

Durham E-Theses

*The economic and social conditions of lead miners in
the Northern Pennines in the eighteenth and
nineteenth centuries*

Christopher John Hunt

How to cite:

Hunt, Christopher John (1968) The economic and social conditions of lead miners in the Northern Pennines in the eighteenth and nineteenth centuries. Masters thesis, Durham University.

Use policy

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

- a full bibliographic reference is made to the original source
- a <https://etheses.durham.ac.uk/id/eprint/9958/> is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

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

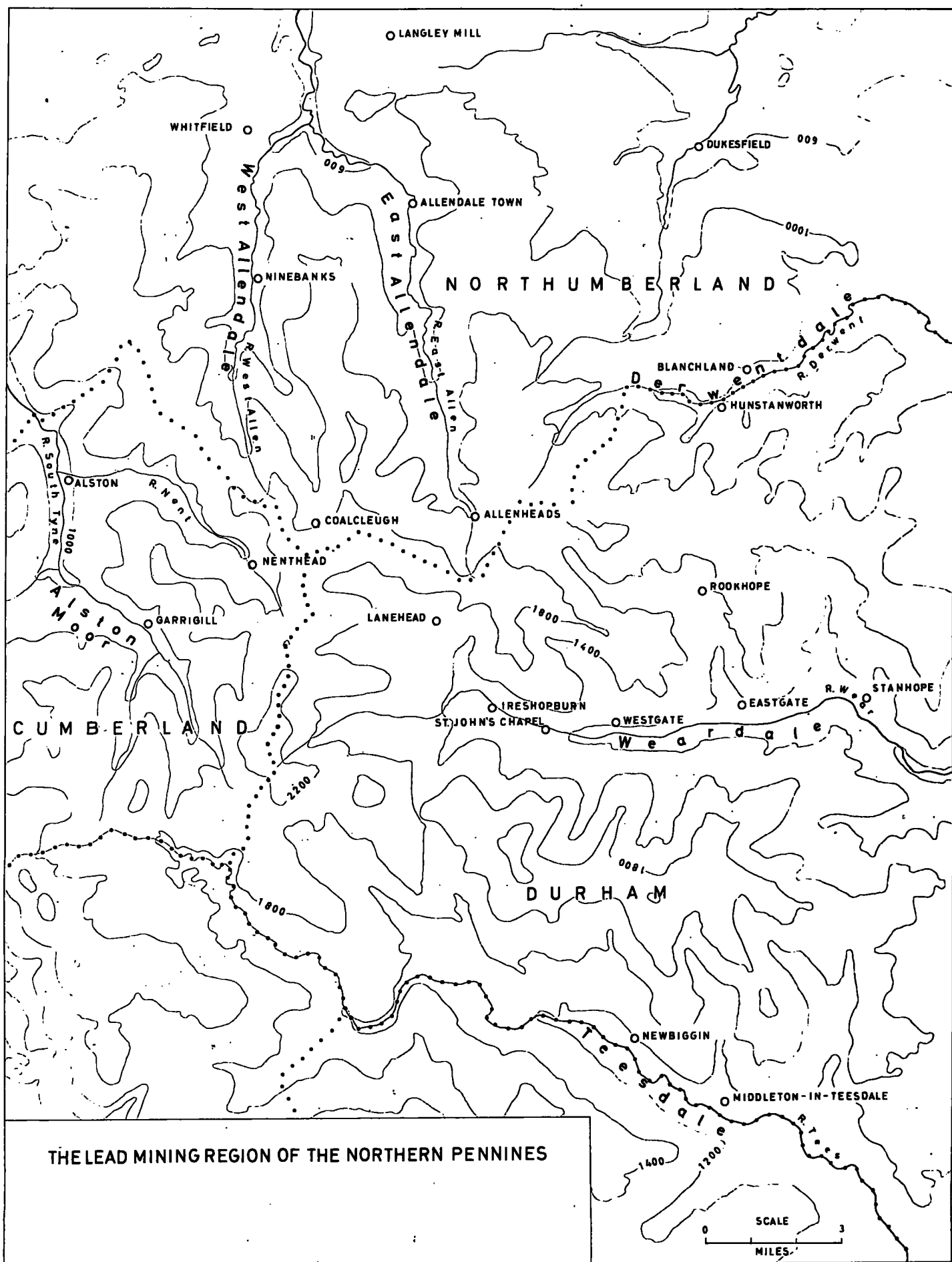
Please consult the [full Durham E-Theses policy](#) for further details.

The economic and social conditions of lead miners in the Northern Pennines in the eighteenth and nineteenth centuries.
Summary of a thesis submitted by C.J. Hunt for the degree of M. Litt. of the University of Durham, 1968.

In the eighteenth and nineteenth centuries the lead mining industry of the Northern Pennines passed through a managerial and industrial revolution. Superficially, life in the lead mining dales changed less between 1750 and 1850 than in the neighbouring coal fields and shipyards. The wild and romantic Pennine scenery remained little corrupted by industrialisation. Mining continued to be governed by an apparently unchanged elaborate system of sub contract. But population increased by a factor of three or four, and below the surface (metaphorically speaking) social institutions changed fundamentally.

Technological advances in underground haulage and in ore dressing at the beginning of the nineteenth century forced organisational changes on the mine owners. In these fields sub - contracting was either abolished, or regulated so closely that the sub-contractors were direct employees in all but name. The contracts governing actual ore getting became tighter, reducing the practical status of the theoretically independent miner to that of an employee. The proportion of agents to workmen increased, allowing greater supervision. The miners were paid more regularly - and were expected to work more regularly.

Outside working hours there was little of their social life not influenced by the mine owners by 1850. Education, churches and chapels, benefit societies, even organised amusements were provided or subsidized by the mining companies. But, misdemeanours in private life - drunkenness, fathering a bastard child, etc. - were as much the province of managerial discipline as any offence during working hours. By 1850, at work and outside, the lead miner was dominated by his employer.



The Economic and Social Conditions of Lead Miners in the
Northern Pennines in the Eighteenth and Nineteenth Centuries

By Christopher John Hunt

A thesis presented for the Degree of Master of Letters
of the University of Durham.

1968

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

ACKNOWLEDGEMENTS

I should like to record my thanks to the following for help received during the writing of this thesis:-

All the private owners, archivists and librarians who have allowed me access to books and papers.

Mr. John Knipe and his staff at the Atlas of Northern England drawing office for help with the general map of the lead mining region.

Dr. Mark Hughes for allowing me to quote statistics compiled for his own thesis, and for helpful suggestions regarding sources.

My mother for typing the final version of this thesis on to lithographic masters.

My wife for typing the first draft and for constructive criticism throughout.

Professor Kingsley Dunham for reading and criticising certain chapters.

Professor Edward Allen who has helped me at every stage of the compilation and writing of this thesis.

v

CONTENTS.

Chapter 1 - Introduction.

pp. 1-12.

Physical geography and climate of the mining region.	1.
Settlements.	2.
Communications.	3.
Importance of lead mining to the inhabitants.	5.
The mining region.	7.
Alston.	7.
Allendale.	8.
Weardale.	8.
Derwent.	9.
Teesdale.	9.
Tyne valley.	9.
Sources used in writing this study.	10.

Chapter 2 - The Lead Mines.

pp.13-54.

Geology of the mining region.	13.
The lead mines.	15.
Discovery.	15.
Shafts and levels.	16.
Supports.	20.
Access.	21.
The ore workings.	23.
Underground haulage.	24.
Mine drainage.	27.
Water power versus steam power.	28.
The miners' work.	32.
Opening up a mine.	32.
The approach to the vein.	33.
Blasting.	36.
Bringing out ore and deads.	37.
Getting rid of water.	39.
Specialist workmen.	41.
Accidents.	43.
Ventilation.	44.
Natural.	46.
Artificial.	49.
Effectiveness.	51.

Chapter 3 - The Bargain System.

pp.55-94.

Nature of the bargain subcontract.	55.
"Hirelings".	58.
Bargain books.	60.
Period.	60.
Ritual.	61.
Development of the bargain system.	63.
Bingtale, Fathomtale, & Tontale.	63.
Mechanisation of ore dressing.	66.

London Lead Company nineteenth century changes.	67.
Tribute and Tutwork in Derwent mines.	68.
Beaumont nineteenth century changes.	69.
Fixing of place to be worked.	70.
Tighter control over workmen in nineteenth century.	71.
Specialisation.	73.
Partnership numbers.	73.
Juvenile miners.	74.
Few compared with collieries.	75.
Work.	76.
Wages.	77.
Day-rate men.	78.
Hours of work.	79.
Friction points in bargain system.	84.
Organisation of underground haulage.	85.
Supply of tools, candles, and gunpowder.	90.

Chapter 4 - Payment and Earnings. pp.95-141.

Pays and subsistence.	95.
Accounting system.	96.
The Pays.	97.
Date and frequency.	98.
Subsistence.	103.
Eighteenth century irregularity.	103.
Sums paid.	104.
Why the system existed.	106.
Pressure for change.	108.
Nineteenth century changes.	111.
Ceremonial.	114.
Individual payment of the miners.	117.
The incomes of the miners.	119.
Difficulty of settling on "average".	120.
Statistical evidence.	121.
Influence of the market price of lead.	123.
Increasing expectations of miners.	127.
Wage equalisation policies.	128.
Chronological survey.	131.
Friendly societies.	134.

Chapter 5 - Washers, Smelters, Carriers, and Agents. pp.142-199.

Washing - Technology.	143.
Eighteenth century.	144.
Nineteenth century mechanisation.	148.
Washing organisation.	151.
Eighteenth century.	152.
Nineteenth century.	153.
Work of washers.	156.

Washing labour force.	158.
Women.	158.
Boys.	159.
Hours of work.	161.
Wages.	161.
Numbers of washers.	162.
Smelting - Location of mills.	163.
Smelting - Technology.	164.
Smelting Organisation.	167.
Competition for skilled men.	169.
Payment and earnings.	172.
Hours of work.	175.
The carriers.	178.
Organisation.	179.
Payment.	184.
Competition for their services.	185.
Agents.	190.
Increase in numbers in nineteenth century.	191.
Career structure.	193.
Salaries.	196.
Perquisites.	198.

Chapter 6 - Strikes and Industrial Disturbances.

pp.200-225.

The eighteenth century.	200.
The London Lead Company in the nineteenth century.	202.
The Beaumonts in the nineteenth century.	203.
Particular strikes.	
Weardale 1795/96.	204.
Weardale 1818.	208.
Allenheads 1849.	212.
Absence of trade unions.	223.

Chapter 7 - The Pattern of Settlement.

pp.226-278.

Siting of settlements.	226.
Nineteenth century land shortage.	229.
Construction of dwellings.	230.
Houses at Langley Mill.	232.
Nineteenth century Nenthead.	233.
Comparison with neighbouring communities.	235.
Tenure.	237.
Miners as part time farmers.	239.
Access to and size of smallholdings.	241.
Value of smallholdings to miners.	243.
Value of smallholdings to mine owners and landlords.	244.
Estate policies of mine owners.	244.
Greenwich Hospital.	245.
London Lead Company.	248.
Blackett/Beaumonts.	249.

Nature of farming.	251.
Stock.	252.
Parliamentary enclosure.	254.
Terms of Acts.	255.
Effects on smallholders.	256.
Stimulus to improved farming methods.	261.
Decline of lead mining.	264.
Gardens.	265.
Fuel.	267.
Journey to work.	269.
Growth of settlements around new mines.	271.
Private lodgings.	273.
Company lodging "shops".	274.

Chapter 8 - Food and its Supply.

pp.279-309.

Budgets of miners.	279.
Evidence concerning food eaten.	280.
Bread.	281.
Rye.	282.
Maslin.	285.
Barley.	285.
Oatmeal.	286.
Other foodstuffs.	289.
Potatoes.	289.
Vegetables.	290.
Milk.	291.
Meat.	291.
Beverages.	292.
Diet.	293.
Supply of food.	295.
Marketing.	296.
Credit buying.	299.
Help from the mining companies.	301.
Co-operative buying.	307.
Constant threat of shortages.	307.

Chapter 9 - Population, Migration and the Poor.

pp.310-345.

Statistical evidence for population history.	310.
Eighteenth century population.	312.
Nineteenth century population.	316.
Collapse of lead mining.	317.
Factors in population change.	318.
Exhaustion of mining field.	318.
Growth of alternative industries.	321.
Migration.	322.
Into the region.	322.
From and within the region.	324.
Why?	325.
Where?	331.
Migration in the eighteen thirties.	334.
Relief of the poor.	340.

Chapter 10 - Health.

pp.346-355.

Vital statistics of the mining region.	346.
Early death of miners.	346.
Pneumoconiosis.	348.
Symptoms.	349.
Attitude of miners towards health.	352.
Attitude of mine owners towards health.	353.
Medical provision.	354.

Chapter 11 - Religion and Social Life.

pp.356-382.

The Church of England in the eighteenth century.	356.
Growth of Wesleyan Methodism.	363.
Growth of Primitive Methodism.	368.
Religious establishment in the mid nineteenth century.	371.
Crime.	372.
Poaching.	373.
Alcohol.	375.
Freedom in eighteenth century.	375.
Temperance enforced by mining companies in the nineteenth century.	378.
Sports and pastimes.	380.
Rough sports of the eighteenth century.	280.
Disciplined amusements of the nineteenth century.	380.
Mine owners' control over total environment of their employees.	382.

Chapter 12 - Education.

pp.383-412.

Intelligence of lead miners.	383.
Stimulus of environment.	384.
Education to 1818.	387.
Demand for better educational facilities.	393.
New schools 1818-1840.	395.
Barrington schools.	397.
London Lead Company schools.	397.
Sunday schools.	400.
Education in 1842.	402.
Sopwith's educational reforms.	403.
Education in 1861.	406.
Libraries.	407.

Chapter 13 - Conclusion.

pp.413-415.

DOCUMENTS.

pp. 419-433.

1. London Lead Company Court Resolutions.
Setting down rules for the Company's
chief agent to follow in administering
mines and estates. 419.
- 13A. 6th Oct. 1785. 419.
17. 6th Dec. 1810. 420.
- 7th Mar. 1812 (in so far as they differ
from the Resolutions of the previous
year.) 422.
2. Arrangements recommended to Colonel and Mrs.
Beaumont for the future Agency and
Management of their Lead Mines. [1804?]
Blackett of Wylam Papers, Northumberland
Record Office. 423.
3. To the Hon. Col. Beaumont, M.P. The humble
Petition of the Commetee of Weardale Miners.
Aug. 17th, 1796.
Hexham Manorial Papers, Newcastle
University Library. 427.
4. The humble petition of the Miners in Weardale.
September 1818, together with an accompanying
letter from the miners to Col. Beaumont.
Blackett/Beaumont lead mining records,
Newcastle University Library. 429.
5. Rules and regulations to be observed and kept
by the Contractors for Washing Bouse and Wastes
at Barney Craig and Coalcleugh Leadmines
entered into this 23rd day of April 1833.
Blackett/Beaumont lead mining records,
Newcastle University Library. 431.

STATISTICAL TABLES.

pp. 434-456.

1. The months in which Blakett/Beaumont "Pays"
were held, 1755- . 434.
2. Frequency and amount of Subsistence Payments,
London Lead Company and Blakett/Beaumonts,
1766-1875. 435.
3. Subsistence payments to individual miners in the
Beaumont mines in Weardale, 1790-1812. 436.

4.	Contemporary estimates of the annual earnings of lead miners.	437.
5.	Houses with and without land attached, Allendale, 1861.	439.
6.	Decennial Census Population figures, 1801-1901.	440.
7.	Alston Moor lead mines: persons employed each quarter 1738-1767: 1818-1844.	441.
8.	Selected employment figures cited in London Lead Company Minute Books, 1801-1814.	447.
9.	London Lead Company quarterly employment figures, 1815-1820.	448.
10.	Persons employed at Allenheads and Coalcleugh lead mines, Midsummer Quarters. 1754-1854.	449.
11.	Non-native inhabitants of Nenthead, 1851.	452.
12.	Statistics showing the growth of Methodism.	453.
13.	Churches and their congregations in Alston Parish, 1840.	454.
14.	Church attendance at evening service in Alston Poor Law Union, 1851.	455.
15.	Growth of Primitive Methodism in Weardale.	456.

BIBLIOGRAPHY.

pp. 457-466.

MAPS AND ILLUSTRATIONS.

- Frontispiece. General map of the lead mining region of the Northern Pennines.
1. Map of the mining region showing lines of communication with the East Coast in 1833. From Sopwith, T. - Alston Moor, 1833.
Facing page 4.
 2. Two photographic views of a [deserted?] lead mine in the Northern Pennines at the beginning of the twentieth century. The taller building on the right in the upper illustration is a miners' shop. The lower illustration shows a washing floor. From Oliver, T. - Dangerous trades, 1902.
Facing page 12.
 3. Miners climbing stemples. Illustration from the 1864 Report.
Facing page 22.
 4. Entries from the Blackett/Beaumont bargain books, June/July, 1734 and April, 1866.
Facing page 64.
 5. Miners' pay slips. From the Appendix to the 1864 Report.
Facing page 96.
 6. Equipment used for washing lead ore at the beginning of the nineteenth century. From Mulcaster, J. - Method of smelting lead ore, M/S in Newcastle Literary and Philosophical Society Library.
Facing page 142.
 7. The washing of lead ore in 1842: a diagrammatic representation of the hand and mechanical processes involved.
Facing page 148.
 8. A plan of Allenheads in 1793. From the Allendale Parish Enclosure map in the Northumberland Record Office.
Facing page 240.
 9. A plan of Allenheads in 1861. From a privately commissioned survey of Allendale. Copy in Newcastle University Library.
Facing page 242.

10. A plan of Langley Mill Grounds, c.1805.
From a collection of early nineteenth century engraved plans of the Greenwich Hospital estates, in Newcastle University Library.
Facing page 246.
11. A plan of the village of Nenthead in 1828.
From the London Lead Company official plans in the North of England Institute of Mining and Mechanical Engineers.
Facing page 248.

GRAPHS.

1. A comparison between the market price of lead, 1755-1855, the top price per bing given for raising ore by the Blakett/Beaumonts, 1755-1855, and the subsistence rate per month given by the Blakett/Beaumonts, 1790-1855.
Sources. Explained in text.
Facing page 122.
2. The population of the lead mining region as given by the Decennial Censuses, 1801-1901.
Facing page 316.
3. Employment on Alston Moor, 1738-1767 and 1818-1844, and at Allenheads and Coalcleugh, 1754-1854.
Sources. Statistical Tables 7 and 10.
Facing page 318.

