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Janice M. McClelland

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To the Graduate Council:

I am submitting herewith a thesis written by Janice M. McClelland entitled "Women's work and the family economy in the Industrial Revolution : a comparative study of the coalmining communities of the Tyne and Wear and the West Riding." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in History.

John Bohstedt, Major Professor

We have read this thesis and recommend its acceptance:

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Associate Vice Chancellor and
Dean of the Graduate School

WOMEN'S WORK AND THE FAMILY ECONOMY IN THE INDUSTRIAL REVOLUTION: A COMPARATIVE STUDY OF THE COALMINING COMMUNITIES OF THE TYNE AND WEAR AND THE WEST RIDING

A Thesis
Presented for the
Master of Arts
Degree
The University of Tennessee, Knoxville

Janice M. McClelland

August 1995

TABLE OF CONTENTS

INTRODUCTION 1

I. The Social and Economic Context

The Economic Geography of the Northeast and West Riding Coalfields

The Tyne and Wear 5
The West Riding 9

The Family Economy 15

II. Wages, Benefits, and Comparative Wages

The Tyne and Wear 20
The West Riding 37

III. Miners' Health: The Impact of Geology and Technology on Wage-Earning Ability 46

IV. Women's Work: Options for Employment 66

SOURCES CONSULTED 71

APPENDICES

Appendix A. Letter to Lord Delaval regarding cavil 79

Appendix B. Unsigned letter to Lord Delaval regarding coal thefts 80

Appendix C. Correspondence from Cross to Delaval regarding grain supplements 81

Appendix D. Percentage of Silicates in Interseam Strata 82

Appendix E. Letter to Lord Delaval regarding Woman's Employment at the Colliery 83

VITA 84

LIST OF ILLUSTRATIONS

Figure		Page
1.	The Northeast Coalfield	6
2.	West Riding Coalfields	10
3.	Spatial Distribution of West Riding Woolen and Worsted Industries, Early Nineteenth Century	12
4.	Andrews House Success Pit, Pay Bill, December, 1777	23
5.	Ventilation of Tyne and Wear Mines	50
6.	Ventilation of Yorkshire Mines	52
7.	Bottom of the Shaft, Walbottle Colliery	59
8.	Ripped Roof to Create Roadway in Thin Seams	61
9.	Packwalls in Bank Work	61
10.	Stratigraphic Maps of Sample Pits of the West Riding and the Tyne and Wear	62

LIST OF TABLES

Table		Page
1.	Comparative Wages by Region	25
2.	Average Annual Expenses for a Collier Family of Five in the Tyne and Wear, c. 1797	29
3.	Average Annual Income for Colliers in the Tyne and Wear Region, c. 1797	29
4.	Average Weekly Expenses for a Collier Family of Five in the West Riding, 1842	42
5.	Average Weekly Income for a Collier Family of Five in the West Riding, 1842	42

LIST OF ABBREVIATIONS

Durham County Record Office, Durham	DCRO
National Coal Board Records--1st Deposit	NCB I
Northumberland Record Office, Gosforth	NRO
Parliamentary Papers	PP
West Yorkshire Archive Service - Leeds	WYAS-Leeds
West Yorkshire Archive Service - Wakefield	WYAS-Wfd

GLOSSARY OF TERMS

adit A drift, commonly waterlevel, driven into a mine from a hillside that opened out onto a hillside or stream at a lower level than the mine or a sloped entry into a mine.

afterdamp A mixture of carbon monoxide, uncombusted methane, and other gases remaining after an explosion of firedamp. Also known as chokedamp.

bank The surface, or brow, of a colliery. The face of the coal being mined is also sometimes called a bank (or "benk").

bassett An outcrop of coal or to outcrop.

binding Until 1810 the binding took place on the Saturday nearest to fourteen days previous to October 10th, the engagement being from October 10th for twelve months.

board (or bord) An excavation, a pillar in length, and four or five yards in width, usually driven at right angles to the cleavage of the coal; sometimes, however, when the coal is very flaky and soft, the boards are driven in the direction of the cleat, when they are called headways boards.

brattice A partition placed in a pit or in a drift for the purpose of ventilation. The former is called a shaft brattice; the latter, the drift brattice.

butty A chartermaster who contracts with the coal owner to have the coal removed.

cavils Lots. A periodical allotment of working places to the hewers and putters of a colliery, usually made quarterly, each person having assigned to him by lot that place in which he is to work during the ensuing quarter.

claggy or scabby Term for seam of coal adhering to roof; most frequently occurs when roof is post.

cleat The vertical joints or facings in coal or stone. There are frequently two cleats in coal, at which the coal will break into rhomboidal fragments.

corf A basket made of hazelwood holding 10 to 30 pecks, used for

conveying coals from the face to the surface. Leading corves are small, holding about 6 to 8 pecks, used for carry stones or rubbish.

coursing Conducting the air backwards and forwards through workings by blocking certain passageways. Worked out areas are blocked off to prevent air from passing through them; by shortening the run of the air, and consequently the resistance to its motion, the workings are more efficiently ventilated.

downcast The shaft or drift from the surface by which the fresh air passes into the workings. Also hitch or slip which casts down the seam below the level at which the hitch is found.

drift An exploring place. Usually a pair of companion drifts are driven simultaneously for ventilation, one being called the fore and the other the back drift. Drifts driven in stone are usually rendered necessary by the occurrence of dislocations in the strata and are typically single.

dyke A fissure in the strata, filled with basalt and detritus from other rocks; sometimes accompanied by a dislocation. Large slips, or hitches, are also called dykes (e.g., the Ninety Fathom dyke).

fault An area of displacement of strata, usually resulting in either upward or downward movement of two formerly adjacent points.

fireclay Clay with quartz, muscovite, and feldspar.

firedamp Explosive gas emitted by coal seams. Lighter than air, it collected in pockets and under roofs of mines.

ganister A very hard and siliceous fire-clay found beneath some of the seams of the lower coal measures.

gateway A passage through the goaf secured by a pack-wall on each side for the purpose of bringing out the coals worked in the longwall system.

goaf A space from which the coal pillars have been extracted. Also known as the gob.

headways The direction of the cleat; also a place or holing driven in this direction. When a pair of headways are driven for exploring or winning the coal, they are called exploring or winning headways, the principal of which is called the fore-headways and the other the back-headways.

heavers Those who shoveled coal at the pitbank.

hewer A man who works at the coal face. Known in Yorkshire as a

getter.

holing The communication between a pair of places.

inbye In the workings. In the direction of the face, away from the shaft. One place further into the workings than another is said to be on the inbye side of it.

jowl A sort of "tattoo" beaten with a hammer; in response, upon the faces of two places or drifts near holing--or intended to hole into each other--by a person in each place for the purpose of ascertaining their relative positions by the sound. Also, to sound the roof.

jud A portion of the seam kirved, nicked, and ready for removal; also a portion of a pillar in course of being worked away in the broken mine.

keel A broad, flat vessel used to carry coals from the staith to the ship.

kirving A wedge-shaped excavation made by the hewer with his pick at the lower part of the seam preparatory to removal.

level A drain cut in the bottom stone to set away or convey water. A pair of levels is a pair of drifts driven in the water level direction of the strata for the purpose of winning coal.

longwall A system of work in which the whole of the coal is removed in long face without any preliminary preparation by pillars, the roads to the face being supported by pack-walls made from the stone taken down to make road-height supports. Often used in thin seams.

nick To cut the coal vertically, next to the side of the place, preparatory to taking down the jud.

outbye Toward the shaft.

pillar An oblong or square mass of coal contained between two boards and two headways courses and left during the first working for the support of the roof.

pit A circular, oval, square, or oblong vertical sinking from the surface.

post Sandstone.

putter An underground transport worker. Also known in the Northeast as a barrowman; in Yorkshire as a hurrier or a thruster.

ragstone Stone-bind.

reckoning day In the Northeast, the day on which the workmen receive their pay-notes or checks from the overman showing the amount each man or each set of men is entitled to receive for the fortnight, usually two days before payday.

return The airway by which the air returns to the upcast shaft after it has left the workings.

seggar Fireclay. An argillaceous and siliceous shale, it is usually the thill of a seam of coal.

score A standard number of tubs or corves of coal at each colliery, upon which the hewers' and putters' prices for working are paid. The score typically consists of 20 corves.

skreeners Those who pass the coals over the screens ("skreens") in order to clean them from stones.

smart money Money paid to workers disabled by accident while working in the pit.

staith A quay for transferring coal to the keels from the wagonways. Also spelled stythe.

stenting An opening between a pair of headways or drifts through which the air circulates until another is holed further inbye.

stone Sandstone.

stonebind Arenaceous shale, often passing into sandstone.

thill The floor of a seam of coal.

trapper A boy whose employment consists of opening and shutting a trap-door.

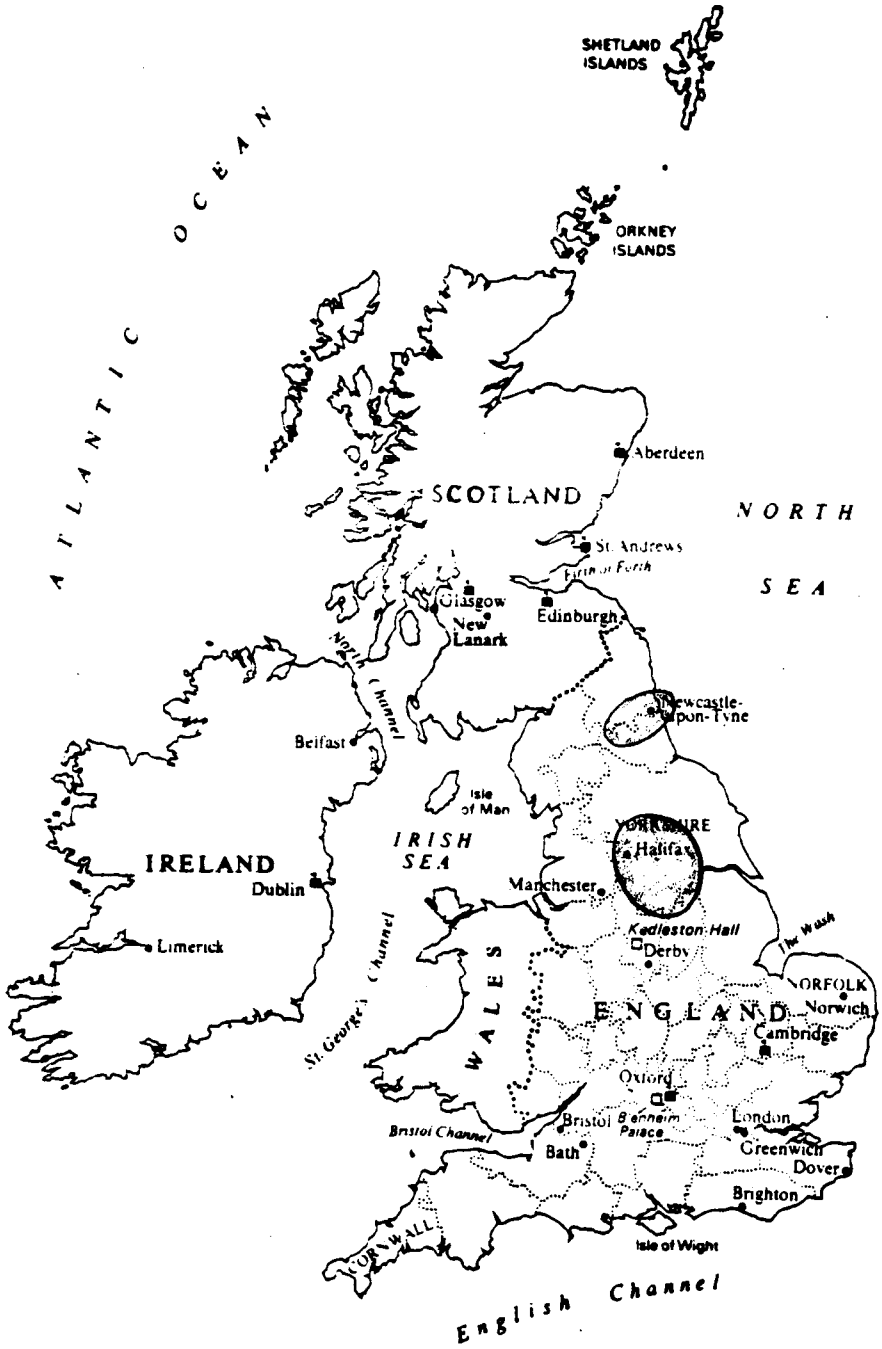
upcast A rise hitch or the shaft up which the air returns from the workings to the surface.

viewer The manager of a colliery; usually the viewer was the manager of both surface and underground work.

wailers Those employed to pick out any stones which have escaped the observation of the skreenmen.

winning A pillar of coal with its board; also a recovery of coal by sinking or drifting in coal or stone.

workings The excavations of a colliery.



England: Key to Regions Mentioned in Text

Source: Lacey Baldwin Smith, ed., A History of England, (Lexington, Massachusetts: D. C. Heath and Company, 1988), vol. 3, 5th ed., The Age of Aristocracy: 1688-1830, by William B. Willcox and Walter L. Arnstein, frontispiece.

INTRODUCTION

At the time of the Coal Mines Act of 1842,[1] which excluded women from underground work in Britain's coalmines, it was noted by the Commissioners reporting to Parliament[2] that women were not universally employed in underground work in Britain's coalmines. They were employed only in some of the mines of the West Riding of Yorkshire, Lancashire, South Wales, Cheshire, and the east of Scotland, and appear to have left underground work 30 to 60 years earlier in other mining regions.[3] How can we account for the fact that women were still working underground in these limited areas, when they already had left the mines elsewhere? Despite widespread scholarly interest in Britain's mining industry and the people who worked in it, there has been no systematic effort to address this question. In his exhaustive study of the colliers of the early nineteenth century, P. E. H. Hair spent a total of five pages out of 460 discussing the reasons for women's underground employment, saying little work was available for them elsewhere.[4] Angela John draws the same conclusion in a brief paragraph discussion of the issue, as does Ivy Pinchbeck in a

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[1] 5 and 6 Victoria c. 99.

[2] Parliamentary Papers (Commons), Sessional Papers, Children's Employment Commission, vols. XV, XVI, and XVII). Hereinafter referred to as PP 1842, Children's Employment.

[3] Michael Flinn, The History of the British Coal Industry, vol. 2 1700-1830: The Industrial Revolution (Oxford: Clarendon Press, 1984), 344.

[4] P. E. H. Hair, "The Social History of British Coalminers, 1800-1845" (D.Phil. thesis, Oxford University, 1955), 231-235.

slightly longer paragraph.[5] The predominant topic of scholarly debate related to the Mines Act of 1842 has focused, not on the reasons why women might have been working underground, but instead on the manner in which the Mines Act functioned as an instrument of exclusion.[6]

The notion of exclusion implies that issues of power and subordination were involved in women leaving the mines of England after 1842; but should we then infer that those same issues were factors in inducing women to leave underground work elsewhere during the previous century? The fact that women were still working in some regions of Great Britain while they largely had left the mines in other areas indicates that different decisions about their lives and work were being made in those different regions, but by whom and for what reasons? Could it be that women in both cases decided for themselves, for reasons that they

---

[5]Angela V. John, By the Sweat of Their Brow: Women Workers at Victorian Coal Mines (London: Routledge & Kegan Paul, 1984), 24; Ivy Pinchbeck, Women Workers and the Industrial Revolution, 1750-1850 (London: Frank Cass & Co. Ltd., 1969), 246.

[6]Angela John believes that the domestic ideology of the middle class prompted that group to exclude women from underground work so that they could concentrate on being angels of the working class hearth (see John, 43-44). Wally Seccombe contends that exclusion was the reassertion of pre- and proto-industrial patriarchal roles: male management of work roles in cottage industry and family gang labor in agriculture, male dominance in the family labor system in mining and textiles, and the long-standing exclusion of women from craft guilds were "re-cast" in the nineteenth-century construct of "the male breadwinner norm" (Wally Seccombe, "Patriarchy stabilized: the construction of the male breadwinner wage norm in nineteenth-century Britain," Social History 2:1 (January 1986), 53-76). Sonya Rose concludes that male miners resisted women in the mines because they felt threatened on two fronts: by the competition for jobs by women willing to work for lower pay and by the threat to the ideology of the male breadwinner and its affirmation of respectable working class gender roles. (Sonya O.Rose, "Gender antagonism and class conflict: exclusionary strategies of male trade unionists in nineteenth-century Britain," Social History 13:2 (May 1988): 207.)

deemed best, whether or not to work underground?

In order to account for such different patterns of employment, this thesis focuses on two separate regions at the times during which each was undergoing rapid expansion of its coalmining industries: the Tyne and Wear region of the northeastern coalfield during the late 1700's, an area where women had left underground work by the 1780's, and the West Riding during the early 1800's, where women continued to work underground until banned from that work in 1842. Women had left the mines of the Tyne and Wear as early as the 1780's; this thesis argues that, rather than being excluded from underground work, they may well have chosen to leave the northeastern mines of their own volition, since doing so allowed them to stay at home and better meet the special and heavy demands of caring for a family employed in the coalmines. It appears that they were able to make such a decision due to several factors: the colliers of the Tyne and Wear made a good living wage and worked under the security of a year-long contract; they had been able successfully to combine for higher wages and better job benefits. Additionally, the type of coal being mined in the Tyne and Wear, coupled with the region's superior ventilation techniques, resulted in healthier miners who were able to work productively for a number of years. The miners of the Tyne and Wear, then, were well able to support their families without the supplementary wages of their wives and daughters.

