16</sup> Lawson, *Letters to the Young on Progress in Pudsey*, 22.

<sup>17</sup> *Leeds Mercury* 9 March 1805, 3.

<sup>18</sup> “Advertisement from Romsey 23 July 1823” University of Southampton Archives BR113/3/5

between 1757 and 1830. They also offer more detail on specific incidents than most legal records. Such evidence becomes more frequent in Hampshire after 1815, which suggests that wood theft was increasing. However, the survival of newspapers, advertisements and correspondence is sporadic and can only indicate that fuel theft was frequently a subject of concern for elites or, in Lawson's case, remembered. In order to better understand how it changed, most of this chapter will thus be dedicated to analyzing the rate of prosecution.

Historians like J. Birrell who write about fuel theft in earlier centuries rely upon the records of manor courts.<sup>19</sup> They emphasize that fuel theft prosecution resulted from local conflicts over changing access to specific plots of land. Manor courts continued to function in many parts of Hampshire and the West Riding into the nineteenth century. Brodie Waddell observes that manor courts in the central West Riding occasionally dealt with hedge-breaking or excessive collection of furze, turves and underwood in the second half of the eighteenth century.<sup>20</sup> A few manor court records were consulted for this project. In some, the court merely recorded the admission of new tenants while in Rotherham it dealt with many trespasses, without recording the type of trespass.<sup>21</sup> However, some manor courts continued to present infractions involving fuel. These include Twyford, in inland Hampshire, which was mentioned in chapter one. Between 1816 and 1823, the manor court reiterated that residents had been damaging Colden

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<sup>19</sup> J. Birrell, "Common Rights in the Medieval Forest" *Past & Present* 117 (1987) 22-49 is one good example.

<sup>20</sup> Waddell, *Landscape and Society in the Vale of York*, 48. He noted 515 presentments from 30 manor courts in the Vale of York between 1750 and 1850 of which eight were in his category of 'unlawful appropriation', which includes those offences along with encroachments or collecting excessive sand and timber.

<sup>21</sup> "Manor of Rotherham" Rotherham Archives 63/B/7/E/15. Examples of manor courts that mostly recorded admittances include: "Manor of Armthorpe Court Leet" RA 186/F6/2, "Accounts of the Ecclesall Manor, 1791-8" SA NBC 29, "Manor of Farnborough 1795-1825," "Newland Manor, 1742-1792" and "Winchfield Manor Court Presentments, 1768-1806" HRO 1M45/6, 5M51/140 and 7M83/1/1.



Common by the collection of turf.<sup>22</sup> Those were the same years when wood and coal theft prosecution rose across Hampshire. Manor courts are an important source on fuel theft but their records are too sporadically preserved and their content too varied to properly analyze regional difference or change.

### **Enclosure, Riot and Fence Breaking**

J.M. Neeson writes about the resistance of smallholders and laboring people to enclosure in Northamptonshire. One form of resistance was the destruction of newly erected fences, which “were taken down and carried home to burn.”<sup>23</sup> Fence-breaking impeded enclosure while also providing fuel, but was rarely caught and prosecuted.<sup>24</sup> The few prosecutions focussed on the destruction of property and tried these incidents under different statutes and common law doctrines than indictable thefts. One such prosecution was at the Easter 1776 Hampshire Sessions. Peggy Kerley, Elizabeth Silvey and Mary Best of Christchurch were found not guilty of a conspiracy to pull down fences.<sup>25</sup> Hampshire Calendars of Prisoners record 159 summary convictions for stealing or illegally cutting trees between 1757 and 1830. Of those 23 were for stealing wood from hedges or destroying them. These include 14-year-old Ann Dennett, who was committed for one month on 8 April 1809 “for stealing hedgewood.”<sup>26</sup> In addition, John Ventham was committed for three months on 3 January 1827 “for taking and destroying a gate for fire-wood.”<sup>27</sup> In the West Riding, seven men and two women were indicted in six such incidents. These include Benjamin and Joseph Hallam, yeomen

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<sup>22</sup> “Twyford Manor Court Presentments 1798-1873” HRO 46M72/M32,

<sup>23</sup> J.M. Neeson, “The Opponents of Enclosure in Eighteenth-Century Northamptonshire,” *Past and Present* 105 (1984) 130.

<sup>24</sup> Neeson, *Commoners* 259-293.

<sup>25</sup> “Easter Sessions 1776 Indictments” HRO Q9/1/381.

<sup>26</sup> “Easter Sessions 1809 Indictments” HRO Q9/1/515.

<sup>27</sup> “Epiphany Sessions 1827 Indictments” HRO Q9/1/581

from Bilton with Harrogate, who were found not guilty of breaking fences to two closes and assaulting Thomas Gill in June 1792.<sup>28</sup> Fences were usually made of stone in upland Yorkshire, so Hannah Lee and Martha Ellis' breaking of an Almondbury fence in August 1814 did not directly provide fuel.<sup>29</sup> Riots were covered by their own statutes, with eight riots in the West Riding and one in Hampshire involving the destruction of fences or walls to enclosed land. There were also five West Riding riots and one in Hampshire that involved the destruction of coal mines and their property.<sup>30</sup>

As Linebaugh found in the Rhineland, enclosure could contribute to fuel theft by criminalizing subsistence use of specific plots of land. Silvia Pinches claims that many English landowners believed that enclosure led to an increase in wood theft.<sup>31</sup> This is difficult to substantiate from the extant records as Calendars of Prisoners did not usually specify the locations for summary convictions. The Quarter Sessions dealt with the theft of felled wood, cut peat and coal which follow Marx's definition of property and the categories of English law. Some of these occurred after enclosure. Blendworth was an inland Hampshire parish whose 1815 enclosure included over 1,000 acres of mostly wooded common downs.<sup>32</sup> Thomas Hopgood, a local labourer, was indicted on 13 November 1824 for stealing "a certain quantity of cord wood" from Thomas Nash.<sup>33</sup> A direct link between that incident and the enclosure of a wooded common cannot be

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<sup>28</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/43/84.

<sup>29</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/52/152. They were found guilty in January 1815 and sentenced to 14 days each of solitary confinement.

<sup>30</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/37/46-47, QS4/38/202-203 and QS4/38/261-262, "Open Letter from Henry Howard to Joseph Kenyon, Master Cutler, 17 November 1774" BL ADD MSS 27,538/228, "Records relating to Coal Working at Shugden Head" WYAS Halifax CNN 105/4 and "Epiphany Sessions 1831 Indictments" HRO Q9/1/591.

<sup>31</sup> Pinches, "From Common Rights to Cold Charity" 39.

<sup>32</sup> "Chalton, Catherington, Clanfield, Blendworth and Idsworth Inclosure Act 1812," and "Charlton, Blendworth and Idworth Inclosure Map 1815" HRO 124M71/E2 and Q23/2/15.

<sup>33</sup> "Epiphany Sessions 1825 Indictments" HRO Q9/1/577. He was found guilty and imprisoned to one month's hard labour.

made but it is possible that the latter contributed by reducing Hopgood's access to fuel. There are other Hampshire parishes in which the only prosecutions for fuel theft occurred in the decade after enclosure but these are not the majority of indictments. As such, enclosure likely contributed to the increasing prosecution of Hampshire wood theft but not in ways that can be easily proven with the surviving evidence.

### **Quarter Sessions**

The Quarter Sessions tried non-capital indictable offences, including the theft of coal, felled wood or cut peat. Occasionally, they also prosecuted repeat offenders for cutting down timber trees.<sup>34</sup> The Quarter Sessions met in January, April, July and October each year and were held separately in each county. I consulted the extant indictments for the West Riding and Hampshire County Quarter Sessions from April 1757 to January 1831. The West Riding Quarter Sessions were held separately at three locations every July, October and January and met jointly in Pontefract in April. Cases were heard at the nearest location, creating three regions that resemble the 1974 division between North Yorkshire, West Yorkshire and South Yorkshire. In each of January and October 1761, one region is missing, while two of the three sessions have not left records for January 1767. In Hampshire the indictments from a number of sessions, especially between 1826 and 1829, no longer exist.<sup>35</sup> Aside from Hampshire in the late 1820s, the few sessions whose records are missing do not have a large impact on the following analysis.

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<sup>34</sup> Bushaway, *By Rite* 217-225. In Hampshire, there were 20 men indicted in 14 incidents for cutting down trees between 1793 and 1825. HRO Q9/1/452-578.

<sup>35</sup> The missing Hampshire Sessions are Midsummer 1759, Easter 1806, Easter 1807, Michaelmas 1809, Easter 1813, Epiphany, Easter, Midsummer and Michaelmas 1826, Epiphany, Easter, Midsummer and Michaelmas 1828, Epiphany and Michaelmas 1829.

Towns with borough status held their own Quarter Sessions, separate from those for the county. These records have not often survived, but those from Basingstoke and Newport will be discussed later. The separate Borough Sessions mean that a few towns, notably Leeds, Portsmouth, Southampton and Doncaster did not send indictments to the County Sessions. Some boroughs held their own Quarter Sessions but also sent many indictments to the County Sessions. Pontefract held its own Sessions but its records do not mention any criminal proceedings.<sup>36</sup> Meanwhile, the West Riding County Sessions heard 125 indictments for offences that occurred there between 1757 and 1830. Similarly, Romsey and Newport sent many cases to the Hampshire Sessions in addition to their borough sessions. As such, it appears that Otley, Leeds, Doncaster and the Liberty of Ripon were not covered by the West Riding County Sessions. Meanwhile, Portsmouth, Southampton, Basingstoke and Andover were not covered by the Hampshire Sessions. The following two charts indicate the population of each fuel region in 1801 and 1831 without those locations. They thus represent the likely population covered by the County Quarter Sessions in each region.

**Table 4-1: Populations of each Fuel Region represented at West Riding Quarter Sessions<sup>37</sup>**

Fuel Region	1801 Population	1831 Population
South Coalfield	89,869	161,596
North Coalfield	244,079	442,336
North-West	46,806	64,913
North-East	33,352	44,027
Central	50,679	69,918
South-East	21,900	31,910
Total	486,685	814,700

<sup>36</sup> "Pontefract Borough Quarter Sessions 1751-1776," "Pontefract Borough Quarter Sessions, 1776-1807," and "Pontefract Borough Quarter Sessions, 1807-1841" WYAS Wakefield WMT/PO/10/1-3.

<sup>37</sup> Populations for Tables 4-1 and 4-2 are from Wrigley, *Early English Censuses* Table A1.5

**Table 4-2: Populations of Each Fuel Region represented at Hampshire Quarter Sessions**

Fuel Region	1801 Population	1831 Population
Isle of Wight	22,097	35,431
South-West	27,448	37,473
Coast	44,652	59,431
Inland	20,861	28,107
North-East	29,947	39,978
North-West	25,511	34,195
Total	170,516	234,615

Between 1757 and 1831, the population covered by both County Sessions increased substantially. In Hampshire, it grew by approximately three-quarters and in the West Riding more than one and half fold.<sup>38</sup> The annual number of prosecutions also rose in both counties. Some of that growth was due to a larger population. Prosecutions also increased as criminal justice changed. Douglas Hay describes an eighteenth-century legal system with low levels of prosecution in which the prospect of judicial discretion encouraged deference and obedience amongst labouring people.<sup>39</sup> Douglas Allen, Michel Foucault and Michael Ignatieff describe the transformation of this exemplary penal system into one increasingly interested in dealing with every offender.<sup>40</sup> New attitudes contributed to the rising number of indictments after 1810. The following two charts trace the total number of indictments in each county's Quarter

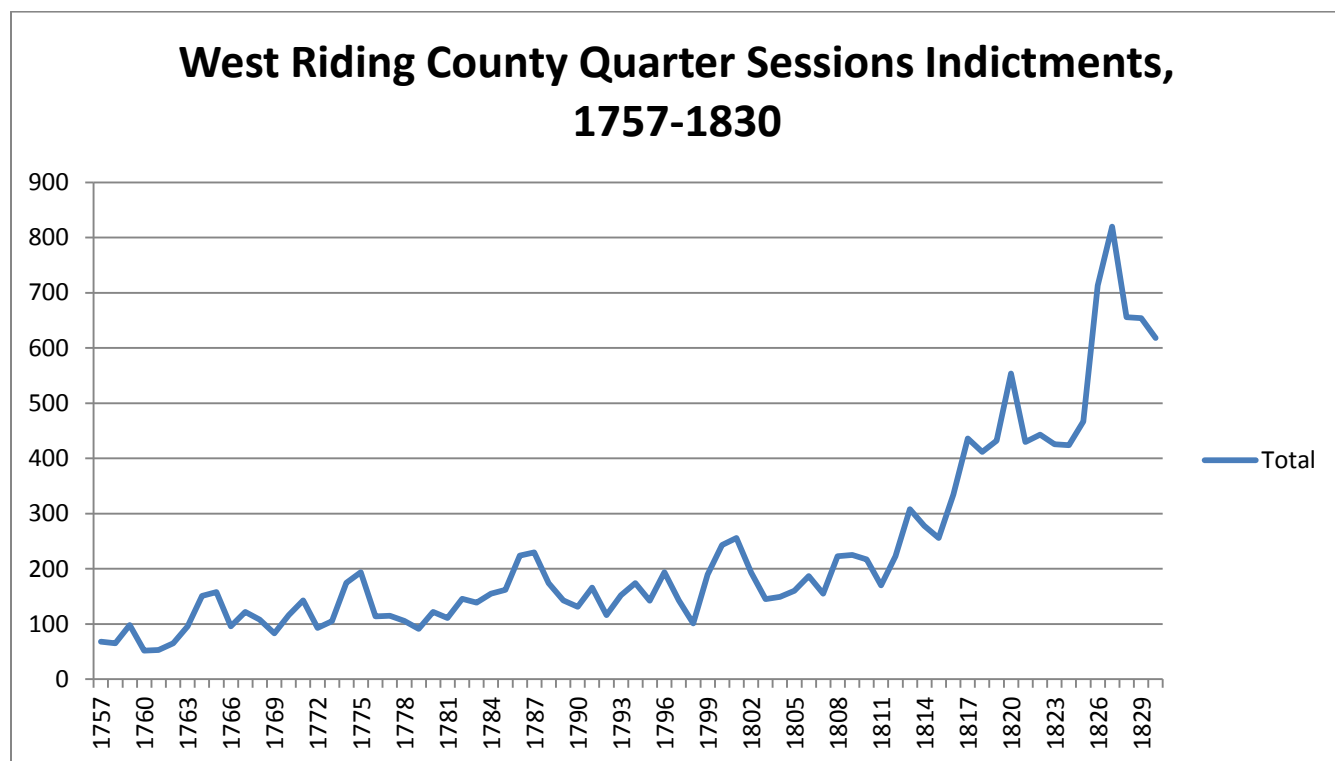
<sup>38</sup> Wrigley, *Early English Censuses*, Table A2.7. Prior to 1801, he has calculated the populations for each census division. These do not correspond perfectly to the fuel regions and have not been included in Tables 4-1 and 4-2. Wrigley does not provide 1761 populations for Andover, Basingstoke and Otley. However, removing Portsmouth, Southampton, Leeds, Doncaster and Ripon from the county population totals for 1761 and 1831 gives an approximate scale of growth. In Hampshire, this would leave 141,127 people in 1761 and 249,533 in 1831, or a 77% increase. In the West Riding, this leaves 318,785 people in 1761 and 844,495 in 1831, or a 165% increase. There are also some slight discrepancies in the county totals from corrections he has made to those but not to the parish populations from which 4-1 and 4-2 are calculated.

<sup>39</sup> Douglas Hay, "Property, Authority and the Criminal Law" in *Albion's Fatal Tree: Crime and Society in Eighteenth-Century England*, Douglas Hay ed, (Brooklyn: Verso Books, 2011, first published 1975) 49-56.

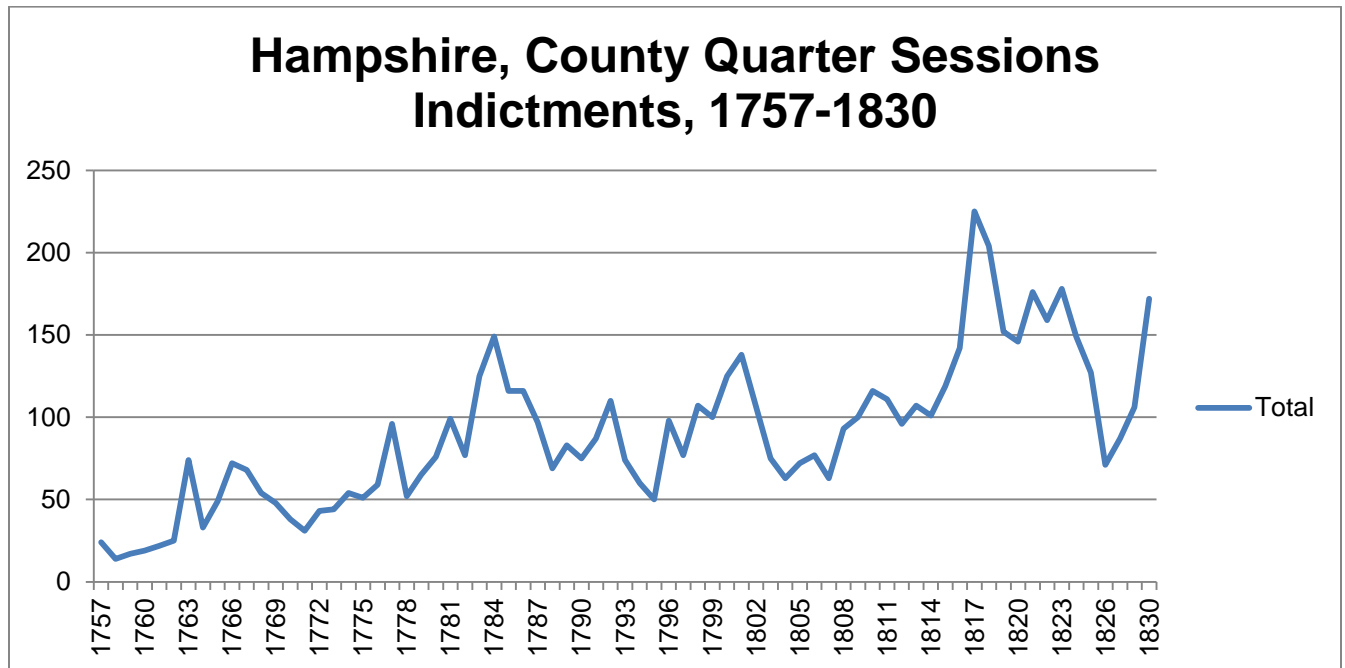
<sup>40</sup> Douglas W. Allen, *The Institutional Revolution: Measurement and the Economic Emergence of the Modern World*, (Chicago: University of Chicago Press, 2012), Michel Foucault, *Discipline and Punish: The Birth of the Prison*, (New York: Vintage Books, 1979), Michael Ignatieff, *A Just Measure of Pain: The Penitentiary in the Industrial Revolution 1750-1850*. (Harmondsworth: Penguin, 1978).

Sessions between 1757 and 1830. They include thefts, assaults, riots, frauds and nuisances. The only indictments that are not included are those for failing to repair roads or bridges. The Epiphany Sessions, held every January, have been treated as part of the previous year because most of the incidents were between October and December.

**Chart 4-1: West Riding Quarter Sessions Indictments, 1757-1830<sup>41</sup>**



<sup>41</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/33/1-QS4/62/140.

**Chart 4-2: Hampshire Quarter Sessions Indictments, 1757-1830<sup>42</sup>**

Annual indictments increased substantially in both counties. The rate of indictments was also higher in peacetime than wartime. John Beattie and Douglas Hay write about this relationship between war and prosecution in eighteenth-century England.<sup>43</sup> There was an especially large increase in prosecutions at the end of the American War in 1783 and the Napoleonic Wars in 1815. The demobilization spike in prosecutions was more pronounced in Hampshire. This is likely connected to its large naval presence, although Table 4-4 indicates that prosecution rates were already high along the South Coast in wartime. That region experienced a minimal postwar spike, as the increasing indictment rate was mostly concentrated on the Isle of Wight, southwest and northwestern regions of Hampshire.

<sup>42</sup> HRO Q9/1/307-591.

<sup>43</sup> J.M. Beattie, "The Pattern of Crime in England 1660-1800," *Past and Present* 62 (1974) 47-95, Douglas Hay, "War, Dearth and Theft in the Eighteenth Century: The Record of the English Courts," *Past and Present* 95 (1982) 117-160.

Another feature of eighteenth-century justice was that indictments disproportionately originated from some communities. This was most obvious with Sheffield, which accounted for over 30 percent of all West Riding theft indictments in this period.<sup>44</sup> In fact, over five percent of all West Riding indictments between 1757 and 1830 were for the theft of tools, knives and other metal goods in Sheffield.<sup>45</sup> This is evident in Table 4-7, where Sheffield has been separated from the rest of the South Coalfield. Sheffield was the largest town in the West Riding without its own Borough Sessions and had an economy characterized by small cutlery-making operations. Its occupational structure left it prone to disputes like those Richard J. Soderlund describes in the Yorkshire textile districts.<sup>46</sup> Interestingly, Sheffield does not appear to have had an Association for the Prosecution of Felons.<sup>47</sup> Although theft prosecutions disproportionately originated in Sheffield, coal theft indictments did not. Thus, they were likely subject to different dynamics than other theft prosecutions. Aside from Sheffield, there were disproportionately few theft indictments from the north-west fuel region and many from the south-east.

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<sup>44</sup> Its population of 31,314, was 6.4% of that covered by the County Sessions in 1801, while its 59,011 people were 7.3% in 1831.

<sup>45</sup> There were 846 such indictments and these do not include the theft of gold watches or money.

<sup>46</sup> Richard J. Soderlund, "'Intended as a Terror to the Idle and Profligate': Embezzlement and the Origins of Policing in the Yorkshire Worsted Industry, c 1750-1777" *Journal of Social History* 31 (1998) 647-669.

<sup>47</sup> David Philips, "Good Men to Associate and Bad Men to Conspire: Associations for the Prosecution of Felons in England 1760-1860" in *Policing and Prosecution in Britain 1750-1850*, Eds Douglas Hay and Francis Snyder, (Oxford: Clarendon Press, 1989) 159-160.



**Table 4-3: Theft Indictments from Each Fuel Region, Hampshire**

Fuel Region	1757-1785	1786-1800	1801-1815	1815-1830
Isle of Wight	38	28	55	146
South-West	43	76	88	201
Coast	238	250	379	383
Inland	67	60	84	140
North-East	101	120	106	142
North-West	62	84	66	189
Total	549	618	778	1,201

**Table 4-4: Annual Theft Indictments per 100,000 Inhabitants from Hampshire Fuel Regions<sup>48</sup>**

Fuel Region	1757-1785	1786-1800	1801-1815	1815-1830
Isle of Wight	10.00	11.08	14.83	34.72
South-West	6.80	19.89	20.02	43.97
Coast	27.60	42.02	53.21	53.42
Inland	16.87	27.01	25.60	41.00
North-East	12.76	26.06	22.21	29.18
North-West	8.07	20.66	16.82	45.78
Hampshire	14.33	26.62	28.60	42.36

Tables 4-3 and 4-4 show the regional distribution of theft and embezzlement indictments at the Hampshire Quarter Sessions. These disproportionately came from coastal communities, particularly Gosport. Like Sheffield, Gosport was the largest town in the county without its own Borough Sessions. Gosport had a unique social structure as a large working-class suburb of a naval port. Adrian Shubert also identified two Associations for the Prosecution of Felons in Gosport and one in neighbouring

<sup>48</sup> Populations are derived from Wrigley, *Early English Censuses*, Tables A1.5 and A2.7. Each column uses the best estimate of the fuel region's population at the midpoint of those dates, or 1771, 1793, 1808 and 1823. The population denominator is census derived after 1801. The earlier populations involved back projections of wapentake/hundred populations and have a greater margin of error. These were done by calculating the percentage of each wapentake/hundred for each fuel region in 1801 and then assigning that percentage of the wapentake/hundred's population for 1771 or 1791 to that fuel region. The 1816-1830 column only contains 13 years of indictments due to the missing sessions and the calculations have been adjusted accordingly.

Portsea.<sup>49</sup> Along with other parts of Alverstoke parish, it accounted for 15 percent of theft indictments in these 74 years.<sup>50</sup> These communities produced an even greater share of Hampshire's indictments for other offences, as there were 553 indictments for various types of assault in these 74 years. In the 1760s, the 130 assault indictments in Gosport were 28 percent of all the indictments across the county.<sup>51</sup>

Each criminal indictment was a social process through which some people sought justice against the acts of others. Their prevalence was influenced by cultural factors or individuals grouping together to facilitate prosecution, in addition to the existence of actual crimes. Charts 4-1 and 4-2 demonstrate that Quarter Sessions indictments rose at a faster rate than population in both Hampshire and the West Riding between 1757 and 1830. In addition, they were sufficiently concentrated in some towns and regions to suggest a greater likelihood of prosecution for the same offences. As such, it is easy to view criminal courts as social processes whose volume of activity is only tangentially related to the number of offences committed. However, fuel theft did not follow the same patterns as overall indictment levels. Fuel theft indictments did not spike with demobilization and were not concentrated in the same locations as indictments for other thefts. Causes specific to the theft of fuel should thus be sought. Fuel theft indictments were more frequent in communities with expensive fuel and limited local consumption. Fuel poverty thus offers a better explanation for their prevalence.

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<sup>49</sup> Adrian Shubert, "Lest the Law Slumber in Action: Associations for the Prosecution of Felons in England, 1744-1978," (M.A. University of Warwick, 1978) 52.

<sup>50</sup> These were 484 out of 3,209 total indictments. In 1801, Alverstoke parish contained 11,295 residents or 6.6% of those represented at the County Sessions.

<sup>51</sup> There 464 criminal indictments at the Hampshire Quarter Sessions from 1760 to 1769.

## Fuel Theft Prosecutions at Quarter Sessions

There were 109 indictments for fuel theft in the West Riding Quarter Sessions between 1757 and 1830. Between five and 19 indictments for fuel theft occurred every decade, but this number did not rise. Given the rapid increase in the prosecution of other Yorkshire thefts, fuel theft declined as a portion of indictments, especially after 1800. Fuel theft indictments for each five-year period are noted in Tables 4-5 and 4-6. Wood has been separated based upon its most likely use. Planks, timber and other building materials have been classed as other wood, while charcoal, cordwood, faggots and branches have been specified as fuelwood. When the description was vague, such as William Hunt's 1763 indictment for stealing "one piece of ash", it has usually been treated as fuelwood.<sup>52</sup> Most of the thefts classified as other wood in the West Riding were of boards and other building materials. These include the July 1821 prosecution of John Coward, William Coward, William Coward the elder, Joseph Hargreaves and Thomas Tattershall of Cudworth for stealing six deal planks from Thomas Harrison on 21 May 1821.<sup>53</sup> The fourth column specifies the total number of theft indictments and includes embezzlements but not frauds.

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<sup>52</sup> "Quarter Sessions Indictment Book" WYAS Wakefield QS4/34/91.

<sup>53</sup> "Quarter Sessions Indictment Book" WYAS Wakefield QS4/56/2. John Coward was found guilty, while the other two Cowards were acquitted and the judgement on Hargreaves and Tattershall was unclear.

**Table 4-5: West Riding Indictments 1757-1830**

Years	Fuel Theft	Theft of other Wood	Total Theft	Total Indictments
1757-1760	9	5	163	283
1761-1765	7	8	230	523
1765-1770	10	7	215	525
1771-1775	4	7	340	710
1776-1780	2	3	157	548
1781-1785	11	1	261	713
1786-1790	6	7	401	902
1791-1795	6	6	293	750
1796-1800	13	11	385	871
1801-1805	9	10	447	903
1806-1810	6	7	486	1,007
1811-1815	6	11	549	1,235
1816-1820	1	17	1,363	2,169
1821-1825	7	15	1,322	2,191
1826-1830	12	38	2,462	3,461
Total	109	158	9,074	16,791

Of the fuel theft indictments, 102 were standard thefts, four involved the embezzlement of coal, two were a robbery and one was a fraud. John Bray was a labourer from Huddersfield, who was indicted in August 1828 for using the pretence of having been ordered to unload coals from a boat in Dewsbury to obtain four dozen (~8.4 tons). He was acquitted.<sup>54</sup> The cases of coal embezzlement include Christopher Hunter of Aldborough, in the north-eastern region, who was found not guilty of taking 40 tons of coals in 1821.<sup>55</sup> John Sampson of Snaith, in the south-eastern fenlands, was found guilty and sentenced to six months hard labour for embezzling four tons of coals from a vessel on the Goole Canal in November 1830.<sup>56</sup> These five fraud and embezzlement indictments were for larger amounts of coal than the thefts discussed below.

<sup>54</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/61/75-76.

<sup>55</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/56/14-15.

<sup>56</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/62/61.