Glossary of selected lead mining terms.

Bing.	The standard measurement of lead ore, equivalent to 8 cwt.
Bingtale.	A contract for payment according to the weight of the washed ore delivered.
Bouse.	Unwashed ore.
Bucker.	Hammer for crushing bouse.
Buddle.	Apparatus for washing ore.
Dead work.	Mining operations intended to open up a vein and not to raise ore.
Deads.	Waste material extracted from mine.
Fathomtale.	A contract for payment according to the distance driven.
Flat.	Horizontal ore deposit.
Forehead.	The face of a mine working.
Galloway.	Either a single packpony or a team .
Galloway Level.	A railed level from which horses could drag bouse and deads.
Grove.	A lead mine.
Hush.	Either the removal of surface soil by a rush of water in an attempt to disclose a vein or the result of such an action.
Kibble.	A small bucket.
Length.	Place of work specified by contract.
Level.	A mine adit.
Pickings.	Old workings.
Sump.	A shaft which does not reach the surface.
Tack.	The leasing of a small amount of ground for mining.
Tontale.	A contract for payment according to the weight of lead smelted.
Vogue.	A waggon used underground.
Washing.	The dressing of lead ore.
Wastes.	That part of the bouse discarded during washing.

ABBREVIATIONS.

B/B.	Blackett/Beaumont M/Ss.
L.L.C.	London Lead Company M/Ss.
Adm.	Admiralty. Greenwich Hospital M/Ss.
<u>1842 Report.</u>	Children's Employment (Mines) R. Com. 1842.
<u>1864 Report.</u>	Mines Commission. 1864.

See Bibliography for full details.

CHAPTER 1.Introduction.

The object of this thesis is to study the social and economic conditions of lead miners in the Northern Pennines during the eighteenth and nineteenth centuries. In this period there occurred an industrial and managerial revolution that greatly changed the lives of the miners, outside work as well as during the actual working hours. The loose industrial organisation of the eighteenth century, when miners sold the produce of their labour rather than their labour itself, gave place to tight managerial control, not only over the place of work, but also over the entire environment of the miners.

The region under consideration is an area of some 650 square miles in the highest and most northerly part of the Pennines. Its centre is not far from where the three counties of Northumberland, Cumberland, and Durham meet. The region is virtually in the centre of Britain - in fact Allendale Town claims to be the centre. It is drained by six rivers and their tributaries - the South Tyne, the West and East Allen, the Derwent, the Wear, and the Tees. The dales of these rivers, in which lie the settlements, are themselves nearly all more than 700' above sea level. The ridges between the dales range from 1500' to 3000'.

The climate is severe by English standards. Winter starts early and continues late, commonly extending into April. The summers tend to be cool and wet. Rain falls on an average of more than 200 days per year. (1) Snow frequently covers the

(1) The geography of the "lead dales" is described by

2.

higher hills for more than 5 months of the year.

Human settlements are limited to the dales, becoming fewer and more scattered as altitude increases and shelter diminishes. In the period 1750 to 1850 there was an expansion of population and of the number of settlements, which crept nearer and nearer to the heads of the dales. "New" villages developed, often around the headquarters of mining companies, but the older villages continued to serve as the marketing centres of their respective dales. Alston was the centre for South Tynedale and the Nent Valley (Alston Moor): Allendale Town, for East and West Allendale: Blanchland, for Derwentdale: Stanhope, for Weardale; and Middleton, for Teesdale. (2)

The high moorland which separated dale from dale formed a barrier isolating the inhabitants of each from their neighbours. The social links of each dale were with the inhabitants of the areas further down the rivers, rather than with those of the other dales.

The region as a whole was orientated towards the East. Alston was in Cumberland, but separated from the rest of the county by the highest hills in the Pennines. Its natural links,

A.E. Smailes - The dales of North East England. 1932.

- North England. 1961. pp. 271/284.

An excellent description of the face of the region in 1842 is given by Assistant Commissioner Mitchell in his Report to the 1842 Commission, pp. 721/724.

Map 1, facing the title page of this thesis, is a general map of the region.

- (2) The pattern of settlement is discussed at length in Chapter 7, and population in Chapter 9.

therefore, were with Northumberland, along the course of the South Tyne.

In the eighteenth century roads within the region were appallingly bad, even by contemporary standards. Rain or snow made them virtually impassable. In 1735 a surveyor of the Greenwich Hospital, which had just been given the confiscated northern estates of the Jacobite Earls of Derwentwater, requested that he should be allowed to postpone his survey of Alston Moor because: "in the first place it is in such a part of the world that they are seldome without rains, in the next it is so Mountainious and Rotten that it would be with difficulty that a man could walk upon the mosses in many places." (3) The roads were so bad that carts were not used in the eighteenth century; galloways, or trains of packhorses, were the only form of transport. Roads were so badly constructed that after a few years' use they were often abandoned for new routes, their surfaces having deteriorated to a state worse than that of the surrounding moorland. John McAdam reported to the Greenwich Hospital in 1823 that the roads "are altogether the worst that have yet come to my knowledge - not only have the old defective methods been followed in the formation, stoning and subsequent repair of the Roads, but the work has been executed in the most slovenly careless manner, without method... No pains having been taken to preserve the Roads from the Winter floods, by keeping open the waterways, they are washed out so as to present the appearance of a bed of rocks

(3) Adm. 66-105. p. 32.

4.

rather than an artificial road." (4)

At the beginning of the nineteenth century the proprietors of land and mines realised that the construction of better roads would be a worthwhile investment. In the ten years between 1820 and 1830 were built most of the roads which exist to-day. (5) The Greenwich Hospital and the two largest mining concerns, the London Lead Company and the Beaumonts, spent thousands of pounds on roads in this period, concentrating on those leading out of the dales. The roads between dale and dale remained bad until after the middle of the century. Thomas Sopwith, whose diary is frequently quoted in this thesis, wrote in 1838 that "Stanhope is at all times nearly inaccessible from Middleton except by a very circuitous route and particularly so after the heavy rains which have fallen of late." In the winter of 1846 he similarly noted that "The road from Allenheads to Coalcleugh [the two major mining centres within Allendale] is deplorably bad and in several places is impassable even with a pony." (6)

After 1850 railway lines were built up each dale. Alston, Allendale Town, Wearhead in Weardale, and Middleton were all the termini of branch lines. Needless to say all have now (1967) long been closed down. (7)

(4) Greenwich Hospital Report. 1823. p. 14.

(5) Map 2^{Plat. 1} is a reproduction of the map given in Sopwith's Alston Moor. 1833. It shows the communications between the mining region and the North Eastern ports.

(6) Sopwith, T. - Diary. July 9th, 1838: Jan. 7th, 1846.

(7) More is said about communications in that section of Chapter 5 dealing with the carriage of lead.

Plan

OF THE PRINCIPAL ROADS &c

Communicating with the

MINING DISTRICTS

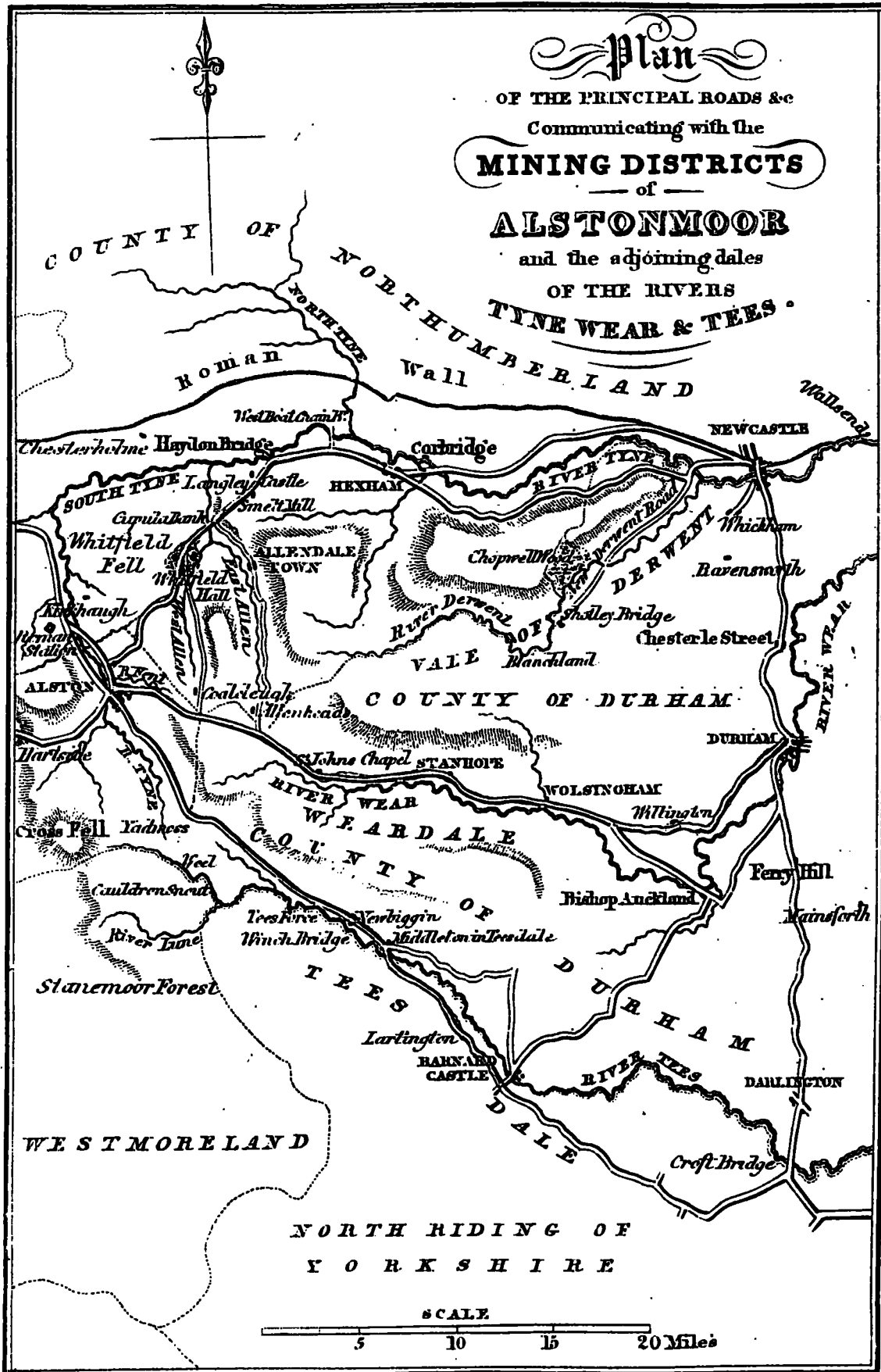
of

ALSTONMOOR

and the adjoining dales

OF THE RIVERS

TYNE WEAR & TEES



NORTH RIDING OF
YORKSHIRE

SCALE

5 10 15 20 Miles

The lead mining region was therefore very isolated until well on into the nineteenth century. No trunk roads ran through it; no traveller would go there accidentally, en route to somewhere else. Visitors or immigrants came there deliberately. In Chapter 9 of this thesis it will be shown that the latter were very few.

In the eighteenth and nineteenth centuries the greater part of the population of the upper dales depended upon lead mining for a living. In 1857 the chief agent of the London Lead Company reckoned that nine tenths of the population of Teesdale were connected with the mines. On Alston Moor "the whole of the residents... are, either directly or indirectly, taking them as a mass, connected with the mines". There was no distinct farming population. "The population is so mixed up, the farming with the mining population, that they are almost all as one; it is scarcely possible to go into a family occupying half an acre in Alston Moor or Teesdale, without finding that one or more members of the family are workmen employed in the mines." (8)

Apart from the service industries - shops, inns, etc. - there was virtually no alternative to lead mining. The land was too poor for arable farming. Communications were too bad to attract manufacturing industries. In the nineteenth century small deposits of zinc and copper were mined, and the discovery of iron ore in lower Weardale led to a temporary boom in employment there that lasted for some two decades after 1850. However,

(8) Rating of Mines Select Committee Report.
1857. pp. 26/29.

for most of the period and for the greater part of the region, lead mining was the only industry. There was no employment for women in the nineteenth century, although in the eighteenth, some were employed in dressing lead ore. Many lead mining families possessed smallholdings, but these were too small and poor to provide a living by themselves. When lead prices collapsed and mines closed in the eighteen seventies and eighties the greater part of the population of the region was forced to migrate. (9)

Lead miners were not engaged only in extracting metal from the ground. The produce from the ground was lead ore; this had to be dressed ("washed" in local terminology) and smelted before it became lead. The labour force was divided into three parts - the miners proper, the washers, and the smelters. In the eighteenth century the first two divisions were confused, the miners commonly washing their own ore; the smelters, however, were separate. In the nineteenth century a threefold division of the labour force became more rigid in all the larger mining concerns. (10) In addition there were the "carriers" engaged in the transport of the ore and lead. As will be shown later, however, most of these lived outside the mining region.

The mines were worked either directly by the landowner who

(9) More extended discussion of smallholdings will be found in Chapter 7, and of population and migration generally in Chapter 9.

(10) Following the practice of eighteenth and nineteenth century sources the word "miners" is used in this thesis to mean (generally) all the workmen engaged in mining and (narrowly) those extracting the ore from the ground. The context should make the meaning obvious.

owned the mining rights, or leased by him to concessionaries. In fact only the Blackett/Beaumont family, who owned the mining rights in Allendale, chose the first alternative. Other major landowners preferred to lease their rights in exchange for either cash (as did the Bishop of Durham in Weardale) or a percentage of the ore raised (as was done by the Greenwich Hospital on Alston Moor.) (11)

The mining region comprised six distinct areas - Alston Moor: East Allendale, or Allenheads: West Allendale, or Coalcleugh: Derwent: Weardale; and Teesdale. In addition there was a small mining field in the Tyne Valley, north of Haydon Bridge and Hexham, separated by some seven miles of country devoid of lead deposits from the mining region proper; this field, however, "quite evidently belongs to the same mineralization province" and evidence referring to the mines within it is quoted in the course of this thesis. (12)

Alston Moor was given to the Greenwich Hospital in 1735, and the mines, which had not been worked for many years, were gradually opened up. The Hospital did not work mines directly but leased them in large and small lots to others in exchange for a

(11) See Hughes, M. - Land, lead, and coal. 1963. pp. 43/69 for the best account of how mining royalty owners converted their rights into cash.

(12) Dunham, K.C. - Northern Pennine Orefield. 1948. p. 319. Map 1 shows the divisions of the mining region. References in this thesis are normally to these mining areas, rather than to individual mines and veins, save in quotations. Dunham lists all mines and veins, so far as they can be traced to-day.

8.

percentage of the ore raised. This ore was then sold back to the mining companies until 1767 when the Hospital built a mill at Langley to deal with it.

The most important lessee of the Greenwich Hospital was the London Lead Company (known also as the Governor and Company or the Quaker Company). This company was the largest single employer of labour on Alston Moor from the mid eighteenth century until the end of the nineteenth. It operated from two centres, at Nenthead on the River Nent, a tributary of the South Tyne, and on the South Tyne itself at Garrigill. (13) There were many other mining concerns on Alston Moor, some very small, employing less than 20 men, and others employing 150 or more. The Hudgill Burn and Rodderup Fell Companies were of importance during the nineteenth century. Little evidence survives about the others.

The mines in Allendale were worked directly by the Lord of the Manor, the most important landowner. This title was held by the Blackett family of Wallington until 1792, when it passed through an illegitimate daughter to the Beaumont Family. The East and West Allendale mining areas were administered separately the one from Allenheads, the other from Coalcleugh.

The Blackett/Beaumonts also leased most of the mines in Weardale, belonging to the Bishop of Durham. Throughout the eighteenth and nineteenth centuries this family concern was by far the largest employer of labour in the region. (14) All the

(13) Dr. A. Raistrick has narrated the history of the London Lead Company in The London Lead Company (in Newcomen Soc. Trans., Vol. 14, 1933/34. pp. 119/162,) and Two centuries of industrial welfare. 1938.

(14) In 1842 the Beaumonts employed just over 2,000 persons in

mines in the western part of Weardale, and in the tributary dale of Rookhope, were mined by the Blackett/Beaumonts. A smaller group of mines to the south of Stanhope were leased jointly to the Blacketts and the Bacon family in the eighteenth century, the "Partnership Mines" as they were called in the Blackett records. In 1791 the London Lead Company took over the leases of these mines and worked them for most of the nineteenth century.

The Derwent mines were worked in the eighteenth century by the London Lead Company, based at Blanchland. The Company abandoned this area in 1806 and the mines were worked for a short time by Easterby, Hall and Company, and then by the Derwent Mining Company who built the new village of Hunstanworth from which to conduct its operations.

Teesdale was worked in the eighteenth century by numerous small groups about whom little has survived. The London Lead Company leased a few mines in the mid eighteenth century; at the beginning of the nineteenth it greatly expanded in the dale, taking over from the smaller concerns. Middleton in Teesdale was the headquarters of its district agent.

The most important mines in the Tyne Valley were Fallowfield and Settlingstones, both of which were worked in a desultory fashion throughout the eighteenth and nineteenth centuries. Evidence about how they were worked, remuneration of their miners, etc. is quoted in the course of this thesis. The country around

Allendale and Weardale. Dr Mitchell (1842 Report, p. 724) reckoned that this comprised two fifths of the mining population. The London Lead Company, the second largest concern, employed about 1,500 persons at that time.

10.

them, however, is not studied, being completely outside the mining region proper. In the nineteenth century at least, these Tyne Valley mines drew most of their labour force from Allendale.

The attempt in this thesis to give a picture of the social and economic life of the lead mining region over a period of nearly two centuries is based on the analysis of many different types of source material. These are detailed in the bibliography but some comment is necessary here to emphasize gaps in the evidence and bias in the surviving sources.

The most important M/S sources have been the records of the lead mining concerns and ground landlords. Inevitably these concentrate on the issues of direct importance to the capitalist and landowner, and details of the lives of the ordinary miners emerge only incidentally. As it has happened only the records of the two largest mining concerns have survived in any volume. This study is necessarily based largely on this material. The employees of the smaller mining companies may not always receive their due proportion of attention and presentation, because few of their records have survived.