In contrast, the evidence reveals that women still working in the mines of Yorkshire in 1842 were so desperate for employment that nothing short of state intervention in the form of protective legislation (in this case, the Mines Act of 1842) could have induced these women to leave the

mines. Their fathers and husbands earned relatively poor wages and worked in mines with inferior mining technologies; they appear often to have suffered from such poor health that they did not have the number of productive work years that northeastern miners enjoyed. Moreover, the Yorkshire colliers' relatively low wages and meager benefits were often not enough to support a family without the assistance of their older daughters or their wives. Pressed though they were to supplement the pitmen's inadequate wages, women were nevertheless limited in their employment options both by geographical constrictions on agriculture and technological advances in the worsted industry.

In these two regions, then, we can readily see differing patterns of employment for women. In order to account for these disparate employment practices, this paper will place particular emphasis on underlying economic structures, analyzing the ways in which these structures influenced the wage-earning abilities of miners and their families. A brief overview of the geographical distribution of industry and agriculture, as well as a discussion of women's roles in the working class family economy, will provide context for our analysis.

CHAPTER I

THE SOCIAL AND ECONOMIC CONTEXT

The Economic Geography of the Northeast and West Riding Coalfields

The Tyne and Wear

The coal deposits of Britain's northeast region began to be excavated as early as the thirteenth century (see Figure 1); the disafforestation of England served to create a demand for an alternative fuel, and there is evidence that by the mid-seventeenth century, the Northeast coalfield was exporting ever larger amounts of coal.[1] The high quality coal of the region was in such demand for domestic heating fuel that the miners of Tyneside worked year round, unlike most other coalfields where colliery work was typically seasonal due to the fact that the demand for coal as a heating fuel declined during the summer months. The area's bassetts and shallow seams had been largely exhausted by the 1780's; consequently, longer shafts had to be sunk to reach deeper seams.[2] Because of the region's many waterways and the industry's steady expansion, coal was relatively easy and inexpensive to transport, and the

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[1]J. U. Nef, The Rise of the British Coal Industry I (Hamden, Connecticut: Archon Books, 1966), 20. Between the years 1551 and 1690, the average annual output rose from 210,000 to 2,982,000 tons, an increase of over 1300 percent.

[2]John Benson, British Coalminers in the Nineteenth Century (New York: Holmes & Meier Publishers, Inc., 1980), 11.

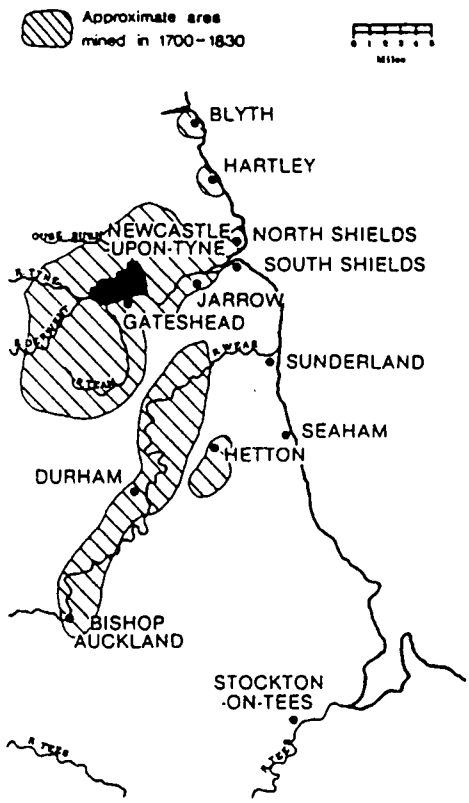

Figure 1. The Northeast Coalfield

Source: Michael W. Flinn, The History of the British Coal Industry, 1700-1830: The Industrial Revolution (Oxford: Clarendon Press, 1984), xxi.

northeast consequently dominated the coalmining industry from 1700 to 1830.[3] The principal coal seams of the Tyne and Wear region were the High Main Seam, the Brockwell, the Main, and the Low Main. All were easily workable at shallow or moderate depths and measured from five to eight feet in thickness,[4] although the High Main Seam varied between two and eleven feet as well as offering a number of easily accessible outcroppings. The Ninety Fathom Dyke, a fault with a downcast displacement (see glossary) of anywhere between 250 to 1,000 feet and running in an east-west direction north of Newcastle, made the accessing of coal north of Newcastle extremely limited prior to the technological improvements of the early nineteenth century.[5] The coal being mined in the Tyne and Wear region during the period under study, then, was "won" (accessed) relatively easily and was typically of an easily-worked thickness.

The Tyne and Wear's coal industry dominated its field, producing over a third of Great Britain's total coal output for over a century, until the 1830's. It also fostered the growth of several ancillary industries, such as transportation and engineering. The chemical industry, the shipbuilding and repair industry, warehousing, potteries, turnpikes, bridges, and railway development--even an active rope-making industry (especially needed by the shipyards)--all existed in a symbiotic relationship with the coal industry that helped create a need for them and

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[3]Flinn, 18-23.

[4]PP 1842, Children's Employment, XVI, ¶ 147, p. 135. See also, Evidence, No. 89, Edward Potter.

[5]Flinn, 19-21.

yet depended in large measure on the services they provided in order to remain competitive in the growing national market. The glass industry, needing plentiful and cheap fuel, moved to the Northeast where coal was readily available; the manufacture of glass came to be the second most important industry on Tyneside.[6]

The region's agriculture, because of its potential for female employment, is of special interest. Large numbers of women were employed as "bondagers;" it was said in 1796 that "our girls are all employed in agriculture, hoeing, hay-making and reaping, etc."[7] Hay harvest began as early as July in "old meadows," whereas it occurred in mid-summer on "new laid lands"; grain harvest generally took place toward the end of August or the month of September. Beans were harvested through October and occasionally till mid-November.[8] Harvest season, then, provided potential employment for women for a period of over four months each year.

The West Riding

The newer coalfields of Yorkshire, on the other hand, were not extensively worked until the late eighteenth century; only then had the development of the Don navigation (1733) and Barnsley canal (1793) enabled

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[6]Ian Ayris and Stafford M. Linsley, eds., A Guide to the Industrial Archaeology of Tyne and Wear (Newcastle upon Tyne: the Tyne and Wear Specialist Conservation Team, Newcastle upon Tyne City Council, 1994), 46.

[7]Bridgit Hill, Women, Work, and Sexual Politics in Eighteenth-Century England (London: Basil Blackwell, 1989), 58.

[8]Joseph Granger, "General View of the Agriculture of the County of Durham, Particularly that part of it extending from the Tyne to the Tees" (1794), The Review and Abstract of the County Reports to the Board of Agriculture, Vol. I, 2d. ed., ed. William Marshall (York: Wilson & Sons, 1818), 131-2. Wheat, barley, oats, rape, potatoes, and turnips were frequently cultivated.

coal to enjoy easier transport and a wider marketability. Even with this development of waterways, the energetic iron industry of the area continued to be a significant purchaser of Yorkshire coal.[9] Three distinct and important seams of coal underlie the West Riding and run side-by-side, roughly north to south. The thinnest and poorest of these lies to the west (the area, it should be noted, where women were more heavily employed underground), bordered by the moorlands of the Pennines; only six to eight miles wide for much of its course, it fans out to the east to incorporate Bradford and Leeds.

In eighteenth century Yorkshire, mining was concentrated in two areas (see Figure 2). The area around Bradford, Halifax, Huddersfield, and Leeds was worked by small, usually family-owned operations that excavated the shallow seams. The Barnsley and Silkstone seams, especially in the area around Barnsley and Sheffield, were worked prior to 1800, but these coalfields were not extensively developed until after the 1830's, when larger collieries were able to employ newer mining techniques to exploit the deeper coalfield.[10]

Because the coalmining industry did not begin its greatest development until the 1830's, the textile industry was far and away the largest employer in the West Riding during the first half of the century.[11] The heterogeneous nature of the textile industry can be seen

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[9]Flinn, 18.

[10]Benson, 13.

[11]At the time of the 1841 census, 144,466 people were employed in textiles, compared to 18,643 in mining. See C. H. Lee, British Regional Employment Statistics, 1841-1971 (Cambridge: Cambridge University Press, 1979), 54 and 58.

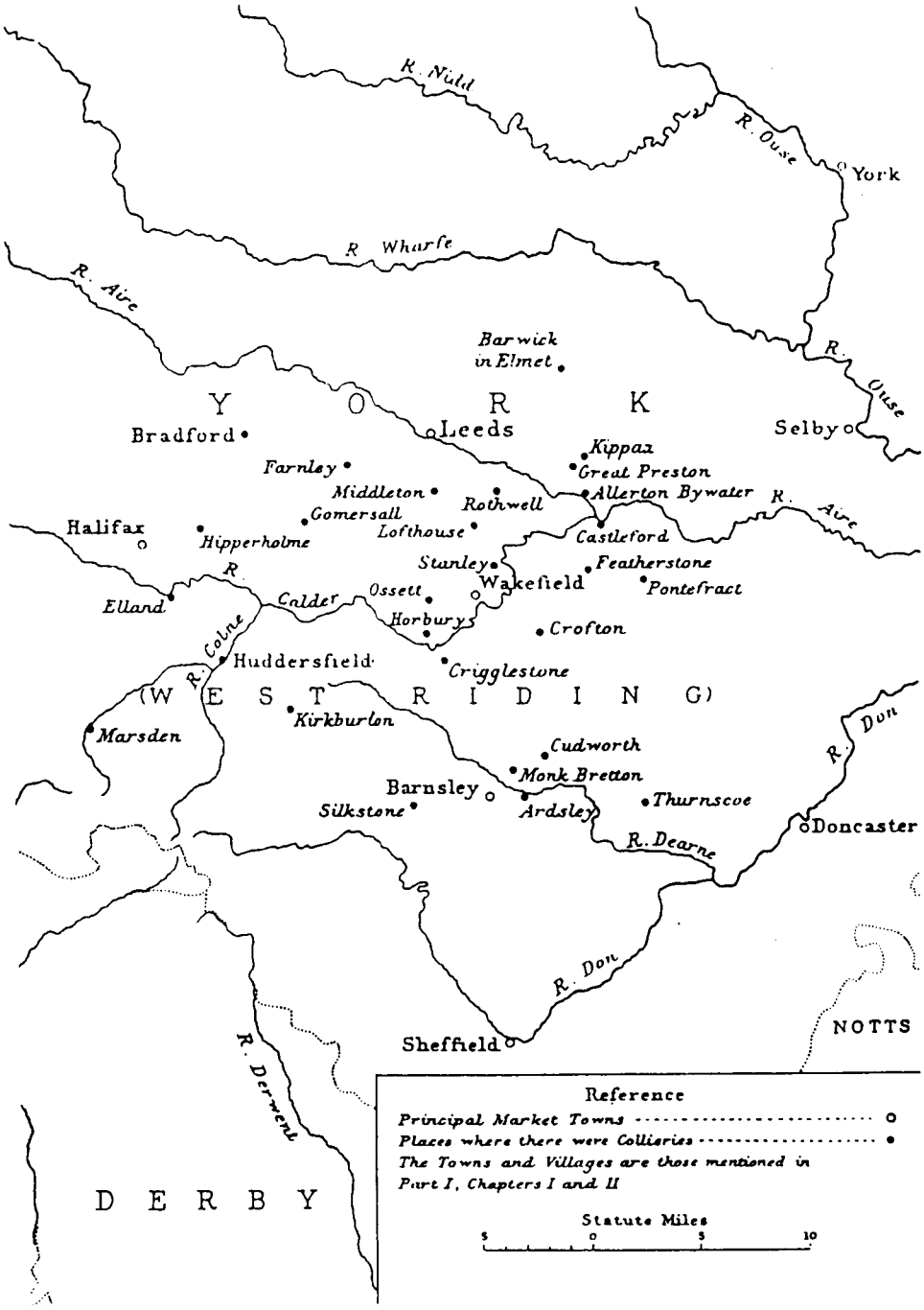

Figure 2. West Riding Coalfields

Source: J. U. Nef, The Rise of the British Coal Industry, vol. 1 (London: Archon Books, 1966), facing p. 60.

on Figure 3: along the eastern end of the West Riding, woolens were manufactured, whereas to the west of the Riding, worsteds were produced. Hudson points out that the early development of the woolen industry allowed it to remain the province of small, independent artisans, even as proto-industries developed in other areas. To the east (where woolens dominated the industry), landholdings were typically small, owner-occupied ones, the farms sources of collateral and cushions against fluctuations in the textile trade.[12] The artisans undoubtedly had little work for non-family members, either in their trade or in their fields; they typically employed only one or two journeymen, with "family labour . . . [providing the] balance [of] activities throughout the year."[13] The woolen industry's potential for providing employment opportunities for mining women was also limited by the slow manner in which the woolen industry mechanized; woolen yarn's short-stapled fibers made it weak and prone to break during handling. Furthermore, yarn for the master clothiers' looms largely was spun by family members and apprentices. The putting-out system, then, never really found a foot-hold in the eastern West Riding, and therefore rarely offered work opportunities for mining women in that

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[12]Pat Hudson, The Industrial Revolution (London: Edward Arnold, 1992), 116. Hudson also points out that partible inheritance had been widely practiced in the area as early as the sixteenth century, and landholdings were therefore smaller. See Pat Hudson, The Genesis of Industrial Capital: A Study of the West Riding Wool Textile Industry, c. 1750-1850 (Cambridge: Cambridge University Press, 1986), 63.

[13]Hudson, Industrial Revolution, 116. Gregory agrees that the "domestic woollen production in the West Riding was dominated by the independent master clothier, relying mainly on family labour and employing perhaps one or two journeymen." See Derek Gregory, Regional Transformation and Industrial Revolution: A Geography of the Yorkshire Woolen Industry (London: The Macmillan Press Ltd., 1982), 52.

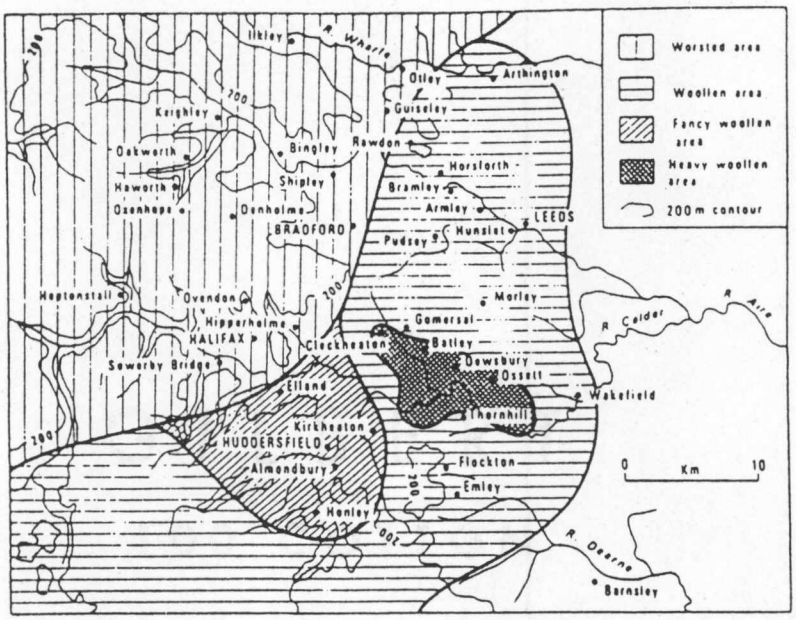

Figure 3. Spatial Distribution of West Riding Woolen and Worsted Industries, Early Nineteenth Century

Source: Pat Hudson, The Genesis of Industrial Capital: A Study of the West Riding Wool Textile Industry, c. 1750-1850 (Cambridge: Cambridge University Press, 1986), 28.

area. It was not, in fact, until the early 1830's that large numbers of women were working in factories, running spinning mules.[14]

The worsted industry, on the other hand, was a relative upstart, not really making much economic impact on the region until the late seventeenth century.[15] Not as tied to artisan traditions as was the woolen industry, it was able to initiate a putting-out system at the same time that it slowly began to mechanize the production process. The putting-out system was the only significant employer of women in the worsted industry until the mid-nineteenth century,[16] and large numbers of women supplemented their families' incomes by spinning wool for merchant-manufacturers, earning in the neighborhood of 4d. to 6d. per day in 1797.[17] With the introduction of spinning jennies at the end of the eighteenth century, women's productivity and wages increased. Running a

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[14]Hudson, Genesis, 29 and 44. Until the 1830's, the mule was thought to be unsuitable for spinning wollen yarn.

[15]Hudson, Genesis, 27.

[16]Because worsted yarn was less fragile than woolen yarn, it was better suited for weaving on the power loom. Power looms would eventually be run by women in large numbers, but there would not be a large number of them in the West Riding until the late 1830's. Heaton suggests that both power looms and carding machines (both run by women) were only present in the West Riding in large numbers after 1838. See Herbert Heaton, The Yorkshire Woollen and Worsted Industries from the Earliest Times up to the Industrial Revolution (Oxford: Clarendon Press, 1965), 356-357.