**Table 4-6: West Riding Fuel Theft Indictments**

Years	Coal Theft	Peat Theft	Fuelwood Theft	Fuel Theft as % of Total Thefts
1757-1760	4	-	5	5.5%
1761-1765	5	-	2	3%
1766-1770	5	-	5	4.7%
1771-1775	2	-	2	1.2%
1776-1780	2	-	-	1.3%
1781-1785	8	-	3	4.2%
1786-1790	3	1	2	1.5%
1791-1795	5	-	1	2%
1796-1800	13	-	-	3.4%
1801-1805	8	-	1	2%
1806-1810	6	-	-	1.2%
1811-1815	6	-	-	1.1%
1816-1820	1	-	-	0.1%
1821-1825	7	-	-	0.5%
1826-1830	12	-	-	0.5%

Jonathan Sutcliffe of Cowling, in the north-western region, was the only person indicted for peat theft. He was found guilty and whipped in April 1787 for stealing two turves the previous February.<sup>57</sup> The 21 indictments of fuelwood theft deserve attention because there is minimal other evidence of its use as a domestic fuel in the West Riding. Seven of the above indictments, including all five in the 1750s were for the theft of cordwood, which was often used to make charcoal. In addition, three of the above indictments were for the theft of charcoal. These include the 7 March 1768 incident when Richard Holdsworth, a clothier in Mirfield, and his wife Ann, assaulted John Spencer and stole three charcoal bags, one of which was full.<sup>58</sup> The regional distribution of these 21 indictments is also noteworthy. Fifteen of them occurred in the industrializing north coalfield, with a further two in the south coalfield. Charcoal lost most of its industrial uses with Abraham Darby's mid-eighteenth century development of a

<sup>57</sup> "Quarter Session Indictment Book" WYAS Wakefield QS4/41/269

<sup>58</sup> "Quarter Session Indictment Book" WYAS Wakefield QS4/36/65

method for smelting iron from coke. However, it continued to be used in some specialized metalworking and textile processes where sulphur and the other chemicals in coal smoke were damaging. Such industrial uses were more common on the coalfield, with both the *Leeds Mercury* and *Sheffield Iris* referring to a charcoal fire that burned down a woolcomber's house at Bradford in 1812.<sup>59</sup> As such, most of the wood theft indictments above were for industrial fuels that were then used for domestic purposes, small-scale manufacturing or resold.

Seventy-five of the 87 above indictments for coal theft involved fewer than three bushels of coals (~0.11 tons). These relatively small amounts include the bushel that John Tingle of Rotherham was sentenced to a month in the House of Correction for stealing in January 1796.<sup>60</sup> Seven of the indictments for coal theft involved larger amounts. These include Benjamin Addy, John Kaye and John Sowerby, of Wath in the central region, who were indicted for stealing six corves (~1.05 tons) on 20 December 1801.<sup>61</sup> In April 1823, John Tuckleton of Horbury, on the north coalfield, was acquitted of stealing a cart load (~500lbs) of coals from Edward Hinchliffe.<sup>62</sup> Table 4-7 breaks down the coal thefts and total thefts from 4-5 and 4-6 by fuel region. There were never enough coal theft prosecutions to provide meaningful prosecution rates per hundred thousand residents. Table 4-7 demonstrates that coal theft indictments were not coming from the same locations as other thefts. This is most evident with Sheffield, where 30 percent of the theft indictments but less than six percent of the coal theft prosecutions

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<sup>59</sup> *Leeds Mercury* 15 February 1812, 3 and *Sheffield Iris* 25 February 1812, 4.

<sup>60</sup> "Quarter Sessions Indictment Book" WYAS Wakefield QS4/44/147.

<sup>61</sup> "Quarter Sessions Indictment Book" WYAS Wakefield QS4/47/40. Sowerby and Kaye were found not guilty, while Addy was found guilty and sentenced to six months in the House of Correction, with the last month in a solitary cell.

<sup>62</sup> "Quarter Sessions Indictment Book" WYAS Wakefield QS4/57/10.

originated. Compared to its share of the West Riding's population, this was actually a disproportionately small portion of the coal theft indictments. Conversely, the central region produced a disproportionately large share of coal theft indictments but not those for other items. This is largely because 15 people were indicted for coal theft in the towns of Pontefract and Knottingley. These were both market towns of between 3,300 and 3,700 residents in a heavily agricultural district along the River Aire.<sup>63</sup> Five of the indictments were in 1813, when Mary Sefton, Hannah Law and May Brown were convicted of stealing 10lbs of coals from Richard Dickon Askham on 22 February. Sefton was acquitted for stealing 10lbs from him on the same date and Margaret King was convicted of stealing 20lbs from him on 2 September.<sup>64</sup> Aside from coal being cheaper, Pontefract and Knottingley resembled the inland towns of southern Hampshire where coal theft prosecutions were also concentrated. Across the rest of the Riding, fuel theft was a small and declining portion of indictments.

**Table 4-7: Coal Theft and Total Theft Indictments by Fuel Region, West Riding 1757-1830**

Fuel Region	Coal Theft	% of County Total	Total Thefts	% of County Total
South Coalfield	13	14.9%	1,025	11.4%
Sheffield	5	5.7%	2,700	30.2%
North Coalfield	33	37.9%	3,520	39.3%
North-West	3	3.4%	204	2.3%
North-East	4	4.6%	335	3.7%
Central	26	30%	782	8.7%
South-East	3	3.4%	389	4.3%
Total	87	100%	8,955	100%

The Calendars of Prisoners from 1816 to 1830 include those in pre-trial custody for the Leeds and Otley Borough Sessions. None of these involved fuel theft at Leeds.

<sup>63</sup> 1811 Census.

<sup>64</sup> "Quarter Sessions Indictment Book" WYAS Wakefield QS4/51/248, QS4/52/38-39.

At the Otley Sessions, three men were indicted for stealing coal or its by-products.

Thomas Waddington was committed on 6 May 1826 for stealing a quantity of coals and later found guilty. David Rhodes and James Hartley were charged on 27 January 1822 “with stealing, at Otley, a large quantity of soot.”<sup>65</sup>

Fuel theft was a small and declining portion of West Riding indictments. Despite having a smaller population and one-third the total theft indictments, more fuel theft was prosecuted at the Hampshire Quarter Sessions. Tables 4-8 and 4-9 illustrate Hampshire fuel theft indictments in the same manner as 4-5 and 4-6 above. More of these cases involved cutting down live trees. These include James Chapel, Thomas Norman and John Culley of Stratfield Turgis, who were indicted for cutting down an ash timber tree with saws on 25 December 1792.<sup>66</sup> That ash was more likely sold as timber than burned and I classified it as other wood. However, some trees had their branches removed by being ‘lopped and topped’, and are treated as fuelwood. For example, Henry Bray and Prior Churchman were indicted for lopping and topping an ash timber tree of the Earl of Portsmouth’s in Hurstborne Priors on 23 December 1800.<sup>67</sup> These two tables indicate that fuel theft was a noticeable component of the few theft indictments in the 1760s and 1770s. Although the absolute number of fuel theft indictments remained steady in the following decades, the increasing prosecution of other types of theft made these a smaller portion of all indictments until 1815. After the Napoleonic Wars, fuel and wood theft indictments increased more than those for other thefts and were a substantial

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<sup>65</sup> “Calendar of Prisoners, 1819-1828” WYAS Wakefield QS7/2.

<sup>66</sup> “Epiphany Sessions 1793 Indictments” HRO Q9/1/452. They were found guilty, with Chapel enlisted into the army, while Norman and Culley were sentenced to 12 months imprisonment each.

<sup>67</sup> “Epiphany Sessions 1801 Indictments” and “Easter Sessions 1801 Indictments” HRO Q9/1/484-485. Both were found guilty, with Bray sentenced to 12 months hard labour and Churchman to nine months imprisonment.



component of the Quarter Sessions. Thefts of various types of wood and coal accounted for more than one-sixth of Hampshire theft indictments in the early 1820s.

**Table 4-8: Hampshire Indictments, 1757-1830**

Years	Fuel Theft	Theft of Other Wood	Total Theft	Total Indictments
1757-1760	0	1	18	74
1761-1765	2	0	51	203
1766-1770	7	9	94	280
1771-1775	2	5	85	223
1776-1780	5	8	78	348
1781-1785	6	4	238	566
1786-1790	0	11	223	440
1791-1795	6	12	169	381
1796-1800	17	19	236	507
1801-1805	7	4	287	454
1806-1810	14	16	236	449
1811-1815	10	11	272	534
1816-1820	25	28	503	869
1821-1825	47	30	421	789
1826-1830	12	17	298	436
Total	160	175	3,209	6,553

The only indictment for peat theft was in south-western Hampshire. John Read of Christchurch was charged with stealing 600 turves from James Pelfry in October 1829.<sup>68</sup> The 26 coal theft indictments in Hampshire were mostly after 1800 and contributed to the rising rate of fuel theft prosecution in those years. With the exception of Thomas and Edward Rumbold's 1807 conviction for stealing 12 bushels of coals in Romsey, all of the Hampshire Indictments were for less than three bushels (~0.11 tons).<sup>69</sup> The most notable feature of the coal theft indictments is that they were primarily urban, with 19 from southern Hampshire towns with more than 3,000 residents. These include Ann Hills of Gosport's indictment at Epiphany 1763 for stealing half a bushel of

<sup>68</sup> "Epiphany Sessions 1830 Indictments" HRO Q9/1/587.

<sup>69</sup> "Michaelmas Sessions 1807 Indictments" HRO Q9/1/509. They were found guilty and imprisoned for six months each.

coals.<sup>70</sup> That was one of only two fuel theft indictments in the populous coal-burning suburb. Meanwhile, there were eight coal theft indictments from Winchester, four from Elling, three from Romsey and another three from Newport. These coal theft indictments are similar to those from the West Riding in that they generally involved small volumes and occurred in towns of 3,000 to 8,000 residents. Such indictments suggest that coal was a more urban fuel than peat or wood and that residents of these towns were not immune from the fuel-poverty affecting rural northern Hampshire.

**Table 4-9: Hampshire Fuel Theft Indictments, 1757-1830**

Years	Coal Theft	Peat Theft	Fuelwood Theft	Fuel Theft as % of Total Thefts
1757-1760	-	-	-	-
1761-1765	1	-	1	3.9%
1766-1770	2	-	5	7.4%
1771-1775	-	-	2	2.4%
1776-1780	-	-	5	6.4%
1781-1785	-	-	6	2.5%
1786-1790	-	-	-	-
1791-1795	-	-	6	3.6%
1796-1800	1	-	16	7.2%
1801-1805	-	-	7	2.4%
1806-1810	4	-	10	5.9%
1811-1815	4	-	6	3.7%
1816-1820	2	-	23	5%
1821-1825	8	-	39	11.2%
1826-1830	4	1	7	4%

One hundred and thirty three of Hampshire's fuel theft indictments were for wood and these tended to originate in rural parishes, especially in the northern half of the county. As Tables 2-3 and 2-4 demonstrate, fuelwood prices rose substantially more than coal after 1790 but it remained the predominant source in communities not connected to the coast by waterborne transit. Many of those northern Hampshire

<sup>70</sup> "Epiphany Sessions 1763 Indictments" HRO Q9/1/328.

parishes also suffered in the agricultural depression of the 1820s. The regional distribution of fuel theft indictments is clear from Tables 4-10 and 4-11. Prior to 1815, such prosecutions were more prevalent in southern Hampshire. Prosecution rates were also lower before the end of the Napoleonic Wars, never exceeding an annual rate of 1.55 per 100,000 inhabitants. After 1815, indictments disproportionately originated in northwestern Hampshire, where wood was especially expensive. Table 4-4 indicates that theft indictments generally were not disproportionately concentrated in the north-west. Northwestern Hampshire was a predominantly rural region, but in southern Hampshire indictments for fuelwood theft were also more likely to come from rural parishes like Twyford. James Tuffon was acquitted of stealing a bundle of wood from William Webster on 19 February 1822.<sup>71</sup>

**Table 4-10: Fuel Theft Indictments by Fuel Region, Hampshire**

Fuel Region	1757-1785	1786-1800	1801-1815	1816-1830
Isle of Wight		-	2	2
South-West	1	5	6	16
Coast	7	6	10	15
Inland	6	2	5	11
North-East	2	3	4	10
North-West	4	4	4	30
Total	20	20	31	84

<sup>71</sup> "Easter Sessions 1822 Indictments" HRO Q9/1/566.

**Table 4-11: Annual Fuel Theft Indictments per 100,000 inhabitants of Hampshire Fuel Regions, 1757-1830<sup>72</sup>**

Fuel Region	1757-1785	1786-1800	1801-1815	1816-1830
Isle of Wight	0	0	0.54	0.48
South-West	0.16	1.31	1.36	3.50
Coast	0.81	1.01	1.40	2.09
Inland	1.51	0.90	1.52	3.22
North-East	0.25	0.65	0.84	2.06
North-West	0.52	0.98	1.02	7.27
Total	0.52	0.86	1.14	2.96

I also consulted the Borough Quarter Sessions indictments for Newport, on the Isle of Wight, and the Minute Book for Basingstoke's Sessions, in north-eastern Hampshire. This sparse evidence from Borough Sessions supports the observations from the County Sessions. For Basingstoke, the Minute Book records 30 prosecutions between 1823 and 1830. Of these, 18 were thefts, and two of them involved faggots. These were the April 1828 and 1830 prosecutions of Thomas Bye and John Smith respectively for each stealing a faggot.<sup>73</sup> The Basingstoke Minute Book implies an annual fuel theft prosecution rate of 7.43 per 100,000 inhabitants in the 1820s. Meanwhile, 546 indictments between 1768 and January 1831 have survived from the Newport Borough Sessions. These include 121 thefts, of which five were for coal. James Squib was indicted for stealing a bushel of coal from the workhouse in May 1819.<sup>74</sup> The other four indictments for coal theft occurred in 1829 and 1830.<sup>75</sup> These Newport cases indicate that coal theft was being prosecuted at a rate of 8.2 indictments per 100,000 inhabitants between 1816 and 1830<sup>76</sup>. Like the County Sessions, coal theft

<sup>72</sup> Population figures for this table are derived from Wrigley, *Early English Censuses*.

<sup>73</sup> "Basingstoke Quarter Sessions Minute Book, 1823-1836" HRO 8M62/31.

<sup>74</sup> "Indictments Newport Quarter Sessions" IWCRO NBC/31/50.

<sup>75</sup> "Indictments Newport Quarter Sessions" IWCRO NBC/31/80,85,86.

<sup>76</sup> "Indictments Newport Quarter Sessions" IWCRO NBC/31. The records of the Newport Borough Sessions between 1768 and 1799 have been preserved sporadically. There are no extant records from

was more prevalent in coastal Hampshire and fuel wood theft in the northern part of the county. Both Borough Sessions also suggest that there were more prosecutions for fuel theft in the late 1820s.

Jane Humphries argues that enclosure impeded the ability of women and children to collect fuel and otherwise contribute to household subsistence.<sup>77</sup> Joseph Sabine also suggested that women were stealing more wood than men in Hertfordshire.<sup>78</sup> However, most of those charged with fuel theft in Hampshire and the West Riding were adult men. Very few children were indicted for fuel theft. The only source used in this chapter which includes the ages of the accused are the Hampshire Calendars of Prisoners. They include the ages of 147 of those summarily committed for wood theft and 183 of those awaiting trial for wood and coal theft prior to 1824. Of those summarily committed, seven of them were 17 and six were younger. Meanwhile, only four of those in pre-trial custody for wood and coal theft were younger than 18.<sup>79</sup> Although few children were prosecuted for fuel theft, some women were. The proportion of women indicted for all offences declined from the mid-eighteenth to the early nineteenth century, a phenomenon M.M. Feeley and D.L. Little write about.<sup>80</sup> In the West Riding, women accounted for over 20 percent of those indicted between 1757 and 1800 and slightly fewer than 10 percent of those indicted between 1801 and 1830.<sup>81</sup> However, they were more likely to be prosecuted for coal theft. Eighteen of the 47

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the Sessions between 1800 and 1815, and the records of most sessions exist from 1816 to 1830. As such, this has been treated as a 15-year sample centred on 1823 for the above calculation.

<sup>77</sup> Humphries, "Enclosures, Common Rights and Women" 33.

<sup>78</sup> Poor Law Report (1817) 73.

<sup>79</sup> HRO Q9/1/307-591

<sup>80</sup> M.M. Feeley and D.L. Little, "The Vanishing Female: The Decline of Women in the Criminal Process, 1687-1912," *Law and Society* 25 (1991) 719-757.

<sup>81</sup> Of the 5,285 indictments between 1757 and 1800, 1,081 were women while 1,114 of the 11,506 indictments between 1801 and 1830 were women.

indictments for coal theft before 1800 were women, along with eight of the 40 in the ensuing three decades. This does not apply to wood theft, as only six women were indicted for it in the West Riding, all before 1770. In Hampshire, only two of those indicted for coal theft and 29 for wood theft were women. However, 36 of the 114 people summarily committed for fuelwood theft in Hampshire were women. Women were thus a higher proportion of those charged with stealing fuel than with stealing building materials or other offences. It is also possible that a larger portion of those stealing wood or coal were women but that they were less likely to be prosecuted for it.

### **Summary Convictions**

The prosecutions for felling trees or collecting wood that interested Karl Marx in Prussia were dealt with by summary conviction in England. Local Justices of the Peace passed judgement upon matters in their own communities and these proceedings rarely left documentary evidence. Occasionally JPs recorded their decisions in notebooks that have survived. That of Devereux Edgar of Suffolk records 97 incidents of wood theft between 1701 and 1716.<sup>82</sup> William Hunt was a justice of the peace in Wiltshire between 1744 and 1749. He recorded 131 cases of wood-stealing and 12 hedge-breaking cases in those six years.<sup>83</sup> Meanwhile, notebooks like those of Sir George Clifton of Nottinghamshire between 1772 and 1812 contain only one incident of coal theft.<sup>84</sup> Notebooks survive only sporadically from the eighteenth century, making it difficult to determine regional variation or changing rates of fuel theft prosecutions from them.

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<sup>82</sup> "Devereux Edgar Notebook, Volume I" Suffolk Record Office. I am grateful to Douglas Hay for lending me his photocopies of the notebooks of Devereux Edgar and Sir George Clifton.

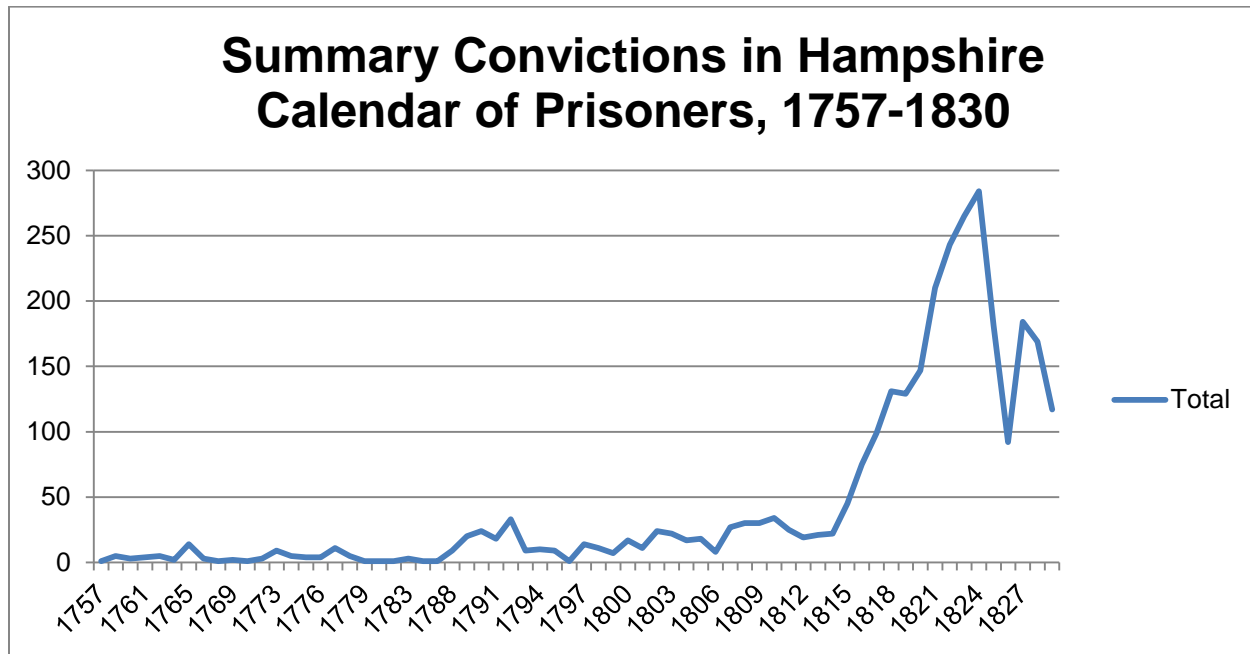
<sup>83</sup> William Hunt, *The Justicing Notebook of William Hunt 1744-1749*, Elizabeth Crittall ed. (Devizes: Wiltshire Record Society, 1982).

<sup>84</sup> "Sir George Clifton, 1772-1774," "Sir George Clifton 1775-1781" and "Sir George Clifton 1781-1812" Nottingham Public Libraries M8050 and M8051.

However, details of some convictions can be garnered from the Calendars of Prisoners prepared for the County Quarter Sessions. These were lists of prisoners prepared four times a year to aid Quarter Sessions Justices. Calendars of Prisoners mostly list those awaiting trial without bail. In some counties, including Hampshire and the West Riding of Yorkshire, they also included lists of prisoners currently serving sentences. In the West Riding, these were referred to as “Prisoners in Custody for Time”. Such prisoners included many convicted of summary offences, such as wood theft, that otherwise did not leave records. Thus they are a useful source to track summary convictions of fuel theft, but only record those who were incarcerated at the beginning of the Quarter Sessions. As such, they include almost all prisoners serving three-month sentences and around one-third of those on one-month sentences. In Hampshire, 56 of the 159 records of summary convictions for wood theft were for one month, while 13 were for three weeks or less.<sup>85</sup>

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<sup>85</sup> HRO Q9/1/307-591

**Chart 4-3: Summary Convictions in Hampshire Calendars of Prisoners, 1757-1830**

Calendars of Prisoners for the West Riding House of Correction at Wakefield only survive after 1816. Meanwhile, in Hampshire they exist for most quarters from 1757 to 1830.<sup>86</sup> Chart 4-3 demonstrates that summary committals became much more prevalent in Hampshire after 1815 as the criminal law attempted to deal with more offenders. Thomas Sweeney describes this development at a national level.<sup>87</sup> Tables 4-12 and 4-13 only include summary committals after 1816 in Hampshire. They indicate that wood theft was a larger component of this type of justice in Hampshire than in the West Riding, and that convictions were thirty times as common on a per capita basis.

<sup>86</sup> The exceptions are as follows: Epiphany 1761, Michaelmas 1767, Midsummer 1771, Michaelmas 1771, Epiphany 1785, Easter 1806, Epiphany and Easter 1807, Michaelmas 1809, Easter 1813, Epiphany, Easter, Midsummer and Michaelmas 1826, Epiphany, Easter, Midsummer and Michaelmas 1828, Epiphany 1829, Midsummer and Michaelmas 1829, Midsummer 1830, Epiphany 1831.

<sup>87</sup> Thomas Sweeney, "The Extension and Practice of Summary Jurisdiction in England c. 1790-1860," (PhD Thesis, University of Cambridge, United Kingdom, 1985)



**Table 4-12: Summary Convictions for Wood Theft in Calendars of Prisoners, 1816-1830<sup>88</sup>**

County	Fuelwood Theft	Other Wood Theft	Total Wood Theft	Total
Hampshire	92	26	118	2,022
West Riding	10	3	13	7,881

**Table 4-13: Annual Summary Convictions in Calendars of Prisoners per 100,000 inhabitants, 1816-1830<sup>89</sup>**

County	Fuelwood Theft	Other Wood Theft	Total Wood Theft	Total
Hampshire	2.39	0.68	3.07	52.64
West Riding	0.08	0.02	0.10	63.30

Thomas Sweeney describes the growth of summary convictions between 1790 and 1830, emphasizing regional diversity in the offences prosecuted. He suggests that wood and food theft were a major contributor and that wood theft sometimes accounted for a third of committals in Gloucestershire. Those cases were concentrated in eastern Gloucestershire, an inland region resembling northern Hampshire.<sup>90</sup> Both Hampshire and the West Riding had higher rates of summary committals than Gloucestershire and wood theft never achieved a similar proportion. Instead Game Law offences were the most common cause for summary committal in Hampshire and bastardy in the West Riding. Tables 4-12 and 4-13 demonstrate that felling trees or some of their parts was a much larger portion of summary convictions in Hampshire than in the West Riding. The above committals involved cutting, lopping or damaging living trees and are different from the indictments for stealing processed coal or firewood. Many of these clearly involved fuel, such as the 11 March 1822 committal of Hannah and James Britain of

<sup>88</sup> HRO Q9/1/307-590, "Calendar of Prisoners" WYAS Wakefield QS7/1-3.

<sup>89</sup> Summary Convictions from HRO Q9/1/307-590, "Calendar of Prisoners" WYAS Wakefield QS7/1-3. Populations are estimated for 1823. Only those summary convictions between 1816 and 1830 have been considered. Hampshire totals treated as 13 years due to missing sessions.

<sup>90</sup> Sweeney 319, 365-375.

Fordingbridge, Hampshire for “cutting a quantity of green underwood.”<sup>91</sup> Other instances, such as James Street and Samuel Back’s 27 December 1823 committal for “cutting timber without consent of its owner” more likely involved trees as a building material to be used or sold.<sup>92</sup> The distinction in Tables 4-12 and 4-13 between types of wood treats whole timber trees as other wood while branches or smaller trees are assumed to be fuelwood. With 118 summary convictions in Hampshire Calendars of Prisoners, wood theft was a component of the increasing use of this type of justice after 1815. Along with the greater number of indictments in those years, these records indicate increasing fuel theft in Hampshire but not in the West Riding of Yorkshire.

A location was only specified for 61 of the summary committals for wood theft in Hampshire. Twenty-seven of these were from the south-western region, mostly the New Forest whose timber thieves were discussed in many letters. New Forest Timber was also protected by its own statutes. Thus, James Hodder’s December 1821 committal for six months was for “having, on the 23<sup>rd</sup> day of January last, at a certain place called Burgneys Wood, within Castlemalwood Walk, in the New Forest, unlawfully and wilfully cut and carried away an oak timber tree.”<sup>93</sup> Meanwhile, cases outside the Forest did not typically record a location. James Legrove was committed in December 1826 to “six month’s imprisonment, for lopping an oak tree.”<sup>94</sup>

## Conclusion

Fuel theft occurred across both Hampshire and the West Riding of Yorkshire throughout the eighteenth and early nineteenth centuries. Most incidents, including

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<sup>91</sup> “Easter Sessions 1822 Indictments” HRO Q9/1/566.

<sup>92</sup> “Epiphany Sessions 1824 Indictments” HRO Q9/1/573.

<sup>93</sup> “Easter Sessions 1822 Indictments” HRO Q9/1/566.

<sup>94</sup> “Epiphany Sessions 1827 Indictments” HRO Q9/1/581.

those described by Joseph Lawson, were not caught or formally prosecuted. The main records for fuel theft are indictments from the Quarter Sessions or summary committals from Calendars of Prisoners. Neither is the product of an unchanging legal system and the volume of both indictments and committals increased substantially in this period.

Gaols expanded to accommodate more prisoners, population grew, landowners developed associations to facilitate prosecutions, towns like Sheffield increasingly hired watchmen and attitudes towards punishment changed. Such developments suggest that the rate of fuel theft prosecutions might bear little resemblance to its incidence.

However, the timing and locations of fuel theft indictments differed from those for theft generally, suggesting different causes. Coal theft indictments tended to originate in towns between 3,000 and 8,000 residents, particularly in agrarian regions. Wood theft indictments were more commonly rural, with a disproportionate number originating in northern Hampshire. Meanwhile, indictments for other thefts disproportionately originated in larger towns in which little fuel theft was prosecuted. Similarly, in the West Riding fuel theft indictments did not increase, even as the overall number of theft indictments rose tenfold between the early 1760s and late 1820s. In Hampshire, coal and wood theft indictments increased after 1815 in conjunction with those for other thefts. They had not increased during a similar rise in other theft prosecutions after the 1780s. As a result, the local availability of fuel and the circumstances of labouring people offer a better explanation of increasing wood and coal theft prosecutions in Hampshire after 1815. Hampshire residents, including Sir Thomas Baring, also commented on the increasing amount of fuel theft after 1815 in a manner that did not occur in Yorkshire.<sup>95</sup>

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<sup>95</sup> Thomas Baring, *Report of the Visiting Justices, of the Gaol and Bridewell for the County of*

The enclosure of common lands or greater enforcement of existing restrictions on cutting trees probably contributed to the rise in wood theft prosecutions. Most of the indictments after 1815 occurred in parishes that had not been recently enclosed, so other explanations must be sought. The most significant of these was growing fuel-poverty, especially in northern Hampshire. Wood-burning communities in north-western Hampshire had the highest fuel prices in either county, while their overseers were disbursing the smallest quantities after 1815. Indictments for the theft of other wood increased simultaneously with those for fuelwood in Hampshire. This fact reflects the increased value of wood and suggests that landowners were increasingly concerned about maintaining it. As a plant, the annual growth of wood could not increase to accommodate the greater needs for timber and fuel which accompanied population growth and naval conflict. These 'organic' limitations did not apply to coal, and demand did not cause the same shortages of the 'mineral' in Yorkshire. The prosecution of fuel theft was one result of northern Hampshire's early nineteenth century fuel crisis. Chapter five will continue with these differences by examining the impact of fuel prices upon air quality, diet and health.

## Chapter Five: Implications of Fuel Use on Diet and Health

Chapters two and three began by comparing the eightfold difference in the 1799 coal prices paid by Overseers of the Poor in the Yorkshire communities of Thurstonland and Staveley. Although both were small communities, Thurstonland was in the heart of the West Riding textile manufacturing region and its residents burned large amounts of cheap coal. Meanwhile, Staveley was an agricultural community in the Riding's northeastern corner where coal was expensive and locals burned considerably less of it. Such differences in fuel use affected the eating habits and health of locals. One of the most striking contrasts between Thurstonland and Staveley was in the height of their inhabitants. Between 1801 and 1803, male inmates in the West Riding House of Correction from Thurstonland's North Coalfield region were 1.6 inches taller on average than those from north-eastern locations like Staveley.<sup>1</sup> Over the next forty years, male stature declined more on the coalfield than in agricultural regions. As a result, in 1842 and 1843 male inmates from the north-eastern fuel region were 0.3 inches taller than those from the North Coalfield. At both points, fuel prices were central to the divergent lifestyles and height differences across Yorkshire.