The records of the Greenwich Hospital furnish much information about its policies as the major landowner on Alston Moor, and there are similarly extensive records of the Blakett/Beaumont estates in Allendale. The vital period of Parliamentary Enclosure around the beginning of the nineteenth century is extensively documented in the collections of the land surveyors, John and Thomas Bell, now in Newcastle University Library.

The most detailed pictures of the whole region at given

points in time are contained in the Reports of the Childrens' Employment Commission of 1842 and the Commission on Conditions in Mines of 1864. (15) Of these, the 1842 Report is vastly superior, directly quoting many statements made by miners and washer boys. The Assistant Commissioner, Dr. Mitchell, obviously made a genuine effort to describe conditions truthfully without bias towards one side. The 1864 Report, however, although it contains many useful statistics and appendices on particular aspects of mining life, is basically an assembly of statements made by the employers and their agents, cross examined, not very critically, by members of the Commission. Taken together the two Reports give a comprehensive picture of lead mining life around the middle of the nineteenth century.

No such sources, of course, exist for the eighteenth century, and here heavy reliance has had to be placed on the mining company records and the descriptions of such observers as Gabriel Jars and Sir Frederick Eden.

The more academic local historians have been generally less useful than other forms of local publication. Parson and White's Directory of Northumberland and Durham of 1827, for example, contains more relevant information than Surtees' History of Durham or Hodgson's History of Northumberland, which were published about the same time. A volume of essays by a Newcastle

(15) The evidence for these Reports was obviously gathered previous to their publication but the convention has been followed throughout this thesis of quoting evidence from them as referring to their respective years of publication.

journalist, J.W. Allan, published in 1881, gives a better description of the mining industry in decline than any more formal work. Critically gathered together casual references in such works as these give a fairly detailed and, it is hoped, a reliable picture of social life in the region at most times.

Lastly, one of the most important lead mining figures left a diary, covering 56 years of his life, in 167 volumes. This was Thomas Sopwith, land agent and surveyor on Alston Moor in the eighteen twenties and thirties, and chief mining agent of the Beaumont family from 1845 to 1871 . (16) He was keenly interested in engineering progress, administrative efficiency and social reform. His technical and topographical works about the area are cited frequently in the course of this thesis. But his diary is uniquely important in its detail and concern with everyday mining life. His highly idiosyncratic views and comments are a welcome relief from the more formal administrative records and government reports.

(16) Selections from the diary were published by B.W. Richardson in 1891. This single volume contains only a minute proportion of the original diary.

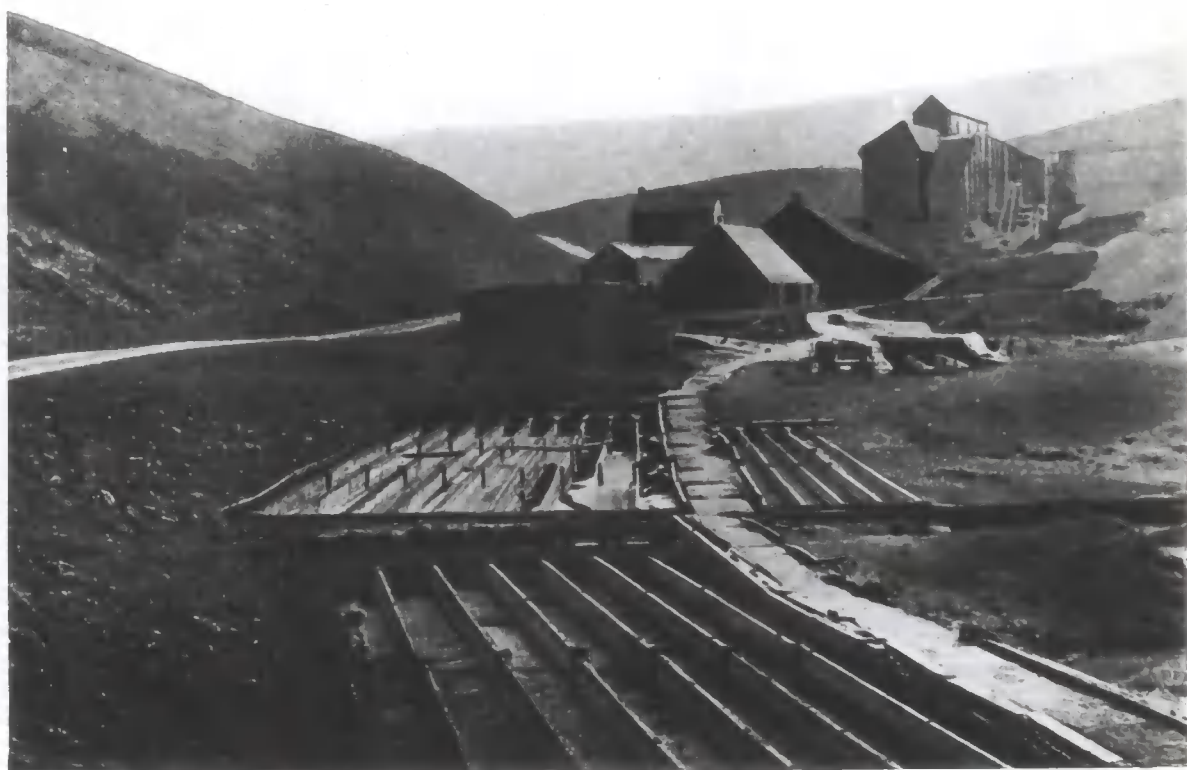


Plate 2

CHAPTER 2.

The Lead Mines.

The conditions in which the lead miners worked changed considerably in the period covered by this thesis. In this chapter is given an account of the physical conditions of labour - the mines themselves, the work performed, and the hazards involved. The account of technical developments is limited, as far as possible, to those which directly affected the work and comfort of the miners: this does not pretend to be a technological history of the Northern Pennine leadmines. The relationship between the miners and their employers, that is between labour and capital, will be considered in the next chapter.

The geological nature of the ore field was directly responsible both for the nature of the mines themselves, and the whole organisational structure of the lead mining industry, so different from that appertaining in the neighbouring coal-fields. (1) The lead ore consists of galena mixed with various other minerals such as fluorite, barite, quartz and calcite (known to the miners as "spar") and, near the surface, with iron hydroxides. It was introduced into faults and fissures in the Carboniferous Limestone by mineralising fluids acting in the remote past; the origin of these fluids is still a matter of controversy. The mineralised faults or fissures are known as

(1) For a comprehensive account of the geology of the area see Dunham, K.C. - Geology of the Northern Pennine Orefield. Vol. 1. 1948.

14.

veins: usually they are nearly vertical in limestones and sandstones, and the orebodies vary from a few inches up to 20 feet wide. They may extend for some thousands of feet horizontally, but their vertical dimensions are measured in tens or at the most hundreds of feet only. Long stretches of the fissures are barren between orebodies. Workable ground seldom occurs in the shales, where the fissures have lower inclinations than in limestone or sandstone. Associated with a few of the veins, horizontal replacement deposits occur in limestone, particularly, though not exclusively, the Great Limestone; they are known as flats and may extend as much as 300 feet from the vein. Pipes, although mentioned by Westgarth Forster, do not occur in the Northern Pennines.

The productive veins lie mainly in E.N.E. and W.N.W. directions across the mining field, with lesser cross veins intersecting them. They are by no means homogeneous, either in their form or their contents. As the vein descends into the ground it may narrow to a point, or else "hade" - slant from side to side, giving a zig-zag course. Wherever two veins intersect one of them may be thrown off its course in a lateral direction, to reappear again several feet further on, on the opposite side of the main vein.

The contents of the vein vary according to the strata through which it passes. In the Plate beds (shale) the vein is filled with a soft clayey substance called "donk" or "dunk" by the miners. Where lead ore does occur it does not fill the whole vein, but is interspersed with ribs of spar, the whole being known as "rider". Sometimes the vein may consist wholly of spar, or sometimes ore

may only appear lower down. A vein of ore two inches thick was considered worth working in the 19th century. (2)

This highly complex and irregular system of veins made lead mining a far more uncertain business than coal mining. It provoked much geological thought and investigation by the miners themselves. Until the end of the eighteenth century the knowledge accumulated remained largely traditional, communicated orally, but in the nineteenth century a number of works were written by miners on the geology of the area. Westgarth Forster's Treatise on a section of the strata, from Newcastle upon Tyne, to Cross Fell in Cumberland; with remarks on mineral veins in general....., first edition, 1809, was the earliest and best of these. A third edition of this work was produced virtually unchanged as late as 1883. A later book, summing up in its title the central problem that faced all miners in approaching the ore field was William Wallace's Laws which regulate the deposition of lead ore in veins, 1861. As far as the general layout of the ore field was concerned, the courses of the main veins were known from a very early date, and maps showing them were produced, both in manuscript by the mining companies, and privately printed and published. But, in spite of the increase in geological knowledge during this period, mining remained a very risky and uncertain business, both for the entrepreneurs and, as will be seen later, for the workmen.

When the presence of a vein was suspected, the initial

(2) Sopwith, T.-Alston Moor. 1833. p.141.

16.

investigation was by means of a process known as "hushing" - a stream was dammed in an appropriate place and the accumulated water released when a sufficient quantity had built up. The flood of water swept away the surface soil and peat in its path, exposing the underlying rock. In the eighteenth century and earlier this technique was used as a crude method of extracting the surface ore: later its prime use was in prospecting to see if a given place was worth mining. The surface proprietors of the land naturally did not like the hushing, as it carried away alluvial soil in the stream valleys, and frequently caused floods miles below the site of the actual hush. (3)

Once the presence of a vein had been established the ore was extracted by means of a system of shafts and galleries, the scale and overall design of which progressed greatly during the eighteenth and nineteenth centuries, independently of the mechanical advances that occurred throughout the same period. At the beginning of the eighteenth century access to the vein was mainly by shaft - the quickest and easiest approach. The cheapest and most primitive form of "mine" was a simple pit, or a series of pits, along the course of the vein. In 1691 the Journal of the Lead-mines at Fallowfield recorded "the disposal and letting the Shafts termed Bargains." Galleries, or "levels", to the outside world, were rarely very long, and mainly constructed for the purpose of drainage. "They were made so as merely to admit the workmen, and were from 4 to 5 feet high, 2 feet wide near the top,

(3) Hushing is described by all the technical writers on mining in the area.

and from 15 to 18 inches at the bottom. Though called levels, their inclination often varied with the strata, and they sometimes rose so much as the rapid ascent of 45°" (4) The construction of long levels was expensive, as they entailed "dead work" - i.e. work which did not produce ore - with no immediate reward, and often a long period of time before completion. The smaller companies and groups of adventurers could not afford the capital for extensive dead work, even if it would eventually result in far greater returns. Thus technical advances in the lead mining field were chiefly made by the three richest and largest concerns - the Blackett/Beaumonts, the London Lead Company, and the Greenwich Hospital, the latter, although not itself concerned with extracting ore, being prepared to give active help to its lessees on Alston Moor.

The advantages to be gained by approaching a vein by means of a level rather than a shaft were threefold. Firstly, as the mining field was in a mountainous area, it was possible to drive levels from the "day" actually at, or below, the level of the ore bearing strata: this greatly eased the labour necessary to extract the ore and "deads" from the mine to the surface. (More will be said shortly about the use of machinery in underground haulage.) Secondly, a level at a sufficiently low altitude would drain all workings above it - and in doing so it would collect the water necessary to drive machinery to pump out the lower parts of the mine. Lastly, these long levels might well strike a new vein.

(4) Sopwith, T. - Alston Moor. 1833. p.18.

in the course of construction.

The chronology of the introduction of long levels and the systematic planning of mines is uncertain. Wallace stated that "it was not before the middle of the last century [i.e. the 18th] that the mines were first opened out and drained in a systematic way." (5) This statement is probably fairly accurate: it was not however a sudden discovery but a gradual evolution. In 1737, for example, one mine lessee on Alston Moor wrote quite casually that if the water did not "goe off there will be obliged to bring up a levell about 160 yards." Another level, mentioned in 1738, was over 600 yards in length. (6) But these levels were apparently wholly intended for drainage, and not for access to the mine. By 1765 there was a level at Coalcleugh containing a horse drawn waggonway, a mile in length. (7)

The longest of these long levels were intended to "unwater" not only one mine but a whole series of mines. The Nent Force Level was commenced by the Greenwich Hospital in 1776 to drain old mines and discover new veins along the valley of the Nent between Alston and Nenthead. It was driven forward intermittently until 1842, when it had reached a total length of over 4 miles. (8)

(5) Wallace, W. - Alston Moor. 1890. p. 140.

(6) Adm. 79/35-4: Adm. 66-106.

(7) Jars, G. - Voyages metallurgiques. Vol. 2. p. 542.
Wallis, J. - Northumberland - Vol. 1, 1769. p. 20.

(8) Wilson, P.N. - The Nent Force Level. (in Cumb. & West. Trans., N.S. 63, 1963. pp. 253/280.)

An equally ambitious plan was the Blackett Level driven up the East Allen by Sopwith, commenced in 1855. This reached a total length of nearly $4\frac{1}{4}$ miles.

By the nineteenth century the opening of a new mine was systematically approached - that is by the larger concerns: the smaller groups of adventurers on Alston Moor went on much as they had always done. The chief agent of the London Lead Company described the procedure to the 1864 Commissioners - "When we set on a level it is seldom for the purpose of covering only one object; we, generally speaking, know of the existence of a number of veins before us, and on our reaching the vein, if it be of sufficient magnitude and of a fair mineral character, then we rise to the surface, not only for ventilation, but for proving the character of the vein in all the strata between the level and the surface; we follow up the vein according to the course of the lode... Into... [the original] level we put a horse and waggons always. Suppose we find, in the course of our rise, in the different strata through which we have passed, ore yielding indications, then we put on, from the rise, drifts in the course of the vein; and between such drift and the horse level, and also the surface, frequent communications are made for ventilation and other purposes. As each vein is reached a like procedure takes place." (9) The scale such mine systems could reach is illustrated by Burtree Pasture mine in Weardale. In 1864 the horse, or main level was 2 miles long. The end of it was 105 fathoms below the surface: below it another shaft went

(9) 1864 Report. (Vol. 2.) p. 374.

down a further 131 fathoms. In all there were 5 levels below the horse level. (10)

The dimensions of the levels were also standardised. A bargain formula much repeated in the Beaumont records from the end of the eighteenth century onwards was that the miners should construct the level "6 feet high upon the sleepers, and $3\frac{1}{2}$ feet wide." (11) By 1864 the London Lead Company's horse levels had been standardised at $6\frac{1}{2}$ feet by $4\frac{1}{2}$ feet. (12) All levels rose slightly as they progressed into the hill to allow water to flow out - some 4 feet in every 1,000 in the best Blakett/Beaumont and London Lead Company levels.

In the early and mid eighteenth century the levels and shafts were generally very badly supported. Jars commented in 1765, after a visit to Coalcleugh, and to the London Lead Company's mine at Rampgill, that, although the rock required little support this little was rarely done at all properly. - "Il y a... une négligence très-grande à cet égard: j'ai passé dans plusieurs de ces galeries où les bois étoient pourris et cassés, et menaçoient d'une danger évident." (13) By the nineteenth century things had altered for the better. A Greenwich Hospital report of 1822 commented that "the walling of shafts, and the

(10) 1864 Report. (Vol. 2.) p. 370.

(11) e.g. Coalcleugh, 1817. B/B 81.

(12) 1864 Report. (Vol. 2.) p. 330.

(13) Jars, G. - Voyages métallurgiques. Vol. 2. p.543. "There is a very great negligence in this respect: I passed through many levels where the wood was rotten and broken, and was obviously dangerous."

arching of the levels was another great improvement, many of the old excavations having fallen in, whereas now the mines are rendered accessible at any future period." (14) In 1864 the London Lead Company agent said that "We always arch our levels with stone arches, as a matter of course, that is our horse levels. I may say that we universally arch our horse levels." (15) At Coalcleugh, however, although some of the horse level was arched or supported with wood, for most of its length no supports of any kind were used: the natural rock was considered sufficiently solid. (16) Shafts were surrounded by dry stone walling, at least when they reached the surface, and where they passed through loose strata.

By the end of the eighteenth century access to the mine was normally by a straightforward walk along a level. Shafts were relatively short, communicating between one level and another, and were rarely the main route from the surface. In 1765 Jars had found no ladders at all in the mines he visited in the area. (17) The shafts were ascended and descended by means of "stemples". These were "pieces of wood placed at two opposite sides (of the shaft), 4 or 5 feet above each other." (18) A frequent payment note in the Blakett/Beaumont records in the

(14) Greenwich Hospital Report. 1822. p.8.

(15) 1864 Report. (Vol. 2.) pp. 374/375.

(16) 1864 Report. (Vol. 2.) p. 361.

(17) Jars, G. Voyages metallurgiques. Vol. 2. p. 543.

(18) Sopwith, T.-Alston Moor. 1833. p. 129.

eighteenth century was "for hewing stemples." (19) Sopwith quotes a visitor to an Alston Moor mine in 1820 who had "to scramble near 30 feet from one cross rafter to another, by hands and feet; an exertion of some difficulty, for these cross sticks were in places so far distant as to require all the active agility of youth to mount them." (20) These stemples were apparently still in common use all over the mining field in the early nineteenth century. By 1864, however, ladders were far more common, save in the smaller mines. No stemples were used at all by that time in the London Lead Company mines as it had been found that "these stemplings are very apt to rot at the ends that go into the rock, and they might break almost without the knowledge of the parties that they were so near the point of breaking." (21) But access to most mines was by means of a level. Miners were saved the wearisome climbs of many hundreds of feet, up and down ladderways, usual in most Cornish mines. At many mines where shafts were the chief means of access in 1864 mechanical means were used to lower and raise men from the mine. At Allenheads, for example, there were two cages in the Gin Hill shaft, each taking 3 men at a time down the 77 fathoms to the foot. (22) In 1842 access here had been by ladders from the surface, unless men walked down the valley to the level

(19) e.g. Allenheads, June 1756. B/B 69.

(20) Sopwith, T.-Alston Moor. 1833. p. 70.

(21) 1864 Report. (Vol. 2.) p. 375.

(22) 1864 Report. (Vol. 2.) p. 327.

STEMPLES.



well as the ore, had somehow to be brought to the surface.