[17]Frederic Eden, The State of the Poor, or An History of the Labouring Classes in England (London: J. Davis, 1797), III, 876. These figures are from Skipton; Eden indicates that in nearby Halifax, wages were depressed: "many poor women, who earned a bare subsistence by spinning, are now in a very wretched condition" (III, 821). These figures are corroborated by J. Bonwick in Romance of the Wool Trade (1887), p. 435 (quoted in Pinchbeck, p. 123).

jenny, a woman could earn about 3½s. per day.[18] By 1815, however, the area's domestic industry was all but abandoned for more efficient mills, many of which remained too small to employ a large number of women.[19]

Located in the uplands to the west of Bradford, the worsted industry grew up in an area of large tracts of wasteland best suited for pasturage of cattle and sheep.[20] Robert Brown, however, pointed out in 1799, "If we run an imaginary line from Ripley southward by Leeds, Wakefield, and Barnsley, to Rotherham, we may affirm, that the greatest part eastward of it, till we come to the banks of the Ouse, which separates the West from the East Riding, is principally employed in raising corn."[21] Unlike the fairly long harvest season in the Tyne and Wear region, the harvest season in Yorkshire was a brief one, from early August to the end of September.[22] As women frequently sought work in harvest, a short season would obviously limit the availability of such work. Not only was there little arable

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[18]Gregory, 74; quoting A. L. Bowley, "The Statistics of Wages in the United Kingdom during the Last Hundred Years, IX: Wages in the Worsted and Woollen Manufacturers of the West Riding of Yorkshire," Journal of the Royal Statistical Society 65 (1902): no page number cited.

[19]Maxine Berg, The Age of Manufactures, 1700-1820: Industry, innovation and work in Britain, 2d. ed. (London: Routledge, 1994), 151, 250.

[20]Heaton, 62. The Board of Agriculture Report states: "A great part of the West Riding is exclusively kept in grass, and where this is the case, cultivation by the plough is considered as a secondary object . . . Upon the higher grounds, there are immense tracts of waste . . . ." See Robert Brown, "General View of the Agriculture of the West Riding of Yorkshire" (1799), The Review and Abstract of the County Reports to the Board of Agriculture, 2d. ed., ed. William Marshall (York: Wilson and Sons, 1818), 372-373.

[21]Brown, 372-373.

[22]Ibid., 336.

land to the west, but enclosure and a decline in dairy farms had further limited alternatives for employment.[23] The area's poor agriculture left many people seeking work, and a proletariat developed in this labor-surplus economy to take in the merchant-manufacturer's materials for home production and, after the 1820's, to run the woolen industry's new spinning jennies.[24]

In addition to the textile industry, the West Riding was the site of several minor industries: leather, brick, glass, and pottery manufacture.[25] These appear to have been small employers; in 1817, for example, Leeds was the county's leading leather manufacturing town and yet had a total of only 91 employees, including bootmakers. Despite this low figure, only weaving is said to have employed more artisans.[26]

The Family Economy

Against this general background of economic structures at play in the two areas under study, we can now look more closely at the part that women in mining families played in helping their families achieve economic viability. If one central assumption of this paper is that women were deciding for themselves where they should work, then we must better understand the manner in which women from mining communities viewed their work if we are to understand the reasons for their decisions. What was

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[23]Hudson, Industrial Revolution, n. 54, 118.

[24]Gregory, 64.

[25]R. C. N. Thornes, West Yorkshire: "A Noble Scene of Industry," The Development of the County, 1500 to 1830 (Wakefield: West Yorkshire Archaeology Service, 1987), passim.

[26]Ibid., 38.

the motivation behind women's work and what were those women hoping to achieve by working?

Tilly and Scott suggest that to understand women's work, we must also understand the economic and familial influences on their work; they assert that, historically, the interplay between subsistence requirements, family relationships, and household demands shaped women's decision-making regarding employment.[27] The pre-industrial family, with the home as its locus of activity, was a unit of both production and consumption wherein all family members contributed to the group's economic viability. David Levine reminds us that even small children understood the importance of their contribution to the family's well-being and were well able to assist in a multitude of chores. Older children would take on greater responsibility; they could do laundry, herd livestock, or help with spinning. Levine perceives an element of self-interest, even self-preservation, in the family economy arrangement. Family, he suggests, "was highly prized and cultivated. For many, the option to family was charity and the stigma of the workhouse."[28] Certainly, self-sufficiency, if not outright survival, often depended upon the combined, cooperative efforts of the entire family.

Bridgit Hill reminds us that the woman's role in the economic unit was as multifarious as it was crucial to the family economy: she bore and raised her children, but also was responsible for the bulk of household

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[27]Louise A. Tilly and Joan W. Scott, Women, Work, and Family (New York: Holt, Rinehart and Winston, 1978), 7-8.

[28]David Levine, Reproducing Families: The political economy of English population history (Cambridge: Cambridge University Press, 1987), 112.

and garden duties, as well as assisting her husband in his tasks. If her husband farmed, she might help with the mowing; if he was a weaver, she might run the loom. She was probably responsible for a cow and some pigs; she might earn a modest income from a small cottage industry. Working as she did out of the home, she was able to organize her day and pace her work in such a way as to accommodate the demands of her family while tending to her chores.[29] Tilly and Scott (with only slight hyperbole) contend that a woman was no less than the cornerstone of the family economy.[30]

With industrialization came the separation of workplace and home and the metamorphism of the family labor unit into a family wage-labor unit; family members increasingly left home to work and earn wages to provide for the family's needs. Despite this transformation in the locus of production from household to factory, "the interdependence of family members and their sense of obligation to the family unit remained strong."[31] Tilly and Scott assert, in fact, that the old family labor unit was often "simply transferred from the farm or from cottage industry to the factory,"[32] the primary change now being that a financial contribution was expected of each family member rather than his or her labor. The challenge for women was that they were no longer to juggle market-oriented activities with household responsibilities; the option

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[29]Hill, 24-25, 40-45.

[30]Tilly and Scott, 60.

[31]Ibid., 104.

[32]Ibid., 112.

they often chose was to stay at home.[33] This does not mean, however, that women were no longer expected to work for their family's welfare; it means, as Levine and Wrightson point out, that the working life of women was restructured.[34] The manner in which it was restructured undoubtedly varied from community to community and as practical necessity demanded. Nevertheless, women's work and contribution was still vital to the family's economic viability even after the shift to a family wage economy.

Colliers left their homes to ply their trade and earn their livings underground; they and their families had made the transition to family-wage laborers. Their children, as we shall see, were often employed underground as well, seeking employment as transport workers or as cleaners of the underground roadways, clearing them of debris that might hinder the transport process. The work of miners' wives was centered in the home and was arduous and unrelenting. Different family members rarely worked the same shift; consequently, the wife and older daughters might cook and serve meals several times each day. Laundry was, of course, a constant chore. Despite these and a myriad of other household responsibilities, wives and older daughters might supplement the family wage by working "in harvest," by making and selling baked goods and rugs, by taking in boarders, by acting as midwives, or by cleaning other people's homes or businesses. Wrightson and Levine state that some women were coal wailers or coal heavers; others were schoolmistresses, spinners,

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[33]Ibid., 120-124.

[34]David Levine and Keith Wrightson, The Making of an Industrial Society: Whickham, 1560-1765 (Oxford: Clarendon Press, 1991), 264.

or washerwomen.[35]

Tilly and Scott remind us, however, that working class women were sometimes forced to seek work outside the home.[36] There were indeed, as we shall see, mining families in desperate need of money; when high rent and food costs could not be met by the husband's wages, wives would find waged work outside the home. Several factors influenced whether or not the women from these families would work underground with their husbands and children. As we look at the different mining regions under study, we will see that the decisions made by women from mining families in those two regions regarding their work and contribution to their families' economic security appear to have been motivated by practical necessity. We will see that the women of the West Riding were under more pressure to find work outside the home than were the women of the Tyne and Wear, but their employment options were largely delimited by geographical factors and technological developments. The following discussion will focus on the economic factors underlying their deliberations, primarily the wage earning ability of their husbands and children and how miners' wages fared against the cost of living. It will be followed by an examination of women's employment alternatives and the wages available with each of those options, helping us to determine why women might have chosen underground work in an effort to make a meaningful contribution to the family income.

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[35]Levine and Wrightson, 266. Wailers picked stones and refuse from the coal; heavers shoveled coal at the pitbank. See also Appendix F, which reveals that women sometimes found non-traditional colliery work.

[36]Tilly and Scott, 124.

CHAPTER II

WAGES, BENEFITS, AND COMPARATIVE WAGES

Clearly, the collier's wage-earning ability was pivotal to the economic success of the working family. A comparison of the compensation earned by colliers in the two regions reveals that, not only did the pitmen of the Tyne and Wear earn a higher average wage than those in Yorkshire, but they enjoyed greater benefits and a relatively high standard of living as well.

Tyne and Wear

The pitmen of Northumberland and Durham were reputed to be the highest paid in Great Britain.[1] Determining an average wage for the male

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[1]PP 1842, Children's Employment, XVI, Evidence, No. 572, W. Crawford. In addition to the sources dealing with miners' wages and standard of living that are cited in this chapter, there are several more general treatments of these topics that serve to place this thesis' findings in a broader context. F. W. Botham and E. H. Hunt make a study of real wage increases in a number of occupational categories between 1750 and 1790 in Staffordshire (see "Wages in Britain During the Industrial Revolution," Economic History Review 40:3 (1987): 380-399). Hunt takes a broader regional look at the geographical pattern of wages between 1760 and 1914 and finds that regional standards of living were improved with industrialization (see "Industrialization and Regional Inequality: Wages in Britain, 1760-1914," Journal of Economic History 46:4 (1986): 935-966). Lindert and Williamson further address the issue of living standards (Peter H. Lindert and Jeffrey G. Williamson, "English Workers' Living Standards during the Industrial Revolution: A New Look," Economic Historical Review 36:1 (1983): 1-25), and contend that living standards dramatically improved after 1820, but that common laborers did not benefit proportionally. Horrell and Humphries further assert that national wage figures reflect the earnings of adult males, but do not accurate reveal that family incomes were less favorably affected due to a number of variables, such as occupation and number of family members employed.

head of household (typically a hewer) can be extremely difficult, however. It had been traditional to pay hewers a piece-rate "per score" (i.e., per score of corves--the corf being the basket or conveyance for carrying the hewn coal to the surface[2]), and sometimes a set rate plus a piece-rate, so attempting to assign an average wage for the hewer is a frustrating task.[3] This is further complicated by the fact that penalties could be assessed on wages for several reasons. Hewers at Charlaw colliery in Wilton Parish agreed to forfeit one shilling for each day they failed to report to work, "and for every Corf . . . deemed foul to pay one penny and for every person refusing so to do shall pay one shilling which [shall be retained] out of the wages of the person . . . so offending. . . .[4] A bond from Hartley colliery in 1770 lists similar assessments. For absence "without Good and sufficient Reason," a hewer would be assessed one shilling; hewers sending to the bank "Corves Not Woodfull" "shall forfiet [sic] the Corf"; and, "the Hewer that Keeps not his Coals Clean from

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[2]There was no standard size for a corf, and it varied from colliery to colliery. Some bonds stipulate the size of the corf, as did a 1777 bond at Hartley Colliery: "Corf will masure [sic] 18 pecks" (NRO 2De 7/6/10). A Walls End Colliery bond of 1772 stipulates that a corf would equal 16 pecks (NRO Bud/18/7), and a Walker Colliery bond of 1782 says a corf was "to contain in measure twenty coalpecks of good clean and merchantable shipcoals" (NRO Wat/1/3/3). A pencilled notation at the bottom of a Charlaw Colliery bond from 1767 (NRO Wat/1/3/14) reads: 2 gals = 1 peck = 1/3 cwt [space] corf - 2.6 cwts. A corf, then, would be the equivalent of 7.8 pecks. This smaller corf might well have been a "leading corf," used for carrying stones or rubbish to a storage area, or "stow-board."

[3]Flinn, 374. John Buddle estimated that a hewer produced 28 corves, or 1.4 score, per day on the average (see Flinn, n.1, 390).

[4]NRO Wat/1/3/14, Charlaw Colliery bond, November 23, 1767.

stoners [sic] or any other Refuse" would be penalized six pence.[5] In 1806, the penalty for "lying idle" for any reason other than illness had risen to a fine of 2s. 6d. per day.[6]

Hewers also earned wages for driving headways: Figure 4 shows that William Smith earned 4s. for driving 8 yards headway at 6d. per yard, another 4d. for "consideration," and 14s. 3d. for 9 score and 9 corves.[7] The bond of Lady Windsor and John Simpson illustrates the difficulty in determining wages for hewers in general terms. The bond pledges that they

> do hereby promise and agree will and truly to pay or cause to be paid unto the said Hewers for every score of Corves of Coals to be wrought . . . the Sum of One Shilling and Seven pence p [sic] score in the whole mine, and One Shilling and <u>three</u> pence p score in the Broken mine or pillars, and six pence p yard for Headways in the whole mine, and Four pence p yard for Headways in Working the Pillars and for every score of Corves of Coals to be wrought . . . in the Hutton Seam and Drawn to Bank the sum of One Shilling and five pence p score. . . ."[8]

A final difficulty in determining average wages for the northeastern collier is the cavil, the lot drawn at the beginning of each quarter to determine the collier's assigned workplace. A bad cavil would be one

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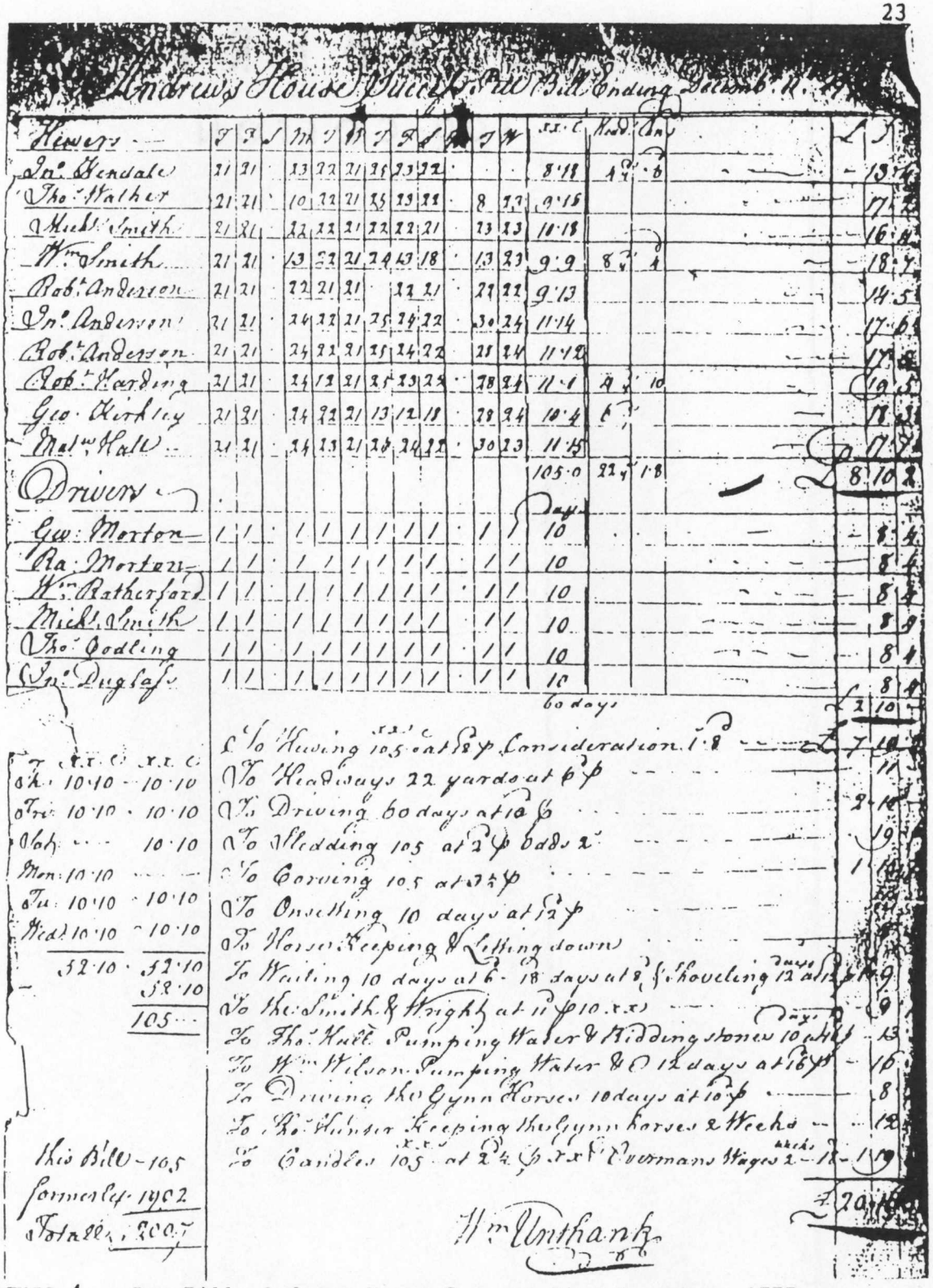
[5]NRO 2De7/6/10. A bond dating from 1771 at Wallsend lists, among several penalties, "For Sticking the Candle above the Bord - 1 shilling" and "Lads riding out on the Sleds - 1 shilling" (NRO Bud/18/15).

[6]Flinn, 378.

[7]"Consideration" pay probably refers to bonus, or compensatory, money, possibly paid for working at night, in narrow boards, in wet workings, or for "working double," <u>i.e</u>., working both the fore and back shifts. In this case, all but one of the men earning consideration pay had been driving headways; and, as cutting "headways" (with the cleat, or grain, of the coal) is more difficult work than cutting "boardways" (across the cleat), headways paid more (see Flinn, 375).

[8]NRO Wat/1/3/1, Pontop Colliery. No date appears on the bond, but archivists date it c. 1757-1772.