Domestic fires were used for both cooking and heating so the price of fuel altered the foods eaten by the lower classes and whether they could afford to cook for themselves. Chapter two showed that wood prices tripled in northern Hampshire between 1750 and 1830 but these were always considerably higher than coal prices in Yorkshire or coastal Hampshire and peat prices in the areas with local deposits. Rising wood prices prevented an increasingly large number of people from cooking their own

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<sup>1</sup> "House of Correction Register, 1801-1808" WYAS Wakefield C118/98.

food and purchased wheaten breads became Hampshire's staple. Peat deposits were sufficient to meet the energy needs of growing communities and peat-burning regions experienced much smaller declines in fuel consumption. This fuel type was also well suited to cooking potatoes so that the root was first grown and eaten in peat-burning communities. In the early nineteenth century, potatoes were increasingly consumed everywhere but remained most prevalent amongst peat-burning households.

Meanwhile, fuel was very cheap on the Yorkshire coalfield, consumption declined less than in areas of more expensive fuel and residents continued to cook their own food throughout the period. Oats and grass grew well in this damper region and diet continued to be dominated by milk, oatmeal and oatcakes. Those foods take less time to cook than potatoes and may thus have held more appeal in an industrializing region. Cheaper fuel also allowed coalfield residents to heat their homes when they were not cooking and gave them a higher quality of life in the eighteenth century. Coalfield residents continued to enjoy these advantages in the nineteenth century but they also had to contend with the increasingly large amounts of smoke produced by domestic and industrial fires.

This chapter examines regional variations in diet and health, with a focus on the role of fuel in food preparation. It begins with a brief examination of seasonal patterns in fuel use. As Poor Law disbursements declined in the early nineteenth century, they became more concentrated in winter and suggest that expensive fuel led residents of some communities to cook only in those months. Rising fuel prices also prevented an increasing number of English households from cooking in the early nineteenth century. Such households often purchased bread from commercial bakers and the next section

examines the regional distribution of this profession. This is followed by a section tracing the regional prevalence of potatoes and cooking habits in areas of more affordable fuel. By increasing the temperature of homes and allowing residents to cook, fuel consumption benefitted health. However, domestic and industrial fires also produced smoke, which became a serious problem on the Yorkshire Coalfield after 1805. Eighteenth-century medicine's ambivalent attitude to coal, the growing smoke problem and its regulation are briefly discussed. Finally, a comparison of the heights of inmates at the West Riding House of Correction between 1801-1803 and 1842-1843 hypothesizes the overall impact of fuel consumption on diet and health. In the eighteenth century, cheaper fuel enabled labouring people to cook more, eat more satisfying food and, outside of the largest towns, to live healthier lives than their fuel-poorer counterparts. They continued to cook more, have warmer homes and eat more satisfying foods in the nineteenth century, but coalfield residents also had to contend with the health problems from the smoke and noxious chemicals produced by those fires and the industrial ones which employed them. These changes are reflected in their declining stature.

### **Historiography of Fuel and Cooking**

Scholars have long written about the diets of industrializing England. In the 1790s, Sir Frederic Morton Eden wrote on *The State of the Poor*. Its overall aim and attempt to discuss various communities was similar to that of David Davies. In terms of cooking, Eden found that

The great advantage which the labourers of the North of England possess over their countrymen in the South, consists in the great variety of cheap and savory soups, which the use of barley and barley-bread affords them an opportunity of making. The cheapness of fuel is, perhaps, another

reason why the culinary preparations of the Northern peasant are so much diversified, and his table so often supplied with hot dishes.<sup>2</sup>

Eden contrasted a northern England where people cooked a variety of dishes with a south where they increasingly purchased bread. Christian Petersen argues that the choice of an increasing proportion of English people to eat wheaten bread was rational. He claims that the fuel savings made this kind of bread cheaper for them to consume despite the higher apparent price and that they understood it to have a higher nutritional value than the alternatives. The savings from commercial bakers arose because they cooked in large batches and thus used less fuel per loaf.<sup>3</sup> John Burnett finds that by 1815 high fuel prices had caused the majority of southern English households to cease baking bread, brewing beer or generally cooking their own food.<sup>4</sup> Recently, Sarah Horrell and Deborah Oxley tested econometrically Eden's claim that northern English people were healthier because of cheap fuel. Using Eden's labourers' budgets and the 1834 Rural Queries to create household diets, they determined the nutrients in them. They then compared the nutritional quality of those diets to numerous variables and anthropometric evidence from military recruits and transported convicts. Although they assume that diets were more similar across counties than they actually were, they show a general correlation between the healthier diets Eden observed in northern England

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<sup>2</sup> Morton Eden, *The State of the Poor, Volume I*, 524-525.

<sup>3</sup> Petersen, *Bread and the British Economy*, 17-26, 45.

<sup>4</sup> John Burnett, *Plenty and Want: A Social History of Diet in England from 1815 to the Present Day*, (London: Scolar Press, 1979) 17-19. G.E. and K.R. Fussell, *The English Countrywoman: A Farmhouse Social History A.D. 1500-1900*, (New York: Benjamin Blom, 1971, first published 1953) 145-147 makes a similar observation that southern English labouring families came to eat cold bread due to not being able to afford fuel.



and taller people.<sup>5</sup> This chapter expands on their findings by considering the impact of fuel prices on diets at the sub-county level.

Other scholars also discuss northern English cooking habits in this period. E.P. Thompson claims that in industrializing Yorkshire “the substitution of potatoes for bread or oatmeal was felt to be a degradation” associated with Irish poverty.<sup>6</sup> Thompson does not provide evidence for this assertion, making it difficult to determine whether this cultural preference existed prior to 1830. The properties of each fuel source affected cooking techniques. Peter Brears describes the various fuels used in eighteenth-century Cumberland and the different methods they engendered for cooking oatcakes.<sup>7</sup> Joan Thirsk’s *Food in Early Modern England* describes the enormous varieties of food consumed and their regional spread. She emphasizes the boiling of pottages over open hearths of the sixteenth century that gradually gave way to purchased wheaten breads across much of England by 1800. Thirsk also acknowledges the role of high fuel prices in the late-eighteenth-century southern English transition to a diet of cold bread and cheese.<sup>8</sup>

### **Seasonality of Fuel Consumption**

William Dunn, an engineer from Sheffield, travelled to fuel-scarce Cold Overton, Leicestershire in 1799. He noted that inhabitants of that community “procure no more than is necessary to cook their Victuals, this done they immediately put out the Fire-

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<sup>5</sup> Sara Horrell and Deborah Oxley, “Bringing home the bacon? Regional nutrition, stature, and gender in the industrial revolution” *Economic History Review* 65 (2012) 1354-1379

<sup>6</sup> Thompson, *The Making of the English Working Class*, 315.

<sup>7</sup> Peter Brears, “Traditional Food in the Lake Counties,” *Traditional Food East and West of the Pennines*, C. Anne Wilson Ed, (Stroud: Allan Sutton Publishing, 1994) 69-90.

<sup>8</sup> Joan Thirsk, *Food in Early Modern England: Phases, Fads, Fashions 1500-1760*, (London: Continuum, 2007) 217.

This would be thought uncomfortable to Sheffield people.”<sup>9</sup> Southern Leicestershire was somewhat warmer than Sheffield in the winter but Dunn observed that expensive fuel meant that the interiors of these homes were colder in this fuel-poor region. He contrasted a coalfield town in which fires were stoked for both heating and cooking with other areas in which they were only used to cook. Dunn considered Leicestershire fuel consumption limited but poorer residents of similar southern English communities did not even have enough fuel to cook. He reminds us that fuel consumption varied and included those who cooked year-round and heated homes in winter, those who cooked year-round but did not heat homes at other times, those who only used fires to cook in winter and those who rarely cooked.

Before discussing regional diets, it is worth considering these seasonal patterns of fuel consumption. Appendix B traces the seasonality of fuel consumption in late eighteenth-century Leeds. Households burnt more coal in the winter because it was used for both heating and cooking. Meanwhile, coal was more expensive in central West Riding communities like Swinton. Overseers typically disbursed equal amounts of coal twice a year. Mary Shaw received half a dozen coals (~1.05 tons) on 27 June 1818 and the same amount on 2 January 1819.<sup>10</sup> Although her consumption is not known beyond its delivery, the equal installments suggest that Shaw and other poor Swinton residents were burning similar amounts year-round. This implies that they were only burning coal when cooking. Further east the pattern was different. The overseers of Rawcliffe, in south-eastern Yorkshire, disbursed small amounts of coal only between the months of November and April, through this period. This suggests that poor Rawcliffe

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<sup>9</sup> SA MD 1738/43 “Letter from Wm. Dunn to wife 5 May 1799”.

<sup>10</sup> “Swinton Poor Accounts 1815-1822” DA P59/6/B2/2.

households were cooking more often in winter than summer.<sup>11</sup> Chapter Three dealt with the decline in fuel disbursements to poor households after 1805. In some communities in both counties, this involved the cessation of fuel disbursements between May and September. Broughton was a wood-burning parish in north-western Hampshire. Its overseers provided faggots to poor residents in both summer and winter from 1791 to 1804, after which they provided firewood only between October and April, with a few exceptions, until 1826.<sup>12</sup> Other places with a similar move to seasonal fuel disbursements include Heckfield and Bentley in north-eastern Hampshire.<sup>13</sup>

Disbursements generally declined when they became more seasonal or, as in places like Rawcliffe, were always lower than in communities where it was also provided in the summer. This suggests Sarah Munday of Broughton and other poor householders in these communities were only able to cook their own food in the winter.<sup>14</sup> Moreover, the differences between Rawcliffe and Swinton or Broughton and Lyndhurst in Hampshire suggest an increasing number of communities where poor residents cooked only in winter in addition to those where they rarely cooked at all.

## **Baking**

Due to the larger scale of their operations, professional bakers required less fuel per edible calorie than domestically cooked grains. Sir Frederic Morton Eden noted this in the case of an Oxfordshire labourer who was compelled “to purchase his dinner at the

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<sup>11</sup> DA P60/6/2/35-81. There were three exceptions through these 80 years. On 17 September 1762, A Ashton and M Winck each received half a dozen coals. Meanwhile, in 1826 Elizabeth Eksworth was given 2s for coals on 2 May while Betty Brooke received 1s 6d for the same on 21 October.

<sup>12</sup> “Broughton Poor Book 1777-1791,” “Broughton Poor Book, 1802-1813” and “Broughton Poor Book April 1813-October 1829” HRO 137M71/PO2,3 and 5.

<sup>13</sup> HRO 1M80/PO1-3 and 27M79/PO1-3.

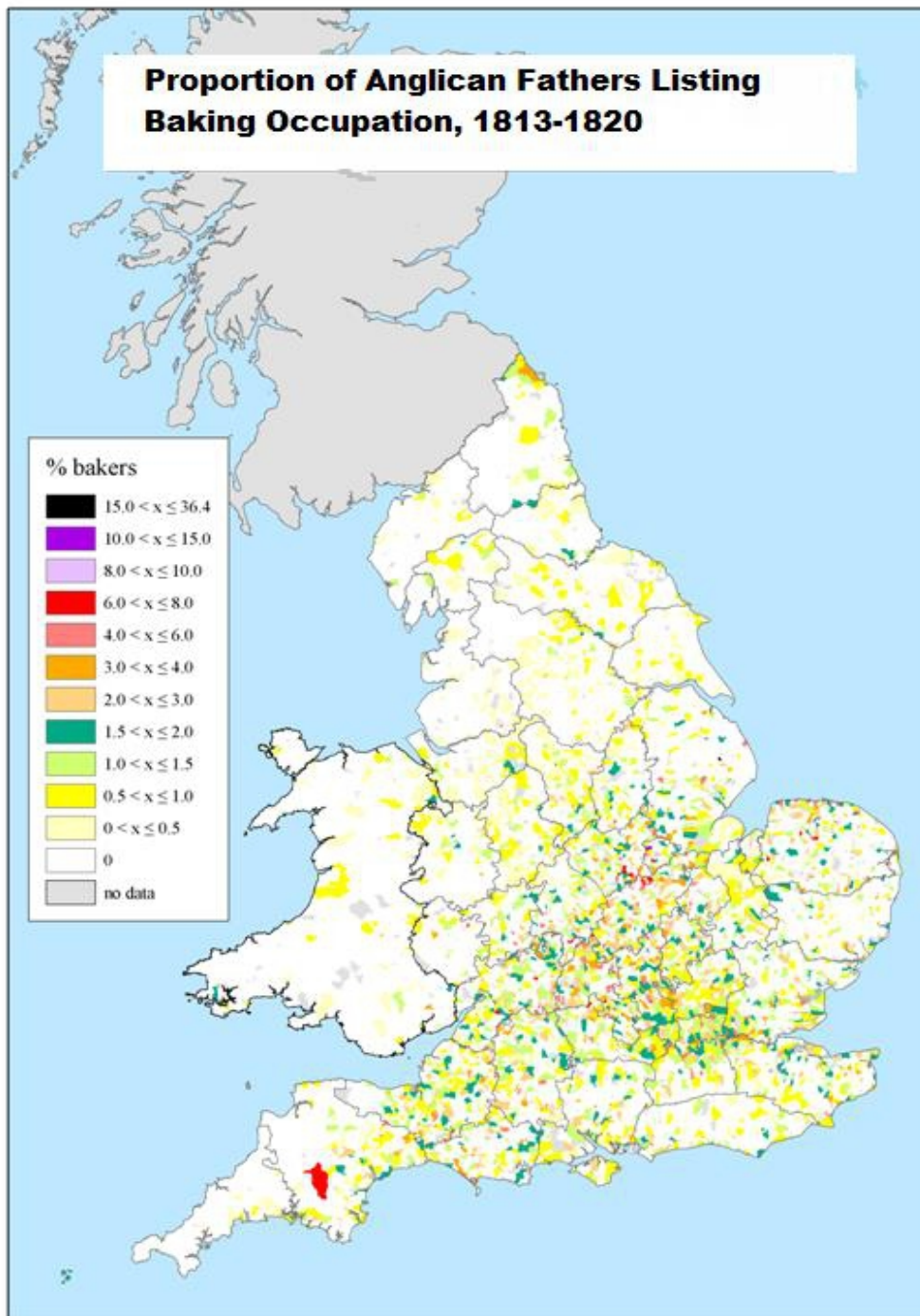
<sup>14</sup> “Broughton Poor Book April 1813-October 1829” HRO 137M71/PO5.

baker's" because of "the extreme dearness of fuel."<sup>15</sup> Unlike those who prepared their own food, this labouring family ate their bread cold and the fire that cooked it did not heat their home. Eden and John Burnett emphasize that the baking profession was more prevalent in southern England due to the high cost of fuel and that its rise was concomitant with a decline in home cooking. Recently, Leigh Shaw-Taylor and Max Satchell used baptismal registers to collate the occupations of Anglican fathers across England and Wales between 1813 and 1820. Their interest is in occupational structure and they have not made any new suggestions about the baking profession. However, they mapped the proportion of Anglican fathers who were bakers in every parish and it is reproduced below. The darker regions on Map 5-1 indicate that bakers were a larger proportion of Anglican fathers than in the lighter regions. Their methodology is more consistent nationally than the West Riding trade directory I used but less accurate for counties in which quality directories survive. However, it suggests similar regional patterns. They demonstrate that the West Riding had one of the smallest proportions of bakers in England and Wales. Those that existed were concentrated in the south-east or around Staveley and Burton Leonard in the north-east. These are the same areas where coal was relatively expensive. Meanwhile, the greatest proportions of bakers were in inland southern England, including northern Hampshire. The profession was more prevalent around the towns of Winchester and Portsmouth or in northern Hampshire than in the south-west or the Isle of Wight.

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<sup>15</sup> Morton Eden, *State of the Poor*, 587.

**Map 5-1: Proportion of Anglican Fathers Employed as Bakers, 1813-1820<sup>16</sup>**



<sup>16</sup> <http://www.hpss.geog.cam.ac.uk/research/projects/occupations/englandwales1817/#bakers1817>  
(accessed January 25, 2013)

The *1831 Census* was the first to record the regional prevalence of certain trades, including bakers. The published census notes the number of bakers for each county and each town with more than 10,000 residents. These have been summarized for Hampshire and the West Riding in Table 5-1, along with divisions of the counties into towns with more than 10,000 residents and smaller communities. As a county, the West Riding had the fewest bakers per capita in England, while Hampshire had the eleventh most.<sup>17</sup> The proportion of Hampshire bakers in 1831 is very similar to the proportions found by Jan de Vries, Ad Van der Woude and Johan Poukens in the late eighteenth-century Netherlands and Brabant, other market economies without significant coal deposits.<sup>18</sup> In every region, bakers were more prevalent in towns than in smaller communities. However, they were most prevalent in towns with more expensive coal. For instance, coal cost more in Sheffield than in Leeds and bakers were twice as prevalent there.<sup>19</sup> Across the West Riding, the larger towns and those at the eastern edge of the coalfield had significantly more bakers than the expanding textile-manufacturing towns west of Leeds. Despite having 23,223 residents in 1831, Bradford only had one baker, while nearby Horton had 10,782 residents and no bakers. For comparison, Southampton had 91 bakers for 19,234 residents while the 10,000

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<sup>17</sup> *1831 Census*. The only counties with fewer bakers per capita than the West Riding were in upland regions of Scotland and Wales: Anglesey, Caithness, Flint, Kirkcudbright, Orkney and Shetland, Radnor and Sutherland. Meanwhile, the counties with more bakers than Hampshire were generally in southern England, had expensive fuel and were often heavily urbanised: Berkshire, Buckinghamshire, Fife, Gloucester, Haddington, Huntingdon, Kent, Linlithgow, Middlesex, Northamptonshire, Oxfordshire, Rutland and Surrey.

<sup>18</sup> Jan de Vries and Ad Van der Woude, *The First Modern Economy: Success, Failure and Perseverance of the Dutch Economy, 1500-1815*, (Cambridge: Cambridge University Press, 1997) 517-522 and Johan Poukens, "‘Tout-à-la fois cultivateurs et commerçans’ : Smallholders and the Industrious Revolution in Eighteenth-Century Brabant" *Agricultural History Review* 60 (2012) 166. De Vries and Van der Woude found 2.5 bakers per thousand Dutch residents, while Poukens observed 1.9 bakers per thousand rural Brabantines. De Vries and Van der Woude do not associate the prevalence of bakers with fuel as in the English historiography, but note that bakers were less prevalent in the south-eastern Netherlands, a region that includes Limburg and the only coal seams.

<sup>19</sup> *1831 Census*, Sheffield had 53 bakers and Leeds 54 despite Leeds being twice the size.

residents of Barnsley and Doncaster were served by eight and 13 bakers respectively. The available evidence does not indicate the size of bakeries but there is no reason to suppose that they were radically larger in Yorkshire. The 1831 Census thus indicates that West Riding residents were much less likely to purchase bread than their Hampshire equivalents. Bakers were especially rare in the textile manufacturing district of the North Coalfield, where fuel was very cheap and people cooked their own food.

**Table 5-1: Residents per Baker, 1831 Census**

Region	Bakers	Population	Residents/Baker
Urban Hampshire <sup>20</sup>	301	69,713	232
<b>Urban England</b>	<b>12,140</b>	<b>4,235,131</b>	<b>349</b>
Hampshire	778	314,280	404
Rural Hampshire	477	244,567	513
<b>England</b>	<b>23,730</b>	<b>13,091,005</b>	<b>552</b>
<b>Rural England</b>	<b>11,590</b>	<b>8,728,676</b>	<b>753</b>
Other Urban West Riding <sup>21</sup>	140	215,767	1,541
Urban West Riding	153	300,175	1,961
West Riding	290	976,350	3,367
Rural West Riding	137	676,175	4,935
Textile Towns West Riding <sup>22</sup>	13	84,408	6,493

In 1822, Edward Baines, editor of the *Leeds Mercury*, produced the first comprehensive trade directory of the West Riding. It included 214 bakers, whose locations are noted in Table 5-2. A comparison of the two samples indicates that the baking profession expanded in smaller communities in the 1820s, while it did not rise as

<sup>20</sup> The appendix to the *1831 Census* breaks down the occupational groupings by county and for each community larger than 10,000. In Hampshire, these were Southampton and Portsmouth. For the West Riding, these were Barnsley, Bradford, Doncaster, Halifax, Horton, Huddersfield, Leeds, Sheffield, Saddleworth and Wakefield. Urban/Rural divisions that follow are based upon whether they were in these communities or not.

<sup>21</sup> For the purposes of this chart, this grouping consists of Barnsley, Doncaster, Leeds, Sheffield and Wakefield. It was chosen because these five towns had a considerably smaller number of residents per baker than the five other towns further west in the heart of the textile manufacturing district. These two categories only exist to emphasize the distinction apparent in the 1831 Census.

<sup>22</sup> This category consists of Bradford, Halifax, Horton, Huddersfield and Saddleworth. These were all major centres of textile production but also had considerably higher numbers of residents per baker than the five above towns.

quickly as population in the larger centres. Bakers were less prevalent on the coalfield, especially when the size of communities is considered. Sheffield was in the South Coalfield and coal was more expensive than in most other manufacturing communities. The town had 38 bakers serving 42,157 residents, while there was one baker for every 3,540 people in the rest of the South Coalfield. Meanwhile, there were only five bakers mentioned in the smaller communities of the North Coalfield, serving an average population of 58,051.<sup>23</sup> The evidence from Baines' West Riding directory reaffirms that bakers were less prevalent in Yorkshire than in Hampshire. Bakers were especially rare in the smaller textile communities of the North Coalfield which, like Thurstonland, enjoyed exceptionally cheap coal.

**Table 5-2: Residents per Baker, West Riding from Baines' 1822 Directory<sup>24</sup>**

Region	Bakers	Residents (1821)	Residents/Baker
<b>Urban West Riding<sup>25</sup></b>	<b>138</b>	<b>213,615</b>	<b>1,548</b>
South-East	15	28,819	1,921
South Coalfield	62	127,109	2,050
Central	24	74,602	3,108
North-West	18	66,404	3,689
<b>West Riding</b>	<b>214</b>	<b>797,825</b>	<b>3,728</b>
North-East	13	54,142	4,165
North Coalfield	82	446,749	5,448
<b>Rural West Riding</b>	<b>76</b>	<b>584,210</b>	<b>7,687</b>

<sup>23</sup> There were 290,256 residents in the North Coalfield from Wrigley, *Early English Censuses* Table A1.5, when Leeds, Wakefield, Huddersfield, Halifax, Bradford, Quick and Horton were removed.

<sup>24</sup> *History, Directory & Gazetteer of the County of York; Volume I, West Riding*, (London: Edward Baines, 1822). Populations are from the 1821 Census and Wrigley, *Early English Censuses*, Table A1.5

<sup>25</sup> This category consists of Barnsley, Bradford, Doncaster, Halifax, Horton, Huddersfield, Leeds, Sheffield, Saddleworth and Wakefield and exists to provide comparison with the occupational details from the 1831 Census.



## Cooking

Cheap coal allowed nineteenth-century residents of the North Coalfield to cook more frequently and differently than those in eastern Yorkshire or Hampshire. Joseph Lawson of Pudsey described a typical 1820s diet for weavers in that expanding town:

Oat-cake, brown bread, porridge pudding, skimmed milk, potatoes, and home-brewed beer, which they always call 'drink', are the principal articles of food. Tea, coffee, and sugar are dear, butter is not much used, and treacle even is deemed a luxury! Most of the women and many girls can bake this oatcake, called 'havver cake' or bread. It is baked on a 'bakstone' (bakestone) built in bricks. Some have double bakstones on which two cakes can be baked at the same time. On these sometimes the neighbours bake in turns, taking their meal tubs and coal to heat the bakstone. In almost every house may be seen a creel consisting of cords attached to the joists over the hearth, on which the oatcake is hung to harden; also cakes made of wheaten flour, called 'bread meal', are put on this creel for the same purpose, and they soon get so hard as to require good teeth, which happily the people as a rule possess. There is much art in baking this oatcake, some can always make it fine, thin, and crisp, while others make it thick and flinty.<sup>26</sup>

Such a household cooked most of its food and enjoyed a varied diet, some of which was eaten warm. These preparations relied upon coal fires for extended periods of time and many Pudsey residents were even able to keep the fires lit in the evening to warm their houses.<sup>27</sup> Oats were the main grain in upland Yorkshire as wheat did not grow well in the cooler climate. Joan Thirsk describes long-boiled pottages of grains, vegetables and occasional meats over open wood and peat fires in earlier centuries.<sup>28</sup> Coal fires require an updraft of oxygen and the mineral does not burn well in traditional open-hearths in the centre of a room. As a result, traditional cauldron-based dishes would not cook well on the open-grate coal fires Lawson describes and his Pudsey diet was an adaptation to coal cooking. Lawson did not mention a stove or many cooking utensils,

<sup>26</sup> Lawson, *Progress in Pudsey* 26-27.

<sup>27</sup> Lawson, *Progress in Pudsey* 23.

<sup>28</sup> Thirsk, *Food in Early Modern England*, 25.

implying that these were less common in industrializing regions than Nancy Cox suggests.<sup>29</sup>

Amongst other foods, Lawson mentioned potatoes. The root is highly nutritious and was understood to be so in the eighteenth century. Adam Smith, Thomas Malthus and Edmund Poulter argued for the nutritional benefits of potatoes by comparing the greater health and physical strength of Irish agricultural labourers to their English equivalents.<sup>30</sup> Carole Shammas reaffirms the benefits of potatoes and finds that they offered 1,000 calories per penny in the 1790s, while oatmeal averaged 880 calories and wheaten bread 384 per penny.<sup>31</sup> Despite the nutritional benefits that are apparent in hindsight and observed by contemporaries, potatoes were not eaten across England. Redcliffe Salaman claims that “the consumption of potatoes per head of the agricultural working classes south of the Coal Line was so small as to be inconsiderable” in 1800.<sup>32</sup> Meanwhile, Robert Dilley finds that potatoes became commonly eaten in fuel-abundant Cumberland in the early eighteenth century and only gradually became popular in other parts of England.<sup>33</sup>

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<sup>29</sup> Nancy Cox, “A Flesh Pott, or a Brasse Pott or a Pott to Boile in’: Changes in Metal and Fuel Technology in the Early Modern Period and the Implications for Cooking,” *Gender and Material Culture in Historical Perspective*, Moira Donald and Linda Hurcombe Eds., (Basingstoke: Macmillan, 2000) 152-153.

<sup>30</sup> Malthus, *Essay on the Principle of Population*, 127, Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Indianapolis: Liberty fund, 1981, first published 1776) 177, Poulter, *Enquiry into the General State of the Poor* 27, Other references to the nutritional benefits of potatoes include: Arthur Young, *General View of the Agriculture of the County of Suffolk*. (London: Sherwood, Neely, and Jones, 1813) 139, Thomas Davis, *General View of the Agriculture of the County of the County of Wilts*: (London: 1794) 51, *Inquiry into the Causes and Remedies of the Late and Present Scarcity and High Price of Provisions, in a Letter to the Right Hon Earl Spencer, K.G., First Lord of the Admiralty* (London: J Wright, 1800) 55, Davies, *Case of the Labourers in Husbandry* 35, and William Buchan, *Observations Concerning the Diet of the Common People, Recommending a Method of Living Less Expensive, and more Conducive to Health, than the Present*, (London: A Strahan, 1797) 30.

<sup>31</sup> Carole Shammas, “The Eighteenth-Century English Diet and Economic Change,” *Explorations in Economic History* 21 (1984) 258.

<sup>32</sup> Redcliffe N. Salaman, *The History and Social Influence of the Potato*, (Cambridge: Cambridge University Press, 1985, first printed 1949) 530.

<sup>33</sup> Dilley, “Agricultural Change and Common Land in Cumberland,” 186, 204.

There is sporadic evidence for English potato cultivation and consumption in this period. All of the available sources on the spread of potato consumption are problematic but suggest a similar pattern. The evidence suggests that it was limited by English people not wanting to eat cold, previously-cooked potatoes. David Davies collected household budgets from labouring households in 29 communities across England and Wales in the mid-1790s. In 11 of those communities, residents mentioned potatoes. Ten of these were coal or peat burning. The other was Holwell, Somerset, where poor residents burnt dung and the occasional piece of hedgewood.<sup>34</sup> Interestingly, none of the Hampshire or Yorkshire labourers surveyed by Davies claimed to eat potatoes.

Meanwhile, the cultivation of potatoes spread unevenly across England. By 1801, labourers and other poor residents frequently planted them as a garden crop across southern England.<sup>35</sup> In some communities, agricultural labourers were allotted arable land to plant them between 1793 and 1830.<sup>36</sup> Other evidence for the introduction of potatoes comes from depositions for tithe disputes in the Court of Exchequer. Potatoes were a titheable crop and often replaced non-titheable fallow fields in crop cycles, affecting the amounts owed. In 1737, George Ripley, of peat-burning Kirkby Malzeard in the north-eastern region of the West Riding, deposed “that the first time that Potatoes were cultivated in the fields within the parish of Kirkby Malzeard aforesaid was within the last thirty years and that one buck about that time first thought of setting Potatoes in large quantities within the said Parish.”<sup>37</sup> Other tithe disputes indicate that potatoes

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<sup>34</sup> Davies, *Case of the Labourers in Husbandry*, 176-231. Holwell is pages 218-219.

<sup>35</sup> “1801 Acreage Returns” National Archives HO67. This includes locations like Stratfield Saye in Hampshire, where “many of the poor in Straffield Saye have small gardens of potatoes taken by permission of the Lord of the Manor out of the waste land.” HO67/24/224.

<sup>36</sup> Jeremy Burchardt, “Land and the Laborer: Potato Grounds and Allotments in Nineteenth-Century Southern England,” *Agricultural History* 74 (2000) 671-674.