Before the long access levels were introduced ~~after~~ the middle of the eighteenth century all the ore and deads had to be lifted from the mine by hand. It was dragged in barrows along levels and loaded into pails called "kibbles" to be drawn up the main shaft by a winch. This latter stage was sometimes done by a horse driven gin. This operation, known as "kibbling", was called by one eighteenth century writer "the most laborious part of manual labour" in the mines. (28) It continued to be done in this way in the small mines leased by groups of adventurers on Alston Moor right through the nineteenth century. In a large and deep mine this primitive form of extraction took up as much, or more, time as the actual driving of the levels. In the Coalcleugh low level example quoted above the agent reported that "the great expence of drawing Deads from such a deep field prevents many Men from attempting to make a search to raise Ore in places that I am of opinion would produce Ore, had they been in a good situation."

The introduction of long levels saved a great proportion of this labour. Within these levels were laid railway tracks along which waggons ran to the open air. The earliest of these waggonways was installed at Coalcleugh in the period 1755-57. (29)

(28) Granger, J. - Agriculture of Durham. 1794. p. 20.

(29) There have been claims for the pre-eminence of both the Greenwich Hospital's Nentforce Level and of the London Lead Company in introducing underground railways. But the Nentforce Level was not started until 1776, and, as will be seen, the London Lead Company had no rails in its largest

This is apparent from the accounts of the mine, recording men "laying waggon rails" and "Trailing them up the Level." (30)

Jars visited Coalcleugh in 1765 and wrote - "Lorsque les minerais et les déblais ont été élevés par plusieurs puits des différentes profondeurs, soit à l'aide des treuils, soit par une machine à moulettes établie dans la mine, jusqu'au niveau de la galerie supérieure d'écoulement, elles sont extraites au jour par cette même galerie, dans laquelle on a pratiqué un chemin semblable aux nouvelles routes, dont on fait usage à Newcastle pour voiturier le charbon, et dans des même chariots, avec cette différence, qu'au lieu de 4 pieds entre les deux pieces de bois sur lesquelles roulent lesdits chariots, il n'y en a que deux, et que ceux-ci sont plus petits et sur-tout très-bas; un seul cheval en conduit deux pleins de matieres. La galerie est prolongée fort avant dans le sillon, même jusqu'aux limites des deux exploitations; et comme la compagnie de Londres n'a pas dans sa mine [Rampgill, Nenthead] la même aisance pour le transport de ses déblais, elle paie à l'autre compagnie pour le passage, une somme fixée par chaque chariot." (31)

mine, Rampgill, in 1765. Rails must have been laid in Coalcleugh mine at about the same time as they were introduced underground in the Northumberland and Durham coalfield.

(See Galloway, R.L. Annals of coal mining. 1898. p. 278.)

(30) B/B 98 March/June 1757.

(31) Jars, G. - Voyages metallurgiques, Vol. 2. p. 542.

"When the ore and deads have been lifted through many shafts of different heights, either by windlass or gin, until they have reached the topmost level, they are brought through it to the day on roads similar to those in use at Newcastle for carrying coal, and in the same sort of

By the beginning of the nineteenth century all the major mines had horse or "galloway" levels. In a well designed mine these would connect directly with the washing floors. Cast iron rails replaced wooden ones in the period, 1805-1820, (32), but the waggons remained much as Jars described them - 2'6" wide, 4' high, and 6' long according to Sopwith in 1833. (33)

The Nentforce Level was unique in the area in being conceived as an underground canal. Some 2½ miles of the Level was constructed in this way. It was then necessary to rise about 200', so the remaining 2½ miles of tunnel was conventional.

The other great mechanical advance which made the lot of the lead miner much easier, was in the field of mine drainage. The engines originally developed to pump out the lower parts of mines became so powerful and sophisticated in the later nineteenth century that in some cases there was a surplus of power available to drive other machinery as well.

carriages, but different in that instead of there being 4 feet between the pieces of wood on which they roll there are only two, and the carriages themselves are small and low: a single horse draws two of them when loaded. The level is continued a great way forward in the vein, as far as the boundary of the two undertakings: and as the London Company have not the same convenience for removing their rubbish, they pay the other company for passage, a fixed sum for every load sent along the level."

(32) Apparently first in the Nentforce Level shortly after 1805.

See Greenwich Hospital Report. 1805. p. 251.

(33) Sopwith, T. - Alston Moor. 1833. pp. 131/132.

The long drainage levels were very expensive to drive, but once this had been done they cost very little to maintain. A pumping engine was also fairly expensive, and in addition required constant maintenance. But some form of pumping was always necessary in the very deep parts of a mine, too low for a drainage level to be practicable. In some of the Derwent mines and in those mines north of the Tyne at Stonecroft and Fallowfield the terrain of the surrounding country and the depth of the veins prevented long levels being employed at all as the primary means of drainage. Here pumping was as essential as it was in the Cornish mines, where many galleries ran below sea level.

The most primitive method of removing water consisted of literally lifting it from the mine in buckets, by hand. As we shall see shortly this method remained the only way of draining isolated deep workings below the level of the pumping system. By shortly after the mid eighteenth century power driven pumps were in common use in the lead mining area to drain the greater part of the mine systems below the main drainage levels.

In Cornwall the pumping engines were, from the beginning of the eighteenth century to the closing down of the mines in the late nineteenth century, steam engines, fired mainly by coal. In spite of the proximity of the coal fields steam engines were unusual in the lead mining area of the Northern Pennines. This was because the topography of the region was ideally suited to the use of engines driven by water. Steam engines were used in only two parts of the area, - Derwent, and the small mines north

of the Tyne. In both cases communications with the coalfields were better than for the mines further west and south. Fallowfield had a steam engine in operation by 1773, (34) and these coal fired engines continued in use here, and at the neighbouring mine of Stonecroft throughout the nineteenth century. In the Derwent mines steam power was twice replaced by water power. According to the first edition of Mackenzie's Historical and descriptive view of... Northumberland, published in 1811, the new lessees of the mines had replaced the water engines with steam engines in 1807, as the London Lead Company, the former lessees had "suffered the engines and gins to go to ruin".(35) But in the second edition of Mackenzie's work published in 1825 - "Water engines have again superceded the use of steam engines in the Lead Mines as, from great improvements made in water-wheels and water-pressure engines, they have been found to be nearly as effective, and far less expensive than steam engines." (36) By 1842, however, there were three steam engines once more in operation in the Derwent area, working alongside the water engines. But water power finally triumphed and the last steam engine was replaced by a water pressure engine in 1872. (37)

In the greater part of the mining field water power was never challenged by steam. Particularly in the Blakett/Beaumont

(34) Blakett of Matfen papers, Northumberland County Record Office.

(35) Vol. 2. pp. 363/368.

(36) Vol. 2. p. 490.

(37) Derwent Mines Report. Jan. 20th, 1872.

areas hydraulic engineering developed to a greater peak of efficiency than anywhere else in England. It was at Coalcleugh in the early seventeen sixties that the water pressure engine was invented, by the resident agent, William Westgarth. Jars described the progress of its installation when he visited the mine in 1765. The lowest parts of the mine were below the drainage level - "mais pour élever les eaux d'une plus grande profondeur, on est dans l'intention de profiter de celles qui passent en très-grande quantité dans la galerie supérieure, pour faire mouvoir une machine d'une nouvelle construction à laquelle celle à feu a donné lieu. On se propose d'avoir un cylindre semblable, mais au lieu de la colonne d'air de toute la hauteur de l'atmosphère, on veut conduire sur le piston une très-grande colonne d'eau."(38)

During the later eighteenth and the nineteenth centuries reservoirs were constructed all over the region to harness its water power. All the streams were made use of, some many times over. Here is a somewhat florid description of the East Allen by a professional guide-book writer in 1859. - "From a reservoir on the hill-side, 180 feet above Allenheads, the water descends, impels the two hydraulic engines, does all the work of the

(38) Jars, G. - Voyages métallurgiques, Vol. 2. p. 542.

"But to raise the water from a greater depth it is their intention to profit from that water which passes in great quantities through the upper level to work a machine of a new type the principle of which has been suggested by the fire engine. It is proposed to have a similar cylinder but instead of the column of air, the weight of the atmosphere, they intend to construct upon the piston a very great column of water."

washing floors, drives the lathes, the saws, the machinery in the machine-shops, keeps four wheels going deep underground, which pump water from the deepest levels of the mine (and drive haulage machinery) by an adit, it flows into the Allen about a mile to the north. Not long, however, does it run at liberty, for intercepted by a race, it flows along that for two miles to Breckon Hill - the first shaft on the Blackett Level - there turns two wheels that force water into the accumulator, and is discharged again into the Allen." Lower down the water worked many more wheels, including that of the Allen smelt mill. (39)

From the limited function of drainage in the seventeenth and eighteenth centuries water power developed into a source of power for virtually all mechanical operations on the mine field. But although this made a great difference to the productivity of mining operations - mines could go to a greater depth, the ore and deads could be extracted with greater ease and despatch, and the washing and smelting operations were made far more efficient, and carried out at a greater speed - it made remarkably little difference to the major part of the labour force, the actual miners. Because of the technical advances they were able to spend a greater part of their time in tunnelling and getting ore in the mid nineteenth century than they had been able to do in the mid eighteenth: veins could then be worked which would have been left as unprofitable in the earlier period. But the actual methods employed in tunnelling and getting ore remained almost

(39) White, W. - Northumberland and the Border. 1859. pp. 464/465.

identical.

The organisation and control of the partnerships engaged in work within each mine will be considered in the next chapter. Here are outlined the jobs undertaken by the ordinary miners, and the techniques used by them. When the presence of lead ore was suspected below the surface at a new place miners were allowed to approach it in their own way. Here is a 1746 bargain from Weardale - "Let to Joseph Featherstone, 4 ptnrs. a bargain to gett Oar by Hushing on the Float where Arthur Watson wrought last at 18/- per Bing... and Arthur Watson to have Liberty to sink where he pleases, not to interfere with their Hush." (40) In 1807, also in Weardale, the initial approach was as vague as it had been sixty years before - "Two little boys had found some small pieces of Ore in the Sides of the Old Hush gutter, and in working further found the quantity of Ore increase, which encouraged some workmen to take a Bargain to raise Ore the last quarter who have made very good wages... at 50/- per Bing without anything for dead work." (41)

The construction of a new mine, or an extension of an old one, "Dead work" as against actual ore getting - was undertaken far more systematically. Men were instructed to sink a shaft, or a sump (a shaft not reaching the surface), or to drive a level, to and from given places - "Lett to Geo. Furnace & 7 ptnrs. a Bargain to Drive a Level from Ireshope Burn to the Vein

(40) B/B 133. Oct. 22nd, 1746.

(41) B/B 53. Oct. 24th, 1807.

they wrought in last and to Drive it immediately thro' the Sump foot at £60 per Sump and they're oblig'd to make a conduit from the burn side to the Bank foot half a yard high and a foot wide and to flagg it in the bottom." (42) When it was the main or "horse" level under construction the men who drove the level were also expected to lay the rails - "Let Jacob Lowe & 7 Partners a Bargain to drive their Level forehead 20 Fathoms more west, at an exact true level, sufficient large Drift, and lay the Vague Rails at 48/- per Fathom." (43) The actual driving of a level, or the sinking of a shaft was done by means of hammer, pick and shovel, where the ground was fairly soft or broken up, and by blasting with gunpowder as a preliminary where the rock was solid.

The vein of ore was preferably approached from below, and work proceeded upwards rather than downwards. "It is easier to work upwards than to work downwards, because in working upwards all the dust and broken pieces fall down, whereas in working downwards they accumulate at the bottom, and it is troublesome to remove them. The miners in their upward work make a small landing-place, and go from one stage to another, so that they may be able to place ladders or pieces of wood from side to side, and be afterwards able to climb up, and have halting places at short distances all the way." (44)

(42) B/B 133. Oct. 13th, 1749.

(43) B/B 136. Feb. 9th, 1779.

(44) 1842 Report (Mitchell.) p. 727

This was known as a "rise": when it was necessary to work downwards access was by means of a "sump". At the bottom of the rise, or top of the sump the level was widened to allow work to be more conveniently put into waggons. After each length from the rise had been worked out it was filled with the deads from the length above, leaving, however, sufficient room for access from the level. These rises might go up several fathoms, but if the vein was sufficiently rich it was economic to drive a new level at a higher altitude before the rise became inconveniently high. (45)

Different geological conditions called for different methods of approach to the vein. "The most difficult part of mining", according to Forster, was getting ore from "soft veins", where the vein was surrounded by fragmented rock and had swollen "out to an enormous width." Here the miner had to surround himself with square timbers as he proceeded, whether on the level or upwards or downwards. "The miners stand within this square timber, where they work, and still set more timber before them, as they can make room for it. This is expensive, troublesome, and dangerous, if they had not got good skill in setting the timber, for the soil is generally quite soft and loose, and... the whole will frequently rush down with violence before or in front of, their timber... But it frequently happens, that the ore is so plentiful and good, in these veins,

(45) For a full description of the ore workings see Sopwith, T.
- Alston Moor. 1833. pp. 127/130.

as abundantly to compensate for all this trouble and expense." (46)

Another peculiar form of ore working was in a flat vein where the ore had replaced a flat post or bed in the limestone. Many men could work together in a "flat", and the workings could "frequently run to a great extent, and the roof being supported by substantial posts of timber, the whole, especially when dimly lighted, presents a receding vista, which reminds the spectator of the aisles and pillars of a cathedral." (47)

A frequent form of entry in the Blakett/Beaumont bargain books was for miners to get ore "in the roofs and sides which is left by the old man." (48) Old workings were constantly re-worked by successive generations of miners because of improvements in mine planning which allowed a better circulation of air to places where the lack of oxygen had previously been almost lethal, and because of the progressive advances in efficiency in the washing machinery causing veins which previously had been abandoned as uneconomic to be worth while reviving. Here, the miners' work was much as it was elsewhere once the vein had been reached, but complicated by the huge piles of deads that jammed abandoned levels and sumps, acting as a barrier both to the circulation of air and to the extraction of fresh ore and deads.

(46) Forster, W. - Section of the Strata. 1821. pp. 241/243.

(47) Sopwith, T. - Alston Moor. 1833. p. 130.

(48) e.g. B/B 176 - Allenheads, Oct. 1st, 1757.

Where the vein was soft the ore was extracted by means of pick and hammer. More usually, however, it was necessary to have recourse to blasting. A hole was first driven into the rock by means of a steel pointed, iron bar, about 2 feet long, known as a "jumper". This was held by one man who slowly rotated it while another hammered it into the rock. The hole having been bored, gunpowder was inserted within a paper cartridge. A thin iron rod, known as a "pricker" was then driven in through the cartridge to the very end of the hole. Around the pricker were placed small pieces of shale or clay, pushed in by means of a "driver". Finally the pricker was withdrawn, and replaced by a paper fuse. All the men concerned save one then withdrew to a safe distance. "The man who has to fire off then lights the match, and runs off as fast as he can, and presently the shot goes off with much noise, smoke, and dust. The men return and find a chasm made in the rock, and with hammers and picks they strike upon every projecting piece of rock, and bring it down. The chamber where they work is now full of smoke, and every additional shot fired off makes the place worse and worse as they continue their work throughout the day." (49)

The method of blasting outlined above is that given in virtually identical terms by Sopwith, writing in 1833, and by the 1842 and 1864 Reports. Thomas Crawhall's article of 1822, on the discovery of old blasting implements in the Allenheads

(49) 1842 Report (Mitchell) pp. 726/727. Accounts of blasting are also given in Sopwith, T. Alston Moor, 1833. p. 130, and 1864 Report (Volen2e) p. 335.

lead mine, makes it clear that the process and implements used had been established for at least a century before that. (50)

A few improvements were made during the nineteenth century.

Between 1842 and 1864 the iron pricker was generally replaced by one made of copper, which did not tend to spark in contact with rock - the most common cause of accidents while blasting. By 1870 gun cotton had replaced gunpowder in many of the Beaumont mines. (51) By this time, too, the rock drill was in experimental use.

A partnership might fire off "six or eight shots a day".(52) In this time much dust would be created, not only by the actual explosions, but also by the constant boring and hammering. Much of this dust inevitably found its way into the workmen's lungs.

When the vein had been opened out timber was put up as roof supports where the men considered it necessary. A Beaumont agent told the 1864 Commission that the workmen were given "the choice of what timber they think proper, in the woodyard." This was supplied to them free on request, although "sometimes we press it on them, and think that they ought to have more." (53) In many places, however, the veins the ore workings were following ran within solid rock requiring virtually no support.

The extraction of the ore from the vein was only the first

(50) In Archaeologia Aeliana. Vol. 1, 1822. pp. 182/186.

(51) Sopwith, T. - Diary. Oct. 30th, 1868.

(52) 1842 Report (Mitchell;) p. 762.

(53) 1864 Report (Vol. 2.) pp. 330/331.

stage. It had then to be got to the surface by the miners, accompanied by considerable quantities of deads of no value, but for which there was no room within the mine. As will be shown in the next chapter the responsibility for dealing with deads normally lay with the partnership who originally cut them. When engaged in getting ore the partnerships' earnings depended solely on the quantity of ore raised. No extra payment was made for the laborious task of extracting deads. Left alone, the workmen tended to block with deads useful space as well as worked out space within the mine. Unless this was strictly controlled by the agents the result was to hamper severely future explorations, as happened at Coalcleugh in 1813. The workmen, therefore, had to carry large quantities of deads as well as ore from the mine.

The means of extracting the ore and deads, and the revolution effected by the use of rails and the introduction of the horse level have already been dealt with. Even in the nineteenth century, however, an enormous quantity of the work had to be transported by manual labour. Here is an extract from the Coalcleugh Agent's report on a partnership that had raised more than 200 bings in a quarter in 1807. "It is almost incredible to believe the 8 men should go through such a quantity of Work, considering the inconvenience attending their getting it to Bank, having first a Sump to draw it up about six fathoms, and carry it back to another Sump, and then draw it up about 20 fathoms. It is then taken to the Whimsey on a Waggon by a Horse about 260 fathoms and drawn up the Whimsey, and taken by Horses down the Level to the surface, from which you will easily see

the Expense which must attend the Banking of every Shift of Bouse Ore." (54)

A London Lead Company miner complained to Dr. Mitchell in 1842 that the mines could be better designed, to cut down the hard work necessary. - "The levels often might be made so as to allow the horse and waggon to go further on, nearer to where the men work, and thereby save the laborious and fatiguing work of carrying the ore in barrows to the horse; the miners have to do this work themselves and this prevents getting so much done of what is properly the miner's work, and keeps down their gains... This severe laborious work injures men much more than the regular work." (55)

There was one other important task that all miners occasionally had to face. This was the problem of dealing with water in the mines. The development of pumping machinery has already been discussed. By the end of the eighteenth century most large mines had long drainage levels together with water pressure engines to drain the parts of the mine below the drainage level. The pumps, however, sometimes failed. In 1786 a disastrous flood occurred at Allenheads, when the river changed its course and went via an old shaft into the mine. It was nearly three months before the mine could be properly worked again. (56) Working could also be

(54) B/B 53. April 6th, 1807.