Andrews House Success Pit Bill Ending December 11. 1777

| Hewers | | |

located in a thin, difficult to work seam which would prove to be a less productive, and therefore less lucrative, assignment for the quarter. On rare occasions, a collier might appeal to management for a different cavil (see Appendix A), but most pitmen accepted the ups and downs of cavilling.

Nevertheless, contemporary observers often made estimates regarding average miners' wages, and surviving bonds and paybills give further evidence as to average wages for colliers in the Northeast and the West Riding. Table 1 indicates that there was a gradual increase in the wages earned by colliers in the Tyne and Wear until the turn of the century, whereupon wages in the Tyne and Wear nearly doubled. Hair points out that wages increased between 1797 and 1807, largely spurred by the war boom;[9] it is likely that early combination activity had an impact on wages as well, as a discussion later in this paper on the benefits of the annual bond will demonstrate. The Tyne and Wear pitman's wages appear to have fallen somewhat by 1816. John Buddle, the eminently respected mining engineer and viewer at Lord Londonderry's collieries, acknowledged this trend in his testimony before the Select Committee in 1830: "A small decrease of wages has taken place since the peace in 1815, not considerable, but there has been a decrease."[10]

Despite this slight decrease, the collier of the Tyne and Wear enjoyed hefty wages and benefits compared to most other groups of laborers in the northeast, as indicated by the sample wages shown on Table 1. Coopers and carpenters appear to have earned one shilling for a day's

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[9]Hair, 339 and 341.

[10]PP 1830 VIII, 36.

Table 1.

COMPARATIVE WAGES BY REGION

Year	Daily Wages in the Northeast: Colliers	Daily Wages in the Northeast: (Others)	Daily Wages in the West Riding: Colliers*	Daily Wages in the West Riding: (Others)
1723[1]		1s/-d (plasterer) /8½d (joiner) 1s/-d (cooper)		
1737		4d w/bd. (reaper†)		
1777	1s/4d			
1787			1s/6d to 2s	
1788	2s/-d			
1792			2s/-d	
1793			2s/6d	
1797	2s to 3s	1s/5d to 2s (hind) 3s/6d (carpenter) -/3d (glassmen)		2s/6d (mason) 1s/9d 1/2 and 2s/5d (weaver)‡ 1s/9d (laborer)
1799			2s/2½d	
1800		1s/6d (laborer)		
1804	3s/7½d			
1805			2s/-d	
1806	5s/2d			
1810		2s/8½d (hind)		
1812	4s/-d		2s/2d to 2s/6d	
1818	3s/1½d 3s/5d 3s/1d			
1829				5d w/bd. (hind)
1831	4s/-d		1s/5½d	
1838		1s/0d (hind)		
1839				2s/2d (laborer)
1842	3s/9d		1s/1½d	

* Wages have been reduced by 1s. to reflect wages retained after hurrier's wage was paid; see discussion p.39 of text. Also see Hair, p. 361.

† The term "laborer" appears often to have been applied in general terms to both agricultural laborers and those often referred to as "common labourers." The term "hind" is used here to designate those cases where the primary source clearly indicates a farm worker; "laborer" is used here to reflect the wages cited more generally to both categories of laborer.

‡ First figure is for worsted weavers in Halifax; the second is for woolen weavers in Leeds.

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[1]Sources are as follows:

DCRO: (1723) D/Sa/E/171 - Household accounts for 1723, Saville papers, under "Servants Wages as to the Houfe and Famaly Businefs" and "Workmen's wages as Masons, Wrights, Joiners, Coopers, Upholsterers, etc. for wk [sic] done In, or about the House;" (1777) NCB/I/X/1 Andrews House Success Pit Pay Bill; (1800) D/Sa E/177 - Wage book; (1810) D/F/e/5/2 - J. Bailey, A General View of the Agriculture of the County of Durham 2d. ed. ([n.p.]: 1810), 262-3; (1818) D/I 115/2; (1838) D/Sa/E/180.

Eden: (1737) I, 572; (1797) II, 166, 168, 175; I, 572; III, 821, 848.

Flinn: (1812) 377.

Griffin: (1788) 76; (1831 and 1842) 77.

Hair: (1787, 1792, 1793, 1799, 1805, and 1812) 361.

NRO: (1804) Bud/35/II/54, 82, 112; (1806) Bud/133/III/12.

WYAS: (1829) Wfd C77 - Bottom Boat Farm, farming book; calculated from an annual wage of £3/-/10; (1839) Wfd C495 - Wakefield farm account book.

labor, with joiners earning 10d. to 1s. per day in 1723.[11] Eden reports that "common labourers" "barely received 4d. a day, and victuals" in the late 1760's and by 1797 were commanding "10s. a-week, with house and fuel, but no board." He goes on to say that "a mason's labourer" was earning 1s. per day in the late 1750's.[12]

Agricultural laborers, like colliers, experienced an increase in wages during the early years of the nineteenth century, but by the 1830's their wages had decreased to near pre-war boom levels. The figures listed on Table 1 indicate that colliers earned higher wages than did agricultural laborers; this finding is consistent with Bowley's assertion that colliers generally enjoyed the higher wages of the two groups of laborers.[13]

It is interesting to note that hewers of the Northeast, because they worked shorter shifts than did their West Riding counterparts (six to eight hours as compared to eight to twelve hours), were able to make enterprising use of their free time. Besides gardening, many were able to "save a great deal by making and mending shoes for their families, and these shoes are often well made. They also make occasionally furniture, as drawers, even with circular fronts, chairs, book-cases, and clock-cases. These cabinet-making men may possibly average 1 in 30."[14] Some

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[11]DCRO D/Sa/E/171. Salvin papers, household accounts, 1723-4.

[12]Eden, I, 572.

[13]A. L. Bowley, "The Statistics of Wages in the United Kingdom during the Last Hundred Years," Journal of the Royal Statistical Society LXI (1899): 558. Quoted in Hair, 372.

[14]PP 1842, Children's Employment, XVI, Evidence, No. 399, 648 (Mr. Robson, resident viewer of Hetton Colliery).

pitmen saw the possibilities in "marketing" their company's coal on their own; if not restricted from exceeding their allowance, they would take more than they needed and sell the remainder.[15] An unsigned letter was sent to Lord Delaval in 1789 alerting him to such an act (see Appendix B).[16]

It also should be noted that, while the colliers of the Tyne and Wear enjoyed year round employment, other working people suffered from seasonal depressions in work and wages. Agricultural workers would be the group most obviously affected, but John Buddle noted that slumps were wide-ranging. In correspondence addressing the necessity of providing aid to the needy, he stated, "Every person of experience must be aware that in the middle of winter in the best of times numbers of people are thrown Idol, particularly masons, Bricklayors [and] Labourers."[17] Compared to other laborers in the region, the pitmen of the Tyne and Wear were earning a relatively high and stable wage.

But were their wages enough to support a family without the aid of their wife or daughters? Few pitmen could afford beef; even mutton was something of a luxury. Most mining families ate a great deal of oatmeal prepared in a variety of ways, from hasty pudding and crowdie (according to Eden, "a common dish in the North, among people of all descriptions,

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[15]Flinn, 380.

[16]The temptation to steal coals did not exist in the eighteenth century alone. Seaham colliery authorities were warning of the consequences of coal theft as late as 1893.

[17]DCRO NCB I/JB/389. Buddle often made copies of his correspondence which he kept among his papers; this copy does not indicate the recipient's name.

but particularly among miners. . . .")[18] to "thar-cakes" (an unleavened bread made with oatmeal and water) and milk boiled with oatmeal.[19] Oats cost 4s. a bushel, but much of the remainder of the collier family diet could be provided from their allotment gardens and the small number of livestock they typically kept. Eden notes, "Many miners keep a cow, . . . They use much oatmeal made into crowdie; and milk, and barley bread. . . .[20] Eden goes on to list a number of average annual expenses, including milk, butter and potatoes.[21] Potatoes, however, would have been grown in the collier's allotment garden, and since most miners owned a cow, it is doubtful that they spent much money on milk or butter. Modifying Eden's list of expenses, we can probably estimate the typical expenses of a miner as those listed in Table 2. If we calculate that the average pitman of the Tyne and Wear was earning 2.5s. per day in 1797 (Eden stated that most were earning 2s. to 3s. per day), and if we assume that the pitman worked 5.5 days per week and missed an average of two days per month, we can estimate that he averaged an annual wage £32/15/0. This figure, it should be noted, does not include the income of any sons who were employed as hewers or putters. The evidence indicates, in fact, that only 17 years after the last reports of women underground in the Northeast, colliers were bringing home, at the minimum, well in excess of their annual cost of living (see Table 3).

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[18]Eden, I, 498. Eden gives the recipe: "Oatmeal boiled in broth, eaten with milk or butter, or topped with a piece of fat."

[19]Ibid., 506.

[20]Ibid., II, 169.

[21]Ibid., II, 174.

Table 2.

AVERAGE ANNUAL EXPENSES FOR A COLLIER FAMILY OF FIVE IN THE TYNE AND WEAR, c. 1797

	£.	s.	d.
Subsidized bread meal (wheat, rye, and barley; at the rate of 7 lbs. per week per person	9	15	0
Oatmeal, 10 d. per week	2	3	4
Butcher's meat, 2 s. per week	5	4	0
Tea and sugar	3	0	0
Groceries	1	10	0
House rent and fuel[1]		12	0
Clothing and dry goods	5	19	1
	£28	3	5

Table 3.

AVERAGE ANNUAL INCOME FOR COLLIERS IN THE TYNE AND WEAR REGION, c. 1797

	£.	s.	d.
52 weeks at 2,5s. per week[2]	35	15	0
Binding money[3]	5	3	0
	£40	18	0

Source (except as noted): Eden, II, 174.

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[1]See discussion regarding housing and fuel expenses, pp. 31-32 of text.

[2]See Table 1.

[3]Eden, II, 174. Flinn cites figures twice to three times as high in roughly the same time period (see page 30 of thesis); this more conservative figure nevertheless makes a convincing case for the favorable wage to cost of living ratio enjoyed by colliers.

Colliers also benefitted from a guaranteed wage; Hair tells us that such wages were widely accepted in the Tyne and Wear by the 1780's.[22] The 1781 bond agreement of Walker Collery states that workmen would be paid "for each day they shall respectively lye Idle in case the same shall happen by or through the means of [the owners] the sum of one Shilling. . . ."[23] Further evidence of guaranteed wages (which in practice amounted to a form of unemployment pay) of one shilling per day can be seen in the bond agreements of Shiremoor and Wallsend Collieries prior to 1800.[24] As penalties for absenteeism rose, so too did the guaranteed wage; by 1812, the absentee penalty was 2s. 6d. and so was the guaranteed wage. The weekly wage, then, came to 13s. 9d.[25]

With the guaranteed wage we see another benefit of entering into the year-long contract known as the bond. In addition to giving skilled pitmen the opportunity to demand higher wages, the bond enabled colliers to press for other benefits. In addition to offering colliers a measure of job security, the annual bond also created an opportunity for colliers to earn bonus money. As competition for pitmen had become heated, owners had sought to lure workers away from other collieries with ever-larger amounts of "binding money," extra money paid to the collier at the time of the contract signing. While the amount of binding money appears to have

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[22]P. E. H. Hair, 321.

[23]NRO Wat/1/3/3, Walker Colliery, 1781-82. Hair states that these terms appeared in all Walker bonds between 1780 and 1798 (see n.2, p. 321).

[24]P. E. H. Hair, 321-322.

[25]Ibid. See also Flinn, 377-378.

been one shilling in the 1770's, it seems to have risen to roughly 10s. to a guinea in 1789, and was to go as high as 12 to 15 guineas by 1800.[26]

The bond had another, less direct, impact on colliers' wages; the negotiating ability required each year of individual colliers laid the groundwork for collective negotiation.[27] As early as 1765, the pitmen of the Tyne and Wear were banding together in common protest against the coalowners, who that year had formed an agreement that no coalowner would hire colliers from another owner's pit.[28] The willingness of Northeast pitmen to employ work stoppages and even the threat of violence as tactics for negotiation grew as they became increasingly aware of their bargaining power.[29] Lord Delaval, owner of Seaton Sluice colliery, wrote to his viewer:

> "I am much concerned at the unlawful and turbulent manner in which the Pitmen employd by me are proceeding but have some consolation in knowing that you and all my Agents will exert Yourselves to the utmost to bring them to reason and to render them sensible of the ungrateful return they make for the good

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[26]NRO 2De 7/6/10, Hartley Colliery bond, 1770 and Flinn, 355.

[27]Ibid., 396.

[28]The agreement was made in order to keep down competition for the better miners and to keep binding costs down, and resulted in a miners' strike on August 25 (see J. L. and Barbara Hammond, The Skilled Labourer, 1760-1832 (London: Longmans, Green & Co., 1919; reprint, New York: Augustus M. Kelley, Publishers, 1967), 13). Nef says that as early as 1662, 2,000 miners from the Tyne and Wear signed a petition to the King regarding working conditions (see J. U. Nef, The Rise of the British Coal Industry I (Hamden, Connecticut: Archon Books, 1966), 9).

[29]Flinn, 398. Flinn recounts episodes of violence ranging from broken windows of strike-breakers to destroying the winding gin, the apparatus at the top of the shaft used to raise and lower both workers and corves (see 403-411). Also, colliers were known to join ranks with keelmen ("the bane of the coal trade" to John Buddle) during strikes, further enhancing their numbers and the implied threat of violence.

treatment they have met with."[30]

Among the colliers' demands was the call for an additional farthing per corf.[31]

Stable and competitive wages were the bond's most obvious contribution to the family economy, but there were other significant benefits coming from it as well. A critical component of the family economy was the cost of housing, and in the Tyne and Wear region, collier housing was either free or available for very little rent.[32] Reference to the building of housing for pitmen can be found as early as 1712, although the practice might not have been widespread at that time. Henry Liddle, writing to William Cotesworth regarding the leasing of properties in Gateshead and Whickham, complains, "Besides they insist that we shall pay damages for way leave to the ten[ants], that we shall not have the least cottage, only liberty on the fell to build. I must own I was shock'd."[33] He later writes, "By this lease . . . we are to make ample satisfaction besides for . . . building hovells, stables, cottages and all other necessarys for the colliery, the like I believe was never heard

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[30]NRO 2De 4/6/41, Lord Delaval to John Crooks dated February 15, 1793.

[31]NRO 2De 4/6/39 and 40, Letters from J. Crooks to Delaval dated February 11 and 13, 1793.

[32]Flinn, 431. In the Northeast, any rent charged was nominal; Buddle stated that both house and coal were provided by employers around 1830 for 1s. a month. A Hartley colliery bond shows that hewers paid that same amount for rent in 1770.

[33]J. M. Ellis, ed., The Letters of Henry Liddell to William Cotesworth, The Publications of the Surtees Society, Vol. 197, ([n.p.]: James Hall Limited, 1987), 92. Letter dated November 5, 1712.

of."[34] In addition to inexpensive housing, the bond frequently provided for a free or cheaply available weekly allowance of coal, made available for a nominal delivery charge. A bond from Walls End colliery in 1771 stipulates that there would be a 3d. charge each week for coal, with the "dwelling provided;"[35] the workmen and "widdows" at Hartley Colliery received an average of 43.5 carts of free coal in the year between March 10, 1759 and March 5, 1760.[36] When a charge was made for coal, it was invariably well below market price.[37] Houses were rented to viewer Matthias Dunn for the Grandlease colliery in 1803; their rents average about £1/10/0 per year, a cost which clearly was not passed on to the collier.[38] That same year, "12 Pitmens Houses" were built at a cost of £130/16/2½--a cost of £10/18/0 each--at Bigges Main colliery.[39] At Pontop colliery in 1824, renters paid £1/1/0 to £1/4/0 annually, but it is unclear if pitmen were expected to pay this rent, or if the charge was for

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[34]Ibid., 93. Letter dated December 20, 1712.

[35]NRO Bud/18/7, Walls End Coliery bond, 1771 to 1772.

[36]NRO 2De 7/6/3, Hartley Colliery papers.

[37]Flinn, 381.

[38]NRO ZCO IX/4. The manuscript is entitled, "Schedule of Cottages Lett to Mefsr. Dunn, for the use of Grandlease Colliery, at the following Rents (Viz) The said Cottages to be Kept in repair at the expence of Mefsr. Dunn." A notation written on the outside of the folded document reads, "from Xmas, 1803." Cookson manuscripts, miscellaneous papers, 1803 (Grandlease rentals listed next to last on the handlist).

[39]NRO Wat/3/110/33, document entitled "Amount of Cash paid for Workmanship etc. in Building 12 Pitmens Houses at Bigges Main in the year 1803." Sometimes workmen's houses were rented to non-colliery people; in 1808, 62 out of the 117 houses provided by Denton Colliery were rented to "hindes" and other "labourers," while five remained "emtey" and twelve were occupied by widows. The listing does not indicate what rent "outsiders" paid (see NRO Wat/3/28/35, "An Account").

outsiders only.[40] Maintenance appears to have been, at least on occasion, a consideration by ownership; in 1823, 2s. 4d. were paid to Robert Stratford "for mending pittmen's houses" at Pontop.[41] By 1825, cottages for pitmen were a universal fixture of the colliery community. "There are commonly as many houses erected near each colliery as serve to hold the workmen, and each one is allowed a small plot of ground for the groweth of pot herbs, potatoes, &tc."[42]

The bond also provided, on occasion, for grain subsidies when prices became exceptionally high.[43] North Bank colliery was distributing credits for subsidized grain in 1771, enabling the mining families to obtain grain for 1s. a peck.[44] The practice was slow to catch on, however. The viewer at Hartley wrote Delaval in 1791 that the pitmen had requested subsidized grain and indicated that such subsidies were of fairly recent practice in

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[40]DCRO D/X 115/6, Pontop Colliery accounts. Four of the houses were occupied by widows.