<sup>37</sup> “Deposition of George Ripley” National Archives E134/10Geo2/Hil3.

were grown in the West Riding communities of Potternewtown by 1756, at Calverly by 1769, at Wath by 1783 and at Tadcaster by 1800.<sup>38</sup> The 1799 edition of Robert Brown's *General View of the Agriculture of the West Riding of Yorkshire* includes an appendix detailing the number of acres devoted to each field crop in 59 parishes or townships. Potatoes were a field crop in 19 of those communities, as illustrated in Table 5-3. Potatoes were most frequently grown in the south-eastern fenlands. They were also grown in larger quantities in the peat-burning south-east. The three parishes with the largest acreages under potatoes were in that region and included the 160 acres at Addlingfleet.<sup>39</sup> Potatoes were also grown in smaller quantities in many north coalfield parishes and in a few other locations across the Riding.

**Table 5-3: Potatoes as a Field Crop in West Riding of Yorkshire by fuel region<sup>40</sup>**

Fuel Region	Fuel	Parishes or Townships with detail on crops	Parishes with potatoes as a field crop	Parishes with more than 25 acres of potatoes
South Coalfield	Local Coal	2	0	0
North Coalfield	Local Coal	14	6	1
North-West	Non-Local Coal/Peat	16	1	1
North-East	Non-local Coal	3	1	1
Central	Non-local Coal	13	2	1
South-East	Peat/Non-Local Coal	11	9	8
Total		59	19	12

More information about the cultivation of potatoes comes from an 1801 Home Office Survey of the land under cultivation in English and Welsh parishes. Local vicars were asked about the arable acreage devoted to each of eight crops, the quality of that year's harvest and the local food supply. Over 5,000 parishes in England and Wales

<sup>38</sup> NA E134/29Geo2/Mich10, E134/9Geo3/Mich9, E134/23Geo3/East1 and E134/40Geo3/Mich7.

<sup>39</sup> Brown, *General View of the Agriculture of the West Riding of Yorkshire*, appendix 87

<sup>40</sup> Brown, *General View of the Agriculture of the West Riding of Yorkshire*, appendix 86-122.

provided returns and these offer an unparalleled source on the use of arable land in 1801. This source presents two difficulties. Some farmers refused to inform the vicar of their acreages out of a fear that the information was being collected in preparation for a new tax.<sup>41</sup> The acreage surveys resembled tithe valuations, which were generally unpopular with farmers. The complaints raised against the Acreage Returns did not mention tithes, but the resemblance to tithe valuations contributed to fears that they were undertaken to increase taxation.<sup>42</sup> As potatoes often replaced non-titheable crops, their returns are not always as reliable as those for wheat, barley, oats or beans. The other difficulty with the acreage returns is that garden crops were only sometimes included. At Everleigh in Hampshire the vicar did not include an acreage total for potatoes as "none worthy of notice grown in this parish, the cultivation of this article being chiefly confined to our small gardens."<sup>43</sup> Vicars noticed substantial fields of potatoes. As such, the discrepancies in how they observed gardens mean that the returns capture the general scale of potato cultivation while not providing accurate totals. There is no indication that the returns were less accurate in some regions than others. Despite these imprecisions, the Acreage Returns suggest the scale of potato cultivation in different regions.

Potatoes were grown in at least small quantities across both counties as only 26 Hampshire parishes and four West Riding ones claimed not to have any planted. They were thus more prevalent across England than Redcliffe Salaman claims. However, the

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<sup>41</sup> One such example is Swanweek, Somerset, where the N Morgan noted "This is the best Return I could obtain, but I will not vouch for its being a correct one. The Farmers who are a cautious set of People suspect that Ministers have some design upon them and therefore it is probable they may not make a true return." "1801 Acreage Returns, Diocese of Bath and Wells" NA HO67/2/244.

<sup>42</sup> Eric J. Evans, *The Contentious Tithe: The Tithe Problem and English Agriculture, 1750-1850* (London: Routledge, 1976) 16.

<sup>43</sup> "1801 Acreage Returns, Diocese of Winchester" NA HO67/24/91.

frequency with which people ate potatoes varied. Potatoes are heavier than grains and thus more difficult to transport. Nor do they store as well. As such, they were more likely to be eaten locally and the amount of land devoted to them offers an indication of how often they were consumed. Inhabitants of places that grew more potatoes ate them more often. For example, the vicar of Newnham, Hampshire noted that “potatoes in this parish are generally planted in small parcels in gardens for the use of the family; the amount of which may perhaps be about an acre and a half.”<sup>44</sup> Newnham had 260 inhabitants in 1801, so these gardens likely produced between two and three bushels of potatoes per resident.<sup>45</sup> Meanwhile, Adlingfleet township, Yorkshire had 203 inhabitants in 1801 but planted 77 acres of potatoes. Even if yields were substantially less than in Newnham, they produced over 30 bushels per resident.<sup>46</sup> Newnham people could thus eat potatoes less than one-tenth as often than those in Adlingfleet or other parishes with more acres devoted to tubers. Tables 5-4 and 5-5 summarize the 1801 acreage returns for Hampshire and the West Riding. The returns for some parishes include garden potatoes. Such Returns indicate that these did not normally amount to more than a few acres in each parish. I have grouped parishes into three categories depending on the potato acreage in order to better estimate the frequency with which they were eaten.

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<sup>44</sup> “1801 Acreage Returns, Diocese of Winchester” NA HO67/24/171.

<sup>45</sup> *1801 Census*. With 260 people and roughly 1½ acres of potatoes, this works out to approximately a perch of potatoes per Newnham residents. The estimate of potato yields derives from the Acreage Returns from nearby Farnborough, where the vicar claimed that potatoes in fields yielded 400 bushels/acre. That was one of the highest yields of potatoes across England and Wales. “1801 Acreage Returns, Diocese of Winchester” NA HO67/24/99.

<sup>46</sup> *1801 Census* and “1801 Acreage Returns, Diocese of York” NA HO67/26/10. The 30 bushels/resident is based upon an estimated yield of 80 bushels/acre, which is the lowest yield noted by any English or Welsh vicar and substantially less than the Newnham estimate. The above paragraph thus underestimates the amount of potatoes available for residents of the two communities. The acres are fewer than from the *General View* for Adlingfleet, as that referred to the entire parish rather than the township. The three townships in Adlingfleet parish combined for a population of 437 in 1801.

Grouping parishes with less than five acres of potatoes together also addresses some of the ambiguity over whether vicars recorded garden acreage.

**Table 5-4: Cultivation of Potatoes in West Riding of Yorkshire Parishes, 1801<sup>47</sup>**

Fuel Region	Fuel	Returns	Less Than 5 acres of potatoes	5-25 acres of potatoes	More than 25 acres of potatoes
South Coalfield	Local Coal	21	7	11	3
North Coalfield	Local Coal	46	5	23	18
North-West	Non-Local Coal/Peat	20	11	5	4
North-East	Non-Local Coal	26	2	13	11
Central	Non-Local Coal	52	19	23	10
South-East	Peat/Non-Local Coal	12	0	2	10
Total		177	44	77	56

Tables 5-4 and 5-5 indicate that more acres were devoted to potatoes in the West Riding of Yorkshire than in Hampshire. They also indicate that potato cultivation differed regionally across both counties. In the West Riding, they were especially prominent in the peat-burning south-eastern region. Meanwhile, many other locations with significant potato cultivation were peat-burning. These include Kirkby Malzeard, in the north-east, where 47 of the 1,158 arable acres were devoted to potatoes in 1801.<sup>48</sup> Potatoes were more rarely planted in the north-western region, which had little arable agriculture, and in the South Coalfield. In Hampshire, more acres were devoted to potatoes in south-western parishes, particularly in the New Forest. Like south-eastern Yorkshire, this was a peat-burning region. The acreage devoted to potatoes in the wood-burning parishes of northern Hampshire was comparatively small.

<sup>47</sup> "1801 Acreage Returns, Diocese of York" NA HO67/26.

<sup>48</sup> "1801 Acreage Returns, Diocese of York," NA HO67/26/257.

**Table 5-5: Cultivation of Potatoes in Hampshire Parishes, 1801<sup>49</sup>**

Fuel Region	Fuel	Returns	Less than 5 acres of potatoes	5-25 acres of potatoes	More than 25 acres of potatoes
Isle of Wight	Non-Local Coal	24	17	7	0
South-West	Peat	11	2	3	6
Coast	Non-Local Coal/Peat	38	21	12	5
Inland	Non-Local Coal	11	5	4	2
North-East	Wood	31	23	7	1
North-West	Wood	33	25	7	1
Total		148	93	40	15

Another indication that potatoes were more commonly eaten in the peat-burning south-eastern corner of the West Riding and south-western Hampshire comes from indictments for potato theft at the County Quarter Sessions. Between 1757 and 1830, 25 West Riding residents and 24 Hampshire ones were indicted for stealing potatoes. These cases involved the theft of previously harvested tubers, such as when labourers George Lee and Robert Chater of Titchfield, on the Hampshire coast, were indicted for stealing one and a half bushels of potatoes from John Morave in November 1762.<sup>50</sup> The regional breakdown of those cases is illustrated in tables 5-6 and 5-7.<sup>51</sup> The total number of food theft indictments for each region indicates that the geographic pattern of potato theft indictments was not dictated by the same social and institutional factors as prosecutions for stealing other types of food. Rather, the spread of potato thefts indictments reflects their presence in a given community.

<sup>49</sup> "1801 Acreage Returns, Diocese of Winchester" NA HO67/24.

<sup>50</sup> "Epiphany Sessions 1763 Indictments" HRO Q9/1/328. Lee was convicted and publicly whipped, while Chater was acquitted.

<sup>51</sup> These indictments arise from the same sample discussed in chapter four, and the regional breakdown of population, total theft indictments and total indictments for these regions is available in Tables 4-1,4-2, 4-5 and 4-7.



**Table 5-6: Potato Theft Indictments by Fuel Region, West Riding, 1757-1830<sup>52</sup>**

Fuel Region	Fuel	Potato Theft Indictments	% of County Total	Food Theft Indictments	% of County Total
South Coalfield	Local Coal	2	8%	309	31.6%
North Coalfield	Local Coal	12	48%	385	39.4%
North-West	Non-Local Coal/Peat	2	8%	38	3.9%
North-East	Non-Local Coal	1	4%	37	3.8%
Central	Non-Local Coal	0	0	133	13.6%
South-East	Peat/Non-Local Coal	8	32%	76	7.8%
Total		25	100%	978	100%

**Table 5-7: Potato Theft Indictments by Fuel Region, Hampshire, 1757-1830<sup>53</sup>**

Fuel Region	Fuel	Potato Theft Indictments	% of County Total	Food Theft Indictments	% of County Total
Isle of Wight	Non-Local Coal	1	4.2%	48	7.4%
South-West	Peat	5	20.9%	108	16.7%
Coast	Non-Local Coal/Peat	10	41.7%	186	28.7%
Inland	Non-Local Coal	6	25%	92	14.2%
North-East	Wood	2	8.3%	108	16.7%
North-West	Wood	0	0	106	16.4%
Total		24	100%	648	100%

Potato theft prosecutions indicate that the roots were eaten by some inhabitants of those communities. There are too few cases for them to indicate much else. Table 5-6 indicates that stealing potatoes was more frequently prosecuted in the south-eastern region of the West Riding. This was the same region where they were most frequently grown in 1801. They were also stolen with some frequency on the north coalfield, which contained Joseph Lawson's Pudsey and had very cheap coal. Meanwhile, Table 5-7 indicates that potatoes were rarely stolen in northern Hampshire. In fact, the only

<sup>52</sup> "Quarter Sessions Indictment Books" WYAS Wakefield QS4/33/1-QS4/62/140.

<sup>53</sup> HRO Q9/1/307-591.

northern Hampshire indictments came from peat-burning Yateley. Labourers George and James Yeomans were found not guilty of stealing 10 bushels of potatoes from James Brown on 29 November 1818.<sup>54</sup> These charges suggest that more potatoes were eaten in peat-burning communities and they were rarer in wood-burning northern Hampshire.

Potatoes were more frequently consumed by the early 1830s, especially in coal-burning communities. The authors of the 1834 *Poor Law Report* directed a series of questions to local overseers and recorded the responses they received to these 'Rural and Town Queries'. One of these questions was whether a labouring family could subsist on the earnings specified in an earlier question "and if so, on what Food?"<sup>55</sup> The judgement of middle or upper-class landowners on the ability of labourers to survive on their wages is not always reliable but their impressions of the foods eaten locally may carry more weight. Potatoes were noted in many southern Hampshire communities but rarely mentioned north of the Downs. Such communities include Bramshaw, in south-western Hampshire, where George Eyre claimed that labouring families could survive on local wages "potatoes being cheap and fuel also."<sup>56</sup> Meanwhile, at Amport, in north-western Hampshire, R.G. Curtois responded that labourers lived "on bread, vegetables, bacon, tea, and sugar."<sup>57</sup> Respondents to the Rural Queries most frequently mentioned potatoes in south-western Hampshire and least often in northern Hampshire, where bread was the main staple. Meanwhile, respondents across the West Riding mentioned potatoes. They were most frequently noted in the peat-burning communities of the

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<sup>54</sup> "Epiphany Sessions 1819 Indictments" HRO Q9/1/553.

<sup>55</sup> *Poor Law Report* (1834) 1b.

<sup>56</sup> *Poor Law Report* (1834) 415b.

<sup>57</sup> *Poor Law Report* (1834) 411b.

south-east and north-west but were also mentioned in most coal-burning parishes. There were exceptions, including Shelf on the north coalfield, where Richard Sutcliffe claimed that labourers subsisted “on oatmeal porridge, bread and milk, coffee, and wheat bread, and occasionally flesh meat.”<sup>58</sup> By the 1830s, a characteristic West Riding diet more resembled Dent, in the north-west, where labourers lived “principally on oat-bread, oat-meal, porridge, milk and potatoes.”<sup>59</sup> Potatoes became more frequently eaten in the early decades of the nineteenth century but retained their reliance upon cheap and plentiful fuel, especially peat.

Jeremy Burchardt claims that potatoes were more frequently grown in peaty regions because the soil was suitable.<sup>60</sup> Moreover, peat was well suited to cooking potatoes and residents of such communities generally had access to sufficient cheap fuel for doing so. In 1828, Sir John Sinclair claimed that there were six ways to eat potatoes. All involved either eating potatoes warm or processing them into flour and baking it as bread. These methods were “1. Boiling or steaming; - 2. Roasting, or baking; - 3. Frying; - 4. Cutting the entire potatoe into thin slices, drying them, and then converting them into meal; - 5. Separating the farina from the fibre of the potatoe, and using them for various purposes; - and, 6. Employing potatoes in various ways, in the manufacture of bread.”<sup>61</sup> Others also describe potatoes being eaten warm. Eden observed that in northern England, potatoes “are sometimes roasted, or boiled, and eaten with butter, as in the South; but are more commonly boiled, (sometimes with the

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<sup>58</sup> *Poor Law Report* (1834) 628b.

<sup>59</sup> *Poor Law Report* (1834) 611b.

<sup>60</sup> Burchardt, “Land and the Laborer” 673.

<sup>61</sup> Sir John Sinclair, *On the Culture and Uses of Potatoes; Accompanied by Engravings, and Practical Directions, Explanatory of the Best Modes of Raising, Preserving and Using that Root*, (Edinburgh: William Blackwood, 1828) 52

skin on, and sometimes with it taken off,) or bacon fried.”<sup>62</sup> Eden also claimed that peat-burning Dorset households ate “potatoes sometimes mashed with fat taken from broth and sometimes with salt alone.”<sup>63</sup> William Cobbett proffered advice to labouring southerners in the 1820s and suggested they consume wheat bread rather than potatoes because it required less fuel. Bread could be eaten over a week after it was cooked, whereas the root needed to be cooked daily “unless cold potatoes be eaten at some of the meals; and, in that case, the diet must be cheering indeed!”<sup>64</sup> Helen Pollard’s work on traditional Lancashire cuisine also reinforces this connection as all of her potato recipes involve eating them warm.<sup>65</sup> In early nineteenth-century Ireland, potatoes were also usually cooked either in the embers of peat fires or boiled in cauldrons over them.<sup>66</sup> Ilmar Talve writes about nineteenth-century Finland, where potatoes were usually cooked in peat fires. Talve finds that cold potatoes were sometimes eaten, either by agricultural labourers taking the previous evening’s leftovers for lunch or in festive salads where the tubers were combined with animal proteins, oils and other vegetables.<sup>67</sup> Those cold potatoes required daily fires and the salads used ingredients that most English people could rarely afford.

Peat burns longer and slower than other fuel sources and Dorothy Hartley explains that potatoes cook well in the embers of such fires.<sup>68</sup> Pottages and other long-

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<sup>62</sup> Morton Eden, *State of the Poor, Volume I*, 501.

<sup>63</sup> Morton Eden, *State of the Poor Volume II*, 148.

<sup>64</sup> William Cobbett, *Cottage Economy*, (London: J.M. Cobbett, 1823, reprinted 1974) 60.

<sup>65</sup> Helen Pollard, “Lancashire’s Heritage,” *Traditional Food East and West of the Pennines*, C. Anne Wilson Ed, (Stroud: Allan Sutton Publishing, 1994) 123-125.

<sup>66</sup> Regina Sexton, “Diet in pre-famine Ireland” *Atlas of the Great Irish Famine, 1845-1852*, John Crowley, William J. Smyth and Mike Murphy eds (Cork: Cork University Press, 2012) 42.

<sup>67</sup> Ilmar Talve, “The Potato in Finnish Food Economy” *Food In Perspective: Proceedings of the Third International Conference on Ethnological Food Research, Cardiff, Wales 1977*, Alexander Fenton and Trefor M. Owen eds. (Edinburgh: John Donald Publishers Ltd, 1981) 278-280.

<sup>68</sup> Dorothy Hartley, *Food in England*, (London: Futura, 1985, first published 1954) 46.

simmering broths are also well suited to cooking in cauldrons over open peat-fires.

These various descriptions of people eating potatoes either roasted or boiled emphasize a connection to longer-lasting fires, which is reaffirmed by their being more frequently grown, eaten and stolen in peat-burning communities. There was a similar connection between potatoes and fuel in eighteenth-century Ireland, France and the Low Countries. Potatoes were more commonly cultivated in the peat-rich south and west of Ireland than along the east coast.<sup>69</sup> An 1801 French survey found that potatoes were not planted in most of the country and the main regions in which they were a field crop were fuel-rich Flanders, Wallonia, Lorraine and Dauphiné.<sup>70</sup> Meanwhile, Christian Vandenbroeke traced the root's adoption across the Low Countries by examining tithe disputes. Vandenbroeke does not connect tubers to fuel and found that they were grown everywhere by 1760. Potatoes were adopted earlier in peaty coastal regions like West Flanders while taking longer in hilly, coal-burning regions such as Hainaut and Limburg.<sup>71</sup>

Most English people ate carbohydrate-based diets and beer was another way to convert grain into edible food. According to Bruce Campbell, medieval English people preferred drinking beer to eating bread or pottages and it remained an important dietary component into the nineteenth century.<sup>72</sup> Beer was traditionally brewed by the

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<sup>69</sup> Alice D'Arcy, "The Potato in Ireland's Evolving Agrarian Landscape and Agri-Food System," *Irish Geography* 43 (2010) 124.

<sup>70</sup> Michel Morineau, "The Potato in the Eighteenth Century" *Food and Drink in History, Selections from the Annales Economies, Sociétés, Civilisations, Volume 5*, Robert Forster and Orest Ranum eds, Elborg Forster and Patricia M. Ranum trans, (Baltimore: The Johns Hopkins University Press, 1979) 26.

<sup>71</sup> Christian Vandenbroeke, "Aardappelteelt en aardappelverbruik in de 17e en 18e eeuw" *Tijdschrift voor Geschiedenis* 82 (1969) 50-53. Poukens, "Tout-à-la fois cultivateurs et commerçans" 162 There is some overlap in the regions of these three studies as the southern Netherlands (modern Belgium) was part of France in 1801 and was included in Vandenbroeke's study.

<sup>72</sup> Bruce M.S. Campbell, *English Seigniorial Agriculture 1250-1450*, (Cambridge: Cambridge University Press, 2000) Also see: Peter Mathias, *The Brewing Industry in England 1700-1830* (Cambridge:

households that consumed it. Joseph Lawson described such brewing in Pudsey.<sup>73</sup> It was also a component of agricultural labourers' wages in many parts of England. The overseers of Lyndhurst, in south-western Hampshire, and other parishes sometimes provided beer to the poor people they had hired to cut turf. For instance, in the summer of 1773 they paid 4s 6d to cart 9000 turves and spent 1s 6d on "beer for the same."<sup>74</sup> Like other methods of cooking, brewing beer relied upon fuel to boil the wort. Richard Unger emphasizes fuel costs and notes that inferior grades of peat were unsuitable to the task.<sup>75</sup> In the early nineteenth century, William Clark was a commercial brewer in Ringwood, south-west Hampshire. He used anthracite, which he referred to as "stone coals" to boil the wort.<sup>76</sup> Such coal was better for brewing beer than bituminous grades as there was less sulphur to mix with the final product. However, it was nearly double the price and required more advanced stoves than most households possessed.

John Burnett notes that high fuel prices increasingly precluded home-brewing in many regions during the Napoleonic Wars. William Cobbett complained that agricultural labourers had ceased brewing their own beer and encouraged them to take up the practice in the 1820s.<sup>77</sup> Such concerns suggest that home-brewing declined in rural southern England. This can be seen in the 1831 Census, which recorded the number of brewers in every county and large town. The scale of brewing operations varied more

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Cambridge University Press, 1959) and Anna Clark, *The Struggle for the Breeches: Gender and the Making of the British Working Class* (Berkeley: University of California Press, 1995) 29.

<sup>73</sup> Lawson, *Progress in Pudsey* 26-27.

<sup>74</sup> "Lyndhurst Poor Book, 1765-1776" HRO 25M84/PO1.

<sup>75</sup> Richard W. Unger, "Beer Production, Profits, and Public Authorities in the Renaissance," *The Economics of Beer*, Johan F.M. Swinnen ed, (Oxford: Oxford University Press, 2011) 44-45.

<sup>76</sup> "Account Book of William Clark's Brewing Business at Ringwood, 1812-1832" HRO 11M61/55.

<sup>77</sup> Cobbett, *Cottage Economy* 38-49.

than that of bakers and they tended to be larger in towns.<sup>78</sup> Their presence underscores the greater prevalence of home-brewing in Yorkshire: Hampshire had 210 brewers or one for every 1,497 residents, while the West Riding had 174 brewers, or one for every 5,611 residents.<sup>79</sup> Paul Jennings also observes that a particularly large portion of the 1826 malt-duty paid in the West Riding was for home brewing. This was especially the case for Bradford and neighbouring communities with cheap coal.<sup>80</sup> Like bakers, commercial brewers were more concentrated in towns but they were also present in the West Riding textile belt.<sup>81</sup> Beer was an important form of grain-consumption that remained home-brewed in rural areas with cheap fuel and came to be purchased in urban ones with expensive coal.

The essence of cooking is using heat to modify food. As such, it relies upon fuel sources external to the food itself and was influenced by their availability. Residents of Yorkshire's north coalfield ate differently from those in northern Hampshire. Some differences were related to climate and local tradition because oats grow well in the Pennines while wheat does better in the Vale or York or in northern Hampshire. Meanwhile, other aspects of regional diets were caused by fuel prices and these became increasingly divergent in the late eighteenth and early nineteenth centuries. Cooking also requires time. Interestingly, after 1815 cooking was most prevalent in

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<sup>78</sup> B.R. Bennison, "The Size and Arrangement of Brewing in North-Eastern England, 1800-1830," *Northern History* 35 (2000) 99-112, Paul Jennings, *The Public House in Bradford, 1770-1970*, (Keele: Keele University Press, 1995) 21, and Ian Donnachie, *A History of the Brewing Industry in Scotland*, (Edinburgh: John Donald Publishers, 1979) 36.

<sup>79</sup> *1831 Census*. Across England there were 4,862 brewers or one for every 2,693 residents.

<sup>80</sup> Jennings, *Public House in Bradford*, 137-138.

<sup>81</sup> *1831 Census*. The numbers of brewers/resident for towns and the rural regions of both counties follow, with the total number in parentheses. Rural Hampshire had one brewer for every 10,262 residents (136), while Southampton and Portsmouth had one for every 942 residents (74). Meanwhile the rural West Riding had one brewer for every 8,146 residents (83), while the towns had the following populations per brewer: Barnsley 1,722 (6), Bradford 5,805 (4), Doncaster 10,801 (1), Halifax 3,076 (5), Horton 1,797 (6), Huddersfield 2,719 (7), Leeds 2,869 (43), Saddleworth 0, Sheffield 3,934 (15), Wakefield 3,058 (4).

industrializing regions where women were more likely to work for wages and men less likely to be underemployed.<sup>82</sup> Regional working-class diets are difficult to trace because they are not reflected in cookbooks or the London-based pamphlet discussions on feeding the poor. This discussion has tried to trace regional differences in working-class eating habits using sources that enable comparison across counties. More work must be done on regional diets but these sources suggest that residents of industrializing Yorkshire were much more likely to cook their own food and brew their own beer than the frequently colder inhabitants of wood-burning regions. Meanwhile, potato consumption began in peat-burning communities, before spreading to coal-burning ones and was less common in wood-burning regions prior to 1830.

### **Fuel and Health**

Cheap fuel improved living standards in eighteenth-century Yorkshire by allowing residents to cook and heat their homes. Many Overseers of the Poor also believed that fuel was beneficial during illness. In September 1825, the Doncaster overseers provided 2d worth of coals per day for Robert Farrington as he was “still very ill & requiring fire night & day.”<sup>83</sup> This was not the only occasion in which overseers purchased fuel for people because of illness. At Avington, in coastal Hampshire, in 1814-15 the Overseers spent £1 5s 9d on coals for Bridget Day at various points when she was ill.<sup>84</sup> Similar purchases were made for ill residents of many other parishes and were more common in Hampshire than in the West Riding. In the West Riding, such purchases were more frequent in the south-eastern fuel region and the southern parts of the Central region

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<sup>82</sup> Leigh Shaw-Taylor, “Diverse Experiences: the Geography of Adult Female Employment in England and the 1851 Census” *Women’s Work in Industrial England: Regional and Local Perspectives*, Nigel Goose ed (Hatfield: Local Population Studies, 2007) 50-51.

<sup>83</sup> “Doncaster Poor Law Memo Book 1825-1830” DA PL/D/2/2/14.

<sup>84</sup> “Avington Overseers Accounts 1737-1817” HRO 22M69/PO1.



than on the coalfield.<sup>85</sup> Coal was generally more expensive in such areas. Overseers there typically purchased less fuel and residents consumed relatively small amounts of it. As mentioned earlier, most parish Overseers purchased fuel in a seasonal pattern that remained consistent in their community. When fuel was purchased on other occasions, it was generally due to illness. This includes the coal bought for Thurstonland's Hannah Nash, which was mentioned in chapter three.<sup>86</sup> A further indication that overseers sometimes purchased fuel for ill residents is that disbursements outside the normal seasonal patterns are often followed in Account books by funeral expenses for the same individual.<sup>87</sup> The extra purchases of fuel for ill paupers indicate that overseers understood that their homes were insufficiently heated for the preservation and maintenance of health, particularly in communities where consumption was generally low.

Peter Thorsheim claims nineteenth-century Britons assumed that the chemicals in coal smoke reduced the spread of infectious diseases.<sup>88</sup> Sir William Clerke

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<sup>85</sup> "Abbots Ann Overseers Account 1773-1786," "Barton Stacey Poore Book 1808-1824," "Bramley Parish Book 1821-1835," "Broughton Poor Book 1791-1802," "Compton Overseers Accounts 1822-1834," "Dogmersfield Overseers Accounts 1740-1787," "Ellingham Poor Book 1822-1828," "Grateley Overseers Accounts 1799-1842," "Heckfield Overseers Accounts 1782-1791," "Hursley Overseers Account Book 1777-1795," "Winchester St Lawrence Poor Rate Assessments and Disbursements 1785-1805," "Kimpton Poor Book 1763-1791," "Lymington Poor Book 1782-1787," "Pamber Overseers Accounts 1795-1814," "Thruxton Overseers Accounts 1748-1788," "Martin Overseers Accounts 1793-1804," and "Warnford Poor Book 1793-1809," HRO 24M68/PO3, 60M70/PO3, 63M70/PO3, 38M72/PO2, 47M74/PO1, 59M72/PO1, 113M82/PO2, 32M76/PO1, 27M79/PO3, 42M82/2, 107M81W/PO1, 42M85/PO1, 42M75/PO17, 15M70/PO1, 79M71/PO1, 9M66/PO1 and 5M66/PO2, "Adwick, Overseers Account 18 April 1818 to 18 April 1819" DA P51/6/B7, "Brampton Bierlow, 1798-1823" RA 3-P/1/1, "Whiston 1799-1822," and "Worsbrough, 1797-1826" SA PR37/46 and PR3/13, and "Badsworth, 1810-1828" WYAS Wakefield WDP19/71.

<sup>86</sup> "Thurstonland town book 1796-1809" WYAS Kirklees KCZ271/2. For Nash, Overseers noted that her weekly relief of 2s was delivered to her on 20 February 1798 as she was ill. On 23 February 1798, they paid 19s towards her funeral.

<sup>87</sup> Hampshire examples include: "Beauworth Poor Book 1822-1836," "Winchester St Lawrence Rates Assessments and Disbursements 1806-1820" and "Thruxton Overseers Accounts 1748-1788," HRO 140M82/PO3, 107M81W/PO2, and 79M71/PO1.