(55) 1842 Report (Mitchell,) p. 761.

(56) B/B 50. Jan. 23rd, 1786.

halted by a drought. At Crowlah mine in Weardale in 1818 - "We have got little done the last quarter for want of a supply of day Water to work the Engine. The men have been off work for seven weeks." (57) In cases like these drainage by hand supplemented the pumps. Individual workings, too, were frequently below the range of the pumps. In these cases the partnerships received more money for working there, either in the form of direct payment for keeping the workings drained, or by being given higher sums per bing of ore. Two bargains at Breckonsike mine in Weardale in 1762 show the distinction. One partnership, in addition to the main bargain, was "to draw the water at the 2 high Sumps... at 5/6 each a Week and to find their own Candles." Another partnership receiving a higher price per bing, was "to keep the Water out of their low bottom the whole Quarter at their own charge." (58) Sometimes the work was too much for the partnership concerned, either because the influx of water into the workings was too strong, so that "the water quit them out" (59) or it became economically impossible to continue in the bargain. (60) In normal circumstances only one or two partnerships in a mine had to drain water by hand. The mine owners paid larger sums to men to get them to work in such situations. If more than a few partnerships were working below the range of the existing pump it

(57) B/B. Midsummer, 1818.

(58) B/B 167. Jan. 7th, 1762 and March 3rd, 1762.

(59) B/B 176. Jan. 9th, 1749.

(60) B/B 48. Nov. 11th, 1764 - "They had 9/- a week to pay for drawing water so they were obliged to quit that bargain or ruin themselves."

became "as much expense [to the owner] drawing the Water as would pay the expense of Engine." (61)

The work of drawing the water with kibbles was irksome and unpleasant. But the miners did not mind a moderate amount of water. As one agent told the 1864 Commission - "I remember some who worked in a dry mine and died sooner than they would have done had they been working in a wet mine, so far as I was capable of judging." (62) This observation was probably quite true, as the dampness absorbed the dust from drilling and blasting, lessening the amount entering the miners' lungs.

As will be discussed further in the next chapter there was very little specialisation among the lead miners. They were prepared, and indeed expected to carry out all aspects of work underground. Boys, however, were employed to drive the waggons removing ore and deads from the mine. They were also employed to pump the "air machines" blowing air along tubes into remote workings.

Most of the relatively few specialist jobs for adult workers were on the surface. Masons, smiths, millwrights, and joiners figure in the Blakett/Beaumont accounts from 1730 to 1870. Their jobs were strictly subsidiary to the partnerships raising ore. "Woodmen" were responsible for the maintenance of the main levels and shafts of the mines. A Weardale partnership of woodmen in 1860 was instructed to "Keep in good repair all those

(61) B/B 53. April 6th, 1807.

(62) 1864 Report (Vol. 2.) p. 331.

Mines or portions of mines specified... including Horse Levels, cross cuts, rises, Wagon drifts, top or Air drifts from Horse Level Mouth to the Forehead and from the Wagon drift to Blakes Laws Ladder'd way top, including all railways." (63) Underground, even jobs like the maintenance of pumping machinery were left to the ordinary partnerships. One partnership in 1760, in addition to its bargain to raise ore, was "to assist Thos. Bradshaw at Leathering the Engine and all things relating thereto all the time of their Bargain at their own charge." (64) The Blakett/Beaumont accounts show no notable change in this policy of non-specialisation of the workmen from the seventeen-twenties to the eighteen-seventies. There was, perhaps, a proportionately greater number of masons, millwrights, etc. and there were also a few new jobs, or at least new nomenclatures, such as "engineers" and "apprentice engineers", in the later period, but it was a very slight increase. At all periods, if a special task had to be done, an ordinary partnership would be asked to do it on a normal quarterly contract basis.

This brief account of the work and conditions of lead miners has been based on the evidence available - which has left many factors unrecorded. The sanitation arrangements within the mine - if any - are not mentioned in the Reports of either the 1842 or 1864 Commissions. One of the witnesses examined in 1842 does remark on the presence of rats underground. (65)

(63) B/B 131. Dec. 11th, 1860.

(64) B/B 167. May 21st, 1760.

(65) 1842 Report (Mitchell.) p. 763.

The normal access route to most mines being by way of the main drainage level meant that many miners started and ended the day with wet feet, even if their actual place of work was dry. These may be considered as the minor discomforts of a lead-miner's employment. The two Commissions do supply more evidence about the more acute dangers to life and health.

Compared with those in the coal mining areas, fatal accidents were comparatively rare in lead mining. This was chiefly due to the virtual absence of explosive gases from the lead bearing strata. According to Raistrick there were only 21 fatal accidents among the employees of the London Lead Company between 1800 and 1875. (66) There were only 5 deaths in the Beaumont mines between 1845 and 1862, and the most serious accident in the Derwent mines between 1855 and 1862 was the loss of one eye by a workman. (67) There is no reason to think that eighteenth century accident figures, if they were known, would be very much higher than those of the nineteenth century.

In an analysis of accidents given in the 1842 Report seven causes were isolated. (68) Minor explosions caused by explosive gases were not completely unknown, but scorching was the only injury caused. Carbon dioxide, "choke-damp", sometimes temporarily disabled men. Minor accidents were caused by falls down shafts and crushing by waggons. But the greatest sources of danger were collapsing of roofs in levels and premature

(66) Raistrick, A. - Two centuries: 1938. pp. 55/56.

(67) 1864 Report (Vol. 2.) p. 346: (Vol. 1.) p. 261.

(68) 1842 Report (Mitchell.) pp. 742/743.

explosions while blasting. Six men had lost their lives in Weardale in 1838 when the roof collapsed on them. Premature explosions were caused both by "gross carelessness on the part of the man himself" and by deficient equipment supplied by the master. The witnesses before the 1864 Commission were all questioned in considerable detail about accidents caused by blasting. The two chief causes appeared to have been deficient fuses, and the use of iron prickers to clear the way for the insertion of the fuse. The fuse was made basically of paper, and prepared by the men themselves. If badly done it could cause the powder to explode prematurely. The London Lead Company had offered to supply its employees with patent safety fuses, but after experiments, most of them declined, - "They do not like the smell of it at all." (69) The iron prickers sometimes caused sparks to fly from the rock, thus igniting the powder while the men were standing near. Copper prickers obviated this risk. By 1864 the copper pricker, unusual in 1842, had replaced the iron pricker in most mines.

The greatest threat to a lead miner's health lay in the atmosphere within the mine. Choke damp was frequently met with. It occurred in pockets in the rock strata and filtered slowly out into the workings. After a strike in Weardale in 1818 the agent noted that "foul air" had set "into a part of the Workings while they were off work, which continued a month before it could be extricated to get regularly forward." (70)

(69) 1864 Report (Vol. 2.) p. 332.

(70) B/B 54. Christmas, 1818.

It could escape quite suddenly into workings. During the driving of the Nentforce Level in the early nineteenth century a bell was rung if gas suddenly appeared at the forehead, and the miners would exit at speed. (71)

The choke damp was fairly easily detectable. Its absolutely poisonous nature meant that men would not attempt to work in it at all. Less obviously deleterious^a to health, and therefore more dangerous, was the air in the extremities of mines, where scarcely any natural circulation took place. One miner told Dr. Mitchell in 1842 that he knew of mines "in which there were levels 90 fathoms below the first level, and no other means of getting [air] but from the first level. The deeper men work, and the further distance they penetrate, the worse the air is." (72) In this close atmosphere the miners were constantly blasting and drilling. Gunpowder fumes and minute particles of rock and ore floated continually in the air. After blasting "we smoke our pipe till it gets off", (73) but time was money to the miners. They went back to work as soon as they could see. The seven or eight "shots" a day that each partnership customarily fired meant that by the end of the shift the men were working in a continual haze. However, unlike the custom in Cornish mines, the mine was normally worked only 8 out of the 24 hours in a day. This did allow some clearance of dust by the start of each new shift.

(71) 1864 Report (Vol. 2.) p. 13.

(72) 1842 Report. (Mitchell.) p. 761.

(73) 1864 Report. (Vol. 2.) p. 353.

The temperature within the mines was fairly constant, both summer and winter, and had little effect on ventilation. What did affect the atmosphere was barometric pressure. "The lower the barometer the worse the mine is for air and so the miners know before they leave the mine whether it is raining or likely to do so when they reach the "day"." (74) In the summer, "this being the worst season for air in the Mines, the Men cannot work more than half the usual time "in places where natural ventilation was bad, and no artificial means of promoting circulation was employed. (75)

The mines were ventilated by "natural" and "artificial" means. Natural ventilation was the deliberate designing of a mine so that there was a flow of air through all levels and shafts. Great progress was made in this respect in the large mines in the nineteenth century, compared with the eighteenth. Artificial ventilation was the supply of air pumped through tubes to the foreheads where a natural flow was impossible.

In the eighteenth century many small mines were scarcely more than outsize pits, ending when air became too scarce. The larger mines were designed in a very haphazard fashion. In the Blakett/Beaumont records there are frequent bargains such as this - "Thos. Waugh... to drive west in the vein at 17/6 per fathom. Wanted Air: let them to sink into a low drift at the same price." (76)

(74) Robinson, W. - Lead Miners and their diseases. 1893. p. 4.

(75) B/B 54. Michaelmas, 1819.

(76) B/B 176. July 1st, 1749.

In other words, if the miners needed more ventilation they were allowed to make a shaft to the surface or to another level to promote circulation virtually as they thought best. Jars wrote, however, that there was no understanding of the principles of natural ventilation - "Si les directeurs entendoient bien la théorie de la circulation de l'air dans les mines, il seroit facile de chaffer ce mauvais air par les tuyaux de communication d'un ouvrage à l'autre." (77)

By the nineteenth century the problem was approached more scientifically. In the lead mines, because of their rambling nature, and many exits, it was difficult to use the system of planned air flow by means of trapdoors and furnaces that the more regular coal workings permitted. But certain fundamental atmospheric laws could be ascertained and made use of. It was noted that the shaft at the highest part of the mine would generally draw the warm air from other parts of the mine to escape into the colder atmosphere outside. This air would be replaced by a flow into the levels and the shafts at lower altitudes. This fact being borne in mind it was possible to devise systems whereby air flowed naturally through all the shafts and levels. Forster wrote in 1821 that "Where it is practicable to obtain a Gallery, which shall lead from the bottom of the Shaft to the day or open air, a current is easily established by this simple artifice; but if this is not possible,

(77) Jars, G. - Voyages metallurgiques, Vol. 2. p. 543.

"If the managers understood the theory of the circulation of air in mines it would be easy to expel this bad air by means of vents from one working to another."

a second Shaft is sunk, at the extremity of the Gallery, opposite to the first, and if it opens at a different Level from the other, a circulation and consequent renewal of air immediately takes place." (78)

By 1864 the larger mining companies were prepared to undertake extensive "dead work" for the purpose of improving ventilation. In the Derwent Mines sumps connecting levels were constantly driven so as to bring proper circulation of air as near to the men driving a new level or getting ore at the fore-head as possible. One Derwent Company sub-agent, who had been a miner for over 50 years, told the 1864 Commission that this was a new policy introduced by a new owner of the mines. Previously smoke from a single "shot" would hang around for hours: in 1864 the bulk would disappear in 10 minutes. (79) In the Rodderup Fell mines "about four fathoms above the level we have an air drift which we drive up, so as always to keep up with the level." The two would be connected by a sump about every 15 fathoms. (80) Both the London Lead Company and the Beaumont concern used trap-doors to increase air flow in the places where it was most needed. The latter had recently opened two furnaces, one at Allenheads, the other at Burtree Pasture in Weardale. These were designed to heat the air at the up-cast shaft, thus stimulating the draught. It was found that they greatly improved ventilation

(78) Forster, W. - Section of the strata. 1821. pp. 322/323.

(79) 1864 Report. (Vol. 2.) pp. 350/351.

(80) 1864 Report. (Vol. 2.) p. 338.

even in places as much as a mile away from the furnace." In one particular part of the mine prior to the furnace at Allenheads being lighted... the men in dull damp weather were frequently prevented from working by a want of ventilation, and since that they have not lost any work, and speak very favourably of the effects of the furnace." (81)

In the blind extremities of levels and shafts, "the fore-heads", it was very difficult to get a flow of air by natural means. Here it was often necessary to pump air along tubes for the men to be able to work. In the eighteenth century this form of ventilation was frequently used extensively, as being cheaper than the dead work necessary for obtaining a natural flow of air. By the nineteenth century the larger mining concerns did apparently limit the use of "artificial" ventilation to those places which it was virtually impossible to ventilate naturally.

The most powerful form of artificial ventilation in use in the eighteenth century was the water blast. A member of the Newcastle Literary and Philosophical Society, visiting Allenheads in 1793, described the system subsequently at a meeting of the Society. "It consists merely of a tub, with a perpendicular pipe, with many holes drilled in its sides fixed in the top, and a bent pipe turned up from the bottom, making, with the tub, an inverted syphon." This was placed under a fall of water down a shaft within the mine. "The water, in its descent, forces down along with it the air in the pipe, which is immediately supplied by the holes bored in its sides at different distances." When

the air trapped in the water fell into the tub it had "no way of escape but along a horizontal square pipe or box inserted into the side of the tub near the top, which, being carried along the roof of the level drift, supplies the miners with air to a vast distance." It was found that the stream of air from the end of the pipe, 400 fathoms away was "so strong as nearly to blow out a candle." (82)

This form of ventilation was in use at least as early as the seventeenth thirties in the Blakett mines, as numerous references to its installation in particular places show. It was still in common use in 1864, sometimes with a miniature pressure engine to give more force. In the eighteenth century the piping was all made of wood, which easily rotted at the joints, allowing air to escape. Iron and lead pipes were introduced early in the nineteenth century. (83) In 1864 it was the normal policy of both the London Lead Company and the Beaumont concern to install a water blast in every new long level as it was being driven. (84)

The great disadvantage of the water blast system was that good air came in via the tube: it was the bad air that was forced out along the level. "The great danger then is of the foul air accumulating behind and clogging up... I have known instances of that kind where the men have had to come through some portion of the drift where they could not carry a lighted

(82) Turner, W. - Short tour through the lead mine districts. 1793, (in Newcastle Lit. & Phil. Soc. Trans.), Vol. 1, 1831, pp. 66/81.

(83) Sopwith, T. - Alston Moor. 1833. pp. 119/120.

(84) 1864 Report (Vol. 2.) p. 377.

candle," the Allenheads agent told the 1864 Commission. (85). In the Blakett Level, being driven along the East Allen to discover new veins, the normal system had been reversed. The hydraulic engine at the water blast sucked air from the forehead causing the fresh air to approach along the level.

For more local use in individual ore workings the mine owners would pay for the installation of piping through which air would be pumped by a boy in the main level. A frequent addition to bargain agreements in the Blakett/Beaumont accounts was such a phrase as "and they are to have 1/11d. per Week for finding lads to blow the bellows." (86) This system was also in use from at least the seventeen thirties until after 1864.

These were the systems in use to ventilate the mines. How effective were they? In a later chapter it will be shown that most lead miners died at an abnormally early age - owing to respiratory diseases caused by the air which they breathed within the mine. The dust and smoke laden air was not immediately lethal as choke damp was. When choke damp leaked into a level the miners left at once. The contaminated air they had to put up with, or lose their occupation altogether. Assistant Commissioner Mitchell wrote in 1842 that "in most mines there are not two levels communicating with the open air... Where nature does not interpose a physical impossibility, there is another what is equally powerful - the dread of expense. The sum required to

(85) 1864 Report (Vol. 2.) p. 367.

(86) B/B 136. Weardale. Aug. 25th, 1787.

sink a shaft or drive a level may be so great that the mine is not worth it. The proprietor would rather discontinue working it than submit to the burthen; and the men, young persons, and boys, having no other means of existence, are eager to be allowed to work at the mine such as it is." (87)

The evidence supplied by the Blakett/Beaumont bargain books and the cross examinations of witnesses in 1842 and 1864 do not expose deliberate cruelty by the masters and agents, but a realisation by both master and men of the need for work to be continued in bad air. An Agent's report on a Weardale mine in 1809, for example, stated that he had "been under the necessity of advancing the price this quarter as the sinking to give the Air to the Mine is not yet completed." (88) A Weardale bargain of 1747 gave a partnership "liberty to work in the old yards when they want air in their working, not to neglect their working when the air will permit." (89) Shorter hours were permitted for men working in bad places, and during damp days in the summer months, many places would not be worked at all. But the miners were prepared to stand very bad conditions for the sake of extra money. One miner in 1842 said that "It is not proper to stop after the candle goes out". But - "Sometimes we must hang the Candle half perpendicular, that the grease may flow down to the flame of the candle, and burn in spite of the foul air. It is seldom necessary to do this, but perhaps it may be a place in

(87) 1842 Report (Mitchell.) p. 728.

(88) B/B 53. April 10th, 1809.

(89) B/B 176. July 9th, 1747.

which this must be done." (90)

Air blowing machines were supplied at the request of the men, providing the agents considered it necessary. (91) Men were allowed to leave their workings, according to a Beaumont agent in 1864, "at their own discretion." (92)

It is difficult to estimate how much improvement there was in ventilation practices in the period covered by this thesis. Undoubtedly there was a greater realisation of the importance of natural ventilation in the nineteenth century. Statistically, however, there was no improvement in the figures for the early deaths of miners from 1842 to 1864. (93) The men and agents asserted, in both 1842 and 1864, that conditions had improved substantially. Dr. Peacock told the 1864 Commission that "The reports of the older men, and of the agents and medical officers, and indeed of almost everyone connected with the mines, show that formerly the state of the mines as to ventilation was very much more defective than at present" but in spite of the improvements "I was repeatedly told by miners now at work 'that all miners have to breathe bad air, more or less', or that in 'all mines there are places where the air is bad'". (94) A Beaumont agent thought that productivity had gone up 10% compared with a period 40 years before 1864 as a direct result of improvements in

(90) 1842 Report (Mitchell.) p. 739.

(91) 1864 Report (Vol. 2.) p. 360.