[41]DCRO D/X 115/7, Pontop colliery accounts.

[42]E. Mackenzie, An Historical, Topographical, and Descriptive View of the County of Northumberland, and of those parts of the County of Durham situated north of the River Tyne, 2d. ed., vol. I (Newcastle-upon-Tyne: MacKenzie and Dent, St. Nicholas' Churchyard, 1825), 208. The idea of miners' cottages being provided by the coalowner gives the impression that miners would be restricted in their job mobility or would be hesitant to strike for fear of losing their homes. The miner's mobility was restricted, but it was restricted by the annual bond (or contract) which effectively tied him to a colliery for the period of a year, rather than by the fear of losing his home. As far as the miner's willingness to strike was concerned, there are many references to entire communities establishing "tent cities" outside the boundaries of the mine following eviction--and making loud complaints to the press! See, for example, the Durham Chronicle, No. 632, February 4, 1832, 1.

[43]Ibid., 381.

[44]DCRO D/St/B1/2/63, North Bank colliery accounts.

the area (see Appendix C). But by 1800, John Buddle was arranging to purchase a small windmill "for the purpose of grinding Corn for our Colliers. . . ," stating that there was "great demand for Rye in this Neighborhood at present as the high Price of Flour puts it out of the Power of the pitmen to purchase it and the Coal Owner [sic] are under the Necessity of supplying them with Rye at the Rate of 10/s. p. Boll."[45]

Equally important to the family economy, however, was the security afforded by the custom of many northeastern colliery owners of continuing to provide free or low-cost housing and coal to disabled or injured miners, or to the widows and families of miners killed in the pits. In an 1830 report to Parliament on the state of the coal trade, Buddle said of the northeastern collieries, ". . . it is not within my knowledge that any coalowner ever disturbed a widow, after an accident of that sort, or put her out of her house; they have their houses and fuel continued to them as long as they live."[46]

Some collieries retained the services of a physician to treat and dispense drugs to pitmen and their family members who had been injured in the mines; George Tweddell was a medical practitioner residing at Houghton le Spring at the time of the 1842 Report of the Children's Employment Commission.[47] This service to the colliers was for injury incurred in the mines, however, and did not cover illness. For that, the physician was

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[45]DCRO NCB/I/JB/1310, Buddle's copy of his letter to Joseph Smith of London dated February 3, 1800.

[46]Parliament (Commons), Reports from Select Committees on the State of the Coal Trade, 1830, VIII, 33. See also Flinn, p. 371.

[47]PP 1842, Children's Employment, XVI, Evidence, No. 98, G. Tweddle.

available for the price of a small retainer. George Casey said, "The employers pay for accidents, and most of [the miners] enter into a contract with a medical man, the head of the family paying 6d. a-fortnight; and the unmarried paying 3d. a-fortnight, for which he attends the sick. The money is frequently, but not always, left in the hands of the overman."[48] Injured colliers were also frequently given disability pay (known as "smart money") if they were going to be out of work for a substantial period of time.[49] In 1793, miners in Hartley colliery had demanded a disability allowance of 5s. per week on the grounds that such was the rate paid by the collieries of the Tyne and Wear.[50] The viewers of the Tyne and Wear did, in fact, take special accounting of those in need of special allowances; an 1811-1815 population survey for the northeastern coalfields made special reference to the category of "widows and dependent relatives;" in the Tyneside and Wearside districts alone there were at least 574 widows and dependents.[51]

The colliers of the Tyne and Wear, then, enjoyed a relatively stable wage (particularly in light of the guaranteed wage), along with benefits that enhanced real wages. There is every reason to conclude that their wives and daughters elected to work inside the home, or, if in need of

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[48]PP 1842, Children's Employment, XVI, Evidence, No. 98, George Casey.

[49]PP 1842, Children's Employment, XVI, Evidence, No. 572, W. Crawford. The under-viewer at Willington Colliery stated in the same report that he "does not think they pay £40 a-year throughout the whole of this colliery for smart-money," implying that their mine was relatively safe from major accidents. See also No. 3, J. Johnson.

[50]Flinn, 424.

[51]Joint Coal Owners' Association 263, Minute book 1805-15, 261-4. Quoted Flinn, 423.

money, take employment that was less arduous than mining.

West Riding

In contrast to the pitmen of Northumberland and Durham who, by 1842, had learned to press for higher wages through collective action and annual negotiation, the miners of Yorkshire do not appear to have had any cohesion at all. Their few efforts at unionization had always been defeated by the coalowners. They succeeded briefly in organizing during the summer of 1819, but the union did not survive long; following an abortive strike for a wage increase the union was abandoned.[52] The literature does not explain why early efforts at combination in Yorkshire met with so little success, and it is difficult to attribute this failure to effectively combine to any single factor. It may be that the colliers simply lacked leadership, or it may have been due to the fact that the butty system (in which a sub-contractor, rather than the individual miner, entered into negotiations with the coal owner) was employed in Yorkshire instead of the bond, and therefore the southern miner did not have the same experience with contract negotiation as did his northern counterpart. The Yorkshire miners' ineffectiveness in combining for higher wages surely was a factor in their inability to support their families without the assistance of their wives and/or their children.

As we have seen, the collieries of the Tyne and Wear had largely made the shift to individual wage labor by the eighteenth century, whereas the colliers of the West Riding were still operating under the system of

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[52]Robert F. Wearmouth, Some Working Class Movements of the Nineteenth Century (London: The Epworth Press, 1948), 242. Wearmouth's source is the Newcastle Courant, dated December 18, 1819.

family labor in 1842. The region's mines were primarily family-run, small enterprises or were operated under the "butty" system, which was widely employed in Yorkshire mines.[53] In this system, a sub-contractor, or chartermaster (often known as the "butty"), would be contracted to drive headings into the coal for an agreed price per yard or to get coal at an agreed price per ton and to conduct the business of running the mine for the coalowner. He would pay the collier (usually each fortnight), but the miner in turn had to pay his hurriers and thrusters for moving the coal to the surface.[54] Those employees (known as "on-cost workers") were typically family members, as clearly revealed by the evidence offered to Parliament in the reports of the sub-commissioners. Given the tendency of families to exploit their own un-waged labor, one can easily see how women and children may have worked underground in the West Riding in order to make a contribution to the family economy.

Because getters (the West Riding term for "hewers") paid their hurriers and thrusters (the Yorkshire equivalent of "putters"), there are, of course, few records of the on-cost workers' wages. When considering getters' wages, however, it is necessary to factor in the expense of transport in order to accurately determine the getters' "take-home" wage. There is a bare minimum of evidence, but perhaps enough to make a

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[53]PP 1842, Children's Employment, XVI, 132. Also see Flinn, 377. Flinn states that this was often the case where longwall mining was taking place, but does not indicate why this would be the case.

[54]PP 1842, Children's Employment, XVII, 177. See also G. G. Hopkinson, "The development of the South Yorkshire and North Derbyshire coalfield, 1500-1775," Chap. 1 in Studies in the Yorkshire Coal Industry, John Benson and R. G. Neville, eds. (Manchester: Manchester University Press, 1976), 27.

tentative estimate of the impact of on-cost pay on getters' wages. Halton colliery records indicate that transport workers earned 9d. per day in 1722;[55] by 1810, a hurrier in the West Riding was earning 1s. per day.[56] A miners' wage book from 1831 gives us another rare look into on-cost wages; it indicates that "hurryers" earned about 1s. 2½d. per day, or 6s. 1d. per week. At the time of the 1842 reports, weekly wages for on-cost workers in the West Riding were just under 6s. to 10s. per week. The significance of these figures is that the getter, who had to pay his transport workers if he could not get a family member to assist him for free, would have a reduction in his take-home pay by the amount of his on-cost worker's wages. A getter earning 2s. 2¼d. per day in 1842 would have been paying more than half his daily wage to his hurrier. Having a family member assist him for free might have doubled the amount of his take-home pay, but there would be no additional wages added to the family purse as a result of his or her efforts. As indicated earlier, the butty system employed in the West Riding may well have been the critical element in determining whether a miner's wife or daughter worked underground; in the Tyne and Wear, where on-cost workers were paid by the company, earnings of such family members would have been added to the hewer's take-home pay. In the West Riding, where the getter was required to hire and pay his transport workers, getting a family member to do this work for him for free was the best situation he could hope for. The family income, then, would not be supplemented by a son's wages until he was old enough to

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[55]WYAS-Leeds TN/HA/C/14, Halton colliery wage sheet.

[56]A. R. Griffin, The British Coalmining Industry: Retrospect and Prospect (Buxton, Derbyshire: Moorland Publishing Company, 1977), 77.

become a getter himself, and then must pay his own hurriers and thrusters.

Just as the Northeast collier dreaded a "bad cavil" that would assign him to a thin seam, colliers in the West Riding dreaded receiving a poor assignment from the butty; thin, less productive seams could have a substantive impact on getters' wages. The weekly wage for getters at Venture Pit at Middleton colliery in 1831, for instance, was 9s. 3p., or 1s. 2¼d. per day; at Gosforth Pit, another Middleton colliery pit, the weekly rate was 17s. 4d., or just under 3s. 2d.[57] The 1842 Report to the Commissioners states that getters in the West Riding earned between 20s. to 25s. per week, or (at an average of 22½s. for the week) a daily wage of 4s. minus 1s. 3d. for the hurrier's wage--a net daily wage of 2s. 9d.

This net wage figure falls into the range of wages revealed in Appendix II accompanying the Sub-Commissioner's report on Yorkshire. It reveals that the colliers of the West Riding brought home six to fifteen shillings per week, an amount at least twenty-five to fifty percent less than the northeastern standard, and their pay--in every example given--was supplemented with pay from their children.[58] Most children listed in the Appendix were hurriers earning approximately four shillings per week, although two homes were lucky enough to have an older son who also worked as a collier. It is interesting to note, however, that in one of these cases, the additional income did not substantially improve the family's

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[57]WYAS-Leeds/MC 153/19. From Middleton colliery's Miners Wage Book for September 21, 1831.

[58]The table's information is at variance with the Sub-Commissioner's report which it accompanied: that report states that, while the wages of men vary with their strength and industry, young men average as much as 20s. per week (¶ 192, p. 192).

income, for although the son was earning ten shillings each week, his father was only earning about six shillings each week--one might speculate due to ill health.[59] Tables 4 and 5 show that, unlike the pitmen of the Tyne and Wear who were able to provide for their family's expenses unaided by their children, the colliers of the West Riding were unable to meet their families' basic expenses without the aid of their wives and/or children; the sample family shown could not have managed without the income of their hard-working daughter who was employed as a hurrier underground.

The butty system created more problems for the West Riding collier than the costs of transport workers' wages. Hewers from the Tyne and Wear earned their wages by a piece-rate system; by the time they had worked an eight hour shift, they had usually "gotten" their average number of scores and could go home having earned their usual wage. The collier of the West Riding, on the other hand, was committed to his butty to "get" a set amount of coal over the pay period. In order to meet his end of the bargain, the getter might have to work overtime.[60] One Yorkshire collier asserted that it took working as many as twelve hours a day "to get his living."[61] This would be particularly true in the Bradford, Leeds, Huddersfield, and Halifax collieries, where the coal seams were thin, because getters were paid from ten to twenty percent less in thin

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[59]PP 1842, Children's Employment, XVI, Appendix II, 218-219.

[60]PP 1842, Children's Employment, XVII, 66.

[61]PP 1842, Children's Employment, XVI, Evidence, No. 94 (246), unnamed collier.

Table 4.

AVERAGE WEEKLY EXPENSES FOR A COLLIER FAMILY OF FIVE IN THE WEST RIDING, c. 1842*

	£.	s.	d.
Malt		2	6
Butter		1	0
Coffee			3
Wheatmeal		6	2
Oatmeal		2	0
Potatoes			8
Butcher's meat		2	6
Tea and sugar		1	7½
House rent and fuel[1]			10
On-cost wages[2]		4	0
	1	0	8½

* Note that expenses for clothing and dry goods are not listed.

Source: PP 1842 XVI, Appendix II, 218-219.

Table 5.

WEEKLY INCOME FOR A COLLIER FAMILY OF FIVE IN THE WEST RIDING, 1842*

	£.	s.	d.
Getter		14	8
Daughter, a hurrier		7	0
Son, a hurrier		5	6
	1	6	4

* The wife's income listed in the Appendix is not listed here, as her income was seasonal work ("in harvest").

Source: PP 1842 XVI, Appendix II, 218.

[1]Rent calculated at 6d. per week; see discussion regarding rent, p. 33 of text. Fuel expenses of 4d. per week taken from Appendix II.

[2]See discussion regarding hurriers' wages, pp. 39-40 of text.

coalpits.[62] It would not be coincidental, then, that these areas werespecifically mentioned by the sub-commissioner as areas with the West Riding's heaviest concentrations of women working underground.

If the getter (the primary wage-earner for the household) was experiencing difficulty in "getting his living," he did not find that the benefits he received were enough to satisfactorily compensate for his inadequate wages. The benefits he received, in fact, did not compare well with those received by the northeastern miner. Coal was free or available at a reduced price (the average price was 2d each week); free ale was distributed when a shaft was sunk ("sod ale") or when the coal was won ("sinking ale"). Occasionally flannel was given for making pit clothes,[63] and the giving of a Christmas feast was a common practice. The average expenditure per miner at a Christmas feast for Thorpe Hesley in south Yorkshire in 1790 was £1. 15s, which, while fairly generous, hardly constitutes a lasting benefit. Housing was more expensive for the collier of the West Riding, as compared to the rent paid by the collier of the Tyne and Wear; it will be remembered that the average rent paid in the northeast, when it was charged at all, amounted to approximately 12s. for the year. The occupants of colliery cottages at Halton colliery near Middleton paid 2s. per month in rent,[64] an expense twice as large as in the Tyne and Wear.

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[62]PP 1842, Children's Employment, XVI, ¶ 193, p. 192.

[63]G. G. Hopkinson, "The development of the South Yorkshire and North Derbyshire coalfield, 1500-1775," Chap. 1 in Studies in the Yorkshire Coal Industry (Manchester: Manchester University Press, 1976), 27.

[64]WYAS-Leeds MC 225. Book entitled, "Collier House Rents."

The hours that colliers worked in the West Riding undoubtedly precluded the more ambitious after-hours pursuits of the northeastern miner. Still, it must be remembered that northeastern miners worked year round during the mid- to late-eighteenth century. Of the country's several coalfields, the Northeast alone was developed enough to meet the growing urban demand for domestic heating fuel; most coalfields lay idle at different times during the summer months when there was a diminished demand for coal. Nef points out that colliers were willing to seek employment in agriculture during these "slack" times,[65] but as John Burnett points out in Plenty and Want, agricultural wages became depressed after 1813 and did not recover for at least twenty years (see Table 1).[66] Colliers in need of money and unable to find work in agriculture would have had difficulty finding work. As our earlier discussion of the other industries in the West Riding indicates, there were few job opportunities in the West Riding for men without specialized skills (such as those required in weaving or pottery making). The area had minor industries in leather, pottery, and glassmaking, but, as indicated earlier, the numbers that could be employed in these occupations would be limited, and certainly could not absorb large numbers of idle colliers.

This would be especially true during times of general unemployment and depressed wages; significantly, Burnett believes that industrialization exacerbated the pre-industrial problem of unemployment

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[65]Nef, 2:184.

[66]John Burnett, Plenty and Want: A social history of diet in England from 1815 to the present day (London: Thomas Nelson (Printers) Ltd., 1966), 15.

during the 20-year period following 1813. He cites industrialization's displacement of workers through mechanization as one of the factors in the nation's growing unemployment problem, but also blames "cycles of [production] booms and slumps," which he believes began in the 1790's; overproduction led to market gluts and subsequent production slumps with reductions in the workforce.[67] It is not surprising, then, that colliers, along with a wide spectrum of other laboring folk in the early- to mid-nineteenth century, were forced by necessity in a region with limited employment opportunities to supplement their wages with their wives' and daughters' incomes.[68]

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[67]John Burnett, Idle Hands: The Experience of Unemployment, 1790-1900 (New York: Routledge, 1994), 5-7. Burnett contends that unemployment "became much more widespread, more seasonal and of longer duration between 1815 and 1830," years when women were working underground in the West Riding coalfield (see Idle Hands, 27).

[68]It is interesting to note, too, that some colliers supplemented their income by rustling sheep. See R. A. E. Wells, "Sheep-Rustling in Yorkshire," Northern History 20 (1984), 127-145, passim. George Fielding, a collier from the Wakefield area, was a more egregious example of such criminal activity. He joined his brother John (a yeoman) in pinching other people's sheep. They would hide the skins down coalpits, sell the tallow, and feed the offal to their pigs (see pp. 134-5).