<sup>88</sup> Peter Thorsheim, *Inventing Pollution: Coal, Smoke and Culture in Britain since 1800*, (Athens: Ohio University Press, 2006) 17.

recommended using peat fires to increase circulation and destroy contagions causing pestilential fever amongst industrial workers in Radcliffe, Lancashire in 1790.<sup>89</sup>

However, eighteenth-century medical advice was geared towards wealthier people as opposed to the labouring poor. Moreover, most writers were ambivalent about the health benefits of fuel consumption. Benjamin von Graf, the Count of Rumford, noted the dangers of draughty rooms with hot fires and the resulting temperature variation across them in winter. However, he generally thought English people would be better off if they inhabited warmer rooms.<sup>90</sup> Meanwhile, James Adair encouraged the circulation of air and associated excessively heated rooms with unhealthy luxury. He encouraged his middle and upper-class readers to avoid heating their rooms above 56 degrees (13°C) in the autumn, winter and spring, or 60 degrees (16°C) in summer.<sup>91</sup> William Buchan's *Domestic Medicine* was the best-selling medical work of the eighteenth century. Like Adair, he was concerned about the dangers of air not circulating. He also found urban air to be unhealthy as it was "loaded with sulphur, smoke, and other exhalations."<sup>92</sup> Fuel was seen as beneficial for the health of poor people but Buchan worried about the smoke it produced in London.

Buchan's concerns about urban air did not extend to Yorkshire. He was impressed that Sheffield cutlers often maintained small gardens. This "induces these people to take exercise without doors, but also to eat many greens, roots, &c of their

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<sup>89</sup> Sir William Clerke, *Thoughts Upon the Means of Preserving the Health of the Poor, by Prevention and Suppression of Epidemic Fevers, Addressed to the Inhabitants of the Town of Manchester, and of the Several Populous Trading Towns Surrounding and Connected with It*. (London: J. Johnson, 1790) 5.

<sup>90</sup> Benjamin Count of Rumford, *Essays Political, Economical, and Philosophical, A New Edition, Volume III* (London: T. Cadell, 1802) 416.

<sup>91</sup> James M. Adair, *Essays on Fashionable Diseases, The dangerous Effects of Hot and Crouded Rooms, the Clothing of Invalids, Lady and Gentlemen Doctors, and on Quacks and Quackery*. (London: T.P. Bateman, [1790?]) 48, 64.

<sup>92</sup> William Buchan, *Domestic Medicine; or, a Treatise on the Prevention and Cure of Diseases by Regimen and Simple Medicines, The Second Edition*, (London: W. Strahan 1772) 93, 95.

own growth, which they would never think of purchasing.”<sup>93</sup> John Aikin was also impressed with soil fertility in 1790s Sheffield.<sup>94</sup> He attributed this to heavy fertilization from the town, which included bone shavings from cutlery manufacturing, coal ashes and night-soil.<sup>95</sup> Aikin considered Sheffield to be a healthy town because of its low mortality rate and attributed this to it being “situated as it is in a hilly country, on a dry soil, and enjoying excellent air.”<sup>96</sup> He found Huddersfield to be similarly healthy, noting “the comparative healthiness of a manufacture carried on in rural situations and at the workmen’s own houses; from the plenty of employ and high price of labour, encouraging to early matrimony; and from the warm cloathing, good fare, and abundant fuel, enjoyed by the industrious in this place.”<sup>97</sup> Aikin associated cheap fuel with full employment, better food and health in this textile manufacturing town. Nor was he concerned about Sheffield or Huddersfield’s air quality in the 1790s.

### **Nineteenth-Century Smoke and its Regulation**

Smoke is a by-product of industrial and domestic fires that has been around for millennia. However, it became a problem with the growing scale of Yorkshire towns and manufacturing after 1800. In 1805, the wealthy Winter family purchased a house near the intersection of Mill-Hill and Swinegate, in the western part of central Leeds. Until 1809, they had a flourishing garden, producing vegetables and soft fruits.<sup>98</sup> At that point, smoke and soot from a nearby dyehouse made their fruits inedible and gardens no longer tenable in that neighbourhood. At Leeds the prevailing winds come from the

<sup>93</sup> Buchan, *Domestic Medicine*, 65.

<sup>94</sup> Aikin, *Description of the Country Round Manchester*, 551.

<sup>95</sup> Brown, *General View of the Agriculture of the West Riding of Yorkshire*, 153.

<sup>96</sup> Aikin, *Description of the Country Round Manchester*, 550.

<sup>97</sup> Aikin, *Description of the Country Round Manchester*, 554.

<sup>98</sup> *Leeds Mercury* 27 April 1811, 3. From the testimony recorded in the *Mercury*, this house was very close to the River Aire. This location suggests that it is in the area torn down for the construction of Leeds Station, probably where the eastern platforms currently are.

south-west, and in the ensuing decades, wealthier people increasingly moved into the hills north and west of the old city. They were smoked out of prosperous neighbourhoods like Mill Hill. Maurice Beresford and R.J. Morris describe the nineteenth-century development of a wealthy and relatively healthy west Leeds and a poor and smoky east Leeds.<sup>99</sup> In 1835, Sir George Head wrote a book like Aiken's about northern English manufacturing districts. He found that more coal was consumed in Leeds "in proportion to its extent," than in any other English town and that "a single glance, whether by night or by day, verifies the above conclusion. The sun himself, obscured by smoke, as by a natural mist, no sooner descends below the horizon, than streams of brilliant gas burst forth from thousands of illuminated windows."<sup>100</sup> Cheap coal enabled an expanding population to cook and encouraged industrial growth but its smoke and other chemical by-products became problematic on the early nineteenth-century Yorkshire coalfield.

Most of the scholarship on English smoke pollution focusses on the period between 1845 and 1955.<sup>101</sup> However, smoke was an increasingly severe problem from the early nineteenth century.<sup>102</sup> In 1819, Michael Angelo Taylor, a Member of Parliament who resided in the West Riding of Yorkshire, sought to address it.<sup>103</sup> He

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<sup>99</sup> Maurice Beresford, *East End, West End: The Face of Leeds During Urbanisation 1684-1842*, (Leeds: Thoresby Society, 1988) and Morris, *Class, Sect and Party*, 39-55. Wealthier residents were also smoked out of central Birmingham in the 1810s: *The Times* 3 May 1820, 2.

<sup>100</sup> Head, *A Home Tour Through the Manufacturing Districts of England*, 172.

<sup>101</sup> Peter Brimblecombe, *The Big Smoke: A History of Air Pollution in London Since Medieval Times*, (Methuen: London, 1987), Thorsheim, *Inventing Pollution*, Stephen Mosley, *The Chimney of the World: A History of Smoke Pollution in Victorian and Edwardian Manchester*, (Cambridge: White Horse Press, 2001), Leslie Tomory, "The Environmental History of the Early British Gas Industry, 1812-1830," *Environmental History* 17 (2012) 30, Catherine Bowler and Peter Brimblecombe, "Control of Air Pollution in Manchester Prior to the Public Health Act, 1875," *Environment and History* 6 (2000) 77-83.

<sup>102</sup> *Leeds Mercury* 12 June 1819, 3.

<sup>103</sup> Roland Thorne, "Michael Angelo Taylor (1756/7-1834)" *Oxford Dictionary of National Biography*, His Yorkshire work as a Magistrate and militia commander are evident in *Leeds Mercury* 3 October 1807, 3 and *Sheffield Iris* 10 October 1810, 4.

brought the matter to Parliament and in 1821 it passed his *Bill for Giving Greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used in the Working of Steam Engines*. This bill modified existing nuisance laws to facilitate prosecutions against heavily polluting chimneys and to mandate modifications to the chimneys which would reduce the smoke.<sup>104</sup> Taylor was concerned that “steam-engines were at present so numerous in many places, that the smoke which issued from them clouded the atmosphere, and endangered the lives of his Majesty’s liege subjects.”<sup>105</sup> The *Leeds Mercury* supported the 1819 parliamentary report on the following grounds.

Nothing can more strikingly illustrate the necessity of the measure brought forward by Mr. Taylor, than the shrubs and gardens in the immediate neighbourhood of Leeds. Wherever the steam-engine chimnies vomit forth their noxious fumes, vegetation languishes, and it may well be supposed, that that air which by its impurity paralyzes and deadens the face of nature, cannot be very favourable either to the health, or to the comfort of those who have to breathe the polluted atmosphere.<sup>106</sup>

The smoke reduced sunlight to the town, made breathing difficult and impeded Leeds residents from growing vegetables. Taylor’s Act had the support of both the radical *Leeds Mercury* and the Tory *Leeds Intelligencer*.<sup>107</sup>

In 1822 and 1823, indictments were brought against more than 40 Yorkshire manufacturers.<sup>108</sup> There were no similar prosecutions in Hampshire because its towns did not have smoke problems. The most significant prosecutions of 1822 occurred in

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<sup>104</sup> *Bill for Giving Greater Facility in the Prosecution and Abatement of Nuisances arising from Furnaces used in the Working of Steam Engines* (19 April 1821)

<sup>105</sup> As reported in *The Times* 9 June 1819, 2.

<sup>106</sup> *Leeds Mercury* 17 July 1819, 3.

<sup>107</sup> *Leeds Intelligencer* 23 April 1821, 3, *Leeds Mercury* 2 June 1821, 3.

<sup>108</sup> “Quarter Sessions Indictment Books” WYAS Wakefield QS4/56-39-QS4/57-67. These are from the County Sessions. The records from the Leeds Borough Sessions have not survived but numerous indictments were described in the *Leeds Mercury* including 20 October 1821 and 2 March 1822.

Bradford, where the 40 proprietors of 20 steam-engines were indicted on March 1.<sup>109</sup>

The *Leeds Mercury* supported these prosecutions and saluted their success. “Though the numerous manufactories in that place are in a state of great activity, there is not thrown up by all the steam engine furnaces in Bradford, in the course of a day, as much smoke as is emitted from one of the engines in Leeds in a single hour.”<sup>110</sup> The effectiveness of Taylor’s Act largely ended with the failed 1824 prosecution of Benjamin Gott, a large cloth-manufacturer in Leeds.<sup>111</sup> During this case, prosecutor Sergeant Cross claimed the following:

In the very town of Leeds, and there was not a garden in the neighbourhood where the flowers and the fruits were not spoiled and rendered distasteful. The persons in the vicinity could not wash, or at least could not dry their linen. Dyers were obliged in delicate colours, frequently to dye the pieces over again. Even persons going along the highway were incommoded by the smoke, and were frequently obliged to hold their breath until they got through the dense column of smoke which crossed the road.<sup>112</sup>

In 1822 and 1823, smoke nuisance prosecutions also occurred in the coalfield communities of Barnsley, Wakefield, Huddersfield, Sheffield, Halifax, Bingley, Heckmondwike, Liversedge, Dewsbury and Pudsey. Air quality was significantly worse across the manufacturing towns than it had been when John Aikin visited in the 1790s.

Household chimneys emitted a large portion of the smoke that destroyed vegetation and began to block sunlight in early nineteenth-century Yorkshire.

Households often burned more bituminous coals with higher sulphur contents.<sup>113</sup>

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<sup>109</sup> “Quarter Sessions Indictment Books” WYAS Wakefield QS4/56/103-125. 13 of the 20 were quashed with the rest eventually pleading guilty.

<sup>110</sup> *Leeds Mercury*, 27 July 1822, 3.

<sup>111</sup> For descriptions of that trial at its various stages see: *Leeds Mercury* 26 July 1823, 3 and 9 August 1823, 3, *Leeds Mercury* 10 April 1824, 3, *Leeds Mercury* 23 October 1824, 4.

<sup>112</sup> *Leeds Mercury* 10 April 1824, 3.

<sup>113</sup> “Dore House Colliery Account for May 1798,” SA MD 1737. This pit on the south coalfield distinguished between the grades of coal that it sold. They were divided into ‘furnace coal’, ‘great coal’,

However, domestic hearths were not subject to Taylor's Act and their effects were not complained of in newspapers. Individual hearths produced less smoke than factories, making it more difficult to blame particular households for smoke clouds. Cheap coal continued to underpin the cooking habits and better diets amongst working-class residents of the Yorkshire coalfield. However, its by-products created a smoke problem in manufacturing districts and a desire to rectify conditions.

### **Anthropometric Study of Inmates in West Riding House of Correction,**

Cheap coal contributed to industrialization, allowed people in manufacturing communities to continue cooking their own food and created smoke. As such, it had a complex relationship to living standards. Historians of living standards have looked at changes in average height since the work of John Komlos, Roderick Floud, Kenneth Wachter and Anabel Gregory in the late 1980s.<sup>114</sup> Humans require nutrients to grow, so that both final adult height and the timing of growth spurts reflect the nutrition available during the peak growth years of infancy and puberty. Roderick Floud, Robert W. Fogel, Bernard Harris, and Sok Chul Hong refer to the energy needed to grow as "nutritional status". This net measure "represents the energy which has been used for growth once the demands of body maintenance, resistance to disease, play, and work have been satisfied."<sup>115</sup> Compared with other ways of studying living standards, anthropometric history has the advantage of studying the actual consumption of human beings Eric

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'soft coal', 'small coal' and 'hard oven Coals'. The softer, or more bituminous coals, were preferred for domestic consumption as they ignited easier while industry preferred the harder, or more anthracitic grades, as they had less impurities and a greater energy content.

<sup>114</sup> John Komlos, *Nutrition and Economic Development in the Eighteenth-Century Hapsburg Monarchy*, (Princeton: Princeton University Press, 1989) and Floud, Wachter and Gregory, *Height, Health and History*.

<sup>115</sup> Floud, Fogel, Harris, and Hong, *The Changing Body*, 11.

Hobsbawm recommended.<sup>116</sup> In order to account for genetic variation or individual circumstances, anthropometric historians use average heights for various groups and rely upon lists of individual heights, which for the period between 1750 and 1830 have usually come from military or penal records. Because they lacked minimum height standards, penal records provide fewer methodological concerns. Previous work found that urban residents were generally shorter than rural ones and men from Northern England, especially Cumberland, were taller than those from the south.<sup>117</sup>

The registers of inmates entering the West Riding House of Correction at Wakefield note their heights and ages. The registers from January 1801 through May 1808, October to December 1842 and April to June 1843 survive. I have treated these registers as two samples of the heights of West Riding residents. Equivalent registers from Winchester do not survive so the subsequent analysis only compares the West Riding with other regions. Unlike other anthropometric studies of people born in the eighteenth century, this one includes female heights and compares different regions of the same county. The House of Correction recorded heights in inches and I have retained that unit. In the earlier register, the inmate's residence was usually recorded between January 1801 and May 1803. Because the following analysis compares inmates from different regions of the West Riding, most of the calculations only include inmates who entered the House of Correction between those dates. After excluding children, prisoners of war, elderly men and inmates from other counties, there were 531 men and

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<sup>116</sup> Hobsbawm, "Standard of Living during the Industrial revolution" 121.

<sup>117</sup> Floud, Wachter and Gregory, *Height, Health and History*, was the first attempt. It was followed by Komlos, "The Secular Trend in the Biological Standard of Living" 115-144 and Roderick Floud, Kenneth W. Wachter and Annabel Gregory, "Measuring Historical Heights – Short Cuts or the Long Way Round: A Reply to Komlos," *Economic History Review* 46 (1993) 145-154, and Nicholas and Steckel, "Heights and Living Standards of English Workers" 937-957.



229 women whose heights, ages and residences were known. The earlier gaol register included residence but not birthplace, leaving the possibility that migration between regions impacted the sample. The small sample size did not allow reasonable comparisons of child heights and growth curves, so only adults are included.<sup>118</sup> For statistical significance, each table includes a p-value, or the probability that the difference between the height of that group and the overall mean occurred randomly. These were calculated using a one-sided T-Test of two samples of equal variance. Statistical significance is usually assigned for p-values under 0.05 and these have been highlighted.<sup>119</sup> The average heights for each group along with their P-Values are in the four tables below.

**Table 5-8: Height of Male Inmates by Fuel Region 1801-1803 (ages 20-60)<sup>120</sup>**

Region	Fuel	Height (inches)	Number	P-Value
<b>North-East</b>	<b>Non-Local Coal</b>	<b>65.22</b>	<b>19</b>	<b>0.011</b>
South-East	Peat/Non-Local Coal	66	9	0.241
<b>South Coalfield</b>	<b>Local Coal</b>	<b>66.27</b>	<b>123</b>	<b>0.045</b>
<b>North Coalfield</b>	<b>Local Coal</b>	<b>66.83</b>	<b>300</b>	<b>0.029</b>
Central	Non-Local Coal	66.87	63	0.255
North-West	Non-Local Coal/Peat	66.93	17	0.324
Total		66.63	531	

<sup>118</sup> In order to determine the age at which inmates reached their full height, I have compared the average heights of all male and female prisoners at each age. Female prisoners grew at each age until 18, suggesting that almost all of them had reached their adult height at that point. There were no female prisoners over the age of 60 whose residence was recorded, so that was used as the upper limit. There were 31 male prisoners over the age of 60 with a residence recorded, but they were excluded to reduce concerns about the effects of shrinking. Meanwhile, male prisoners continued to grow into their early twenties and regional averages were compared using various age ranges. An age range of 20 to 60 produced the best results.

<sup>119</sup> I am thankful to Joel Zylberberg, Acting Assistant Professor of Applied Mathematics, University of Washington, for his guidance on the appropriate methods of calculating P-Values. I should note that the T-Tests were done comparing the members of each group to all members of the sample not part of that group. Thus, for the first line of Table 5-8, the 19 men from the north-east were compared to the 512 men from other regions.

<sup>120</sup> "House of Correction Register of Prisoners, 1801-1808" WYAS Wakefield C118/98

The most striking element of Table 5-8 is that inmates from the north-eastern fuel region were significantly shorter than other male prisoners. Coal was more expensive in this region than in other parts of the West Riding. In addition, prisoners from the textile-manufacturing North Coalfield were nearly half an inch taller than those from other fuel regions. However, men from the South Coalfield were shorter than the average. Seventy of those 123 men came from Sheffield and they averaged 65.875 inches, in comparison to 66.78 inches for the 53 other men. Cities were less healthy than smaller communities as it was more difficult to remove larger quantities of waste or provide clean water. In 1772, Cornelius Cayley of Leeds complained of “the noxious effluvia constantly exhaling from collected filth, in the streets and yards, of great towns,” which “have a more pernicious influence on peoples’ constitutions than most are aware of.”<sup>121</sup> They also presented more risk of disease. As such, cities had long been less healthy environments with higher mortality rates.<sup>122</sup> Sheffield and Leeds were significantly larger than any other West Riding towns and were both on the coalfield. Inmates from those cities, and Leeds’ industrial suburb of Hunslet, were an inch shorter on average than those from other coalfield communities. In order to better understand developments in industrializing communities, Table 5-9 and 5-11 indicate average heights using different combinations of fuel regions. Table 5-9 indicates that men from smaller industrial communities were an inch taller than those from Sheffield and Leeds and significantly taller than those from the more agricultural regions of the West Riding. Heights are a

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<sup>121</sup> Cornelius Cayley, *A Tour Through Holland, Flanders, and Part of France, In the Year, 1772* (Leeds: Old Printing Office, 1772) 39.

<sup>122</sup> Linda A. Newson, “A Historical-Ecological Perspective on Epidemic Disease” In William Balée, ed., *Advances in Historical Ecology*, (New York: Columbia UP, 1998), Michael W. Flinn, *The European Demographic System, 1500-1820*, (Baltimore: The Johns Hopkins University Press, 1981), Richard M. Smith, “Periods, Structures and Regions in Early Modern Demographic Regimes” *History Workshop Journal* 63 (2007) 213.

crude measure of health. The extent to which a more varied diet, warmer homes or the ability to purchase more food with the higher incomes of a flourishing manufacturing economy contributed to this advantage cannot be determined.

**Table 5-9: Height of Men by Combined Regions 1801-1803(ages 20-60)**

Region	Height (Inches)	Number	P-Value
Coalfield	66.66	423	0.291
<b>Coalfield without Sheffield/Leeds</b>	<b>66.93</b>	<b>314</b>	<b>0.001</b>
<b>Sheffield/Leeds/Hunslet<sup>123</sup></b>	<b>65.9</b>	<b>109</b>	<b>0.001</b>
<b>North-East/South-East</b>	<b>65.47</b>	<b>28</b>	<b>0.013</b>
All east of coalfield	66.44	91	0.211
North-West/Coalfield	66.67	440	0.211
Total	66.63	531	

Average heights of female inmates were calculated using the same regional breakdown as the male heights and are illustrated in tables 5-10 and 5-11. There were fewer female prisoners and some of the regions did not provide usable samples. This is particularly evident for the northeastern region, where one of the two inmates, Mary Hudson of Dacre with Bewerly, was 68 inches tall.<sup>124</sup> The difference between average female heights is not the same as for men, but it is evident that women on the north coalfield were significantly taller than those in the central region. In addition, women in Sheffield and Leeds were notably shorter than those in smaller industrial communities. The prisoners in these samples were born between 1741 and 1784. The differences in their average heights indicate that in those decades, residents of the fuel-rich textile manufacturing district were healthier and physically larger than residents of the agricultural communities to the east. Cheap fuel allowed for the combination of better

<sup>123</sup> This urban region is Sheffield, Leeds, Sheffield Park and Hunslet

<sup>124</sup> "House of Correction Register of Prisoners, 1801-1808" WYAS Wakefield C118/98/61-62. She was committed for one month on 21 April, 1802, for "having behaved [*disrespectfully*] towards Wm Hall Gentlemen, Overseers of the Poor of Dacre with Bewerly" and was released on 19 May 1802 having behaved well in gaol.

employment opportunities, higher wages, improved diets and warmer homes that made coalfield residents healthier. The evidence of prisoners' heights also indicates that residents of Sheffield and Leeds were less healthy than those of smaller manufacturing communities.

**Table 5-10: Height of Women by Fuel Region 1801-1803(ages 18-60)**

Region	Fuel	Height (Inches)	Number	P-Value
<b>Central</b>	<b>Non-Local Coal</b>	<b>60.025</b>	<b>20</b>	<b>0.024</b>
South Coalfield	Local Coal	60.76	69	0.093
North-West	Non-Local Coal/Peat	61.125	8	0.489
South-East	Peat/Non-Local Coal	61.33	3	0.437
<b>North Coalfield</b>	<b>Local Coal</b>	<b>61.4</b>	<b>127</b>	<b>0.026</b>
North-East	Non-Local Coal	64.5	2	0.029
Total		61.1	229	

**Table 5-11: Height of Women by Combined Regions 1801-1803 (ages 18-60)**

Region	Height (inches)	Number	P-Value
Coalfield	61.17	196	0.154
Coalfield without Sheffield/Leeds	61.31	148	0.051
Sheffield/Leeds/Hunslet	60.76	48	0.149
All East of Coalfield	60.54	25	0.122
North-West/Coalfield	61.17	204	0.122
Total	61.1	229	

Many things changed between 1803 and 1842 and these are reflected in the later prison register. The Napoleonic Wars ended, fewer men were in the army and more of them were present in the West Riding. Healthy men were less likely to avoid imprisonment through impressment or enlistment. As such, peacetime should have increased the height of male inmates. The West Riding also received many immigrants, particularly from Lancashire and Ireland. By the early 1840s, there were more prisoners born in both Lancashire and Ireland than in any of the non-coalfield regions of the West Riding. The 1842-3 prison registers recorded the birth place of inmates alongside their current residence. Heights are generally indicative of infant and childhood living

standards, so I have only considered inmates born in the West Riding. The regional divisions are based upon the fuel region of birth. The following registers date from the 1840s, but all of the inmates were born prior to 1825. The House of Correction expanded in the early nineteenth century, so there were 839 West Riding born men between the ages of 20 and 60, along with 113 women between 18 and 60. The average heights of those groups are below with the differences that there were no female prisoners born in the north-west and Sheffield has been considered separately as inmates born there were notably shorter than those from Leeds.

**Table 5-12: Height of Men by Fuel Region, 1842-1843 (ages 20-60)<sup>125</sup>**

Fuel Region	Average Height (inches)	Number	P-Value
<b>South Coalfield</b>	<b>65.55</b>	<b>189</b>	<b>0.0281</b>
North Coalfield	65.89	494	0.453
North-West	66.19	46	0.215
North-East	66.21	35	0.231
Central	66.03	59	0.330
<b>South-East</b>	<b>67.36</b>	<b>16</b>	<b>0.014</b>
Total West Riding born	65.88	839	

The most notable aspect of Table 5-12 is that inmates from most regions were shorter than their equivalents forty years earlier. In addition, the regional variation in heights changed so that prisoners from the North Coalfield were no longer taller than others. Meanwhile, prisoners from the peat-burning south-east were notably taller than all others, while they had been amongst the shortest in the earlier sample. Fenland drainage between 1780 and 1820 probably reduced the prevalence of malaria and they increasingly benefitted from the nutritional advantages of eating more potatoes. The regional differences are even more striking in Table 5-13.

<sup>125</sup> "Wakefield House of Correction General Receiving Book, October-December 1842" and "Wakefield House of Correction General Receiving Book, April-June 1843" WYAS Wakefield C118/99-100

**Table 5-13: Height of Men by Combined Region, 1842-1843 (ages 20-60)**

Combined Region	Average Height (inches)	Number	P-Value
<b>Coalfield</b>	<b>65.80</b>	<b>683</b>	<b>0.029</b>
<b>Sheffield/Leeds/Hunslet</b>	<b>65.05</b>	<b>165</b>	<b>0.000</b>
<b>Sheffield</b>	<b>64.61</b>	<b>84</b>	<b>0.000</b>
<b>Coalfield without Cities</b>	<b>66.04</b>	<b>518</b>	<b>0.020</b>
<b>North-East/South-East</b>	<b>66.57</b>	<b>51</b>	<b>0.031</b>
<b>East of Coalfield</b>	<b>66.28</b>	<b>110</b>	<b>0.049</b>
<b>Coalfield/North-West</b>	<b>65.82</b>	<b>729</b>	<b>0.049</b>
Total West Riding born	65.88	839	

As was the case forty years earlier, inmates from smaller industrial communities were taller than those from Sheffield and Leeds. On average, they were half an inch taller than those from Leeds and 1.5 inches taller than those from Sheffield. However, male inmates from smaller industrial communities were no longer taller than those from agricultural ones. Inhabitants of those smaller coalfield communities continued to consume more fuel than their eastern equivalents, which allowed them to cook more frequently, eat more nutritious food and heat their homes. However, a smoke problem developed in smaller industrial communities between 1780 and 1820. As such, it appears that the cheap fuel and industrialization had caused the coalfield's health advantage to disappear by the time that M.A. Taylor introduced legislation to address it in 1819.

**Table 5-14: Height of Women by Fuel Region, 1842-1843 (ages 18-60)**

Fuel Region	Average Height (inches)	Number	P-Value
South Coalfield	61.30	26	0.312
North Coalfield	61.46	67	0.386
North-East	63.25	2	0.171
Central	61.73	15	0.366
South-East	62.5	3	0.254
Total West Riding Born	61.52	113	

**Table 5-15: Height of Women by Combined Region, 1842-1843 (ages 18-60)**

Combined Region	Average Height (inches)	Number	P-Value
Coalfield	61.41	93	0.181
Sheffield/Leeds/Hunslet	60.86	30	0.052
<b>Sheffield</b>	<b>60.48</b>	<b>16</b>	<b>0.043</b>
Coalfield without cities	61.68	63	0.231
East of Coalfield	62	20	0.181
Total West Riding Born	61.52	113	

Women were a smaller portion of those incarcerated in the 1840s than they had been at the beginning of the century. In addition, a greater portion of the female inmates were born outside of the Riding which leaves only a small sample to compare between regions. The regional patterns were not the same as with male prisoners but female inmates born in Sheffield and Leeds were 0.9 inches shorter than those from the rest of the Riding. The most notable aspect of Tables 5-14 and 5-15 is that female inmates in the 1840s were slightly taller than those at the beginning of the century. The heights of female inmates increased while those of male inmates declined. This suggests that measurement practices did not change in the House of Correction between 1808 and 1842. As such, it is possible to compare the two registers to give an indication of changing living conditions for the entire Riding and individual regions. This follows in Table 5-16. Inmates who entered the House of Correction between June 1803 and May 1808 have been included in the first line of Table 5-16 and Table F-1 in order to increase the sample size. These are the inmates whose heights and ages were recorded but not their residence in the West Riding.

**Table 5-16: Comparison of Inmate Heights from 1801-1803 and 1842-1843**

Group being compared	1801-3 height	1842/3 height	P-Value
<b>West Riding Men</b>	<b>66.59</b>	<b>65.88</b>	<b>0.000 (2.27x10<sup>-10</sup>)</b>
<b>Coalfield Men</b>	<b>66.66</b>	<b>65.80</b>	<b>0.000 (2.175x10<sup>-7</sup>)</b>
<b>Sheffield/Leeds/Hunslet Men</b>	<b>65.9</b>	<b>65.05</b>	<b>0.005</b>
<b>Coalfield without Sheffield/Leeds/Hunslet Men</b>	<b>66.93</b>	<b>66.04</b>	<b>0.000 (2.84x10<sup>-6</sup>)</b>
East of Coalfield Men	66.44	66.28	0.258
West Riding Women	61.1	61.52	0.080

Table 5-16 indicates that male prisoners from across the coalfield were considerably shorter in the 1840s than their equivalents had been forty years earlier. As most prisoners were from the coalfield, the average male prisoner was also three-quarters of an inch shorter in the 1840s than he had been at the beginning of the century. The decline in living conditions was such that male prisoners reached full adult height at a later age. I chose to use an age cut-off of 20 for the 1842-1843 prisoners to facilitate comparison with the earlier group. Male prisoners between the ages of 23 and 60 averaged 66.04 inches. Thus, West Riding men born in the early nineteenth century were both significantly shorter than their eighteenth-century predecessors and took longer to reach that height. The stature of male inmates from the eastern regions did not decline enough to be statistically significant. As such, the decline in living standards between 1780 and 1820 primarily affected men living on the coalfield. Their fuel consumption declined less than in eastern regions and they continued to eat a more varied diet. Appendix F divides the male prisoners by birth cohort and shows that the declines in average height occurred primarily amongst prisoners born after 1810.