(92) 1864 Report (Vol. 2.) p. 371.

(93) See Chapter on Health.

(94) 1864 Report (Appendix.) p. 13.

ventilation. (95)

We have seen, therefore, that although the conditions under which the miners worked were considerably improved in the period covered by this thesis, the actual work performed by the miners changed very little. If a miner of the seventeen-fifties were to return to his work a century later, he would find the mine better drained and ventilated, his own access and the removal of ore and deads greatly eased by the construction of horse levels, and more machinery in use for pumping air and water. When he came to the forehead, however, he would find the same method of work, and even the same tools as he was used to. It is probable that had the mines remained open until the later years of the nineteenth century greater changes would have taken place, such as the wholesale introduction of the power-driven rock drill. As it was, however, most mines closed down while these improvements were still in the experimental stage, and to the last the miners went on working by hand as they had done for the previous two hundred years.

(95) 1864 Report (Vol. 2.) p. 379.

CHAPTER 3.The Bargain System.

The relationship between the employers and their employees in the lead mines was governed by the bargain system. This contract between the two sides - capital and labour - remained in theory the same throughout the period covered by this thesis. In practice, however, as will be seen, the interpretation of the bargain changed considerably, resulting in a general tightening up of the control over the workmen by the mine agents, so that the miners, although still nominally independent contractors, found themselves forced to work regular shifts at specified times, and many of their traditional holidays and celebrations quietly disappeared. The theory, and even the format, of the bargains remained the same right up to the closing of most of the mines in the late eighteen seventies. The interpretation of the basic contract, however, had changed considerably by 1842, and the changes continued at a more rapid rate after that date. These changes will be considered in detail later in this chapter.

The following quotations from various sources covering nearly an hundred years show how little the bargain changed in its basic constituents. Jars, writing in 1765, described the system, - "Tous les ouvriers en général travaillent à prix-fait par troupe de deux, quatre, six, huit, etc. On leur donne tout par toise pour des endroits ou il n'y a pas du minéral, & pour ceux où il y en a, le prix est fixé pour chaque mesure que l'on nomme bing (8 cwt.); sur ce prix ils sont tenus de se fournir les outils, la poudre, la lumière, de trier le minéral & de le

livrer pret a etre fondu." (1)

In 1821 Forster wrote "The miners take a certain piece of ground, commonly called a length in which they propose to raise ore, for a certain time, at so much a Bing, according to the richness of the Mine or working. A length of ground is commonly either twelve, fifteen, or twenty fathoms, and the price of procuring the Ore, depends much upon the hardness, the expence of drawing the Stone or Ore out of the Mine, and the probable quantity of Metal that can be raised..., the miners always paying for Candles, Gunpowder, the expences of drawing the Ore or Stone from the Mine, working, dressing, and preparing it, fit for the process of Smelting." (2) The 1842 Report stated that "The miners with few exceptions, speculate on the produce of the mines in which they work. Four miners... form a partnership together, and they make a bargain that they will work in a certain part of a certain mine for the next three months, for so many shillings for every bing of ore which they dig out: the expense of washing and cleaning the ore, and making it fit for the furnace, being charged to them. All the other men in the mine, in parties of 4, 5, or 6, or more make bargains in the same way. These bargains are entered into a book, and the miners sign them." (3)

-
- (1) Jars, G. - Voyages metallurgiques, 1774/81. Vol. 2. p. 543.
 "In general all the workmen work at prices fixed according to the work they are doing in partnerships of two, four, six, eight, etc. So much a fathom is given them in places where there is no ore, and where there is, the price is fixed for every measure which is called a bing. They are obliged to find their own tools, powder, and light; to dress the ore and deliver it fit for smelting."
- (2) Forster, W. - Section of the Strata. 2nd. ed. 1821. pp. 332/333.
- (3) 1842 Report (Mitchell.) p. 744.

Thomas Sopwith, on being examined before the 1864 Commission, described the bargain system in much the same terms, adding only that a time clause had lately been introduced, compelling the miners to work regular hours, which had at first been much resented. (4)

For the mine owners the bargain system allowed piecework payment of their employees - payment by results. The more ore the men raised, or ground they dug away, the more they were paid. This system therefore encouraged the miners to work hard - for their own profit was linked closely with that of their masters. In a group of resolutions voted by the Court of the London Lead Company in 1810, No. 12 was "That as few Wagemen as possible be employed, but that in every instance where it can be accomplished, the work to be done by the Piece, of what nature soever". (5) The Blakett/Beaumonts followed the same principle. Their mine accounts show that no men engaged in getting ore or driving shafts and levels were paid wages. The "wagemen" were those in the subsidiary occupations, such as blacksmiths, woodmen, etc. and were a very small proportion of the whole labour force. The bargain system also allowed the mine owners to spread the risks of lead mining. The miners had to speculate in the same way as their masters with the same chances of ill luck. But the miners working in a rich vein were paid far less per bing of ore than those working in a poor place. The richer the mine, the less

(4) 1864 Report (Vol. 1.) p. 262.

(5) L.L.C. 17. Dec. 6th, 1810.

the mine owners had to pay per bing. The workmen, therefore, did not share good fortune in mining to the extent that they shared the bad, when, if for example the price of lead fell below a level which made it uneconomic to work poor veins, mining operations were ruthlessly curtailed, and part of the labour force dismissed.

Another resolution agreed to by the Court of the London Lead Company in 1810 was "That in letting of Bargains no person whatever shall have an hireling employed on any account in the Company's Works". (6) In other words, every partnership had to work its own bargain, and not hire other men to do the work on a wage basis. This had apparently been a common practice in the Blakett/Beaumont mines until Sir Walter Blakett put a stop to it in 1764. The mine agents had been giving bargains to their "hired servants", a practice that could obviously lead to corruption. Sir Walter wrote to one Agent who wanted to do this, - "After you had left me the other day, I considered the nature of the request you had made to me and which I agreed to upon your telling me it was an usual practice, to wit, to put a Man into the Grove to work for you; that is, you agree to give him a certain daily Sum and all the Oar he gets is to be your's. Now according to my notion this agreement cannot be for my advantage, a man cannot be supposed to work so diligently for another as he will for himself (witness all the Statute work which is done upon the Roads) wherefore I have sent to my Stewards, that no such persons, who do not work for their own

(6) L.L.C. 17. Dec. 6th, 1810.

profit entirely, shall be taken into the Groves." (7) In instructions to the Blakett/Beaumont agents issued at the beginning of the nineteenth century they were strictly ordered that only such persons whose names had been "inserted in the Bargain Book at the time of contracting, to be intitled to the benefit or advantage arising from such Bargains." (8) In 1813, after the chief agent had observed "in the Coalcleugh Accounts for the last year... the very large sum of £1147-2-3 earned by 2 different partnerships both under the name of Joseph Walton", he instigated an enquiry resulting in the dismissal of the Coalcleugh agent. The circular letter to the other agents explaining this act ordered them "to avoid in every instance partiality by observing an equal consideration towards all the workmen and to discontinue the improper practice, which has been excercised at Coalcleugh contrary to the positive injunctions laid down for your Regulation, of employing Hirelings." (9) After this episode there is no later evidence of corruption or collaboration between agents and men in the Beaumont records.

The contracting miners liked the bargain system because of the independence it gave them. They felt themselves to be free men working for their own profit at times of their own choosing. As will be seen later in this chapter this freedom was to become

(7) B/B 20. July 1764.

(8) "Arrangements recommended to Colonel and Mrs. Beaumont for the future Agency and Management of their Lead Mines." In Blakett of Wylam Papers, Northumberland Record Office. Appendix. Document 2.

(9) B/B 51. June 19th, 1813.

more and more illusory as the nineteenth century progressed.

The administration of the bargain system is well illustrated by the Blakett/Beaumont records, where long series of bargain books exist, covering every one of their mining districts. Information about the practices in other companies is far more scanty, except for the evidence gathered by the 1842 and 1864 Commissions.

The bargains were conceived to have the same legal nature as leases. In the eighteenth century bargain books covering the Blacketts' Weardale area, "tacks" - or leases of ground to small groups of adventurers giving them full mining rights for a period of years - are recorded alongside the normal bargain entries. Bargains were contracts between the employers and the employed, with legal recognition. In 1805, after a threat of a strike in the London Lead Company's mines, the magistrates "compel the Miners to complete their Bargains." (10)

The bargains were recorded in "bargain books". The format varied in the Blakett/Beaumont mines from place to place and period to period. (See illus. 4) The fullest form of entry included a list of all the partners, a definition of the area of work, and the price to be given for work performed, and the period of the agreement. Sometimes one of the partners signed the record. A duplicate of the bargain contract was given to the partnership concerned, and the Beaumonts introduced a printed form for this purpose in the eighteen-sixties.

In the eighteenth century the bargains of the two largest

(10) L.L.C. 16, Sept. 16th, 1805.

concerns ended, or were renewed, at three monthly intervals. The Blackett/Beaumont records show that most bargains were taken in January, April, July, and October. There was some unevenness of letting; most bargains were let at the beginning of the quarter but some not until the middle or end of it. Nearly all these bargains ended at the same time. The bargains for longer periods were mainly of the "tontale" variety (to be explained later) or those at very small and isolated mines with only one or two partnerships working. Occasionally there was a bargain allowing the partners discretion when they were to finish - "to June 1754, but if it prove a hard Bargain they're to be loose at March 31st 1754". (11) In the nineteenth century letting was far more regular, and both the larger concerns changed to a 4 monthly bargain period. The Court of the London Lead Company resolved in 1810, "That no Bargain be let for a longer Term than a Quarter of a Year". (12) In 1816, however, the bargain period was lengthened to 4 months, so that bargains were taken only 3 times a year instead of 4. The Beaumont concern retained a 3 monthly bargain period until 1859 when it too changed to a 4 monthly period.

"Letting" the bargains was an elaborate ritual which required complex organisation. In 1845 Sopwith described in his diary the procedure involved at Allenheads, (which had apparently changed little in the preceding century). - "26 Sept. I went

(11) B/B 133. Jan. 21st, 1754.

(12) L.L.C. 17. Dec. 6th, 1810.

at an early hour to accompany the Inspectors of Mines on their quarterly examination of the several workings preparatory to arranging the prices for new contracts. This survey is called "Riding the yards"... 4 Oct. I let the Bargains... This occupied the greater part of the day and was followed by a dinner at the Inn at which all the Inspectors and chief clerks were usually present and which I was expected to provide... 6 Oct. This is called 'Placing day'... Some workmen when offered a Bargain... refuse the offered price and if no agreement is come to, they remain 'out' - or unemployed. Occasionally there is not employment for the entire body of miners and those who are not required, are also 'out'. The object of "Placing day" is to reconsider the contract prices and to endeavour to find occupation for all the workmen resident in the district." (13)

In 1864 the system had changed little. "Viewing agents" inspected the mines and recommended a price. The actual letting was done in the presence of the agents of Allenheads, Coalcleugh, and Weardale, as well as of the chief agent. "We give independent opinions, so that we cannot cheat anyone." (14)

The London Lead Company's chief agent gave the 1864 Commission an elaborate description of the procedure in the Company's mines. "We send not fewer than five agents to each working, throughout the whole of the mines... Formerly one set of agents used to view all the mines, and it took them a fortnight to complete their work;... but for some years past, instead

(13) Sopwith, T. - Diary. 1845.

(14) 1864 Report (Vol. 2.) p. 332.

of having one set of agents going, I have had two sets to view, and we are able to accomplish all our bargain arrangements within a week. As a general rule, the men do not work at the time that the view is going on, so that we have a loss of time, a loss of time to the masters, and a loss of time to the men also... These agents are not exclusively the local agents, but they are drawn from the different districts... mingling the home agents and the stranger agents together; and in that way all possibility of partiality, and all possibility of any improper dealing between the local men and the miners is prevented..." This system had been in operation "for the last half century". (15)

The Blackett/Beaumont bargain books provide a splendid record of the changing conditions imposed in the bargains for a period of over 150 years. In the eighteenth century there were four basic kinds of bargain. The most usual was "bingtale" - the mining partnership was paid according to the number of bings of ore it extracted from the mine and washed ready for smelting. Then there was "fathomtale" - the partnership was paid according to the total number of fathoms it had driven through the ground, (i.e. "deadwork"). "Tontale" was payment based on the total number of tons of lead produced from the ore extracted by an individual partnership. Lastly there were "Lump Bargains", where the partnership had been given a task or tasks to do for an agreed payment. These were the basic forms of bargain, but there were many variations and combinations of them in actual practice.

(15) 1864 Report (Vol. 2). pp. 375/376.

In the very earliest surviving bargain book, for Weardale in the seventeen twenties, the agreements recorded are mainly of the first two types. By the middle of the eighteenth century variations were common. Frequent changes of practice suggest that the agents in the early and middle eighteenth century were not given such precise instructions as to the conduct of bargains as their later successors. A change of agent led to a change of bargain practice, as each ordered matters as he chose. In the seventeen fifties lump bargains were more common than fathom contracts. Unpleasant conditions were frequently imposed - "Let... a Bargain to Cut Cross to a Sun Vein in the Low Hazel Sill... at £15 per Lump: but if it so happen that they do not Cutt a Vein they are to have nothing for Cutting Cross." (16) Differential prices based on the number of bings raised, which had been common earlier, had disappeared. As an example, a typical bargain of the seventeen twenties altered the price if the men were too successful - "to get ore att 20/- per bing, but in case they gett above fifteen Bings of ore before the 31st of Oct next they are to have but 18/- per Bing". (17)

The reason for the existence of tontale as well as bingtale bargains for the extraction of ore is not obvious. In the early eighteenth century, and for all of the nineteenth after about 1810, tontale bargains were limited to those workers who were engaged in washing the "wastes" - the heaps of deads and rejected material - for the scraps of ore remaining. (More will be said

(16) B/B 133. Aug. 1st, 1754.

(17) B/B 132. Oct. 13th, 1724.

June 4th 22: 1794
 Then Let To Geo: Graime
 of part of a Bargain for 9th mo for
 the same place They wrote Let to
 for at 20th of Bury till 30th of 30
 1794 - Wellen's own hands
 Geo: Graime
 Geo: Carlin

After Clough
 July 7th 2: 1794 Then Let to Tho: Jackson
 and 2nd 1st of a Bargain for the fore
 Head They now work for to give 5 fath
 at 30th of fathom & Twenty Phillips
 of Bury for what are they Let for dioc
 the 3rd 3 fathoms

229

April 5th 1866

Bellsburne.

Thomas Ward.	Thomas Ward is for agree to raise the in this
Miller Roadsman	ground (c. 15 th 1 st 17 th 18 th till 20 th June.
Wet. Gardener.	To work for eight hours shifts for work for man.
L. P. Gardener.	Wet. - 15 th 1 st 17 th 18 th Bury William. Roadsman
	158.
Hugh Fairless	Hugh Fairless is for agree to drive the Colwell & P.
Joseph Walton.	east from last bargain (c. 15 th 1 st 17 th 18 th till 20 th June.
Thomas Roadsman	159.
John Roadsman.	To work for eight hours shifts for work for man.
John Gardener.	East. 15 th 1 st 17 th 18 th Hugh Fairless
James Gardener.	159.

heureux, grâce à l'intelligence mieux conduite de nos ouvriers".(21)

Other innovations were introduced into the bargain contract as the nineteenth century progressed. A particularly important change, (and one most resented by the miners) was the enforcement of more regular hours of work: this will be discussed shortly. Another was a change in the nature of the fathomtale contract.

In the eighteenth century, and, in the case of the Beaumont mines, until well on into the nineteenth century, fathom work implied merely the removal of barren ground. Any ore found in so doing belonged to the workmen, and they were given a price for it: this was often recognised in the terms of the contract - a partnership received so much per fathom for ground cut, and so much per bing for ore raised. Later it became the custom that ore extracted by fathom workers was the property of the mine owners. Stagg reported to the Court of the London Lead Company in 1817 that he was conducting "an experiment to ascertain whether it may not be more advantageous in some part of this Vein to cut the whole of it out by the Fathom instead of working it by the Bing. By the Mode now trying much Wood will be saved, the Wages will be more equalised, and there will be considerable saving also in the Washing [this saving in the washing was due to the fact that by the new system the "bouse", or unwashed ore, extracted by each partnership, no longer had to be kept carefully separate] but it remains to be proved by trial which will be most

(21) Dufrenoy, P.A. and Elié de Beaumont, J.B.A. L.L. - Voyages metallurgique. 2nd. Ed. 1837-1839. Vol. 2, p. 536.
 "would bring most fortunate results thanks to the intelligence of our workers being better applied."

profitable." (22) In 1842 both systems of fathom payment were in use in different mines: in the Beaumont mines the old system prevailed; in the London Lead Company the new. In 1864 the chief agent of the London Lead Company told the Commissioner that payment by bing and by fathom were both still in use, but that "three fourths" of the London Lead Company miners were now paid by fathom. (23)

A few years before 1864 the Derwent mines had been taken over by a new company who had introduced Cornish customs, Cornish terminology, and a few Cornish miners. The Agent of these mines in 1864 talked to the Commissioners in Cornish terms - bingtale was called tribute work: fathomtale, tutwork. Instead of the letting of bargains there were "settings". The procedure was now completely different from that elsewhere on the mining field. "Sometimes we let our bargains for a month, but generally speaking, we give them a certain stint, two or three fathoms, and they may have a second or probably a third bargain too in the month." This was normal Cornish tutwork practice. A surviving report book of the Derwent Company from the eighteen seventies shows that the Cornish system of bidding for "sets" was in operation, with the men competing with one another to take favoured "sets" at a percentage of the value of the total ore raised. The tributer who was prepared to take the lowest percentage was allowed to work the set. (24)

(22) L.L.C. 16a. Midsummer 1817.

(23) 1864 Report (Vol. 2.) p. 376.

(24) 1864 Report (Vol. 2.) p. 347. Derwent Mines Report. See

In the small mine at Stonecroft, north of Hexham, bingtale had been abandoned altogether by 1864. Men were paid "by the square fathom", i.e. 6 feet high, and 6 feet forward. (25)

In the Beaumont mines the old arrangements continued longer than in those belonging to the other mining companies. The system was streamlined - for example forms were specially printed to serve as the miners' record of bargains - an eight hour day was enforced, the period of bargains was extended to four months, and there was virtually no stoppage of work at the beginning and end of the bargain periods. But as late as 1875 the Weardale bargain books show an almost equal number of fathom and bing contracts. By the end of the eighteen seventies, when lead prices had fallen to a disastrous level and the Beaumonts were considering abandoning mining altogether, the book keeping degenerated enormously. Bargains were badly entered, and if renewed, the new dates were written in over the old, instead of re-writing the entry.