CHAPTER III

MINERS' HEALTH: THE IMPACT OF GEOLOGY AND TECHNOLOGY ON WAGE-EARNING ABILITY

Recent studies have pointed to an additional problem faced by colliers and their families in the West Riding, one that would have an appreciable impact on a collier's wage-earning ability and therefore on the family economy: that of health. The evidence suggests that the average, able-bodied pitman of the Tyne and Wear was able to support his family without the aid of his wife and daughters because he enjoyed reasonably good health and thus was able to work productively for a relatively long period of time. Accidental injury notwithstanding, in fact, the miners of the Northeast appear to have enjoyed general good health; witnesses before the Sub-Commissioner in the Northeast repeatedly report to this effect: "I have often felt surprised that greater suffering and disease should not result from the admixture of gaseous exhalations in the atmosphere of the mines, but these appear for the most part innocuous as to general health."[1] Although probably not typical, the ages of witnesses Ralph Hall (age 77) and Thomas Batty (age 93), both of whom claim to have started work below ground at the age of seven, attest to the fact that mining work did not necessarily ruin one's health. Batty said he had been employed "in and about pits up to about his 85th year, and has always had good health and good fortune . . . Considers pit-work

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[1]PP 1842, Children's Employment, XVI, Evidence, No. 498.

healthy if the pit is free from foul air [emphasis added]. Never knew any men who suffered much from pit-work."[2]

Conversely, the Sub-Commissioner's report for Yorkshire repeatedly refers to the delicate health of Yorkshire colliers. Dr. Thomas Rayner related, "I have had 27 years' practice, and I know of no old colliers--their extreme term of life is from 56 to 60 years of age." John Ibbetson, aged 53, had worked in the pits for 45 years. He attested, "I have suffered from asthma, and am regularly knocked up. A collier cannot stand the work regularly." John Ostcliffe, the registrar of Barnsley district said, "The men are always to be recognized by their paleness . . . The colliers are . . . not . . . long-lived, which I attribute generally to harder labour and to chronic diseases arising at from 40 to 50 years of age. They suffer chiefly from asthma, rheumatism, &c. arising from their sub-terraneous employment." The surgeon at Barnsley and the vicar of Silkstone similarly voiced their observation that miners did not live "to an advanced age."[3]

What might account for such a decided difference in the reports from the Northeast and Yorkshire? Technology, in terms of ventilation and drainage, appears to have had a significant impact on a miner's health, as did the method of coal extraction (i.e., pillar and stall in the Northeast vs. longwall working in the West Riding). These factors, combined with the geology of the region and the type of coal being mined, contributed to

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[2]PP 1842, Children's Employment, XVI, Evidence, No. 32, Thomas Batty and No. 33, Ralph Hall.

[3]PP 1842, Children's Employment, XVI, Evidence, Nos. 268, 267, 251, 139 (Michael Thomas Sadler, Esq.), and 167 (The Rev. Henry Watkins).

the volume and type of airborne dust being aspirated by colliers, and thus to the types of pulmonary disease to which colliers were prone.

It appears that the miners of Northumberland and Durham enjoyed better health due to the superior methods of ventilation and drainage employed in the Northeast. The older mining industry of the Northeast had been dealing with the problems of deep mining since the late fifteenth century, when pits were becoming deep enough to warrant the use of drainage pumps. By the time that the deeper coalfields of Yorkshire came to be extensively worked in the late 1830's, the mining industry of the Northeast had enjoyed well over 100 years of experience in dealing with the problems of drainage and ventilation, and thus was much more sophisticated in its technology.

Ventilation was undoubtedly the most intransigent and dangerous problem facing the industry; it was generally considered that pits deeper than 180 feet ran the risk of serious gas accumulations and increased the need for greater ventilation.[4] Gases emitted by coal strata were principally of two types, "firedamp" and "chokedamp." Firedamp was methane gas, and when mixed with coal dust was especially volatile. Because the primary source of underground illumination was open-flamed candles (until the development of the Davy lamp in 1815), it was an unfortunate circumstance of deep-shaft coalmining that explosions became increasingly common. In addition, firedamp could explode without ignition, and chokedamp (or "black damp") was a noxious, suffocating gas

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[4]Flinn, 128.

that was left behind after an explosion of firedamp.[5] Heavier than air, chokedamp was carbon monoxide resulting from incomplete combustion that was responsible for the larger portion of those killed by colliery blasts.[6] In an effort to control the problem of chokedamp, the northeast collieries developed an efficient method of cleansing the underground air.

Around 1760 (about 20 years before the last reports of women working underground in the Tyne and Wear), the viewer of the Whitehaven collieries devised a method for effectively directing air through a colliery's workings. Called "coursing the air," the system provided a maximum draft by closing off side passages and thus maintaining the velocity of the air's movement by preventing its dissipation (see Figure 2). Air velocity would also be enhanced by the generally long, straight courses through which the air current flowed. Additionally, the Northeast's coal seams were largely thick ones; thus a greater volume of air was able to move through the workings. The consensus opinion in the 1842 Sub-Commissioner's report appears, in fact, to have been satisfied that most mines in the Northeast were properly drained and had achieved good success in providing adequate ventilation.[7] The report further attributes the health of the Northeastern miner to the region's superior ventilation.

In contrast, the Inspector's report damns all the Yorkshire collieries for their slipshod efforts at ventilation: "I had prepared

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[5]Helen and Baron Duckham, Great Pit Disasters: Great Britain, 1700 to the Present Day (Newton Abbot: David & Charles Limited, 1973), 18.

[6]Griffin, 124.

[7]PP 1842, Children's Employment, XVI, Evidence. See for example No. 98, George Bland and No. 99, George Tweddell.

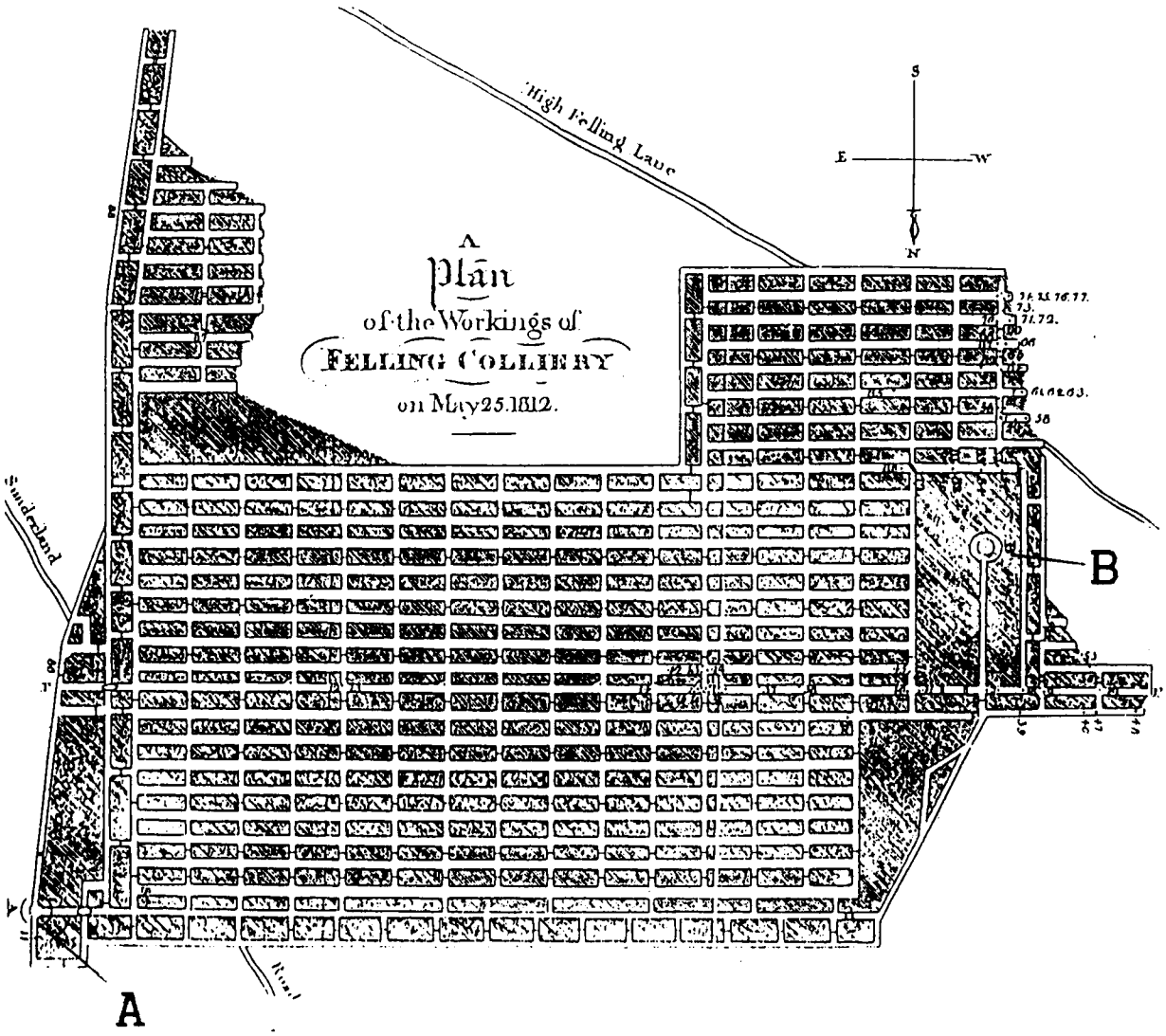

Figure 5. Ventilation of Tyne and Wear Mines

The downcast, working shaft is located at Letter A in the lower left corner; the upcast shaft is at Letter B. Stoppings are indicated by small, horizontal lines in the holings and show how air was usually conducted up two boards and down two by means of stoppings placed in every second wall in each headways-course.

Source: F. Atkinson, The Great Northern Coalfield, 1700-1900 (Durham: Durham County Local History Society, 1966), 12.

notes of each different colliery I visited in my district, but I found that a complete and true statement would be more likely to give offence than to do good, and I abandoned the design. I may, however, with truth state, that neither drainage nor ventilation are sufficiently attended to for the health and comfort of the workpeople in a majority of cases; whilst in some the ventilation is so imperfect that it is positively dangerous."[8] His report indicates that two varieties of ventilation were employed in the Yorkshire coalfields. Where the seams were thicker (the Silkstone and Barnsley seams to the south), a method similar to that used in the Northeast was employed. To the west where seams were thin, however, as in the Bradford and Leeds area, the mines were typically ventilated by two shafts, upcast and downcast, with one placed at the bassett (outcrop) and one at the deep (the lower end of the underground workings): just as in the Northeast, all the air from the downcast shaft was pulled through the underground coursings and then out through the upcast shaft. The difficulty in ventilating West Riding mine workings appears to have resulted from the method of coal extraction employed in that area. Since the Bradford-Leeds area to the west is primarily where women worked underground in the West Riding, the mining techniques employed in that area are of special interest to this study.

The thin-seamed mines of the Bradford/Leeds area used a modified form of the longwall method ("bank work") to remove coal from the workings; Figure 6 shows how the individual banks where the getter worked the face could readily provide pockets of relatively stagnant air.

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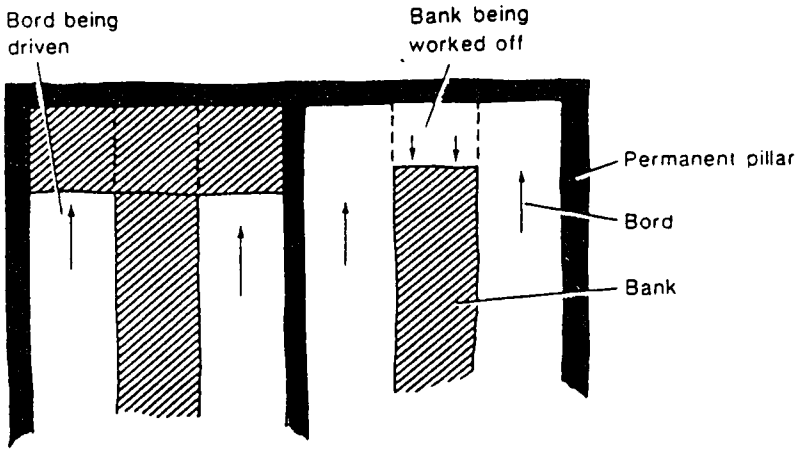
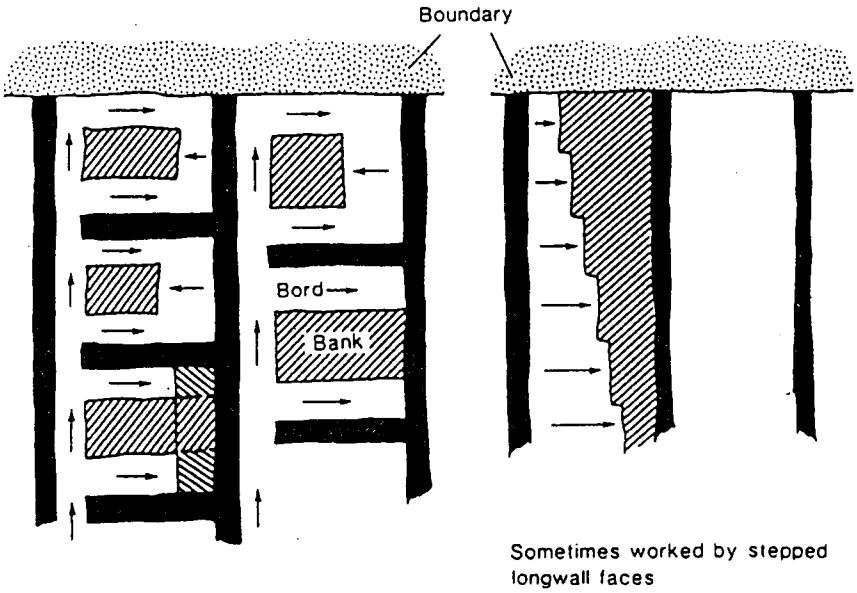
[8]PP 1842, Children's Employment, XVI, ¶ 126, p. 183.



Bankwork or bord and bank



Bankwork in 'sets'

Figure 6. Ventilation of Yorkshire Mines

Source: Roy Church, The History of the British Coal Industry, vol. 3, 1830-1913: Victorian Pre-eminence (Oxford: Clarendon Press, 1986), 334.

Furthermore, if one remembers that these banks and the "side roads" from which they projected were often only 20" in height, one can readily see how imperfectly ventilated the West Riding's thin-seamed mines were. Ventilation of the West Riding's thin-seamed mines was complicated by the fact that many of the coalseams lay on a steeply inclined plane (the "dip") and it was considered more transport-efficient to sink the downcast shaft about a third of the way up the workings. The air was not divided by brattices, as in the Tyne and Wear, but rather allowed to "divide itself" between the lower third and upper two-thirds of the mine workings.[9] The result was that the air current with the longer course would tend to lose velocity and thus be less effective in cleaning the air than the current in the shorter course. The Inspector for the 1842 Commissioners' Report inquired of several experts on colliery workings as to the efficacy of this latter method; their reports uniformly convey misgivings as to its ability to sufficiently cleanse the underground air.[10]

Ventilation was intended, of course, to prevent dangerous accumulations of firedamp, but an unintended byproduct of it was the lessening of airborne coaldust. The dangers of breathing coaldust were unknown to nineteenth century medicine; some thought that black expectoration was the result of breathing firedamp, while others thought it was an extrusion into the lungs from the blood.[11] The precise nature

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[9]PP 1842, Children's Employment, XVI, 172-173.

[10]PP 1842, Children's Employment, XVI, Evidence, Appendix A, 208-210.

[11]George Rosen, M.D., The History of Miners' Diseases: A Medical and Social Interpretation (New York: Schuman's, 1943), 191.

and etiology of pneumoconiosis (otherwise known as "black lung disease" or "miner's asthma") was only beginning to be researched in the 1820's. The Sub-Commissioner's report states that Drs. John Brook and Uriah Bradburg made reference to the asthmatic "affections" of many miners "owing to damp underfoot, and also to the dust from the working of the coal."[12]

The connection between aspirable dust and respiratory disease is, however, no longer in doubt. Long-term epidemiological studies of coalworkers' simple pneumoconiosis (CWSP) in Britain have been sponsored by the National Coal Board's Pneumoconiosis Field Research program conducted under the auspices of the Institute of Occupational Medicine in Edinburgh; their early studies found "a strong relationship between exposures to respirable airborne dust and prevalence of disease, . . ."[13] There are three types of pneumoconiosis that are of significance to our study: coalworkers' simple pneumoconiosis (CWSP), progressive massive fibrosis (PMF), and silicotic massive fibrosis (SMF).[14]

CWSP is a condition that results in the reduction of ventilatory function due to the narrowing of airways and in abnormalities in the

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[12]PP 1842, Children's Employment, XVI, Evidence, No. 200 (279) John Brook; No. 199 (278) Uriah Bradburg. See also Nos. 110, 138, 139, and 199.

[13]A. Robertson, J. F. Hurley, P. W. Brown, H. P. R. Colins, J. Dodgson, and W. M. Maclaren, Final Report on CEC Research Contract 7256-31/051/08: A Case-Control Study of Reasons for Unusual Radiological Changes of Pneumoconiosis Among Individual Mineworkers (Edinburgh: Institute of Occupational Medicine, July 1987; Report No. TM/87/11; UDC 616.24-00316:616-03612), 7.

[14]In the scientific literature, PMF is also referred to as "rapid progression" pneumoconiosis (or RP). To confuse matters further, PMF is often used to refer to rapid progressing pneumoconiosis resulting from either coal dust exposure (PMF) or quartz exposure (SMF).

distribution of inspired air, which in turn leads to a small decrease in the oxygen level of arterial blood. These modifications in the miner's breathing capacity do not appear to cause clinical illness or disability, or to reduce life expectancy; bronchitic complaints of cough, black sputum, and minor shortness of breath are frequently made by miners with clear chest x-rays. CWSP is the pulmonary reaction to dust alone; it does not progress in the absence of further exposure.[15] When, however, the dust burden is very high and exposure prolonged (usually over the course of many years[16]), progressive massive fibrosis (PMF) can result. Clinical manifestations of debilitating shortness of breath and high blood pressure are associated with large opacities visible on x-rays indicative of massive lesions in the lung. PMF has been associated with decreased longevity;[17] the commonest secondary disease linked to it thus far is emphysema.