One explanation for the declining stature of men from manufacturing communities is a general reduction in wages after 1810. West Riding manufacturing



districts suffered from a severe trade depression in 1811 and 1812, partly caused by the Orders in Council embargoing trade with the United States and Europe. Amidst many descriptions of unemployment in early 1812, the *Leeds Mercury* complained “that these Orders were attended with many effects highly dangerous and detrimental to the trade of this country.”<sup>126</sup> Many Luddite actions occurred in 1812, and these are usually associated with unemployment, poverty, declining living conditions or the threat of these.<sup>127</sup> Living conditions declined in trade depressions but there is no evidence to suggest that either the 1810-1812 or 1816-1818 depressions lasted long enough to account for all of the declining stature.

Male Inmates from the eastern agricultural regions were taller than coalfield ones in 1842-3. If reduced wages caused the coalfield decline, one would expect that wages were higher in agricultural than industrial communities after 1810. Yet an examination of the ‘Rural Queries’ produced during the manufacturing depression of 1834 does not bear this out. Male earnings varied considerably between different communities in both the industrial and agricultural regions but were not generally higher in the latter. Women were also more likely to be employed in manufacturing communities, so family incomes were generally higher.<sup>128</sup> Theodore Koditschek describes the years between 1810 and 1825 as prosperous ones for worsted textile workers around Bradford before their living

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<sup>126</sup> *Leeds Mercury* 8 February 1812.

<sup>127</sup> Navickas, “The Search for “General Ludd” 281, Gregory, *Regional Transformation* 144-155, Thompson, *Making* 609-617 and Dinwiddy, “Luddism and Politics” 56-59.

<sup>128</sup> *Poor Law Report* (1834). For more detail on the geographic scope of female employment see Shaw-Taylor, “Diverse Experiences:” 50-51. Shaw-Taylor used the 1851 Census to map adult female employment in England and this is the earliest date for which such scope of evidence exists. The West Riding coalfield had one of the highest proportions of women working for wages, while the neighbouring Central region, or Vale of York, had one of the lowest. Given that these regions were similarly specialized in textile manufacturing and agriculture before 1825 and the evidence from the Rural Queries, this geographic pattern likely applied at the earlier date.

standards declined.<sup>129</sup> The years after 1810 were not uniformly prosperous in manufacturing communities and changing patterns of production impoverished some people. However, the other evidence does not conform with the emerging regional pattern of stature and is not sufficient to explain the large decline.

The increasing poverty and low wages of handloom weavers in the 1810s and 1820s are another possible explanation for the declining height of coalfield men. Weavers prospered in the late eighteenth century as textile manufacturing expanded and spinning mechanized. The introduction of steam-powered looms and factories after 1810 created competition for weavers, reducing the demand for their work and lowering piece-rates. In the 1820s, numerous people commented on the poverty of Yorkshire hand-loom weavers, including the *Leeds Mercury* article on Colne in April 1826. "A great number of weavers have been sometime out of work, and their number daily increases. The overseers of that township have relieved in one week, 328 families, comprising 1305 individuals."<sup>130</sup> If the poverty of handloom weavers caused most of the declining stature, one would expect that weavers to be much shorter than other inmates. The occupations listed by prisoners are not a precise indicator of the frequency of employment or the multiple ways in which people earned a living. However, 85 of the prisoners from smaller coalfield communities listed a weaving occupation. Their average height of 65.86 inches was slightly shorter than other inmates from those communities and does not account for the reduced stature of the entire sample. Had these 85 men not been included in the sample of men from the smaller coalfield communities, the

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<sup>129</sup> Theodore Kotitschek, *Class Formation and Urban-Industrial Society, Bradford 1750-1850* (Cambridge: Cambridge University Press, 1990) 91.

<sup>130</sup> *Leeds Mercury* 15 April 1826. Other references to the poverty of weavers in the 1820s include Thompson, *Making* 314-319 and Joseph Lawson, *Letters to the Young on Progress in Pudsey During the Last Sixty Years*, (Stanningley: J.W. Birdsall, 1887) 22-23.

group would have averaged 66.07 rather than 66.04 inches.<sup>131</sup> Hand-loom woollen weavers suffered with the decline of their trade in the early nineteenth century but their plight did not account for all of the declining stature. Similarly, the suggestion that shorter men were better suited to coalmining does not explain the reduced stature. The 31 adult coalfield-born miners in the second sample averaged 61.47 inches and were shorter than other coalfield-born men. Excluding them from the sample would only increase the group's average height by 0.01 inches. The deleterious effects of child labour and factory working conditions are another possible explanation for declining stature. However, Peter Kirby finds that children working in nineteenth-century factories were generally taller and stronger than their neighbours.<sup>132</sup> Additional explanations are needed for the reduced height of coalfield men but not those in the agricultural Vale of York.

The smoke clouds which afflicted manufacturing communities after 1810 correspond to the timing and location of declining male stature. Such clouds contributed to the declining stature by frequently blocking the sun and impairing Vitamin D absorption. This was observed in later decades, when there was a high frequency of rickets in northern English industrial towns that left most Mancunian men unfit to serve in the Boer War.<sup>133</sup> In the 1940s, Arnold Marsh noted the higher rate of rickety pelvises in smoky northern industrial towns.<sup>134</sup> Sir Alexander MacGregor also noted the detrimental effects of smoke on human health, emphasizing the lack of Vitamin D in

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<sup>131</sup> 'Wakefield House of Correction General Receiving Book, October-December 1842' and 'Wakefield House of Correction General Receiving Book, April-June 1843' WYAS Wakefield C118/99-100.

<sup>132</sup> Peter Kirby, *Child Workers and Industrial Health in Britain, 1780-1850* (Woodbridge: Boydell Press, 2013) 161.

<sup>133</sup> Mosley, *Chimney of the World* 65

<sup>134</sup> Arnold Marsh, *Smoke: The Problem of Coal and the Atmosphere*, (London: Faber and Faber, 1947) 63.

industrial cities.<sup>135</sup> Such smoke clouds also led to respiratory infections, lung cancer, and may have increased the severity of tuberculosis.<sup>136</sup> Current medical research emphasizes the role of Vitamin D in the bone development of children, kidney function, immune systems and prevention of autoimmune diseases, while emphasizing diet, clothing and indoor lifestyles as causes of those deficiencies.<sup>137</sup> Smoke clouds in Yorkshire during the 1810s were not measured but the smoke pollution in later decades contributed to large-scale Vitamin D deficiency, which is known to impair childhood development. By making gardening more difficult, the smoke pollution may also have reduced access to fresh vegetables and impeded coalfield diets. These smoke clouds correspond with the timing and locations in which stature declined.

## Conclusion

Residents of the Yorkshire coalfield burnt more fuel than inhabitants of other West Riding regions or Hampshire in the mid-eighteenth century. The region was more industrial and cheap coal allowed residents to heat their homes when not cooking. They were also healthier and physically larger than other Yorkshire people, as evidenced by their stature. These regional differences had increased by the 1790s. Rising prices led to declining fuel consumption in wood-burning northern Hampshire. Many labouring people there abandoned cooking in favour of purchased bread, especially in summer.

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<sup>135</sup> Sir Alexander MacGregor, "Smoke and the Public Health" *Proceedings of the Annual Conference of the National Smoke Abatement Society* 15 (1947) 69-73

<sup>136</sup> R.E. Waller, "Current Research on the Possible Effects of Smoke upon the Incidence of Diseases of the Lung" *Proceedings of the 17<sup>th</sup> Annual Conference of the National Smoke Abatement Society* (1950) 53-60

<sup>137</sup> Hector F. DeLuca, "Evolution of our Understanding of Vitamin D," *Nutrition Reviews* 66 (2008) s73-s87, Evelyne van Etten, Katinka Stoffels, Conny Gysemans, Chantal Mathieu and Lut Overbergh, "Regulation of Vitamin D Homeostasis: Implications for the Immune System," *Nutrition Reviews* 66 (2008) s125-s134, A. Prentice, "Vitamin D Deficiency: A Global Perspective" *Nutrition Reviews* 66 (2008) s153-s164 and C. M. Girgis, R.J. Clifton-Bligh, M.W. Hamrick, et al "The Roles of Vitamin D in Skeletal Muscle: Form, Function, and Metabolism," *Endocrine Reviews* 34 (2013) 33.

Most of the region's domestic manufacturing also disappeared in those decades. Meanwhile, prices were more stable in peat and coal burning regions and household consumption did not decline. As such, residents continued to cook their own food and potatoes become common in most peat-burning and some coal-burning communities. The daily lives of English people continued to diverge in the early nineteenth century. Industry expanded on the Yorkshire coalfield while other regions specialized in arable agriculture and southern Hampshire in naval provisioning. However, growing industry and increasingly dense populations created a smoke problem on the Yorkshire coalfield and its residents lost their health advantage by the early nineteenth century. Industrialization also replaced some textile manufacturing trades and the earnings of weavers fell in the late 1820s. Population grew everywhere, fuel prices rose and consumption declined in most communities. These declines were most severe in wood-burning regions where production could not increase to meet rising demand. As a result, purchased wheaten bread replaced cooking across most of Hampshire and amongst some people in the eastern parts of Yorkshire. Potatoes were increasingly eaten in areas where residents had sufficient fuel to cook in the early nineteenth century.

Some culinary habits were connected to climate and growing conditions. Oats grew on the damp, cool hills of the Yorkshire coalfield while wheat did not. Potatoes grew better in the peaty soils of south-east Yorkshire or south-west Hampshire although climate and soil did not preclude their cultivation in other regions. Moreover, the local fuel supplies were also well suited to the preferred methods of cooking those foods. Oatcake cooked well on open-grate coal fires of the type preferred for heating homes in Pudsey. It also cooks quickly and was well-suited to the lifestyles of weaving families

with ample employment for all adults. Similarly, potatoes roasted well in the embers of a peat fire or boiled in cauldrons over open flames. Meanwhile, the small quantities of wood burnt in wheat-growing northern Hampshire made cooking difficult by the late eighteenth-century. Despite women being less likely to work for wages, residents there increasingly relied upon purchased wheaten bread and the county had a high proportion of bakers by 1831. Cheap fuel thus allowed residents to cook more satisfying food while using those flames to heat their homes. In some locations, like Pudsey and Sheffield, they also continued to heat their homes when not cooking. A combination of warmer homes, better food and more employment meant that living conditions were better on the West Riding coalfield than in agricultural regions prior to 1780. They continued to enjoy these advantages into the nineteenth century, but by the early 1800s cheap fuel also contributed to a serious smoke problem that reduced stature and endangered health.

## Conclusion

English domestic fuel use changed dramatically between 1750 and 1830 despite there not being any fundamental changes in the environmental relationships shaping it. The fuel sources used in most communities were the same as eighty years earlier. Coal was available only near where it was mined or in areas connected by waterways. Mining remained confined to the same regions of northern, midland and western England. Meanwhile, most of the new canals and river navigations connected coal mines to existing markets. In this way they helped to reduce transport costs to southeastern Yorkshire but did not serve new regions like northern Hampshire. Communities without affordable coal continued to rely upon local wood, peat, dung and various other plants. As these were all expensive to transport, early nineteenth-century people generally used the same fuel sources as earlier generations.

What changed in these years was the amount of fuel that most labouring poor households consumed and the prices they paid for it. Population grew everywhere, with Hampshire doubling its overall population and the West Riding's population nearly tripling.<sup>684</sup> Meanwhile, fuel-intensive industries expanded on the West Riding coalfield and came to consume a greater portion of its coal. Coal is non-renewable and needs to be mined, but large deposits existed in the West Riding. Mining increased to meet the needs of a growing population and industrializing economy. Peat renews itself slowly but many communities had available deposits. The amounts taken could not increase as much as coal, but were sufficient to continue meeting local needs. Meanwhile, wood is a renewable fuel using the recent growth of plant matter. Its growth was well

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<sup>684</sup> For more details on population change, see Appendix E.

managed in the early eighteenth century and could not be raised to accommodate a rising population. Woodlands also occupied land on which food could otherwise be grown. The fuel sources burnt in each community affected their ability to meet the needs of expanding populations after 1750. Although wood-burning northern Hampshire had the slowest population growth in either county, it still exceeded its wood supplies and severe shortages ensued. The fuel crisis is evident in the tripling of prices, the small amounts disbursed to poor households, the rising prosecution of wood theft and the prevalence of bakers in early nineteenth-century northern Hampshire.

The amounts of fuel disbursed to poor households varied considerably throughout this period and declined in most communities. As such, declining fuel consumption is most evident amongst such poor households. Their coal consumption was similar to that of many labouring poor households on the Yorkshire coalfield until 1810 as the sums spent on coal for them are similar to what labourers told Arthur Young or David Davies that they spent. Meanwhile, it is difficult to imagine that many labouring households chose to purchase more than the ten tons frequently disbursed in Thurstonland or the three tons in Worsbrough. However, northern Hampshire overseers disbursed somewhat less fuel than the fairly low amounts that David Davies observed. High fuel prices likely led to a greater difference in the amounts consumed between poorer and wealthier households in northern Hampshire communities. The poor relief recipients were the lower end of that distribution. Disbursements declined with rising prices in the late eighteenth century. Labouring households also suffered from rising wood prices and northern Hampshire also had comparatively high rates of wood theft prosecutions and bakers in the years of low fuel disbursements after 1815. Recipients



of poor relief were particularly cold in wood-burning regions of northern Hampshire but others also suffered during the fuel crisis.

Experiences were never uniform across England and diverged between 1750 and 1830. Coalfield households burnt more fuel than those in other regions throughout these eighty years. They also enjoyed more varied diets and better living conditions than others. In this regard, they experienced some of the higher wage economy that Robert C. Allen associates with all of England.<sup>685</sup> Nevertheless, the fuel consumption of individual households declined slightly in the early nineteenth century. My anthropometric study and that of Nicholas and Steckel also found that, like other English people, those in industrializing communities became shorter between 1770 and 1815.<sup>686</sup> The large hand-loom weaving sector declined in the 1820s, leading to hardship in many coalfield communities. In addition, the larger concentrations of people and industry on the Yorkshire coalfield created greater amounts of smoke which came to block sunlight and were generally detrimental to health after 1810. Combined with the small declines in fuel and food consumption, the smoke problem led to a sharp decline in coalfield living standards.

Living conditions were better for the labouring poor in manufacturing communities than agricultural ones in the late eighteenth century. This is clear from the evidence of Yorkshire heights. Households burnt less fuel in the eastern agricultural portions of the Riding and these amounts declined more sharply than on the coalfield. By the early nineteenth century, households in some eastern communities could only afford to cook grains in winter, when the fuel they consumed also heated their homes.

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<sup>685</sup> Allen, *British Industrial Revolution in Global Perspective*, 25.

<sup>686</sup> Nicholas and Steckel, "Heights and Living Standards of English Workers" 937-957.

Bakers were also more prevalent here than in similar sized coalfield communities. Potatoes were more frequently grown and eaten in the peat-burning communities of eastern Yorkshire. The tubers were more nutritious than other foods, cheaper where purchased and more of them could be grown on the same amount of land. As such, their use mitigated some of the effects of declining living conditions where there was sufficient fuel to cook them. However, living conditions declined slightly as fuel consumption fell in the eastern portions of the West Riding. Moreover, women were less likely to work for wages in these communities and in many of them male employment did not increase as quickly as population. The greater unemployment and underemployment after 1815 is evident in the higher proportion of male-headed households receiving poor relief than in manufacturing communities.<sup>687</sup> Overall living standards were more comparable across the West Riding in 1830 than they had been eighty years earlier. However, this was because the smoke problem impaired health in the most prosperous areas rather than any improvements in the eastern regions. Coal prices continued to drive both the beneficial and negative changes in living conditions across the West Riding.

Meanwhile, northern Hampshire suffered a fuel crisis in the early nineteenth century. The crisis was most severe in communities that both depended upon wood or plants as fuel sources and had a gradually increasing population to feed. Peat and coal do not have the same immediate dependence on photosynthesis and regions that burnt them did not suffer from similar fuel shortages. The northern Hampshire fuel crisis was the result of Malthusian constraints similar to those in many other regions of Eurasia.

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<sup>687</sup> Unemployment of adult men is also evident in *Poor Law Report* (1834) 617a. The fenland parish of Hatfield had 2148 inhabitants in the 1831 *Census* and its overseers reported 20 unemployed men in 1834.

Although not as severe as the fuel crisis Kenneth Pomeranz describes in Shandong, the turn away from cooking in northern Hampshire was the product of similar constraints.<sup>688</sup>

The fuel crisis caused living conditions to decline more sharply in northern Hampshire than elsewhere in these two counties. By the early nineteenth century, the inability of most people to cook meant that they ate less nutritious food and did not heat their homes. In 1831, Edward Gibbon Wakefield characterized labourers' lives in rural southern England as "hunger, cold and wet, the discipline of the workhouse and breaking stones for sixpence a day."<sup>689</sup> Northern Hampshire residents were less prosperous than their Yorkshire coalfield counterparts in 1750 but their lives were not this dreadful. Small towns had some domestic manufacturing, agricultural labourers were generally employed and they were not subserviently dependent on the poor law. In addition, fuel was affordable and most households actually consumed it. I have estimated the amounts they burnt and its significant effects on diet. However, there are elements that are difficult to imagine, like living through wet English winters in an unheated home with only cold bread and cheese to eat. Although such regions of inland southern England did not contain the majority of the population, they were significant and living standards declined noticeably. Coal-burning southern England also suffered after 1815. In January 1831, *The Times* argued that coal duties needed to be reduced as expensive fuel left urban labourers benumbed with cold.<sup>690</sup>

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<sup>688</sup> Kenneth Pomeranz, *The Making of a Hinterland: State, Society, and Economy in Inland North China, 1853-1937* (Berkeley: University of California Press, 1993) 123-137. That fuel crisis was such that Shandong's forests were almost entirely depleted and the gleaning of straw as fuel left fields bare, contributing to high levels of soil erosion.

<sup>689</sup> Wakefield, *Swing Unmasked*, 19.

<sup>690</sup> *The Times* 14 January 1831

The living standards of most English households declined between 1750 and 1830. Unemployment and underemployment were more prevalent at the later date, while work intensity increased substantially for the employed. This uncertainty accompanied new scales of resource use in industrializing regions. The concentration of people and production in manufacturing regions created smoke clouds that would have been unimaginable in 1750. Meanwhile, population had grown faster than the food supply and most people ate less in 1830 than their ancestors had. Declining household fuel consumption was thus one aspect of an overall decrease in living standards during the early Industrial Revolution.

### **England in a northwestern European Perspective**

The changing fuel use described in this dissertation was not unique to England. Other wood-burning regions of northwestern Europe also suffered from fuel shortages. Fuel relationships were not governed by national borders. The most important factor in their changing use was the ability of each fuel source to supply a gradually increasing population. Concerns differ amongst national historians and the debates are not always parallel. However, the evidence across northwestern Europe suggests fuel crises in wood-burning regions, greater stability in peat-burning ones and coalfield industrialization.

T.C. Smout compares fuel-poor Iceland to fuel-rich Scotland and Ireland. Iceland had minimal peat and was largely deforested by the eighteenth century so Icelanders burnt small amounts of seaweed, dung and juniper.<sup>691</sup> They did not heat their homes and generally ate uncooked food. Smout claims that dried fish covered in sour butter

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<sup>691</sup> T.C. Smout, *Exploring Environmental History: Selected Essays*, (Edinburgh: Edinburgh University Press, 2009) 122.

was the main element of the diet while Gudmundur Jonsson suggests that milk and other dairy products were the staple food.<sup>692</sup> These foods were neither cooked nor heated. Ireland had extensive peat deposits and most of its households cooked potatoes.<sup>693</sup> Scotland was similar but not all regions had access to cheap coal or good peat.<sup>694</sup> Richard Oram emphasizes the differences between towns that burned coal or peat and the increasing fuel-poverty of some early nineteenth-century Scots.<sup>695</sup>

Wood-burning European regions also suffered from fuel crises and growing scarcity in the eighteenth and early nineteenth centuries. Astrid Kander and Magnus Lindmark quantified Swedish energy consumption since 1800. They found that total consumption by all Swedish households fell between 1800 and 1820, despite population growth and that per capita consumption remained lower in 1830 than at the beginning of the century.<sup>696</sup> Swedish food consumption and living standards also declined in the first half of the nineteenth century.<sup>697</sup> Sweden was well-wooded and the fuel-crisis was more severe in Denmark. Little is written about Danish peat-burning regions but Thorkild Kjaergaard estimates the consumption of wood-burning households. He finds that national fuel consumption declined by a quarter between 1500 and 1700, despite population doubling, and that typical households in 1800 burnt half of what had been used in 1500. He argues that Danes were colder in the late eighteenth century than at

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<sup>692</sup> Smout, *Exploring Environmental History* 121, Gudmundur Jonsson, "Changes in Food Consumption in Iceland, 1770-1940" *Scandinavian Economic History Review* 46 (1998) 26.

<sup>693</sup> David Dickson, "The Potato and the Irish Diet Before the Great Famine," and Leslie J. Dowley, "The Potato and Late Blight in Ireland" *Famine 150: Commemorative Lecture Series*, Cormac Ó Gráda ed, (Dublin: Teagasc, 1997) 5 and 55

<sup>694</sup> On lower quality Perthshire peat see Smout, *Exploring Environmental History* 110.

<sup>695</sup> Richard Oram, "Social Inequality in the Supply and Use of Fuel in Scottish Towns c.1750-1850" *Environmental and Social Justice in the City: Historical Perspectives*, Geneviève Massard-Guilbaud and Richard Rodger eds, (Cambridge: White Horse Press, 2011) 211-232.

<sup>696</sup> Astrid Kander and Magnus Lindmark, "Energy Consumption, Pollutant Emissions and Growth in the Long Run: Sweden Through 200 Years," *European Review of Economic History* 8 (2004) 297-335

<sup>697</sup> Lars G. Sandberg and Richard H. Steckel, "Overpopulation and Malnutrition Rediscovered: Hard Times in 19<sup>th</sup> Century Sweden" *Explorations in Economic History* 25 (1988) 1-19

any other period and that this contributed to tuberculosis replacing plague as the main disease.<sup>698</sup> Bent Sørensen agrees that wood consumption declined but disagrees with Kjaergaard about the extent of this decline.<sup>699</sup> Meanwhile, Mather, Needle and Coull note that Danish firewood prices doubled between 1780 and 1800, while peat prices also rose considerably.<sup>700</sup> Imported English coal also replaced wood as the primary fuel in the coastal cities of Gothenburg, Stockholm and Copenhagen in the mid-eighteenth century.<sup>701</sup> In terms of changing fuel prices and use, the Scandinavian situation thus resembled southern England in the late eighteenth century.

Few French regions had peat deposits or easily accessible coal, so most of inland France suffered from a fuel crisis at least as severe as northern Hampshire's. Jeremy Hayhoe notes that the price of Burgundian wood doubled between 1750 and 1789. In some regions, however, it more than tripled and lords increasingly enforced forest rights, with a high rate of prosecutions for wood theft.<sup>702</sup> Carol Kieko Matteson's study of Franche-Comté notes that the needs of locals led to forest cover reaching its lowest level ever in the early nineteenth century while rising wood prices meant that many poorer people could only acquire it through theft.<sup>703</sup> David Young suggests that the French fuel-crisis was less severe but still notes rapidly rising wood prices in the

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<sup>698</sup> Kjaergaard, *The Danish Revolution*, 97-98, 185-191.

<sup>699</sup> Bent Sørensen, *A History of Energy: Northern Europe from Stone Age to the Present Day*, (Abingdon: Earthscan, 2012)

<sup>700</sup> A.S. Mather, C.L. Needle and J.R. Coull, "From Resource Crisis to Sustainability: the Forest Transition in Denmark," *International Journal of Sustainable Development & World Ecology* 5 (1998) 185-186.

<sup>701</sup> <http://www.soundtoll.nl/public/cargoes.php?cname=Kull> (accessed March 19, 2012) emphasizes the growing coal trade to Copenhagen and Stockholm, along with Danzig and Königsberg in the 1760s. Sørensen, *A History of Energy* 317 and Kjaergaard, *Danish Revolution* 130-131 note the importance of coal in Copenhagen. For Gothenburg see: Per Hallén, Lili-Annè Aldman and Magnus Andersson "Gateways and Shipping During the Early Modern Times – The Gothenburg Example 1720-1804" working paper <http://gup.ub.gu.se/records/fulltext/167491.pdf> (accessed 24 May 2013) 5.

<sup>702</sup> Hayhoe, *Enlightened Feudalism*, 187-191.

<sup>703</sup> Carol Kieko Matteson, "Masters of their Woods: Conservation, Community, and Conflict in Revolutionary France, 1669-1848" (PhD Dissertation, Yale University, 2008) 282-286.

1770s and 1780s, along with regions where people burnt straw.<sup>704</sup> The situation was no better in southern France, where the fuel crisis continued through the nineteenth century, as evidenced in Eugen Weber's description of 1870s cooking practices.

Bread was baked in large batches to save on fuel: every two or three weeks where fuel was accessible; otherwise every six or twelve months. In the Romanche valley, between Grenoble and Briançon, Adolphe Blanqui found villages so short of fuel that they used dried cow dung to bake their bread and prepared the loaves only once a year. He himself saw in September a loaf he had helped begin in January.<sup>705</sup>

The Danish and French fuel crises bore many similarities to that in northern Hampshire and so suggest a general situation in wood-burning Europe whereby population growth and resource use outstripped the fuel supply by the second half of the eighteenth century.

The fuel situation was better in the Low Countries due to abundant peat deposits and easily accessed coal. J.W. de Zeeuw, Richard Unger and Jan Luiten van Zanden argue about the extent to which this peat was an important factor in seventeenth-century Dutch economic growth.<sup>706</sup> However, eighteenth-century Dutch, Flemings and Walloons consumed more fuel than other northwestern Europeans. With sufficient fuel to cook them, potatoes came to be grown and eaten in the eighteenth-century Low Countries and adjacent regions of France.<sup>707</sup> Michael Wintle characterizes the poverty

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<sup>704</sup> David B. Young, "Forests, Mines and Fuel: The Question of Wood and Coal in Eighteenth Century France" *Proceedings of the Third Annual Meeting of the Western Society for French History* Brison D. Gooch ed, (Western Society for French History, 1976) 328-336.

<sup>705</sup> Eugen Weber, *Peasants into Frenchmen: The Modernization of Rural France, 1870-1914* (Palo Alto: Stanford University Press, 1976) 136

<sup>706</sup> J.W. de Zeeuw, "Peat and the Dutch Golden Age: The Historical Meaning of Energy-Attainability" *Afdeling Agrarische Geschiedenis Landbouwhogeschool* (1978) 3-31, Richard Unger, "Energy Sources for the Dutch Golden Age: Peat, Wind and Coal" *Research in Economic History* 9 (1984) 221-253, Jan Luiten van Zanden, "Werd de Gouden Eeuw uit turf geboren?" *Tijdschrift voor Geschiedenis* 110 (1997) 484-499.

<sup>707</sup> Michel Morineau, "The Potato in the Eighteenth Century" *Food and Drink in History, Selections from the Annales Economies, Sociétés, Civilisations, Volume 5*, Robert Forster and Orest Ranum eds, Elborg

of the nineteenth-century Dutch diet without realizing their comparative prosperity. “The main meal was at midday, when the tubers were peeled and freshly boiled; at supper the leftovers were served as a mash, and the next day’s breakfast was warmed up from what was left over from the night before.”<sup>708</sup> Many Dutch people also ate bread, but they purchased it from bakers in a manner similar to the English. Bakers were more prevalent in the north-western Netherlands than in the south-east, where coal deposits made it cheaper for people to cook.<sup>709</sup> Meanwhile, Georges Lefebvre writes about the fuel-rich Nord department, which had abundant peat, affordable coal, reasonably priced wood and significant manufacturing in the 1780s. Cheap fuel allowed these Flemings to cook soups, which they ate with bread.<sup>710</sup> The experiences of those who lived in peat and coal burning regions of the Low Countries bore many similarities to their English counterparts.

The main indication that the Low Countries had access to more fuel than other parts of north-western Europe was the fate of fuel intensive industries. The peat-burning Netherlands did not experience an Industrial Revolution but retained heat-intensive brick-making, brewing and sugar-refining industries.<sup>711</sup> Meanwhile, coal seams were close to the surface in Hainaut and Liège, as in Yorkshire. Here ironworking, textile, glassmaking and armaments industries expanded rapidly in the early nineteenth century. Walloon industrialization resembled that in Yorkshire, so much so that Joel Mokyr and E.A. Wrigley argue about the extent to which local coal was an important

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Forster and Patricia M. Ranum trans, (Baltimore: The Johns Hopkins University Press, 1979) 17-36, Vandenbroeke, “Aardappelteelt en aardappelverbruik” 49-68

<sup>708</sup> Michael Wintle, *An Economic and Social History of the Netherlands, 1800-1920*, (Cambridge: Cambridge University Press, 2000) 61.

<sup>709</sup> de Vries and Van der Woude, *First Modern Economy*, 516-522.

<sup>710</sup> Georges Lefebvre, *Les Paysans du Nord Pendant la Révolution Française, Nouvelle Édition* (Paris : Librairie Armand Colin, 1972, première édition 1924) 64-65, 259, 314-315.