So far the essence of the whole bargain system - the fixing of the place or "length" to be worked, and the price to be given - has not been discussed. The principles governing these vital factors remained the same all the time the bargain system was in operation, but, as the nineteenth century progressed, so did the control of the agents over the deployment of the workmen.

Jenkin, A.K.H. - The Cornish miner, 1927, for an account of the tribute and tutwork systems.

(25) 1864 Report (Vol. 2.) p. 355. N. of Eng. Inst. of Min & Mech. Eng. Trans., Vol. 27, 1877/78. pp. 15/22.

Even in the early days of mining the miners were not allowed complete freedom as to where they were to work. At Fallowfield in the late seventeenth century, each partnership was allocated a shaft from which to dig ore. Directions to the Blakett miners in the eighteenth century were normally precise - e.g. "to get Ore in the ground, East of the hole that Bainbridge's Horse fell into". (26) If a partnership raised ore from a part of the mine, or part of a vein, without a contract to do so, its members were not paid for it. (27) This was, of course, because the price a partnership was paid was based on the precise conditions at a particular place. The factors that both the agent and the contracting miners had to consider included the hardness of the vein, its quality, whether blasting was necessary or not, the distance from the surface and the nearness of a horse level, and the ventilation and drainage conditions. If the vein were rich, and access easy, a relatively low price was given: if the opposite, a much higher price per bing. The price had to be agreeable to both sides. Over and above these local factors, the agents had to consider the prevailing economic conditions - the price of lead, and of food, for even when the mines could be worked only at a near loss some work had to be kept going, or the skilled labour force would migrate from the area.

The miners were "free to accept or refuse the price the Agents... fix upon the different Workings". (28) They could

(26) B/B 167. Oct. 21st, 1783.

(27) B/B 46. Jan. 16th, 1760.

(28) B/B 51. Dec. 26th, 1816.

suggest to the agent where they would like to work, but, more usually, it was done the other way about. However, at the Bargains, the partnership at a given place expected to work it again if its members chose, and a price could be agreed on. One Allenheads partnership actually wrote a letter of complaint to Sir Walter Blackett himself, when the local agent "as soon as their Bargain was out,... took the best of the ground from them where she was $\frac{3}{4}$ of a yard clean Ore in width and let at 17/- a Bing, and put them into the worst ground". (29) If the original partnership refused to renew a bargain, because its members thought the new price offered too low, another partnership was free to move in if it was prepared to accept this price. A low and uneconomic price, wrote Sopwith in 1852, would sometimes be taken "with a view to obtain a footing and to displace others". (30) The mine owner always gained the advantage in this sort of manoeuvring as, save in the very rare times of great demand for lead, there was almost invariably a surplus of labour over jobs available.

Detailed reports covering the years 1816 to 1819, written by the newly appointed London Lead Company chief agent, Robert Stagg, illustrate how control was kept over the mine workings, and a balance maintained between extracting ore, and doing the necessary dead work for future expansion. In 1816 Stagg wrote that the prices in one mine were far too high as "the chief workings having been pushed forwards upwards of 20 Fathoms

(29) B/B 48. Nov. 11th, 1764.

(30) Sopwith, T. - Diary, April 16th, 1852.

before the drawing Level from an improper anxiety on the part of Mr. Dodd [the previous agent] to raise a great quantity of Ore". The men were temporarily removed from these forward workings to the "old pickings" to allow the necessary dead work of driving the horse level to progress. Stagg calculated that the average price per bing would then drop 7/-. Men working in the old pickings were given very high prices as these were "parts of the Mines which had been left as being too poor to work & are all therefore entirely speculations on the part of the men". But "it is a notorious fact that a great proportion of the good Mines now working were originally discovered by speculations of this description made by the Men, rather than that they would be entirely out of work". (31)

A report of 1819 shows how the miners were deployed in their attack on a vein. Each partnership was allotted a square, "which they cut round in the first instance, whereby the Agents are enabled to judge with comparative certainty of the prices that ought to be given". These large squares would then be divided into "two or more compartments" as was thought fit. (32) This regular method of approach to a vein was apparently introduced into the Northern Pennine orefield by Stagg, and it replaced, in the larger mines, the random following of a vein in all its "twitches" and "throws". By approaching in a pattern of squares, no ore was missed, and minor veins, or "strings" were more certainly discovered.

(31) L.L.C. 16a. Midsummer 1816.

(32) L.L.C. 16a. Lady Day 1819.

It does not appear that the partnerships of miners were specialists in either bing or fathom work. An examination of the Blakett/Beaumont records for both the eighteenth and the nineteenth centuries shows that a partnership would change from bing to fathom work, or vice versa, at successive bargains. This fluidity of labour was essential to deal with the constantly changing conditions in a lead mine. A detailed account of the work of a single partnership working at Fallowfield in 1770 shows that in a six monthly period its members had raised 12 bings of ore, driven 25 fathoms, spent 21 days repairing levels, and spent 8 days in Fallowfield smelting mill. (33) This is, of course, an unusually varied example, due to the fact that Fallowfield was relatively small and isolated. It is most unlikely that miners elsewhere did all these different jobs in a single quarter, but over the whole mining field there was none of the specialisation in either tributing or tutwork that was a feature of Cornish mining.

The number of men in a partnership varied from 2 (which was unusually low) to 12: at all periods, (as witnessed by the Blakett/Beaumont records) most partnerships consisted of from 4 to 8 men. Every partnership had to declare its members at the time of the bargain, and was not permitted to hire any "wagemen" itself. The only exception to this rule was for the boys, usually the children of members of the partnership, who, as will be shown later, were taken into the mine by their fathers during the winter months. The very large partnerships of 10 or 12

(33) Fallowfield journal 1769. Blakett of Matfen papers, Northumberland Record Office.

members were normally employed either at driving a level or shaft where speed was essential, or in places where there was much water, and therefore constant pumping was required. In a report of 1816 Stagg wrote that one reason why it was economically better that a horse level should be close to the ore workings, was that the large sizes of the partnerships could be reduced. "Small partnerships of 4 men instead of the large partnerships of 8 or 10 men" could work at lower prices, as most of their time would be spent in the actual getting of the ore. The large partnerships had used much of their labour force in transporting ore and deads over a long distance by hand. (34)

The smaller partnership groups consisted of "shoulder fellows, between whom a lasting intimacy springs up". (35) The Blakett/Beaumont bargain books show that the smaller partnerships were fairly constant in their composition; the larger ones, however, were ad hoc groupings made up as occasion demanded. Many of the partnerships were between members of the same family, often of different generations, "and there is the skill of the one and the physical energy of the other, the one compensates for the other". (36)

The 1842 Report on the Employment of Children in Mines gives a great deal of information on the training of juvenile miners and the stages through which they proceeded before becoming full members of partnerships, amongst whose members all earnings were divided equally. The number of jobs that could be done by boys

(34) L.L.C. 16a. Midsummer 1816.

(35) Featherston, J.R. - Weardale men and manners. 1840.pp.64/65.

(36) 1864 Report (Vol. 2.) p. 379.

who had not yet come to their full strength was rather limited. They could help in getting the ore and deads from the mine, - leading horses, loading wagons and kibbles, breaking up deads, and generally sweeping up. Boys were also employed in turning the wheels to drive fans in otherwise unventilated workings. The actual work of ore getting and cutting new levels was beyond their power and skill, although they could assist the partnerships in the more menial tasks. There was none of the wholesale exploitation of child labour within the lead mines, as there was in coal mining. This was, however, due less to humane feelings, than to the fact that child labour could more efficiently be employed on the washing floors where the ore was dressed. Also, much of the work inside a mine was beyond a child's capacities. Lead veins are worked vertically, while coal seams are worked horizontally, so that while in a coal mine it might be economic to open out a low seam just enough for a small child to crawl through, in a lead mine it was more economical to drive a horse level as close to the actual ore workings as possible. In 1842 there were only 41 boys under 18 employed in the mines in East and West Allendale, 8 of whom were under 14, the youngest being aged 10. (37) At that date 10 appears to have been the earliest age at which boys were allowed into the mines, although, as will be shown later, there were younger boys working on the washing floors. In 1864 one of the medical witnesses to the Commission enquired of miners when they had first begun working underground. In Weardale and in the Allendales many of the older men had

(37) 1842 Report (Mitchell.) p. 746.

begun work at the age of 7, at Nenthead 9 was the earliest age. (38) For virtually all of these, however, this work was only temporary, when weather conditions had stopped work on the washing floors. By 1864 boys were not allowed into the mines until they had reached a certain age, which varied with the different companies. The London Lead Company allowed no one to work regularly underground until he had reached the age of 18, although boys of 14 years old and upwards were allowed in for three months during the winter. (39) 13 was the youngest age in the Beaumont mines, although Sopwith admitted that "It is found practically difficult to enforce a rule rigidly. When family matters or other matters of that kind come into consideration, we sometimes relax the rule". (40)

It is thus seen that most boys came into the mine only in the winter months when the washing floors closed down. In 1842 only the 16 and 17 year olds normally worked in the mines all the year round. They performed several tasks in the mines, and each type of job had its own form of payment. Those engaged in working ventilation machinery were employed on a wage basis by the mine owner. The boys removing ore and deads from the mine were employed by the contractor who owned the horses working in that level. (41) The remainder were employed directly by the partnerships. In the eighteenth century these latter were mentioned in

(38) 1864 Report. (Appendix.) pp. 20/21, 82/91.

(39) 1864 Report (Vol. 2.) p. 376.

(40) 1864 Report (Vol. 1.) p. 258.

(41) See later in this chapter.

the Blakett/Beaumont bargain books as "- & lad" and counted in the total number of partners, although they were not apparently paid as such. By the middle of the nineteenth century they were employed without being numbered as partners at the Bargains. In 1842 "when boys are first taken into a mine with men they are hired, and either paid wages by the shift, or so much in the shilling of the men's share of the produce of the contract when the ore is washed and weighed... The wages of the boys employed in partnerships are paid by the men employing them: the wages are agreed for by their parents generally, but are frequently determined by age, and the agents of the mine sometimes fix the boys' wages". (42) The boys worked the same hours as the men, which, as will be seen, hardly ever exceeded 8 hours.

The boys received a few pence a day as wages - for example a 14 year old would normally receive 9d a day in 1842. Eighteen was the earliest age at which a boy was usually admitted as a partner "If his father or brother be already working in the mine his advance to be a partner is much facilitated". (43) Some were not admitted to full partnership until they were 20 or 21. Working with the same partnership, and eventually gaining acceptance by its members, was the way for a young man to become a full partner. (44) In a contract for drawing work at Allenheads in 1846, it was recorded that "the undertaker to be assisted in hiring Lads to drive waggons etc, and to have two of the Lads

(42) 1842 Report (Leifchild.) p. 681.

(43) 1842 Report (Mitchell.) p. 745.

(44) 1842 Report (Mitchell.) p. 760.

(most deserving) taken annually from the driving and employ'd otherwise in the Mines". (45)

The numbers of the non-bargain adult workers in the mines were limited as much as possible. Basically the day-rate men were of two kinds. Firstly there were the labourers doing odd jobs underground and on the surface. In the Blakett/Beaumont mines the accounts show that these workers were drawn from the men out of bargains for one reason or another - such as failure to come to an agreement over price, or that the bargain had proved to be so bad as to be unworkable. There was apparently no regular class of unskilled labourers. The other type of day-rate men were the tradesmen doing skilled work subsidiary to the main task of ore getting. These jobs have already been outlined in the previous chapter. The Blakett/Beaumont accounts show that the proportion of men employed by day-rate did not increase in the nineteenth century. If anything, the opposite occurred. From the eighteen thirties onwards complex bargains appear in the accounts by which the tradesmen contracted to do their work in the same way as the ore getters, although usually for longer periods. There were such bargains for blacksmiths, engineers, and woodmen, who had previously been paid on a wage basis. As an example of such a complex bargain, here is one by which pumping was undertaken at a given place for one year. - "William and John Curry agree to pump the water at the east end in Wentworth Vein, they finding Horse, driver and Candles - And to have the pump Horses shod, the Engine kept in repair at the expense of Mr.

Beaumont for one year... if it is necessary to work the pump for that period, if not, to be paid in proportion for the time it is wrought, for the sum of Sixty Five Pounds for one year. If the quantity of water should increase to be more than one Horse can possibly keep, then the time of an additional Horse to be allowed, at the rate of 4/- per Day, including the driver, calculating six hours pumping for one day's work, but no additional Horse to be allowed, so long as it is found that one Horse can do the work, averaging seven hours per day through the week. N.B. The above W.J. Curry to take Mr. Beaumont's Horse which is now used for pumping at the value of Ten pounds." (46)

One of the most important changes that occurred in the organisation of lead mining in the eighteenth and nineteenth centuries was the change from irregular hours and days of work in the eighteenth century to an enforced 8 hour day, 5 days a week, by the middle of the nineteenth. This development is best chronicled in the Blakett/Beaumont records. The normal eighteenth century bargains for ore getting make no mention of any fixed hours to be worked by the partnerships. It was apparently left to the men themselves to decide whether they worked long or short hours, the whole quarter, or merely a fraction of it. The accepted number of hours per day was probably 6. A wageman's bargain of 1749 named 6 hours as being the normal shift. (47) In the London Lead Company conditions were the same. An 1816 report mentioned "the usual Miners week of five shifts of 6 hours

(46) B/B 62. Jan. 22nd, 1833.

(47) B/B 176. June 5th, 1749.

each". (48) Mackenzie, discussing Northumberland lead miners in 1826, said that they "seldom work more than six hours a day, which is called a shift". (49) If a partnership struck it rich, however, its members might work very much longer hours, to get out as much ore as possible before the end of that quarter brought about a revision of the bargain price.

Neither was the number of days worked in a week strictly enforced. A Cumberland historian of 1800, said of Alston Moor lead miners that "They work hard about four days in the week, and drink and play the other three". (50) On the other hand, the inhabitants of Wolfcleugh in Weardale were especially commended by the Beaumont agent in 1811, as they "go regularly to their work every day, Saturday not excepted, and in general work the whole of the day". (51) Even later in the century, however, Saturday working was most unusual.

In exceptional cases the bargain included a time clause. In the eighteenth century this was invariably either for dead work, when the completion of a new level or shaft was urgently needed, or for pumping, which often had to be maintained for 24 hours a day, 7 days a week. In these cases large partnerships were employed, the men working in shifts and relieving one another. Sometimes a penalty clause was inserted in the bargain. A partnership of 12 men at Coalcleugh in 1821 had to relieve "each

(48) L.L.C. 16a. Lady Day, 1816.

(49) Mackenzie, E. - Northumberland, 2nd. ed. 1826. Vol. 1, p.208.

(50) Houseman, J. - Cumberland, 1800. p. 70.

(51) B/B 53. April 9th, 1811.

other at the forehead, from Monday morning till 6 o'clock on Saturday evenings, if a single instance can be proved of the forehead standing in the above mentioned time an hour, to forfeit 10/- per fathom". (52) Such shift work was, however, unusual and indeed exceptional in both the eighteenth and nineteenth centuries. The members of a partnership normally all worked together in a single shift, which had the advantage that the sixteen or eighteen hours between shifts allowed the air to clear of dust and powder fumes.

As for the actual time of day when the shifts were worked, about 7 a.m. was probably the usual time for entering the mines. At the beginning of the eighteenth century the Allenheads miners were invited to attend prayers "every Morning at six o'clock, before they begin Work". (53) In 1842 most miners still began work at 7 or 8 a.m.

Holidays from work were taken at every possible excuse. Every ceremony connected with mining life had a holiday attached, often lasting for several days; - the letting of the Bargains, the issuing of subsistence money, and the Pays. As most miners were also small farmers, all of them stayed away from work during the hay harvest.

During the decade before 1850, however, the old laxity of time keeping disappeared completely in the Beaumont mines and probably in the other mines as well. The reason for this change was chiefly the desire on the part of the mine owners to achieve

(52) B/B 81. June 28th, 1821.

(53) Ritschel, G. - Account of certain charities in Tindale Ward, 1713. pp. 16/17.

higher production figures but it was linked with the gradual improvement in ventilation practices, which allowed the veins to be worked for longer and more regular periods. In 1842 a new formula was added to Bargains at Allenheads, and other Beaumont mines: that the partnerships were "to work five days per week per man". In 1843 this became "to work five eight hour shifts per week per man", and this latter remained a normal addition to bargains in the Beaumont mines until their closure. As late as 1841 the Allenheads agent had stated that the miners "generally work... 6 hours in each day", (54) so that there was a definite change of policy at this time. When Thomas Sopwith took over the agency in 1845 he increased the monthly subsistence money paid to miners. He told the miners on this occasion that "the advance of forty shillings has reference to actual work performed during five days of eight hours each". (55) A clock tower was erected at Allenheads, so that the miners had no excuse for not keeping regular hours. In 1849 there was a strike at Allenheads, largely because of the enforcement of regular hours. (56) In a letter to the Newcastle Guardian, defending his actions against accusations made by the strikers, Sopwith wrote that eight hours per day had been "for many years before I came" the accepted period of work, and that bargains were not just piece work, but also contracts to work a certain period of time. (57) The bargain books show,

(54) 1842 Report (Leifchild.) p. 682.

(55) Sopwith, T. - Observations addressed to the miners. 1846, p. 15.

(56) For a full account of the strike see Chapter 6.

(57) Newcastle Guardian. March 31st 1849.

however, that although the time contract was normally written into bargains before Sopwith's arrival, the practice had only started two years before. The 1849 strikers, in their letters to the newspaper, surprisingly did not emphasize the novelty of a time clause in their contracts. They protested most against the "spy system", which was introduced by Sopwith, whereby the agents observed when the miners entered and left the mine. The men were expected to be actually working for 8 hours, the time necessary for entering and leaving the mine being in addition to this. However, the strike was crushed, and the victory won by the owners. Regular hours of working were fully established in the Beaumont mines from this time.

In the London Lead Company mines five 8 hour shifts per week were already normal practice in 1842. (58) In 1864 and probably in 1842 also, the Teesdale miners, who, while at work lived mainly in lodging shops at the isolated mines well above the habitable parts of the dale, were allowed to work four 10 hour shifts, and thus have a weekend of three days at home. (59)

In the smaller independent mines too discipline was becoming stricter by 1842. A miner at one of the smaller Alston Moor mines (Holywell) told Dr. Mitchell in 1842 that "We have just time enough to get our dinner and then go to work again. If we were to sit too long at dinner, and master should know it, he might discharge us, and work is so scarce we shall not know where

(58) 1842 Report (Mitchell,) p. 756.