In 1981, Davis first identified the multivalent nature of advanced pneumoconiosis, suggesting that a silicotic type of PMF was associated with low-rank collieries (those mining softer coals) and exposure to quartz;[18] thus was the distinction between PMF and silicotic massive

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[15]Gerald L. Baum, M.D. and Emanuel Wolinsky, M.D., eds., Textbook of Pulmonary Diseases, 5th ed., vol. 1, (Boston: Little, Brown, and Company, 1994), 847, 854. See also Joseph P. Costantino, "Health Effects of Respirable Coal Mine Dust: Coal Workers' Pneumoconiosis," Mining Congress 67:10 (October 1981), 55-56.

[16]Ibid., 851.

[17]Ibid., 855.

[18]J. M. G. Davis, "The Relationship Between the Mass and Composition of Coal Mine Dust and the Development of Pneumoconiosis," Chap. 21 in Health Implications of New Energy Technologies, ed. William N. Rom and Victor E. Archer (Ann Arbor: Ann Arbor Science Publishers, Inc., 1981),

fibrosis (SMF) made. A follow-up study in 1982 similarly identified the two patterns of advanced pulmonary disease;[19] it found that men from high rank collieries (where aspirable dust would have a high carbon/low ash content) developed either CWSP (with small lesions evenly pigmented with dust) or PMF (with lesions being larger than 1 cm. in size). In low rank collieries (where respirable dust would have a high ash/low carbon content), miners developed nodules containing no dust particles or, in extreme cases (i.e., SMF), lesions composed of several small nodules fused together.[20] The colliers working in high rank coal, then, were breathing dust of a purer carbon content and were therefore likelier to develop CWSP or PMF, whereas those miners working in low rank coal were breathing dust consisting of coal dust mixed with ash (often containing quartz) and would be prone to develop CWSP rapidly developing into SMF.

The significance of the quartz content in respirable dust was explored by the Institute of Occupational Medicine's pilot study of 112 British coalminers. The study, basing its findings on radiographic appearance of lesions, concluded that exposure to large quantities of mixed respirable dust could cause CWSP to develop into PMF. It further concluded that miners who experience unusually rapid progression of CWSP had lung opacities consistent with SMF, this being attributed to the

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284-286.

[19]J. M. G. Davis, J. Chapman, Paula Collings, A. N. Douglas, June Fernie, T. Lamb, and V. Anne Ruckley, "Variations in the Histological Patterns of the Lesions of Coal Workers' Pneumoconiosis in Britain and Their Relationship to Lung Dust Content," American Review of Respiratory Disease 128:1 (July 1983), 118.

[20]Ibid., 188, 123.

cumulative mass of respirable quartz in the dust at the coal face.[21]

In those cases where CWSP progresses to SMF, the change is rapid and profound. Shortness of breath becomes more severe; the patient develops a dry, irritative cough often accompanied by fever and loss of weight. Tuberculosis is a common secondary infection, and, in fact, there is little distinction made between the symptoms of acute silicosis and tuberculosis; both are frequently manifested by weight loss, cough, shortness of breath, and hemoptysis (expectoration of blood).[22] Furthermore, the development of silico-tuberculosis tends to cause an even more rapid progression of the pulmonary disease.[23]

Many Yorkshire miners were described in the Reports to the Commissioners of 1842 as being in "delicate health" and aging prematurely;[24] that is certainly consistent with the clinical manifestations of acute silicosis (SMF) and silico-tuberculosis. This strongly suggests that miners in the West Riding were suffering from a more virulent form of pneumoconiosis than were the miners of the Tyne and Wear.

This preliminary conclusion is bolstered by an examination of the mining techniques of the two regions, especially when viewed in light of

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[21]C. A. Soutar and H. P. R. Collins, "Classification of progressive massive fibrosis of coalminers by type of radiographic appearance," British Journal of Industrial Medicine 41 (1984), 338.

[22]Baum, 834.

[23]Occupational lung diseases: Prevention and control, Occupational Safety and Health Series, No. 67 (Geneva: International Labour Office, 1991), 52-53.

[24]PP 1842, Children's Employment, XVI, Evidence, Nos. 268, 267, 251, 139 (Michael Thomas Sadler, Esq.), and 167 (The Rev. Henry Watkins).

the types of dust created by those different mining methods and the strata in which the colliers were working. The coal seams of the Tyne and Wear, as indicated earlier, were usually thick enough for underground roadways; passages were tunneled through the coal seam and were usually high enough to accommodate a man's standing height (see Figure 7). Although isolated roof falls might occur, most were prevented by the large pillars of coal supporting the roof; especially in those areas where sandstone created a hard roof, pillars were especially suited to supporting it.[25] It was only after a large area of the mine had been worked that the pillars were "robbed" of their coal and the roof allowed to fall. A minimum of stone, therefore, needed to be dislodged in the mining of the Tyne and Wear's thick seams, and pitmen were exposed to airborne dust largely created by the disturbance of bituminous coal. As PMF is associated with the higher ranked coals (primarily anthracite),[26] it is unlikely that the miners of the Tyne and Wear developed serious pulmonary disease in significant enough numbers to have a notable impact on their average wage earning ability.

The thin seams of the West Riding, however, not only required miners to work in extremely cramped conditions that prevented the efficacious ventilation of the area being worked, but they also required the ripping of headways through stone in order to accommodate the transport of coal to

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[25] A Treatise on Coal Mining, 3rd. ed., vol. 2 (Scranton: The Colliery Engineer Co., 1901), §14, 5.

[26] Michael D. Attfield and K. Morring, "An Investigation into the Relationship Between Coal Workers' Pneumoconiosis and Dust Exposure in U. S. Coal Miners," American Industrial Hygiene Association Journal 53 (August 1992), 486, 489, and 491.

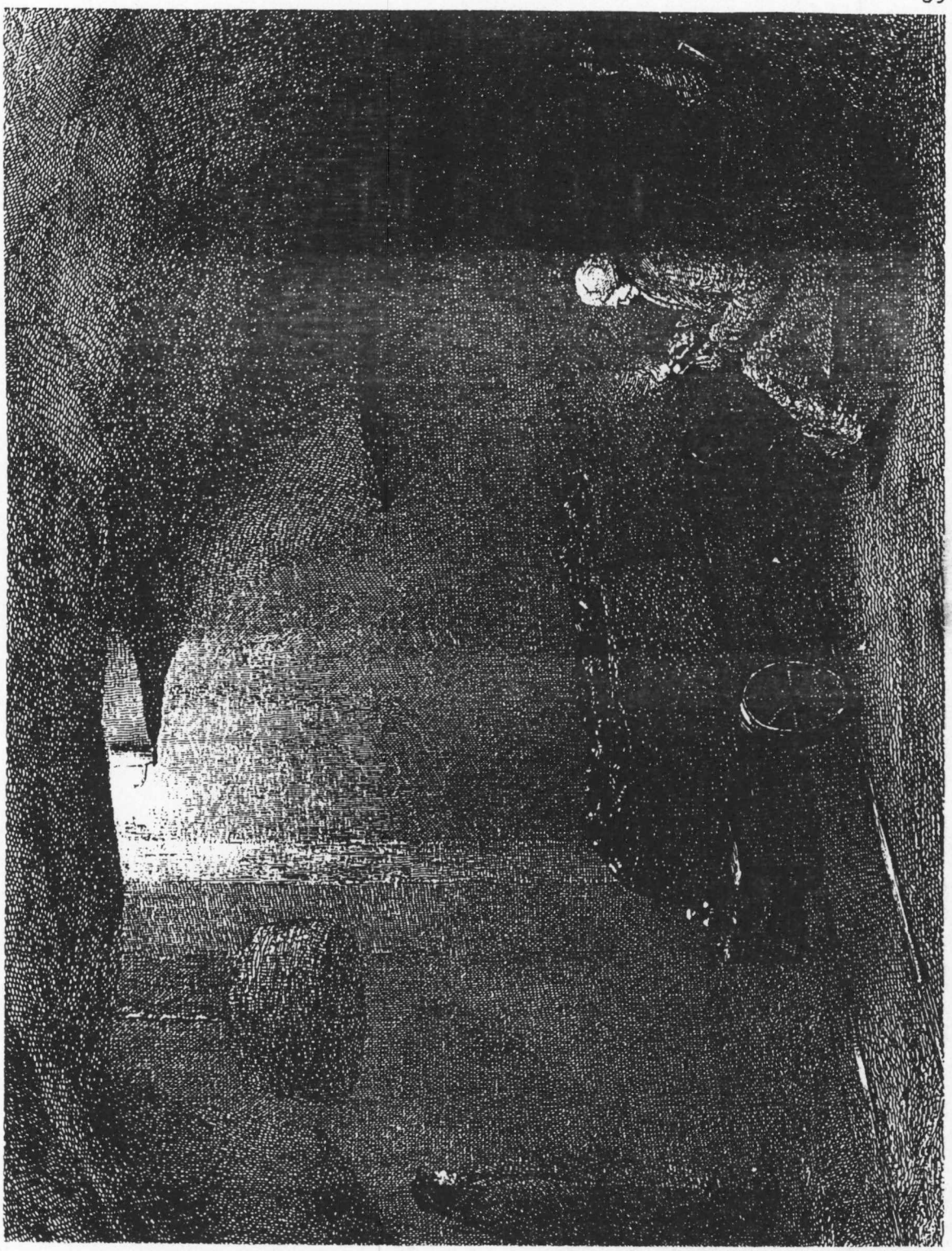

Figure 7. Bottom of the Shaft, Walbottle Colliery

Source: T. H. Hair, Views of the Collieries in the Counties of Northumberland and Durham (London: [n.p.], 1844); reprint edition, Newcastle upon Tyne: Davis Books Ltd, 1987.

the surface. Because the coal seam was not high enough for transport passageways, the roof was taken down ("ripped") to provide greater headroom; the roof was also allowed to fall in order to encourage the loosening of the coal face and thus expedite the coal's removal;[27] colliers then packed the stone to form pillars and roadways (see Figures 8 and 9). These processes whereby the adjacent strata were disturbed are of central importance to our study; if the adjacent strata were silicaceous, the silicate-content of the aspirable dust would be significantly affected.

It is an almost universal phenomenon that coal seams are underlain by a deposit known as a "seat earth" or "fire clay." The 1842 Report to the Commissioners lists the depths of many of the shafts at those collieries visited;[28] they range from roughly 80 to 185 yards in depth. Figure 10 (page 62) shows sample pits being worked in the West Riding in the mid-1800's. The coalseams at those depths were most commonly underlain with either spavin or spavin stone, the local term for fireclay. The term "ganister" is applied to the more siliceous types of seat earths; Yorkshire coalfields are still sometimes referred to as the Ganister Group due to the abundance of this material in the region.[29] The quartz grains found in spavin are angular and closely packed. Figure 10 also reveals that the coalseams' superincumbent strata were commonly different varieties of shale and, less frequently, stone. Shales have a silicate

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[27] Treatise, §15, 5.

[28] PP 1842, Children's Employment, XVI, Appendix N, 223-225.

[29] Iain A. Williamson, Coal Mining Geology (London: Oxford University Press, 1967), 60. See also Hopkinson, 1.

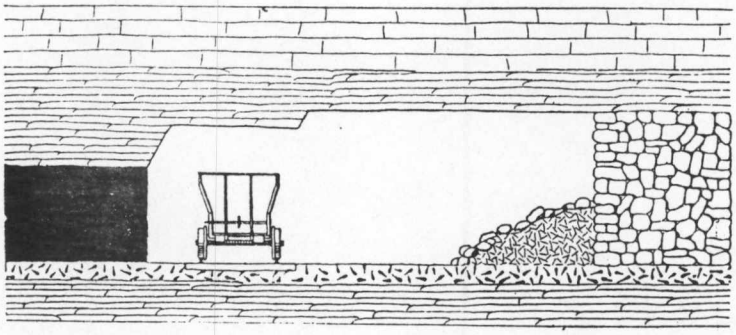

Figure 8. Ripped Roof to Create Roadway in Thin Seams

This side view clearly shows how sub- and superincumbent strata had to be removed in order to accomodate coal access and removal in thin seams.

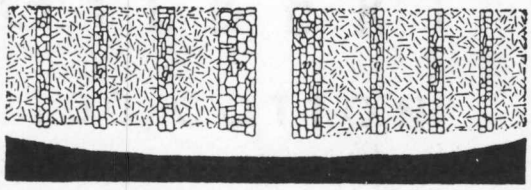

Figure 9. Packwalls in Bank Work

This view of packwalls (looking down from above) shows the manner in which stone previously removed from the roof and floor, along with fallen stone, was used to create a support for the roof.

Source: A Treatise on Coal Mining, 3d. ed., vol. 2 (Scranton: The Colliery Engineer Co., 1901), § 15, 23.

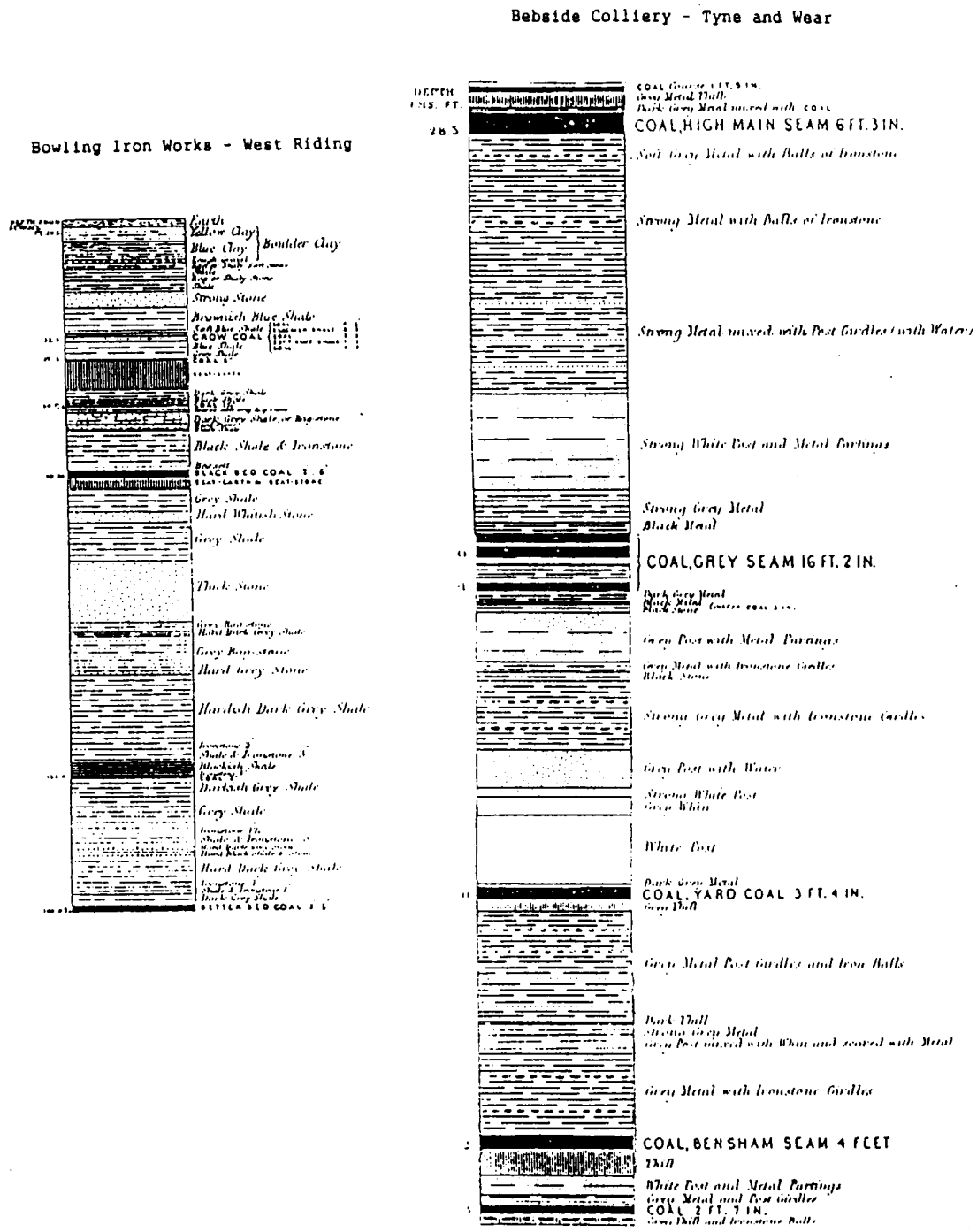

Figure 10. Stratigraphic Maps of Sample Pits of the West Riding and the Tyne and Wear

Source: British Geological Survey, Nottingham
Stratigraphic Maps: MR 78/332, #43 - Halifax and Bradford Districts (August, 1878) and MR 78/332, #39 - Tyne and Wear District (December, 1871).

content of 45 to 60 percent, whereas sandstone could range between 80 and 90 percent. It should be noted, however, that sandstones in the lower coal measures frequently had silicate contents in excess of 90 percent.[30] The colliers of the West Riding, then, were dislodging immense amounts of silicaceous material in the course of their everyday work; they were undoubtedly aspirating significant amounts of silicates, which would predispose them to SMF. Furthermore, the packing of stone to form roadways and pillars was a continual process that occurred as the coal was removed; this process is certain to have increased the amount of airborne quartz.