<sup>711</sup> De Vries and Van der Woude, *First Modern Economy* 336.



factor.<sup>712</sup> As in England, manufacturing regions with local coal industrialized while many without it saw the decline of long-standing industries.<sup>713</sup> Salt-making is one of the most fuel-intensive industries and expanded in northern England in the eighteenth century. Cheaper northern English salt led to the collapse of centuries-old industries in eighteenth-century Lunenburg, Zeeland and Normandy, along with Lymington.<sup>714</sup> Coal was also important in early Scottish industrialization, concentrated as it was on the central Scottish coalfield.<sup>715</sup>

There are many similarities between English and other European developments, when regions are defined by their fuel rather than national borders. The Industrial Revolution occurred on the coalfields of northern England, central Scotland and Wallonia. People in these regions consumed more fuel than others and continued to cook their own food. Meanwhile, wood-burning regions experienced a fuel crisis. They lost long-standing industries, while household consumption declined and many ceased cooking. Coal also came to replace wood as a domestic fuel wherever it could be economically shipped. This was particularly the case in coastal towns like Portsmouth,

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<sup>712</sup> Joel Mokyr, *Industrialization in the Low Countries, 1795-1850* (New Haven: Yale University Press, 1976), E.A. Wrigley, *Industrial Growth and Population Change: A Regional Study of the Coalfield Areas of North-West Europe in the Later Nineteenth Century*, (Cambridge: Cambridge University Press, 1962).

<sup>713</sup> Pierre Deyon, « L'enjeu des discussions autour du concept de 'proto-industrialisation' » *Revue du Nord* 61 (1979) 9-18, Charles Engrand, « Concurrences et Complémentarités des Villes et des Campagnes : les Manufactures Picardes de 1780 à 1815, » *Revue du Nord* 61 (1979) 61-82, Pierre Deyon, « La diffusion rurale des industries textiles en Flandre française à la fin de l'Ancien Régime et au début du XIX<sup>ème</sup> siècle » *Revue du Nord* 61 (1979) 83-96, Louis Thibaut, « Les voies navigables et l'industrialisation du Nord de la France, » *Revue du Nord* 61 (1979) 149-164, Serge Chassagne, « Aspects des phénomènes d'industrialisation et de désindustrialisation dans les campagnes françaises au XIX<sup>ème</sup> siècle » *Revue du Nord* 63 (1981) 35-58, Hubert Watelet, *Une Industrialisation sans Développement: Le Bassin de Mons et le Charbonage du Grand-Hornu du Milieu du XVIII<sup>e</sup> au Milieu du XIX<sup>e</sup> Siècle*, (Ottawa : Éditions de l'Université d'Ottawa, 1980), Pierre Lebrun, Marinette Bruwier, Jan Dhont et Georges Hansotte, « Essai sur la Révolution Industrielle en Belgique, 1770-1847 » (Bruxelles : Palais des Académies, 1981), Reed G. Geiger, *The Anzin Coal Company, 1800-1833* (Newark: University of Delaware Press, 1974).

<sup>714</sup> Jean-Claude Hocquet, « Les mutations du commerce du sel dans l'Europe du Nord au tournant des XVIII<sup>e</sup> et XIX<sup>e</sup> siècles » *Revue du Nord* 73 (1991) 597-610.

<sup>715</sup> T.M. Devine, "Industrialisation" *The Transformation of Scotland: The Economy Since 1700*, T.M. Devine, C.H. Lee and G.C. Peden eds, (Edinburgh: Edinburgh University Press, 2005) 34-35.

Southampton and Copenhagen. Peat-consuming regions fared somewhere between the others, as they neither industrialized nor suffered from a fuel crisis. The early Industrial Revolution can be understood as a period when many parts of northwestern Europe outstripped their fuel supplies while those with easily accessible coal seams were able to accommodate growing populations and increase their industrial output. Human decisions affected population levels and were necessary to build canals, mines and factories. However, local environments, in particular the location of coal seams, limited the available responses and helped to shape the increasingly divergent experiences of coalfield, peat-burning and fuel-poor peoples.

### **Developments after 1830**

Hampshire and the West Riding of Yorkshire were very different in 1830 than they had been in 1750. A new world was also appearing with the increasing scale of factories, new technologies, intercity railways and the political response to the November 1830 riots. Many of the processes described in this dissertation continued to affect fuel consumption and living standards in subsequent decades. Regional environments limited fuel use in the same manner as they had since the 1740s. Yorkshire coal production doubled in the following two decades, reaching more than six million tons per year in the early 1850s.<sup>716</sup> Coal remained the predominant fuel in southern Hampshire, where imports tripled in the 1830s.<sup>717</sup> Local peat continued to be harvested where it was available, especially around the New Forest in southwestern

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<sup>716</sup> Roy Church, *The History of the British Coal Industry, Volume 3, 1830-1913: Victorian Pre-eminence*, (Oxford: Clarendon Press, 1986) 3.

<sup>717</sup> Church, *History of the British Coal Industry, Volume 3* 22.

Hampshire. It was still the main fuel source there in the 1850s.<sup>718</sup> Most of northern Hampshire relied upon wood fuel through the 1830s and woodlands continued to be managed for its production. The Vyne Estate, in Sherborne St. John, sold wood from its lands throughout the nineteenth century. Until 1838 faggots were a sizeable portion of their sales and they ceased selling them only in 1842.<sup>719</sup> The geographic pattern of fuel use in 1840 was similar to what it had been in 1740, as coal could not yet be economically shipped to inland southern England.

The divergence in regional diets also continued in subsequent decades. Bakers were more prevalent across the Island of Britain by 1851 and purchased bread was increasingly the staple. However, cheap fuel meant that the West Riding continued to have the most inhabitants per bakery worker of any English county. Bakers remained noticeably sparse in Bradford, and the West Riding as a whole had twice as many inhabitants per baker as similarly industrialized Lancashire. Hampshire remained a county with a high proportion of bakers.<sup>720</sup> Meanwhile, residents of the North Coalfield textile belt continued to eat oatcake and oatmeal throughout the century. This was also one of the last British regions to abandon home-cooking.<sup>721</sup> By mid-century, more English people were eating potatoes and purchased wheat bread, but cheap fuel and oats maintained a distinctive diet on the Yorkshire coalfield.

Aside from coastal regions like southern Hampshire, coal prices were central to regional economic development in the early Industrial Revolution. They remained

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<sup>718</sup> Tubbs *New Forest* 230, "New Forest Claims and related Correspondence 1845-1852" HRO 21M57/E862-864, *Abstract of the Claims to the Rights of Common and Other Rights over The New Forest, As Published in and Extracted from The London Gazette of the 24<sup>th</sup> December, 1852* (London: Harrison and Son, 1852)

<sup>719</sup> "Vyne Farm, Wood and Repair Account 1827-1875," HRO 31M57/602.

<sup>720</sup> Pedersen *Bread and the British Economy*, 80-83.

<sup>721</sup> Marie Hartley and Joan Ingilby, *Life & Tradition in West Yorkshire*, (London: J.M. Dent & Sons, 1976) 110-117.

important to industrial growth in subsequent decades, while southern Hampshire did not expand as rapidly during those peaceful years. Steel production developed in Sheffield and eventually complemented cutlery as the city's main industry. Steel also came to be manufactured in Rotherham as South Coalfield manufacturing expanded after 1830.<sup>722</sup> Textile manufacturing grew across the North Coalfield with the development of larger mills and factories. Bradford's expansion was notable, as it became an important national centre and the quintessential nineteenth-century industrial city. By 1851, it was the ninth largest city in England and one of three towns on the Yorkshire coalfield with more than 100,000 inhabitants.<sup>723</sup> Regional growth from industrialization on the Yorkshire coalfield continued longer than naval growth in coastal Hampshire. As a result, historians have been more interested in the early growth of manufacturing towns than the temporary prominence of Portsmouth. By 1851, Bradford was larger than Portsmouth and textile mills were growing more rapidly than naval ships.<sup>724</sup> During these decades, northern Hampshire and the Vale of York remained devoted to arable agriculture. Thus, the economic contrast between an industrial coalfield and agricultural areas without local coal grew in subsequent decades.

Living standards continued to decline. The smoke problem became much worse on the Yorkshire coalfield and by 1850 the moths in Leeds had evolved a new pigmentation to merge with the increasingly black atmosphere.<sup>725</sup> The smoky atmosphere of industrial towns increasingly blocked sunlight and led to people

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<sup>722</sup> Alan Birch, *The Economic History of the British Iron and Steel Industry, 1784-1879* (London: Frank Cass and Company, 1967) 302-314.

<sup>723</sup> Wrigley, *Energy in the English Industrial Revolution*, 62-63.

<sup>724</sup> Wrigley, *Early English Censuses* Table A1.5

<sup>725</sup> Thorsheim, *Inventing Pollution* 38

developing rickets from insufficient vitamin D.<sup>726</sup> High population densities and insufficient sanitation also increased disease rates in industrial towns. Sheffield, Leeds and Bradford all had life expectancies of 36 or 37 in the 1850s, well below the English average.<sup>727</sup> The smoke and urban pollution problems increasingly reduced coalfield living standards by mid-century. Meanwhile, people across England ate less in the 1850s than their parents in earlier decades. Roderick Floud continues to argue that living standards improved between 1740 and 1820 but even he acknowledges their decline between 1820 and 1850.<sup>728</sup> Ian Gazeley and Sara Horrell examine changes in the nutritional composition of agricultural labourers' diets. They observe that diets did not improve in the 1830s and 1840s, and that a reduction in self-provisioning of vegetables led to increasing deficiencies in vitamin A, vitamin C, riboflavin and niacin.<sup>729</sup> The decline in living conditions was only reversed with the large-scale importation of cheap New World grain in the last decades of the nineteenth century.

Many of the key developments connected with energy transitions and the Industrial Revolution either occurred prior to 1750 or after 1830. Seen simplistically, these years could be seen as ones of continuity in England. However, English lives fundamentally changed during these eighty years. Population growth outstripped the ability of woodlands to supply people with affordable fuel in the late eighteenth century. The situation became severe enough that such households had generally ceased cooking by 1830. The point at which people ceased cooking marked an important shift

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<sup>726</sup> Mosley, *Chimney of the World* 65

<sup>727</sup> Simon Szreter and Graham Mooney, "Urbanization, Mortality, and the Standard of Living Debate: New Estimates of the Expectation of Life at Birth in Nineteenth-Century British Cities," *Economic History Review* 51 (1998) 88.

<sup>728</sup> Floud et al, *The Changing Body* 138-139.

<sup>729</sup> Ian Gazeley and Sara Horrell, "Nutrition in the English Agricultural Labourer's Household Over the Course of the Long Nineteenth Century," *Economic History Review* 66 (2013) 777.

from the relative prosperity of the early eighteenth century to the cold and hungry misery of the mid-nineteenth century. Their experience was similar to those in fuel-poor Denmark, Iceland and France during the same years. This would have provided cold Hampshire residents with little comfort but reminds us that European populations had generally outgrown the ability of woodfuels to meet their needs.

These eighty years were central to industrial development on the Yorkshire Coalfield. This region was already densely populated in 1750. Here, a rapidly growing population meant that people were living in increasingly large communities and in the nineteenth century suffered from the smoke emanating from all those households. Meanwhile, these eighty years saw the development of new work processes and factories, which transformed Yorkshire experiences. The same cheap coal that fueled industrialization also allowed coalfield inhabitants to maintain many aspects of their traditional diet. Their living standards increasingly diverged from those in northern Hampshire between 1750 and 1830. The development of comparatively prosperous industrial northern English regions with poorer agricultural ones was an important shift driven by cheap coal and the fuel crisis. The regional differences in these developments were crucial in shaping nineteenth-century English society and the lives of those who lived through them.

## Appendix A: Coal on Aire and Calder Navigation, 1775-1830

**Table A-1: Tons of Coal for which Dues Paid on Aire and Calder Navigation<sup>1</sup>**

Year	1 <sup>st</sup> Quarter (tons)	2 <sup>nd</sup> Quarter (tons)	3 <sup>rd</sup> Quarter (tons)	4 <sup>th</sup> Quarter (tons)	Total (tons)
1775	28,649	31,121	36,520	33,628	129,920
1776	24,137	40,514	40,608	51,206	157,137
1777	30,466	47,533	36,911	49,571	161,183
1778	31,726	47,556	32,862	42,239	154,384
1779	35,199	41,787	33,271	40,739	150,998
1780	27,624	47,880	31,742	46,145	153,393
1781	32,153	41,165	33,122	45,221	151,661
1782	31,309	40,475	42,458	45,458	159,702
1783	39,920	43,593	25,180	46,174	154,868
1784	17,316	57,579	44,734	40,404	160,034
1785	49,625	48,595	53,149	56,867	208,237
1786	37,987	53,598	47,111	55,844	194,542
1787	54,565	53,325	53,085	50,772	211,749
1788	54,169	51,043	51,380	52,685	209,808
1789	47,343	66,387	58,720	61,690	234,141
1790	58,992	52,017	58,158	62,138	231,307
1791	54,599	59,331	56,112	54,770	224,813
1792	51,207	52,584	49,052	42,657	195,502
1793	41,591	56,381	59,200	62,323	219,495
1794	42,809	54,158	59,252	67,947	224,168
1795	36,530	71,101	66,153	72,941	246,727
1796	57,506	63,921	66,276	62,960	250,665
1797	71,049	70,736	71,102	70,998	283,886
1798	67,190	68,528	71,143	79,553	286,416
1799	46,664	86,363	76,034	88,870	297,933
1800	87,003	90,329	81,760	108,582	367,676
1801	81,243	95,396	98,016	92,355	367,011
1802	75,007	104,215	111,357	105,730	396,311
1803	82,849	111,240	103,146	104,025	401,261
1804	98,760	120,303	110,601	113,313	442,977
1805	97,150	108,547	100,547	102,812	409,058
1806	96,045	112,557	110,825	111,190	430,619
1807	101,014	111,273	108,779	118,008	439,075
1808	112,388	121,791	113,950	112,652	460,783
1809	99,648	125,622	116,380	126,607	468,258
1810	105,394	117,853	116,899	116,022	456,169

<sup>1</sup> "Aire and Calder Navigation Accounts Currant, 1775-1816," and "Aire & Calder Navigation Abstract Accounts and Comparative Statements for the Aire & Calder Navigation, 1817-1830," WYAS Wakefield C299/1/3/1/1-13.

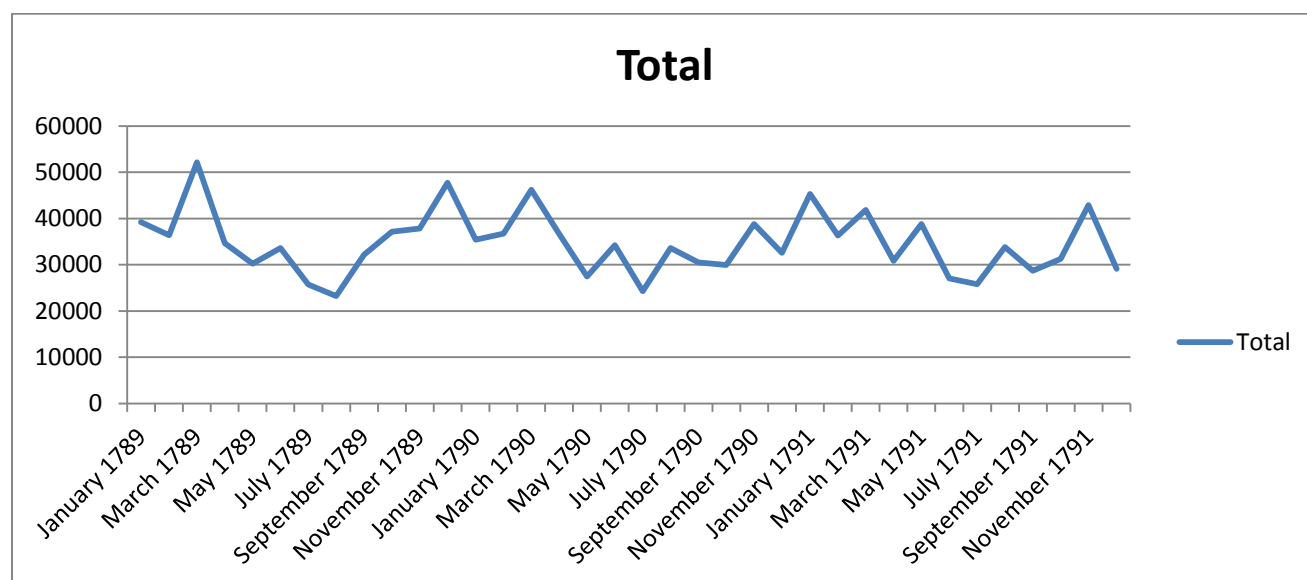
1811	100,922	122,053	121,287	125,213	469,476
1812	111,087	113,237	113,257	116,447	454,030
1813	120,369	112,393	111,582	128,381	478,787
1814	78,316	138,327	127,642	135,469	479,755
1815	113,797	119,433	124,116	114,978	472,326
1816	109,360	113,135	115,737	119,960	458,201
1817	103,074	99,131	111,481	121,424	435,110
1818	97,309	118,033	108,761	134,762	458,866
1819	111,887	117,010	125,462	113,067	467,426
1820	109,615	139,322	134,200	149,170	532,307
1821	97,870	104,718	116,351	119,170	438,110
1822	107,674	106,144	112,300	117,398	443,518
1823	93,117	129,120	133,230	129,786	485,253
1824	118,650	117,730	125,487	113,973	475,840
1825	122,935	119,459	119,440	131,406	493,240
1826	109,405	119,829	136,432	145,494	511,160
1827	103,356	128,265	134,620	139,709	505,950
1828	122,596	119,962	124,209	142,561	508,928
1829	124,766	123,926	121,923	143,673	514,288
1830	113,735	130,447	128,368	147,606	520,156



## Appendix B: Seasonality of Coal Sales in Leeds, 1789-1791

The Middleton Colliery was 1.5 miles from the centre of Leeds and the largest coal mine in Yorkshire. It sold coal at three locations: its pithead on Hunslet Moor, a staith along the River Aire in Hunslet and a staith in the town of Leeds. The coal sold at the riverside staith was delivered to locations across the eastern regions of the West Riding, York, Hull, the East Riding and Lincolnshire.<sup>1</sup> Given Middleton Colliery's size, proximity to Leeds and large downriver market, it provided most of the coal consumed in the expanding town. The following analysis uses the monthly sales from its staith in town between 1789 and 1791 and treats them as a reasonable indicator of monthly coal consumption in Leeds. Chart B-1 shows the total coal sold in each month for the three years and indicates that sales were higher in the winter than the summer.

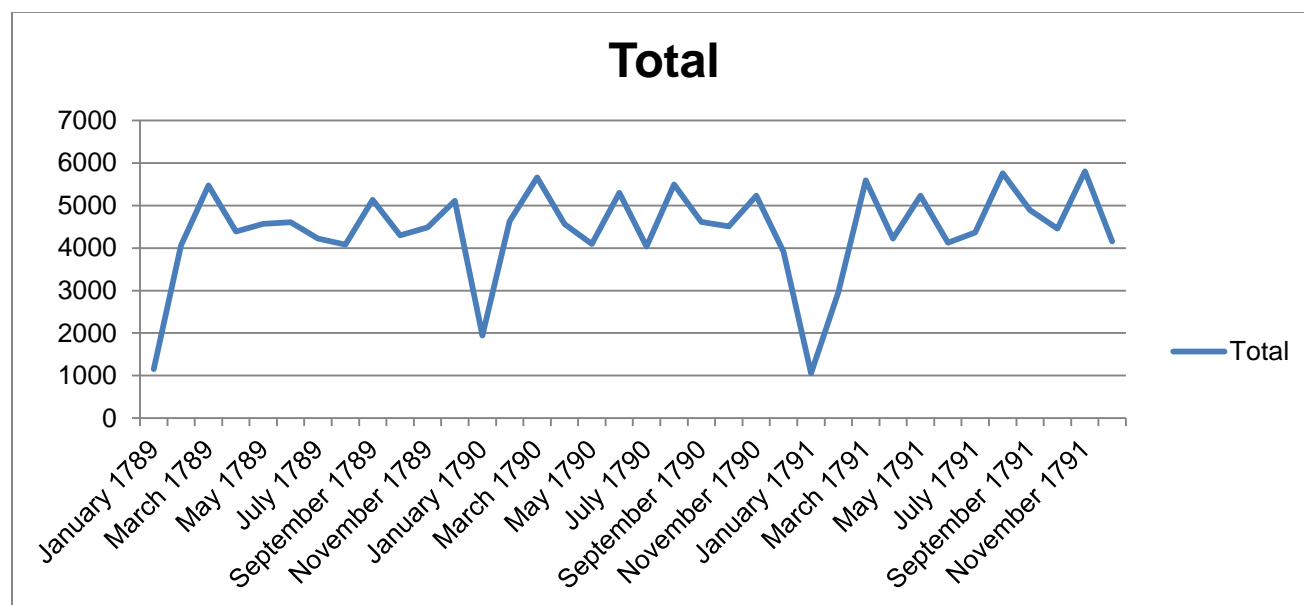
**Chart B-1: Leeds Staith Monthly Coal Sales, 1789-1791 (in Corves)**



<sup>1</sup> "Middleton Colliery Sales 1789-1796" WYAS Leeds WYL899/197. In April 1789 coal at the riverside staith was sold to buyers from Knottingley, Beverley, Wallingbro Ferry, Hull, Buterwicke, Rothwell, Rawcliffe, Woodhouse Hill, Northcave, Leeds, York, Brigg, Selby, Elekar, Louth, Aram, Lincoln, Brotherton, Newton, Holme, Lockington, Torkilsey, Woodhall, Hullbridge, Wonsford, Nabron, Driffield, Monk Weigton, Winterton, Barron, Standfordbridge and Esrick.

Coal was burnt for industrial and domestic purposes in Leeds and these followed different seasonal patterns. Most of the coal sold at the Leeds Staith involved cash transactions, including 15,451 of the 23,219 corves sold in August 1789.<sup>2</sup> The surviving accounts do not include the names of those who purchased coal for ready money, but do record those who bought on credit. These include the largest purchasers, most of which were industrial. The largest customer every month was the Leeds Pottery and its monthly purchases have been graphed in Chart B-2. These show very little seasonal change. Aside from slack business in January, most of the variation is due to whether there were four or five weeks in the recording period.

**Chart B-2: Leeds Pottery Monthly Coal Purchases, 1789-1791 (in Corves)**

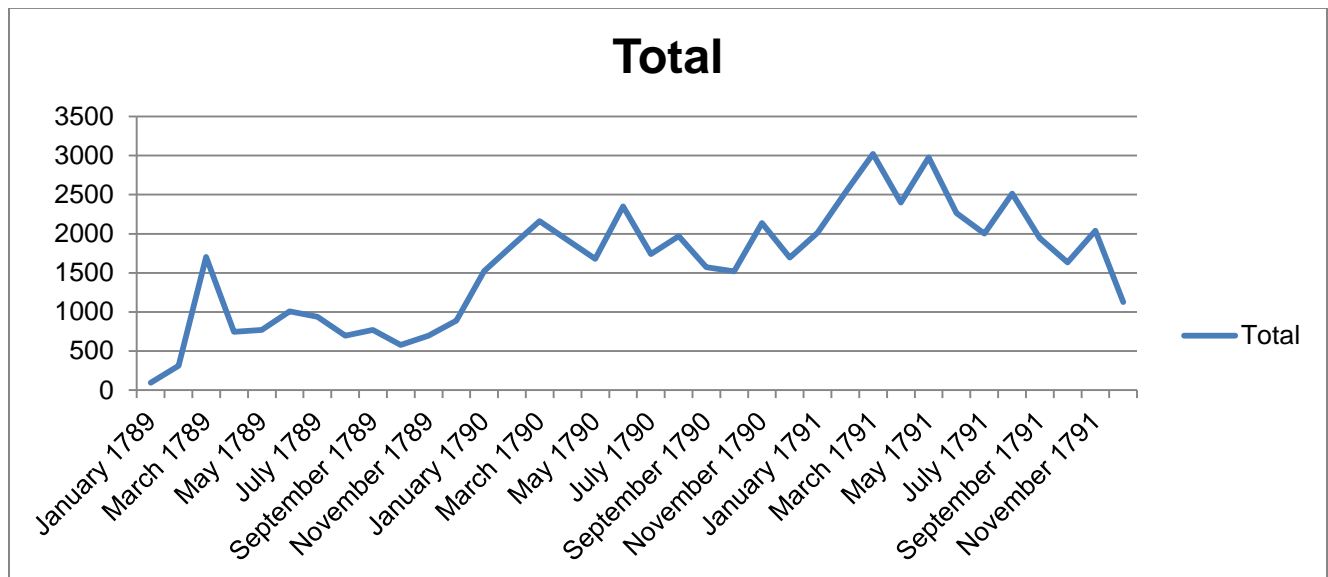


Cloth dyeing was one of the largest industries in Leeds and consumed significant amounts of coal. Cross-referencing the list of coal customers from November 1790 against the 1798 *Leeds Directory*, indicates that Jas. Whiteley, Sayner, Wray and Son

<sup>2</sup> "Middleton Colliery Sales 1789-1796" WYAS Leeds WYL899/197.

and Messrs. Carr were cloth dyers.<sup>3</sup> Their purchases are in Chart B-3. Their coal consumption fluctuated more than the Pottery's and appears to have been more influenced by the business cycle. However, it was not seasonal. The large increase in January 1790 is because Sayner and Carr only began purchasing coal on credit that month. The exact amount of household and industrial coal consumption each month cannot be determined. However, Charts B-2 and B-3 suggest that industrial coal consumption was not seasonal. Coal consumption in Leeds overall was higher in winter. As such, household consumption was more seasonally varied than the town's overall coal use. The numbers used in these three charts are in Table B-1 below.

**Chart B-3: Monthly Coal Purchases of Four Cloth Dyers, 1789-1791 (in Corves)**



<sup>3</sup> *The Leeds Directory for the Year 1798 Containing an Alphabetical List of the Corporation Clergy, Merchants, Professors of the Law and Physic, Manufacturers, Traders, &c, Also Particulars of the Mail and Other Coaches, Waggons, and the Navigation Barges by which Goods and Merchandize are conveyed from this Town to various parts of the Kingdom, (Leeds, 1798)*

**Table B-1: Monthly Coal Sales, Middleton Colliery Leeds Staith, 1789-1791<sup>4</sup>**

Month	Leeds Staith Total Sales (Corves)	Leeds Pottery Sales (Corves)	Sales to Cloth Dyers (Corves)
January 1789	39,225	1,152	96
February 1789	36,346	4,056	312
March 1789	52,181	5,472	1,704
April 1789	34,632	4,392	744
May 1789	30,250	4,566	768
June 1789	33,634	4,608	1,008
July 1789	25,750	4,224	936
August 1789	23,219	4,080	696
September 1789	32,184	5,136	768
October 1789	37,148	4,296	576
November 1789	37,850	4,488	696
December 1789	47,692	5,112	888
January 1790	35,384	1,944	1,524
February 1790	36,716	4,632	1,848
March 1790	46,237	5,664	2,160
April 1790	36,658	4,560	1,920
May 1790	27,421	4,098	1,680
June 1790	34,233	5,301	2,352
July 1790	24,278	4,032	1,740
August 1790	33,635	5,496	1,968
September 1790	30,524	4,616	1,572
October 1790	29,925	4,512	1,518
November 1790	38,811	5,232	2,136
December 1790	32,540	3,912	1,695
January 1791	45,330	1,056	2,016
February 1791	36,294	2,952	2,529
March 1791	41,869	5,592	3,020
April 1791	30,821	4,224	2,398
May 1791	38,786	5,232	2,976
June 1791	27,021	4,128	2,264
July 1791	25,806	4,368	2,001
August 1791	33,802	5,760	2,514
September 1791	28,703	4,896	1,944
October 1791	31,285	4,460	1,632
November 1791	42,857	5,808	2,040
December 1791	29,088	4,152	1,128

<sup>4</sup> "Middleton Colliery Sales 1789-1796" WYAS Leeds WYL899/197.

## Appendix C: Types of Fuel Consumed in Hampshire

Transitions in fuel sources interest scholars. Such transitions occurred in some Hampshire communities between 1750 and 1830. The following three tables serve to indicate fuel transitions and are derived from Accounts of Overseers of the Poor. Table C-1 notes the wartime substitution of wood, peat or furze for coal in otherwise coal-burning Hampshire communities. All of these purchases involved new fuel sources but coal was also purchased in some of them. As such, the fourth column indicates the fuels overseers purchased in those years and the fifth column whether they also purchased coal. The sixth column notes the period of time for which overseers purchased the new types of fuel.

**Table C-1: Short-Term Changes to Type of Fuel Consumed in Coal-Burning Hampshire Parishes<sup>1</sup>**

Parish	Region	Years	New Type of Fuel	Was Coal Also Purchased?	Duration of Change
Bonchurch	Isle of Wight	1761/2	Wood	Yes	1 year
Godshill	Isle of Wight	1761/2	Peat & Furze. Previously with coal	No	4 years
Wymering	Coast	1765/6	Wood	No	5 years
Titchfield	Coast	1786/7 1801/2	Peat.	Yes	1 year
Portsmouth	Coast	1788/9	Wood, previously with coal	No	4 years
Saint Mary, Southampton	Coast	1808/9 1813/4	Wood. Charcoal	Yes	1 year
Fareham	Coast	1811/2	Wood	Yes	1 year
St Bartholomew Winchester	Inland	1789/90	Wood	No	1 year
St Lawrence, Winchester	Inland	1811/2	Wood	Yes	1 year

Table C-2 indicates the first year that coal was purchased by overseers in otherwise wood, furze or peat-burning Hampshire Communities. Most of these were wood burning and these purchases indicate the points at which fuel sources began to transition. This table has been arranged chronologically. The final column indicates the

<sup>1</sup> Overseers Accounts that were consulted in this project follow. Hampshire Record Office: 24M68/PO2-5, 21M71/PO2, 21M71/PO9, 20M70/PO1, 22M69/PO1-2, 60M70/PO1-3, 140M82/PO1-3, 1M80/PO1-3, 1M67/PO1-2, 1M67/PO4, 145M82/PO8, 30M77/PO3-8, 63M70/PO1-3, 20M83/PO14-16, 38M72/PO2-4, 137M71/PO5, 148M82/PO2-5, 130M83/PO1, 1M70/PO3, 47M74/PO1, 59M72/PO1-2, 46M68/PO2, 1M48/PO1, 147M82/PO1, 113M82/PO1-3, 94M82/PO1, 10M57/PA16-17, 43M48/2026-2027, 151M71/PO1-2, 25M60/PO7-11, 55M78/PO1, 24M82/PO2, 81M71/PO1, 32M76/PO1, 13M80/PO1-2, 46M69/PO8-10, 27M79/PO1-3, 9M75/PO11-13, 26M79/PO13-15, 10M58/PO1-2, 96M82/PO3-8, 42M82/1-2, 55M81W/PO1, 55M81W/PO3, 107M81W/PO1-3, 1M82W/PO31-32, 71M81W/PO2-5, 42M85/PO1-4, 19M78/PO1-3, 19M69/PO1, 45M77/PO1-2, 47M66/1-2, 25M84/PO1-5, 78M72/PO7-8, 42M75/PO16-20, 37M73/PO2-8, 37M73/PO11, 37M73/PO13, 37M73/PO17, 108M70/PO3-9, 39M75/PO1, 15M70/PO1, 49M67/PO1-2, 79M71/PO1, 9M66/PO1-2, 5M66/PO1-3, 67M81/PO1 and 85M71/PO1. Isle of Wight County Record Office: BRA/APR/1A/1-3, ARR/APR/1B/3-4, BON/APR/1A/1, CAR/APR/1A/5-6, BRI/APR/1A/4 and GDL/APR/1A/1-2. Portsmouth Museum and Record Service: CHU43/2C/1-4, PL1/6-32, CHU46/2A/1, CHU19/2/2 and CHU15/D/1/1/2-3. Southampton City Archives: SC/AG8/3/1, SC/AG8/5/1, SC/AG8/6/1-2, PR7/10/5, PR5/11/6/23, PR5/11/11-17, PR9/15/7-22 and D/PM19/3/11. In order to save space, these Overseers Accounts can be understood to be the source for Tables 2-1 through 2-6.

subsequent years in which coal was purchased. It distinguishes the eighteenth-century transition to coal-burning in rural southern Hampshire from the one-time purchases in northern Hampshire parishes that remained wood-burning in 1830.

**Table C-2: Introduction of Coal into Hampshire Overseers Accounts**

Parish	Region	Year	Previous Fuel	Was Coal Purchased in Later Years?
Bishop's Waltham	Coast	1744/5	Wood	1744-51, 1767-75 and after 1790
Carisbrooke	Isle of Wight	1752/3	Wood	Yes
Bursledon	Coast	1766/7	Wood	Yes
Petersfield	Inland	1773/4	Wood	Yes
Romsey Extra	Inland	1776/7	Wood	Yes
Warnford	Inland	1787/8	Wood	Yes, between 1787-90 and after 1807
Bishopstoke	Coast	1789/90	Wood	1789-94 and after 1819
South Stoneham	Coast	1791/2	Peat and Wood	Yes
Long Sutton	North-East	1791/2	Wood	No
Binstead	North-East	1792/3	Peat and Wood	Occasionally
Barton Stacey	Inland	1799/00	Wood	Until 1803/4 and after 1810
Wooton St Lawrence	North-West	1801/2	Wood	No
Fawley	Coast	1803/4	Peat and Furze	Yes
Grateley	North-West	1805/6	Wood	No
Bentley	North-East	1806/7	Peat and Wood	Only purchased 1806-12
Bramley	North-East	1808/9	Wood	No
Broughton	Inland	1808/9	Wood	Only bought 1808/9 and 1814-16
Hambledon	Coast	1814/5	Wood	n/a
Avington	Inland	1814/5	Wood	No
Hordle	South-West	1820/1	Wood and Furze	Yes
Compton	Inland	1824/5	Wood	No
King's Worthy	Inland	1826/7	Wood	n/a
Lockerley	North-West	1828/9	Wood	No

Table C-3 indicates the first purchase of wood or peat by overseers in communities that predominantly burnt the other fuel. Most of these consist of



predominantly wood-burning parishes without peat deposits. There, overseers purchased peat from other parishes on a few occasions as wood became expensive. Most of these communities were in northern Hampshire and indicate that substituting fuel sources was one response to rising prices in areas without affordable coal.

**Table C-3: Changes in Type of Traditional Fuel Purchased in Parishes**

Parish	Region	Year	Previous Fuel	New Fuel	Duration of Change
Bentley	North-East	1756/7	Wood	Peat and Wood	1756-63, 1778/9, 1791/2 and after 1802/3.
Leckford	North-West	1761/2	Wood	Peat and Wood	Until 1776/7
Lyndhurst	South-West	1771/2	Peat	Wood and Peat	Until 1776
Heckfield	North-East	1771/2 1785/6 1789/90	Wood	Wood and Peat	1 year
Tadley	North-West	1773/4	Wood and Peat	Furze, Wood and Peat	1 year
Burghclere	North-West	1774/5	Wood and Peat	Peat	Until 1794/5,
Dogmersfield	North-East	1777/8	Wood	Wood and Peat	Until 1830
Thruxton	North-West	1783/4	Wood	Wood and furze	1 year
Hursley	Inland	1785/6 1794/5	Wood	Peat	1 year
Titchfield	Coast	1786/7	Wood and Coal	Wood, Coal and Peat	Peat purchased in 1786/7 and 1801-11
Hale	South-West	1799/00	Peat	Wood and Peat	1 year
Hordle	South-West	1809/10	Wood and Peat	Wood and furze. Also coal after 1820	Until 1830
Holdenhurst	South-West	1810/1	Mostly Peat	Peat, Wood and Furze	Until 1830
King's Worthy	Inland	1811/2	Wood	Furze	Until 1826/7
Mapple-durwell	North-East	1815/6	Wood	Wood and Peat	1 year

## Appendix D: Units of Fuel Measurement

In 1800, coal was sold by the dozen, corf, pull, load, cart load, waggon, chaldron, bushel and sack across the West Riding of Yorkshire. Yorkshire peat was sold by the load. Meanwhile, in Hampshire coal was sold by the bushel or chaldron while peat was measured by the turve, clod or load, and wood by the faggot or bavin. In both counties, tons and hundredweights were occasionally used to measure fuel but most of the above units were not simple fractions of those. The lack of standardization in fuel measurement and local variability of some units are generally seen as obstacles by economic historians. However, the same units that make calculations difficult reflect real differences in how fuel was consumed and understood. The units reflected the most important relationships between its production and consumption. With corves, dozens, turves, faggots and bavins the local labour used to extract the fuel is emphasized. Loads and cartloads emphasize its overland transport, while bushels, sacks and chaldrons reflect a more abstract commodity that has travelled by water. The contrasting units by which coal was measured also reflected its varied use between different communities. The following pages describe the various units, where they were used and the manner in which they reflected local fuel relationships.

Peat-burning communities around the New Forest, denominated this source in multiples of the turve, or the amount of peat taken out of the ground every time that the turf spade entered. Although variations undoubtedly existed between individual turves, these were rectangular cubes, of which a thousand turves frequently weighed

approximately one ton.<sup>1</sup> When households were allocated specific common rights to peat or local Overseers of the Poor disbursed it to the families of poor widows, it was usually in multiples of a thousand turves. For example, the Lyndhurst overseers bought three thousand turves for Widow Louch in July 1769.<sup>2</sup> In this region, peat was sometimes denoted by the load, as when the parish of Hale paid for cutting and carrying two loads of peat each for Frances Teller, Elizabeth Kember, Mary Durdell, Susan Shering, George Wheatley, Mary Larson and Amy Allen in May 1792.<sup>3</sup> While turves were used in Eversley, loads were the most frequent unit for peat in overseers Accounts in northeastern Hampshire parishes like Elvetham or Dogmersfield, where they were known locally as loads of clods.<sup>4</sup> Loads, cart loads and horse loads were also the unit when overseers and gentry households in the West Riding recorded peat purchases, such as the cart load of peat purchased by Matthew Wilson's household on 17 July 1773 or the overseers of Denton paying 10s for one day's labour to lead two loads of peat on 14 July 1810.<sup>5</sup> Denoting peat by the turve indicated an understanding of the fuel consumed as resulting from the act of digging with the spade, while evoking the geographic proximity between deposit and consumption. The term clods in Dogmersfield reflected local variations in the exact properties of the peat. Measuring peat by the load emphasized the labour required to transport it to Denton, while often retaining some connection to the source of its extraction.

<sup>1</sup> Rotherham, Egan and Ardron, "Fuel Economy and the Uplands" 104. Porter, "Fenland Peat" 163-164

<sup>2</sup> "Lyndhurst Poor Book, 1765-1776" HRO 25M84/PO1.

<sup>3</sup> "Hale Overseers Accounts 1769-1803" HRO 13M80/PO1.

<sup>4</sup> "Eversley and Bramhill Overseers Accounts 1738-1762," "Eversley Overseers Accounts 1803-1825," "Elvetham Overseers Accounts 1780-1797," "Dogmersfield Overseers Accounts 1740-1787," and "Dogmersfield Parish Book and Overseers Accounts 1803-1823" HRO 43M48/2026-2027, 94M82/PO1 and 59M72/PO1-2.

<sup>5</sup> "Household Accounts of Mathew Wilson, 1772-1786" Yorkshire Archaeological Society (hereafter YAS) MD335/2/1/3/7 and "Denton Parish Overseers' Account Book 1804-1843" North Yorkshire County Record Office (hereafter NYCRO) ZFW 13/3/3, 52.

While peat was measured by the turve or load, in Hampshire wood fuels were denoted by the faggot or bavin. Both refer to bundles of wood with faggots generally being the shoots of twelve to fourteen year-old coppiced trees and bavins brushwood. Sixteenth century legislation dictated that faggots were to be at least twenty-four inches in diameter and all of the sticks were to be at least three feet long.<sup>6</sup> However, the size and quality of wood in both faggots and bavins varied. For instance, the overseers of Leckford specified that they bought Philip Moor “9 large faggots” in January 1782.<sup>7</sup> While often oak, faggots could consist of different types of wood. In January 1796, the overseers of Martin bought thirty-nine furze faggots for the poor while in April 1783 Thomas Tarver delivered two hundred ash faggots to the Romsey Extra workhouse.<sup>8</sup> The variability in faggots and bavins emphasizes their connection to individual trees and the process of cutting them, thereby reflecting circumstances in which wood was consumed near to where it grew.

Wood could only be economically transported more than a few miles if it had been coaled. Charcoal continued to have some industrial uses throughout this period but the labour required and energy lost in its production prevented its use in the domestic hearths of households near the woodlands from which it originated. The few occasions when it appears in Hampshire Overseers Accounts are from Southampton parishes, where it was purchased by the bag, sack or bushel.<sup>9</sup> These units are defined by the vessels in which charcoal was sold and are the same units to those used for

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<sup>6</sup> Richard Burn, *The Justice of the Peace and Parish Officer: Twenty-First Edition, Volume II* (London: A. Strahan, 1810) 432. The legislation was 43 El c.14.

<sup>7</sup> “Leckford Poor Book, 1770-1799” HRO 45M77/PO2.

<sup>8</sup> “Martin Overseers Accounts 1793-1804” and “Romsey Extra Overseers Accounts, 1774-1784” HRO 9M66/PO1 and 10M58/PO1

<sup>9</sup> “Southampton Holy Rood, 1732-1751”, “Southampton St. Mary,” “South Stoneham” and “Southampton 1816-1817 relief” SCA SC/AG8/6/1, PR5/11/16, PR9/15/12-16 and D/PM19/3/11.

mineral coal, which indicates an understanding of fuel as a product delivered from distant locations rather than the shoots of locally grown trees.

While wood and peat were usually measured in ways that reflected the process of collecting them, in Hampshire mineral coal was sold in multiples of the bushel. The bushel is the basket in which coal, wheat and other goods had long been sold. Coal was also sold by the peck, sack or chaldron, which were all easily converted into bushels. A peck was one-quarter of a bushel, a sack three and a chaldron thirty six bushels.<sup>10</sup> Bushels and chaldrons were the main units by which Hampshire overseers bought coal, as when the Barton Stacey overseers paid 4s for three bushels of coal for Curtis Girl on 26 December 1801 or when the Bishopstoke Poorhouse purchased a chaldron of coals for £1 19s in 1824-25.<sup>11</sup> These were also the units by which coal was measured in London and Newcastle, so that chaldrons were used in national discussions of the fuel such as the 1830 *Report on the Coal Trade*.<sup>12</sup> Chaldrons were a different measure at the two ends of that trade, and Brien Dietz calculated that in the late eighteenth-century they averaged 25.7cwt in London and 46.2cwt in Newcastle.<sup>13</sup> Using these measurements defines coal by its container in the market, thereby treating it primarily as a purchased commodity with little connection to its production.

Bushels, sacks and chaldrons, in addition to being the standard units by which coal was sold in southern England, were used to measure coal in some non-coalfield communities in the West Riding of Yorkshire. These include the fenland village of Rawcliffe, which lies on the River Aire fifteen miles north of Doncaster. Its coal had to

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<sup>10</sup> "Waggon Book Manor Colliery, 1805" SA MD 3629.

<sup>11</sup> "Barton Stacey Poor Book, 1789-1808" and "Bishopstoke Overseers Accounts 1785-1845" HRO 60M70/PO2 and 145M82/PO8.

<sup>12</sup> *Report of the Select Committee on the State of the Coal Trade* (13 July 1830)

<sup>13</sup> Dietz, "The North-East Coal Trade," 284.

travel over twenty five miles from the pithead, and with the exception of 1762-3, its overseers bought coal by the sack from 1760 until 1830.<sup>14</sup> Chaldrons and bushels were also the units by which coal was measured in the north-eastern parts of the West Riding. These include the adjacent parishes of Burton Leonard and Staveley, north of Knaresbrough. One such purchase occurred on 7 April 1823, when the Burton Leonard overseers paid 9s for a half-chaldron of coals for John Thackray.<sup>15</sup> The closer proximity to coal mines meant that prices were considerably lower than in Southern England, but its transportation led to the same units being used and reflects these non-coalfield communities having similar fuel relationships to their southern counterparts.

Although coal was measured by the chaldron in the coastal coal trade and often sold by that unit, canal tolls were based upon tons. This weight measure was used on Yorkshire's Leeds and Liverpool Canal and Hampshire's Basingstoke Canal, where it cost 12s to ship a ton of coal the entire distance from London.<sup>16</sup> They were also the measure for toll collection on the West Riding's extensive Aire and Calder Navigation.<sup>17</sup> They are a measure of weight and their use on canals treated coal like other commodities that occupied space in boats and consumed the energy of the horses pulling those barges. While there was no community in which fuel was usually sold by the ton, overseers occasionally measured coal or wood by weight. The only such instance in Hampshire occurred in 1766 when the parish of Beauworth paid 2s 6d to "let

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<sup>14</sup> "Rawcliffe Overseers Accounts" Doncaster Archives (hereafter DA) P60/6/2/35-81.

<sup>15</sup> "Burton Leonard Overseers Accounts" NYCRO PR/BTD10/3/7.

<sup>16</sup> "Canal Trade" WYAS Bradford JOW/11/a/2 and "Basingstoke Canal Navigation Notice, 1794" HRO 5M52/TR3/18

<sup>17</sup> "Aire and Calder Navigation Accounts Currant, 1775-1816," and "Aire & Calder Navigation Abstract Accounts and Comparative Statements for the Aire & Calder Navigation, 1817-1830," WYAS Wakefield C299/1/3/1/1-13.

Thomas Elton have a quarter ton of faggots.”<sup>18</sup> Tons were sometimes used for the purchase of coal, as by the overseers of Denton, in the northern part of the West Riding in 1815.<sup>19</sup> Hundredweights of coal appear a little more frequently in Overseers Accounts, notably in the parish of Wadworth three miles south of Doncaster.<sup>20</sup> The overseers of Todwick, ten miles east of Sheffield, also used this unit on one occasion, when they paid 1s 2d for two hundredweight of coal for William Tyas in 1805/6.<sup>21</sup> Pounds and tons, units that continue to measure commodities, were occasionally used prior to 1830 and by economic historians like Michael Flinn in discussing coal consumption. However they were never the main measurement for fuel in any Hampshire or West Riding community between 1750 and 1830. Energy continued to be denominated in volume measures more connected to the process of bringing fuel to those communities.

Loads of coal were the main unit of measurement in the northern part of the West Riding coalfield and in the accounting of some mines, including Malham mine in Craven.<sup>22</sup> With the exception of one purchase by the Midgley overseers in 1769, these units are the only ones to appear in Overseers Accounts in the large textile-manufacturing parish of Halifax.<sup>23</sup> Such units were also the only ones used in a number of other communities on the northern part of the coalfield, including Burley whose overseers numerous purchases included paying 1s 10d for two loads of coals for Simon

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<sup>18</sup> “Beauworth Book for the Overseers of the Poor, 1733-1784” HRO 140M82/PO1.

<sup>19</sup> “Denton Parish Overseers’ Account Book 1804-1843” NYCRO ZFW 13/3/3.

<sup>20</sup> “Wadworth Overseers Accounts,” DA P21/6/B1/1-4 and

<sup>21</sup> “Todwick, 1800-1830” SA PR1/14.

<sup>22</sup> “Lord Ribblesdale’s Letters, Correspondence and Accounts Respecting the Malham Mines in Craven, Yorkshire” YAS MD335/1/6/2/3.

<sup>23</sup> WYAS Calderdale RIP 227, MISC165/10/1-2, HPC/A/25, SPL 32/1, SPL 33, MISC 86/1 and MISC 86/2/1-2.

Smith in October 1780.<sup>24</sup> Variations of loads were also the main unit by which coal was sold in a number of parishes without coal mines but whose fuel travelled relatively short distances overland. These include the parish of Arksey, three miles north of Doncaster, where overseers usually bought coal by the wagonload, or some of the parishes near Sheffield, which like Tinsley did not possess their own coal mines.<sup>25</sup> Loads were also the unit by which coal was sold in upland areas north-west of the coalfield, including Burnsall, twenty five miles north of Bradford in the Yorkshire Dales. Overseers here listed fuel purchases that included 4s 6d for three loads of coal for Ann Nelson on 7 February 1795.<sup>26</sup> Measuring coal in loads in these non-coalfield communities reflects an understanding of the mineral primarily as something which is transported overland by a specific type of vehicle.

While coalmines on the northern part of the West Riding coalfield measured output in loads, on the southern part of the coalfield it was usually measured in corves, pulls and dozens. A corf was the basket in which colliers placed coal underground before carrying it to the surface with a pull being a synonym for it and a dozen consisting of twelve pulls. These were the units by which coal was sold from pits that included Earl Fitzwilliam's Elsecar and Lawwood Collieries.<sup>27</sup> Dozens could also be taken as measurement of size or weight, being understood as forty-two hundredweight of coal at Fitzwilliam's collieries. An October 1800 memo defined a dozen of coals stacked "at Lawwood and Elsecar Collieries [as] 6 feet Long, 3 feet broad, 4.5 feet high", while noting that they could consist of 6 corves of 7cwt each, 7 corves of 6cwt or

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<sup>24</sup> "Burley 1762-1813" WYAS Bradford BDP/33/13/6/1 130.

<sup>25</sup> DA P14/6/B1/6 and SA PR 144/40.

<sup>26</sup> "Burnsall Overseers of the Poor" NYCRO PR/BNS/12.

<sup>27</sup> "Elsecar Colliery Journal 1765-1767," "Lawwood Colliery Journal, 1776," "Lawwood Colliery 1803" and "Lawwood Colliery 1807" SA WWM A 1577, 1582, 1583 and 1585.



12 corves of 3.5cwt.<sup>28</sup> Corves and their multiples were also the units by which coal was sold in a number of communities throughout the southern part of the coalfield and occasionally appear in Overseers Accounts of some parishes to the east like Doncaster.<sup>29</sup> Selling coal by these units in nearby communities indicates that they understood the mineral as a direct result of the labour of miners. A dozen coals nominally contained forty-two hundredweight, so the 4s paid for each dozen coals at the Elsecar pithead in 1766 or the 2s 4d that the overseers of Denby paid for a dozen coals for Betty Williamson on 10 May 1781, indicate how much cheaper fuel was in this coalfield region.<sup>30</sup>

The largest mine in Yorkshire was the Middleton Colliery, 1.5 miles from Leeds in the industrial suburb of Hunslet. At the Hunslet Moor pithead and in the town of Leeds, they sold coal by the corf in the eighteenth century, although it is unclear whether this had the same implied weight of 3.5cwt.<sup>31</sup> At their staith along the River Aire in the eighteenth century and at all three locations in the early nineteenth, coal was sold by the waggon.<sup>32</sup> The waggon was a large unit, variously described as weighing around three or three and a quarter tons.<sup>33</sup> Measuring coal by the waggon emphasized the container in which it travelled during its short rail journey from the mine. Selling coal by

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<sup>28</sup> "Memorandum of 31 October 1800" SA WWM F100.

<sup>29</sup> "Doncaster Poor Law Memo Book 1825-1830" DA PL/D/2/2.

<sup>30</sup> "Elsecar Colliery Journal 1765-1767," SA WWM A1577 and "Denby, 1772-1801" WYAS Kirklees KC735/2.

<sup>31</sup> "Middleton Colliery Leeds Staith Sales January 1762-December 1767," "Middleton Colliery Leeds Staith Sales, January 1772-December 1774," "Middleton Colliery Leeds Staith Sales January 1784-December 1788," "Middleton Colliery Coals Sold at Hunslet Moor Pit, 1778-1790," WYAS Leeds WYL899/185-188, 199.

<sup>32</sup> "Middleton Colliery Leeds Staith Sales, July 1806-December 1808," "Middleton Colliery Hunslet Slaith Coal Sales, 1762-1765," "Middleton Colliery Hunslet Slaith Sales 1766-1777," "Middleton Colliery Hunslet Slaith Sales 1778-1785," "Middleton Colliery Hunslet Slaith Sales 1792-1800," "Middleton Colliery Hunslet Slaith Sales 1801-1807," "Middleton Colliery Hunslet Moor Pit Sales, 1807-1808" WYAS Leeds WYL899/189-194, 200.

<sup>33</sup> *Leeds Mercury* 27 June 1812, 1 August 1812 and 18 March 1815.

the corf reinforced the close proximity of its mining and consumption. The waggon was a multiple of the corf, likely twenty four of them, so the use of either measure in surviving accounts is a reflection of coal being understood as a product mined near Leeds that arrived by rail.

## Appendix E: Population of Hampshire and the West Riding of Yorkshire

**Table E-1: Population of Hampshire and West Riding of Yorkshire, 1750-1831<sup>1</sup>**

Year	Hampshire	West Riding of Yorkshire
1750	144,633	323,482
1761	168,330	353,543
1771	162,572	390,758
1781	195,234	451,960
1791	200,874	524,269
1801	229,221	590,518
1811	256,552	681,599
1821	289,541	819,367
1831	320,587	996,199

**Table E-2: Population of Hampshire Fuel Regions<sup>2</sup>**

Fuel Region	1801	1831
Isle of Wight	22,097	35,431
South-West	27,448	37,473
Coast	87,499	130,485
Inland	20,861	28,107
North-East	32,536	43,554
North-West	28,815	38,943

**Table E-3: Population of West Riding Fuel Regions**

Fuel Region	1801	1831
South Coalfield	89,869	161,596
North Coalfield	299,582	568,221
North-West	50,857	71,118
North-East	42,694	57,167
Central	57,694	82,597
South-East	21,900	31,910

<sup>1</sup> Wrigley *Early English Censuses* Table A2.6

<sup>2</sup> The populations are from Wrigley, *Early English Censuses* Table A1.5 and the fuel regions are defined by the parishes mentioned in chapter two.

## Appendix F: Anthropometric Study by Birth Cohort

The following three tables demonstrate the average height of male inmates from the West Riding House of Correction in five-year birth cohorts. The first table consists of all West Riding born male inmates between the ages of 20 and 60 in 1842-3 and all male inmates of those ages between 1801 and 1808. This is a larger sample than those used in the fuel region breakdowns of chapter 5. Table F-1 includes inmates who entered the House of Correction between June 1803 and May 1808 despite their residence not being recorded. Most of these inmates were from the coalfield as it contained most of the population and produced most of the inmates earlier in the decade. Other than the additional inmates, the methodology is unchanged from that used in chapter 5 and the statistically significant values are in bold.

**Table F-1: Male Inmates by Birth Cohort, (ages 20-60)<sup>1</sup>**

Birth Cohort	Average Height (inches)	Number	P-Value
1740-4	65.77	32	0.104
1745-9	66.39	78	0.477
1750-4	66.34	104	0.447
<b>1755-9</b>	<b>65.90</b>	<b>140</b>	<b>0.019</b>
1760-4	66.50	160	0.274
<b>1765-9</b>	<b>66.71</b>	<b>223</b>	<b>0.030</b>
<b>1770-4</b>	<b>66.68</b>	<b>264</b>	<b>0.028</b>
<b>1775-9</b>	<b>66.73</b>	<b>397</b>	<b>0.003</b>
<b>1780-4</b>	<b>66.80</b>	<b>415</b>	<b>0.000</b>
1785-9	66.44	107	0.397
1790-4	65.56	29	0.054
1795-9	66.56	39	0.336
1800-4	65.87	76	0.052
1805-9	66.41	101	0.448
1810-4	66.07	133	0.094
<b>1815-9</b>	<b>65.87</b>	<b>256</b>	<b>0.001</b>
<b>1820-4</b>	<b>65.32</b>	<b>181</b>	<b>0.000</b>
Total	66.37	2736	

Table F-1 indicates that the average height of male inmates fluctuated prior to 1810, when it began a sharp decline. The earlier fluctuations were related to relative economic fortunes in manufacturing and the quality of harvests. Thus, the greater height of those born between 1765 and 1784 reflects generally prosperous years for textile workers. Meanwhile, those born in the early 1790s are shorter and this is likely from having been young during the severe dearths in the middle of that decade. Similarly, bad harvests in the early 1800s explain the shorter stature of those born in those years. However, the large fluctuations between birth cohorts end in 1810 and are replaced by a steady decline. These are the same years in which the smoke problem became serious on the Yorkshire coalfield. Inmates from the coalfield became significantly shorter between 1803 and 1842, while those from the agricultural eastern regions did

<sup>1</sup> "House of Correction Register, 1801-1808," "Wakefield House of Correction General Receiving Book, October-December 1842" and "Wakefield House of Correction General Receiving Book, April-June 1843" WYAS Wakefield C118/98-100.

not. In order to better isolate the declining stature, Table F-2 includes the average heights of inmates from the coalfield by birth cohort. As in chapter 5, it uses the residence of inmates from 1801-3 and the birthplace for those from 1842-3.

**Table F-2: Male Inmates by Birth Cohort, Coalfield (ages 20-60)**

Birth Cohort	Average Height (inches)	Number	P-Value
1740-4	65.8	10	0.354
1745-9	66.95	21	0.085
1750-4	66.64	30	0.153
1755-9	66.27	45	0.362
1760-4	65.87	47	0.259
<b>1765-9</b>	<b>67.22</b>	<b>43</b>	<b>0.004</b>
<b>1770-4</b>	<b>67.03</b>	<b>76</b>	<b>0.002</b>
<b>1775-9</b>	<b>66.60</b>	<b>93</b>	<b>0.043</b>
<b>1780-4</b>	<b>66.75</b>	<b>64</b>	<b>0.033</b>
1785-9	66.73	11	0.237
1790-4	65.75	25	0.245
1795-9	66.74	30	0.111
1800-4	65.85	63	0.458
1805-9	66.21	83	0.386
1810-4	65.90	103	0.191
<b>1815-9</b>	<b>65.84</b>	<b>212</b>	<b>0.049</b>
<b>1820-4</b>	<b>65.17</b>	<b>150</b>	<b>0.000</b>
Total	66.13	1106	

The trends in heights from Table F-1 are more pronounced in Table F-2. In particular, the prosperity of 1765 to 1784 is more notable. Meanwhile, the decline in heights for those born after 1810 is sharper. This reaffirms the importance of coalfield specific causes for the decline in living conditions. One of these is the smoke problem which became serious in the same years and was discussed in chapter 5. Meanwhile, the increasing poverty of hand-loom weavers was also specific to the coalfield and increased in those years. Table F-3 also notes the same effects, as it indicates the heights of male inmates by birth cohorts from all coalfield communities with the exception of Sheffield, Leeds and Hunslet. As these were the largest towns and their

residents were generally shorter, Table F-3 helps to better isolate changing living conditions in smaller industrial communities.

**Table F-3: Male Inmates by Birth Cohort, Coalfield without Sheffield/Leeds/Hunslet (ages 20-60)**

Birth Cohort	Average Height (inches)	Number	P-Value
1740-4	65.94	8	0.327
1745-9	67	19	0.159
1750-4	66.84	23	0.207
1755-9	66.38	34	0.492
1760-4	66.33	35	0.462
<b>1765-9</b>	<b>67.88</b>	<b>33</b>	<b>0.001</b>
<b>1770-4</b>	<b>67.09</b>	<b>60</b>	<b>0.018</b>
<b>1775-9</b>	<b>66.95</b>	<b>70</b>	<b>0.034</b>
1780-4	66.86	38	0.135
1785-9	66.73	11	0.334
1790-4	65.79	20	0.169
1795-9	67.19	27	0.060
1800-4	65.85	56	0.073
1805-9	66.34	68	0.458
1810-4	66.12	80	0.200
<b>1815-9</b>	<b>65.94</b>	<b>159</b>	<b>0.014</b>
<b>1820-4</b>	<b>65.67</b>	<b>91</b>	<b>0.005</b>
Total	66.37	832	

As in Tables F-1 and F-2, the prosperity of the 1760s and 1770s is very evident, along with the fluctuations from bad harvests. The decline after 1810 is striking and reaffirms the effects of the smoke problem which developed in many smaller industrial communities, along with Sheffield and Leeds.

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