A final factor of importance in the study of pneumoconiosis is the debate over the potential of certain minerals present in some types of clay to inhibit the effects of quartz on lung tissue. Earlier work had suggested that the presence of illite, a clay mineral, might explain the low incidence of pneumoconiosis at a high-quartz mine.[31] Respirable dust from a mine in Nottinghamshire, where there was little incidence of pneumoconiosis, was compared with dust from a mine in Scotland where there was a high rate of SMF. Quartz levels were similar in the two samples, but there were notable differences in the levels of illite, a mineral found in some clays. The dust from Nottingham contained 15.7% quartz,

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[30]Ibid., 55.

[31]W. H. Walton, J. Dodgson, G. G. Hadden, Jacobsen, M. The Effects of Quartz and other Non-coal Dusts in Coalworkers' Pneumoconiosis," referred to in "The Effects of Quartz in Coalmine Dust - A Synthesis of Results from Research in the British Coal Industry," in Proceedings of the Eighth International Conference on Occupational Lung Diseases, vol. II, J. Hurych, M. Lesage, and A. David, eds., (Geneva: International Labour Office (ILO), 1993), 594.

18.6% kaolinite, and 32% illite, whereas the dust from Scotland contained 18.4%, 25.5% kaolinite, and 17% illite.[32] While these figures would seem to indicate the inhibitive influence of illite, Miller et al point to the type of quartz as the causative factor in SMF. They point out that the Nottingham quartz came from shales and mudstones, and had probably been separated across grain boundaries, rather than heavily fractured; the Scottish quartz dust was derived from medium- to coarse-grained sandstones in the roof and floor of the seam.[33] The Scottish quartz dust would bear a strong resemblance to that found in the Ganister Group, with its angular quartz grains, and would point to yet another factor in the development of SMF among Yorkshire colliers.

The colliers of the Tyne and Wear were able to work longer, more productive years than did their West Riding counterparts, primarily due to the relative luxury of being able to mine thicker seams. The colliers of the West Riding, on the other hand, were frequently exposed to higher concentrations of silicates in airborne dust underground, due to the nature of their mining methods and the geology of the region in which they worked. As a consequence, they were suffering from pulmonary disease that

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[32]J. M. G. Davis, J. Addison, G. M. Brown, A. D. Jones, C. McIntosh, B. G. Miller, and M. Whittington, Final Report on CEC Research Contract 7248-33-044: Further Studies on the Importance of Quartz in the Development of Coalworkers' Pneumoconiosis (Edinburgh: Institute of Occupational Medicine Ltd; Technical Memorandum Series, 1991), IOM Report TM/91/05, i-iii.

[33]B. G. Miller, M. Jacobsen, and R. C. Steele, Final Report on the CEC Contract No. 7246.16/8/001: Coalminers' Mortality in Relation to Radiological Category, Lung Function and Exposure to Airborne Dust (Edinburgh: Institute of Occupational Medicine, June 1981; Report No. TM/81/10; UDC 312.1:622.872), 598.

incapacitated them to the detriment of their working ability and wage-earning capacity.

From our earlier discussion on the wages and benefits accruing to the Northeast collier, we know that he was able to make a comfortably decent living, provided he was able to work. We now have reason to believe that, aside from accidents, he enjoyed relatively good health. It is reasonable to assume, then, that miners' wives and daughters in the Tyne and Wear were not pressured by necessity to find work outside the home. We have also learned that the collier of the West Riding earned less money than the amount needed to support a wife and family; coupled with the evidence that he was exposed to conditions that could seriously impair his health and working ability, it can be reasonably argued that the economy of the West Riding collier's family was severely strained. Knowing what we do regarding the integral role that women played in the family economy, we can readily assume that many West Riding colliers' wives and daughters sought work outside the home, and not just work for supplementary pay: they were needed, in the case of an ailing breadwinner, to become breadwinners themselves. An investigation into their options for work indicates that, in such extreme circumstances, only the jobs they found in mining were able to provide them with lucrative employment.

CHAPTER IV

WOMEN'S WORK: OPTIONS FOR EMPLOYMENT

A comparative analysis of the wages that women could earn in the West Riding in those areas of employment most typically dominated by women--domestic service, textiles, agriculture, and clothing manufacture--shows that mining wages were in fact superior. Women in urgent need of money might well have looked to the coalmines for lucrative employment.

It will be remembered that the area of the West Riding's thinnest coal seams where women might be seeking well-paying employment, was the same general area where domestic and agricultural work was scarce.[1] Not surprisingly, figures from the 1841 census show that only 2,060 out of a total of 104,628 working women in the West Riding were finding work in agriculture.[2] Wage records for women in agriculture are difficult to find, but sample figures show that their wages tended to be seasonal, and tended to be low. At Leeds (an area bordering the more agriculturally productive part of the Riding) in 1802, women were earning 6d. to 8d. per day.[3] The rate of their wages, in fact, remained steadily low until the

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[1]Hudson, The Industrial Revolution, n. 54, 118.

[2]Lee, 62.

[3]WYAS-Leeds, HAR/238. List of annual wages for Harewood estate's "labourers."

1830's, when wages began to recover from the 1813 depression.[4] The diaries of Samuel Hirst, a prosperous farmer in the Wakefield area, indicate that he appears to have hired temporary labor for the week of March 4, 1835, for wages ranging between 2s/4d and 8s/-d; the lower figure was probably a child's wages, but it seems as if women's wages had barely begun to rise over the 1802 level.[5] Given the scarcity and seasonal nature of agricultural work, it is not surprising that women sought work either in mills or mines.

The West Riding was, of course, the location of a vital textile industry, and certainly women were finding work winding, scribbling, carding, and sometimes spinning. The number of women working in textiles and clothing manufacture in 1841 amounted to 44,237, or nearly one half of the total number of employed women in the area. But what kind of wages were these women earning? In Leeds, the average weekly wage for women in mills was 6s. 5d. per week in 1833,[6] but those wages may have been unusually high. In 1843, a "clever knitter" might earn as much as 3s. per week by "incessant toil," but most were earning about 2s. 6d.[7] As late

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[4]Burnett, 15.

[5]WYAS-Wfd, Z188, Box 1 Samuel Hirst diaries dated 1831-35. It was not until the time of the Coal Mines Act of 1842 that women's wages in agriculture had finally reached competitive levels with on-cost work in the mines. The farming book of Boat Bottom Farm indicates that women were earning between 10d. and 1s. per day in 1834. Next to one of the women's names in the Boat Bottom book was the notation, "paid her off--idle beyound endurance" (WYAS-Wfd/C77 Boat Bottom farming book, 1825-1842).

[6]"First Report of the Central Board of His Majesty's Commissioners on Children in Factories," Sessional Papers, 1833, XX, 40.

[7]"Reports from the Select Committee on Agriculture with the Minutes of Evidence," Sessional Papers, 1833, V, 295-6.

as 1848, winders in Huddersfield were earning 2s. 4d. for a six-day week. These wages, compared with on-cost wages of 6s. to 10s. for a five-day week, are hardly competitive. Furthermore, there is evidence that wages were not this high as a general rule. The depressed years of the early 1840's saw over one third of Leeds' adult population unemployed, and linen weavers (Leeds had mills engaged in flax/linen production) were making no more than 4s. 11½d in a week's time.[8]

These comparative wages and shortage of alternative jobs might also account for the fact that women were working underground in the Sheffield/Barnsley area of the West Riding in 1842. Getters' wages were, as we have seen, quite low, and women seeking supplementary employment might well have had little choice in where they might work. A 45 year old collier with five girls working underground said, "I don't like their coming down, but I have had one (Ann) at home, and I cannot get any work for her to do; though I can get nothing, I have tried." He indicates that the wages she makes underground (10s. per week) would be "a hard thing to lose. . . ."[9] A collier's wife said that she could not get her daughter into service; "there is nothing else for her to do."[10] Parents appear to have disliked having to send their daughters underground, but had no alternative. An 18 year old female hurrier whose 16 year old sister also hurried underground said, "Father said last night it was both a shame and a disgrace for girls to work as we do, but there was nought else for us to

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[8]Burnett, Plenty and Want, 137.

[9]PP 1842, Children's Employment, XVI, 256, No. 128.

[10]PP 1842, Children's Employment, XVI, 263, No. 144.

do. I have tried to get winding to do, but could not."[11] This area was somewhat removed from the area of densest textile production; and Barnsley residents seeking parish relief were sent to the mines for work, further indicating the lack of alternative employment which may also account for the presence of females underground in an area where miners were presumably relatively healthy because of the thicker seams to the south. Even where alternative employment was available, underground work was simply more lucrative. Not only were miners sending their daughters underground, but non-collier families were known to send their children into the mines as well, in order to take advantage of the higher wages. A weaver and his wife sent their boys underground, asserting that weaving was "irregular work" and paid only 4s. 6d. per week as compared to 9s. per week underground.[12]

The evidence indicates, then, that in the areas where females were working underground, the reason was a combination of low miners' wages (sometimes further reduced by irregular work brought on by poor health) and a lack of alternative work that paid as well. While most of the women referred to in this study are pre-teen and teenaged girls, it was not unheard of for married women to work in the pits; they were usually hurriers, but there is evidence that women were working as getters as well.[13] As we have seen, unlike the pitmen of the Tyne and Wear, the collier of the West Riding was unable to support his family by himself;

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[11]PP 1842, Children's Employment, XVI, 252, No. 113.

[12]PP 1842, Children's Employment, XVI, 265, No. 156.

[13]PP 1842, Children's Employment, XVI, 234, ¶ 11 and Evidence, p. 248, No. 99 and p. 247, No. 97.

certainly that was the opinion of the owner of Hunshelf Bank colliery who said, "There are people in this neighborhood who cannot do without their children working in the pits."[14] Finally, it should be remembered that trade-cycles brought on by industrialization had the potential to make women's employment in the West Riding sporadic, whereas the women of the Tyne and Wear left underground work before such cycles could affect them.

Whether females were seeking work in mines because there was no other work available for supplementary income, or because they were forced to seek more lucrative employment to compensate for their husbands' and fathers' reduced wages due to illness, women in the West Riding coalmining communities clearly were looking for ways to contribute to the family's economic viability. On the other hand, the women of the Tyne and Wear, three generations before, had been able to leave the mines of their own volition due to a number of factors. Job security afforded by the bond and a year-round demand for coal, collective negotiation for higher wages and better benefits, mining techniques that offered pitmen a chance at superior health and wage-earning capacity, and a favorable wage to cost of living ratio all contributed to the miners' ability to earn high enough wages to relieve economic imperatives for women's work outside the home. From this perspective, the notion of "exclusion" seems overdrawn and unwarranted. Rather, it seems as if women were not working in the coalfields of the Tyne and Wear at the time of the Commissioners' Report of 1842 because they simply had chosen not to do so, and were in a situation that made their decision both reasonable and workable.

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[14]PP 1842, Children's Employment, XVI, 234, No. 39.

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Manuscript Sources

Durham County Record Office, Durham

NCB First Deposit:	NCB/I/JB	Papers of John Buddle
	NCB/I/X	Miscellaneous papers
	NCB/I/SC	Stella Coal Company papers
	NCB/I/TH	Thomas Young Hall papers
D/St	Strathmore manuscripts	
D/Sa	Salvin manuscripts	
D/Wat	Watson manuscripts	

Northumberland Record Office, Gosforth

NRO/Wat	Watson manuscripts
NRO/Bud	John Buddle manuscripts
NRO.82/ ZCO	Cookson manuscripts
NRO/2De	Delaval manuscripts

West Yorkshire Archive Service - Leeds

TN/HA/C	Temple Newsom and Halton colliery records
HAR/accounts	Harewood accounts
MC	Middleton colliery manuscripts

West Yorkshire Archive Service - Wakefield

C77	Boat Bottom Farm, farming book, 1822-43
C495	Wakefield farm account book, 1839
Z188	Samuel Hurst diaries, 1831-80

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APPENDICES

APPENDIX A

Letter to Lord Delaval regarding cavil, undated (probably late 1780's). As it was saved, one might believe that its petition was favorably received.
(NRO 2De/7/6/20)

My Loard

I hope your honerable Loardship Will pardon the liberty of one of your eldering subjects and it is throuw the greatest necefsity that makes me do it my lord for I have wrought in the collery all my life time and so did my fathor he was employed about Seaton Haul [Seaton Hall] several years before he lost his eys sight and my unkil George Wilk'on and his Wife both leaved and lied in favour of the Honerable Dalevails and if it is my lords good pleasure I hope to leave and die hese humble servent, my lord I was lotted out of the Main coll pit into the Low seem and pleasure your lordship I cannot work in it, it is so low without making my days meserable with trouble all by a pain that came in to my Back three years ago whin I was at my work and hath been ever since a great complent to me--& my lord Mr Crooks [the viewer] is so hard that he will forse Me to work thair and no whair els or to go about my businefs all on a count of sum offence that I have geven Mr Crooks and he sais that I shall never have A favour that He can hinder me ef & please my lord I dizert [desire] no more favour then to stay in the pit whair I can work & pleasure my Lord I cannot think of no offence I have given any further then equenting his Lordship of Gledson cursing my Lord. & Mr Crooks hath hold it me at a groige ever since & it is very hard he hath cept me of[f] my work a bove a month sore against my will My lord I have nothing else to depend uppon but my work as long as god is pleased to spair me with my Life and hilth and stil is willing to be my Lords humble servent if it is my Lord's will and pleasure to employ me.

& if it is my lords pleasure to hear my carictor I can get it from people of creadit under his Lordship primmeces.

from your Humble Lordship
Humble servent

George Hindmarch

APPENDIX B

Unsigned letter to Lord Delaval dated December 20, 1789.
(NRO De 7/6/17)

My Right Hon'ble Lord Delaval Exquse my fredem but I have seane so much of Pepel Stealn Coals that ican not Let it pas nolongner with out let your Lord Ship no of it.

Henery Wilson tow fires James Lawson three fires Thomas Reay four firs and thease three Pepel dis not by half of thar Coals and all Tradesmen if your Lord Ship in quires at the Coleare office you will find in the Landsale bel What isa to be the throrith.

APPENDIX C

Correspondence from Crooks to Delaval, April 20, 1795
(NRO 2De 4/6/69)

A few days since, our Pitmen applied to me & the rest of the Agents, to know if we had any objection to provide them Rye at 8s./p Boll, as the same was now become general at all the Collieries both on the Wear & Tyne, & also at Plefsey. declaring, at the same time, that the high price of corn, particularly Wheat & Oats, rendered it impofsible for them to provide any longer for their Families without some Aid or afsistance. This being a new claim & never before requested, they were told that nothing of the kind could be done without your Lordship's exprefs Order. They then requested no time might be lost in applying to your Lordship.

For a grant . . . I have since [learned that] at several of the Neighbouring Collieries what regulation they use in the serving it out to the different Families, which I find, is one Peck p/Fortnight to Each person according to the number they respectively contain. They deliver it [?] at 8s./per Boll & pays [sic] for it at present not lefs than 10s./6d. & I believe some is sold still higher. Therefore a considerable lofs will attend it. But is everywhere done at present.

On August 17, 1795, Crooks writes again, concerned that the sale of cheap corn to pitmen at nearby collieries will induce "great numbers" of their miners to bind elsewhere (NRO 2De 4/6/69).

APPENDIX D

Percentage of Silicates in Interseam Strata

Siltstones	20 - 50%
Mudstones and Shales	45 - 60%
Fireclays	50 - 75%
Siliceous Seat Earths	90%+
Sandstones	80 - 90%
Ironstones	0 - 20%
Limestones	0%

Source: Williamson, Coal Mining Geology, 54-65.

APPENDIX E

Letter to Lord Delaval, dated October 18, 1806
(NRO 2De 7/6/26)

My Lord

Emboldened by that Humanity and Benevolence that so Eminently Distinguishes Your Lordship I presume to present My Case. I had on Sunday Last the Misfortune to be Deprived of my Father in his Eighty Sixth year -- the Greatest part of those years He had the Honour of Serving Your Lordship by taking account of the Coals worked Each Day -- and Set out work -- But Having the Misfortune of Being Severely Burnt Some years ago his sight was so much Impaired that the whole has for Many years Devolved on Me -- --

What I would Humbly beg of Your Lordship is that I may be allowed to Continue to keep the Account in the Usual way - by taking it from the Banksmen every Evening at Home -- as that and My Sisters School would Render Us Comfortable. I would Humbly beg Your Lordship's Leave to Continue in the House which has been for a Number of years in the pofsefsion of Our Ancestors--

Humbly Imploring Your Lordships Pardon for the Liberty I have presumed to take and with the most Ardent Prayers that Your Lordship and Lady Delaval may Long be Continued to Blefs a Number of Family's whose Interest and Happinefs has ever been your Lordships Care -- I beg Leave to subscribe My self

My Lord

Your Lordships
Most Obedient
Humble Servant
Mary Smith

VITA

Janice McClelland pursued undergraduate studies at the University of Tennessee, Knoxville, where she majored in Music and Honors History. During that time, she was a soloist with the Concert Choir and sang with the Chamber Singers, the University's a cappella group. She was graduated summa cum laude in December of 1991 with a Bachelor of Arts degree. The following fall, she entered UTK's master's program in history, concentrating her studies on Modern European history while teaching courses in the Women's Studies Program. In spring of 1994, McClelland received funding to do archival work in Great Britain and went to England that summer to do research on mining communities and miners' health during the Industrial Revolution. She was awarded the Master's degree in August of 1995.

McClelland is currently employed as a soprano soloist at St. John's Cathedral in Knoxville and is continuing her studies in the doctoral program at the University of Tennessee.