(59) 1864 Report (Appendix.) p. 18.

to go." (60)

The actual hours of work in both 1842 and 1864 were generally from 6 or 7 a.m., to 2 or 3 p.m. As in earlier times miners would work longer hours or in alternate shifts if they had struck a lucky bargain or were doing urgent dead work. Saturday work was uncommon and work on Sunday unknown.

Holidays and ceremonies at the letting of the bargains, the Pays, etc. disappeared or were limited to a single day. One custom that did persist was to allow the men "two or three weeks from the mines" to get in the hay harvest in July or August".(61) Thomas Sopwith much disapproved of this "period of laxity" which "so much interferes with work in the Mines and with attendance at school" (62) but even he did not attempt to change this custom, which would indeed have been difficult, as the miners' economy depended on their small farms.

The bargain system was devised, or rather developed, in a pre-industrial age. Its survival was obviously precarious in the rapidly changing social conditions of the eighteenth and nineteenth centuries. However its basic framework did persist in the lead mines until the collapse of the industry at the end of the nineteenth century. Points of friction did arise and caused many changes in detail - generally in favour of the masters. One such change has just been outlined - the enforcement of regular hours

(60) 1842 Report (Mitchell.) p. 769.

(61) Select Committee on the rating of mines report. 1857, p.7.

(62) Sopwith, T. - Diary. Aug. 7th, 1856.

of work upon the theoretically free and independent miners; another, the transformation of irregular and precarious earnings into what amounted to a regular system of wages, will be dealt with in the next chapter.

To conclude this chapter I should like to outline two other points of friction which the records of both the Blakett/ Beaumonts and the London Lead Company frequently mention - the removal of ore and deads from the mines, and the provision and ownership of tools, candles, and gunpowder.

All the ore and a considerable proportion of the deads dug in a mine had to be brought to the surface. This was the responsibility of the partnership which had mined them. In the primitive days of mining there was little administrative difficulty, if much hard labour. The material was dragged or hauled to the surface by each partnership working independently. The introduction of the horse level and the great enlargement of mines from the mid-eighteenth century onward created new problems. The horse levels and, to a lesser extent, the whimses, or horse driven windlasses which hauled material up the shafts, could not be manned or "horsed" by each partnership separately. Organisation was necessary to regulate the time when the ore and deads of each partnership could be removed and to provide the horses to do the labour. The waggon was provided free by the mine owners; it was necessary for each partnership in turn to hire the labour of an horse. Forster wrote in 1821 that "The expense of drawing the Ore or Stone, out of the Mine, when Horses are employed, is pretty considerable, and depends much upon the length of the

Level or Adit, and depth of the Mine. In Alston Moor, it is usually drawn at so much per Shift, and at some mines a shift contains eight Waggon, at others only six... The expense of drawing a Shift... varies from 3/6, to 8/-, including the filling, driving, and emptying the Waggon, there being no allowance made for the difference of weight between the Ore and the Stone." (63) These charges were deducted from the miners' pay.

The ownership of the horses and control of the drawing work was organised in one of three ways. In the early days of horse levels in all mines for which records exist it was the prerogative of the agents. The second method was to let the drawing work to an outside contractor, in much the same way that bargains were let. The last method was that the actual mining company should own the horses. In all three of these methods it was to the interest of the mining company that its miners should not be over-charged. The first method was dropped because of its liability to abuse - it was in fact a form of "truck" - and either the second or third method employed. If the contract system was kept, the prices the contractor was to charge were laid down by the Company.

The first mention of the problem in the London Lead Company's records was in 1785, when the Court of the Company ordered "That no Agent... be concerned in Whimseys or letting Horses to draw Waggon or Wood, or anything of that kind for the Company". (64) Before this date the agents had obviously been allowed to own and manage horses within the mines under their control, as the

(63) Forster, W. - Section of the strata, 2nd. ed. 1821. pp.33/34.

(64) L.L.C. 13a. Oct. 6th, 1785.

Company's chief agent, Thomas Dodd, put in a pay claim in 1793 on the grounds that he had been promised "an equivalent for Horses that former Agents used to employ". (65) The contract system was still in use in 1810, when the Court resolved (apparently in accord with contemporary practice) "that for engaging of Whimsey or Level Horses used by the Company, Notice to be given to the parties letting the same for receiving proposals of the yearly Contract; the proposals to be given under seal and forwarded to the Superintendent." (66) In 1816 the contract system was abandoned, and the Company took over the ownership and organisation of all horses used in drawing work. (67) This system persisted until the closing of the mines.

The more extensive extant records of the Blackett/Beaumont mines show more of the reasons which lay behind these changes. By 1770 William Westgarth, the Coalcleugh agent who invented the hydraulic engine and introduced horse drawn waggons into lead mines, was drawing a higher income per quarter from his horses than from his salary. A jotting at the back of a Weardale bargain book of 1788 indicates how the drawing was arranged. The horses (presumably there were more than one) worked a 24 hour day - the work of one partnership at "12 night", of another at "4 morning", and so on through to midnight again. (68) The 1796 petition from the Weardale workmen to Col. Beaumont shows that

(65) L.L.C. 17. Nov. 7th, 1793.

(66) L.L.C. 17. Dec. 6th, 1810.

(67) Raistrick, A. - Two centuries. 1938. pp. 91/92.

(68) B/B 167.

the miners disliked this system. (69) The workmen told the Colonel that "were we to inumerate all the advantages resulting from the works to the agent and his friends you would really be astonished; suffice it to say that the Money he receives for one horse employed in drawing the Ore and Strata amounts to the enormous sum of 120£ per annum and the number of horse's imployed in the mines at one third less price would aford comfortable livings to Several poor famleys". The Newcastle chief agent commented to Colonel Beaumont on this petition that "As to the charge of the Agent having the advantage of employing some horses, I do not see the evil arising from it, in case the charge be fair and reasonable, it has always been allowed to the Agents who can do it at a lower rate than you". (70) The value of the "advantage" to the agents was considerable. In 1799 for the quarter June-Sept. the Coalcleugh agent's salary was £15. His income from his horses (before deduction of expenses) was £177.18.6.(71) In 1807, however, the agents complained that their drawing privilege was only just economic - "They think the present prices being too little, not being any advance for upwards of 30 Years and both the Horses and their feed being considerably advanced since that time." (72) Upon investigation the chief agent found that the charges per shift were less than those of the London Lead Company, and he agreed that the charges in the Beaumont

(69) See Appendix. Document 3.

(70) 50. Jan. 17th, 1797.

(71) B/B 98. 1799.

(72) 53. Oct. 24th, 1807.

mines should be increased accordingly.

The prices charged for drawing work by the agents were, therefore, strictly controlled. The agents could only charge a standard price which was authorised by the mine owner, and the complaint in the 1796 petition was more that the agents were overpaid than that the workers were overcharged. But the system was obviously very much open to abuse and sometime between 1807 and 1832, (possibly after the dismissal of the Coalcleugh agent for corruption and malpractice in 1813) ownership of the horses was taken over directly by the mine owners, the Beaumonts. In the bargain books contracts are recorded with men to undertake the leading of the horses and the loading of the waggons. (73) But for some reason direct ownership was abandoned again in 1833, at the time of a thorough re-organisation of many aspects of the Beaumont mines. Contractors for each mine were to buy all Mr. Beaumont's horses at an agreed valuation, and take over the drawing work. These contracts were renewed yearly, and recorded in the bargain books. Among the points laid down in the very full Coalcleugh agreement were the price per shift the workmen were to be charged (it is noteworthy that this price was actually less than that charged in 1807), the conditions of employment of the wagemen leading and loading the waggons, and directions about keeping the produce of each partnership separate. (74) Similar agreements were entered into at the other mines, that at Allenheads including the proviso that the workmen should have the

(73) e.g. B/B 81. Coalcleugh. Feb. 14th, 1820. Jan. 11th, 1827.

(74) B/B 81. April 2nd, 1833.

"privilege" of running their work to the shaft "by their own labour without charge, if they so choose". (75) These agreements continued, without fundamental change, until the closure of the mines.

The supply of tools, candles, and gunpowder also caused difficulties in the administration of the bargain system. The lead mines were so isolated that the workmen had no choice but to get their equipment through the mining company; there was thus the dual risk, both of a form of truck system developing, and that the goods supplied might be inferior in quality.

The supply of tools caused little friction. The workmen bought their own tools - picks, shovels, hammers, pricklers, etc.-- from their company on starting work, or when they needed renewal. A regular item in the Blakett accounts throughout the eighteenth century was "For so much pd. by the workmen for new geer and sharpening". In 1864 the system was still the same in all the mines. The miners bought tools from the companies as they were needed, and the companies were always prepared to re-purchase them at the same price allowing for any loss of weight caused in use and sharpening. Some companies charged their workmen for sharpening, others did this free. (76) During the Allenheads strike of 1849 Sopwith was approached by some of the strikers who "desired to have their working implements out of the Mine in order that they might thus be in a condition to go and seek employment in other Mines. These tools partly belong to the Owner

(75) B/B 62. Nov. 23rd, 1833.

(76) 1864 Report (Vol. 2.) pp. 331/332, 359.

of the Mines, and partly to the Miners (who pay for them by instalments) but overlooking any claim on the part of the Owner I at once agreed to consider the working tools as the property of the Miners and I gave them leave accordingly for them to have them". (77)

The supply of Gunpowder and candles did cause some trouble. Vast quantities of both were used - in 1864 the London Lead Company's miners used 113,000 lbs. of candles and 93,000 lbs. of gunpowder (78) - and the quality of both these articles affected the efficiency, and even the lives of the miners. Sopwith noted in his diary that "sometime before I came the West Allen Miners seized a quantity of powder which they disliked and put it in the river". (79) In 1809 the powder supplied to the London Lead Company's miners was so poor that "the Workmen were obliged to dry it before the Fire, before they could use it, and it is as well that no misfortune happened by it". (80)

The inferior quality of this powder was probably due to an attempt on the part of the supplier to make a larger profit by supplying cheaper goods. If the supplier were the mine Agent or someone connected with him it was easy for this to happen. The Blakett/Beaumont records show the difficulty of firmly suppressing this form of truck.

During Sir Walter Blakett's ownership "Frauds and Irregularities arose from the Mine Agents furnishing Articles for the

(77) Sopwith, T. - Diary. March 22nd, 1849.

(78) 1864 Report (Appendix.) p. 442.

(79) Sopwith, T. - Diary. April 16th, 1852.

(80) L.L.C. 16a. Jan. 20th, 1810.

Mines, and it was found necessary to put a stop to that evil, since which it has been a standing rule in the Concern, as well as that of the Lead Company, that no Lead Mine Agent (whose duty it is to receive and examine the quantity and quality of each Article) shall furnish Mines with any one Article". (81) This statement was contained in a letter from the chief agent in 1787 to the new owner, Sir Thomas Blackett, who had just allowed the son of the Allenheads agent to supply the miners with candles. The chief agent did not suggest that the decision should be rescinded but that another supplier should also be approached as he hoped that there would then be "an emulation between them which shall furnish Candles of the best quality". This happy result apparently did not follow, for the Weardale miners complained in their 1796 petition that the candles supplied to them were not only more expensive than "those of which other miners use" but that they were of an inferior quality and "much broke". The gunpowder arrived lacking "the wrappers in which the Barrels are contained for the safety of the Powder and convenience of carriage which wrappers are delivered in barter at 8/- per stone to sellers of earthen ware". The Blackett/Beaumonts did not finally get rid of this wretched form of truck until after Sopwith's appointment in 1845. He discovered that the candles were then supplied "by parties connected with the mines" so he transferred the contract to "respectable firms at Hexham, Bishop Auckland and Richmond". (82) The Court of the London Lead

(81) B/B 50. Oct. 21st, 1787.

(82) Sopwith, T. - Diary. July 1st, 1865.

Company had firmly laid it down in 1810 "That no Gunpowder (or candles) be used by the Company's Workmen but what is furnished by order of the Court and to be charged to them at prime Cost, with only the addition of Freight and Carriage". (83)

None of the agents questioned by the 1864 Commission had any connection with the supply of goods for the mines. A table in the appendix to the report (84) showed that it was almost universal for miners to be charged cost price only for candles and powder.

In this chapter we have discussed the workings of the bargain system, and shown how, although in theory a contract of equal benefit to both the mine owner and the miner, in fact, and especially in its later years, the system became one ordered for the convenience of the mine owner alone. Yet it is difficult to conceive of any other system whereby the inequalities of fortune inherent in mining could have been so fairly shared between master and man, and the very fact that the bargain system lasted until the closure of the mines shows its practicability. Also the bargain system enabled the miners to feel that they were partners in the enterprise, rather than mere employees, and encouraged their initiative and exertions. The moral effect of this is testified by no less a person than Charles Darwin, who, in his voyage on the Beagle, visited a mine in Chile where the bargain system was unknown, and thus describes it:

"The Chilian miners are a peculiar race of men in their

(83) L.L.C. 17. Dec. 6th, 1810.

(84) 1864 Report (Appendix.) pp. 441/443.

habits. Living for weeks together in the most desolate spots, when they descend to the villages on feast-days, there is no excess or extravagance into which they do not run. They sometimes gain a considerable sum, and then, like sailors with prize-money, they try how soon they can contrive to squander it. They drink excessively, buy quantities of clothes, and in a few days return penniless to their miserable abodes, there to work harder than beasts of burden. This thoughtlessness, as with sailors, is evidently the result of a similar manner of life. Their daily food is found them, and they acquire no habits of carefulness; moreover, temptation and the means of yielding to it are placed in their power at the same time. On the other hand, in Cornwall, and some other parts of England, where the system of selling part of the vein is followed, the miners, from being obliged to act and think for themselves, are a singularly intelligent and well-conducted set of men." (85)

(85) Darwin, C. - A Naturalist's Voyage in H.M.S. Beagle,
May 4th, 1835.

CHAPTER 4.Payment and Earnings.

In spite of the span of the Blackett/Beaumont records, which include series of account books covering the greater part of both the eighteenth and the nineteenth centuries, it is almost impossible to give a methodical account of the average earnings of the lead miners. As the account of the bargain system has shown, the miners worked in partnerships, and were paid on a piece-work basis. Because of this, and because of the uncertainties of mining, their earnings varied enormously. The peculiar method of accounting and payment can be described in detail, but the amount of money which individual lead miners made in a year varied so greatly, both from year to year, and from individual to individual, that any attempt to average it out is only misleading. In this chapter there is given an account of the administration of the system, followed by such facts as can be fairly stated concerning wage levels. Lastly, there is an account of the benefit societies that existed in the area to provide money in cases of sickness and retirement.

It has already been shown that the bargain system was basically piece-work. The miners were paid according to the number of bings of ore or tons of lead they raised, or the number of fathoms driven. The amount to be paid for working at a given job in a given place was settled in advance after an evaluation by both sides of the various factors involved. No human skill, however, could judge what would occur as working progressed: good or ill fortune vitally affected the eventual earnings of the

miners. After every three months (normally) conditions were reviewed and prices changed as necessary. The miners were paid once or twice a year. Periodically, between "pays", each miner received a subsistence allowance, which, together with money for candles, washing charges, etc., was deducted from his "pay".

In 1842 Dr. Mitchell described the accounting system employed by the two major companies to calculate the exact sums due to their employees. "An account is opened against each miner, and he receives say 40s, which is called lent-money, on the first Friday in every month, which is entered against him. Also if any tools be supplied to him, or gunpowder, an entry is made against him. So also his quota of the expense of washing the ore. Then when the ore has been washed which the partnership have dug during the three months, the part of the money to which the miner is entitled is entered on the other side of the account to his credit. If the same partnership go on, then the proceedings of the second period of three months are the same as the first three months; and so it is with the third period of three months, and with the fourth period of three months. If the miner shall have entered into partnership with any other persons it makes no difference in the manner of keeping his account; after three months' ore has been washed his proportion is put to his credit. Suppose that the miner's year shall have terminated at Michaelmas, it will be some time before the ore shall be all washed, but when that shall have been accomplished the masters are now in a condition to make up his year's account. If the money which he has earned shall exceed the lent money of £2 every month and the

W.B. LEAD MINES.—WEARDALE.

BURTREE PASTURE MINE.

Reckoning with ——— 6 Pts. for the Half-year ending 31st December 1862.

Charge.	£	s.	d.	£	s.	d.
Candles, 28½ doz. lbs. at 6s. 2d.	-	-	8 15 9			
Gunpowder, 325 lbs. at 5½d.	-	-	7 9 0			
Drawing, 28½ shifts, at 4s. 6d.	-	-	6 8 3			
Laborage, brakeing, &c., 28½ „ at 3s.	-	-	4 5 6			
Smith work and stores, per account	-	-	7 3 7			
Washing and } 7½ bings at 11s. 4d. }	-	-	6 18 4			
crushing - } 7½ do. 7s. 2d. }	-	-		41	0	5
Cash advanced, as per other side	-	-		84	0	0
Arrears deducted, do.	-	-				
Centage, do.	-	-				
Amount due	-	-				
				£125	0	5

Fathoms, Ore, Days, &c.	£	s.	d.
First Quarter.			
Fathoms, 3½ at 200s.	-	-	31 13 4
Contracts	-	-	
Ore raised, bings cwts.	-	-	
Days	-	-	
Second Quarter.			
Fathoms, 5 at 200s.	-	-	50 0 0
Contracts	-	-	
Ore raised, 15 bings cwts. at 30s	-	-	22 10 0
Days	-	-	72 10 0
Arrears	-	-	20 17 1
			£125 0 5

NOTICE.—This statement is issued subject to correction, and if the parties interested observe any inaccuracy therein, they must give intimation of the same at Newhouse Office, between the hours of 9 a.m. and 5 p.m., on any week-day on or before Saturday, the 23d day of May 1862.

The balance due according to this statement will be paid on the next half-yearly pay day at Newhouse Office, when and where one of the partnership (or if an individual himself) is requested to present this statement.

— 6 Pts., Burtree Pasture Mine.

Name of Partner.	Cash advanced.		Previous Arrears deducted.	Centage.	Total.	Arrears due this Half-year.	Previous Arrears.	Total Arrears.
	First Quarter.	First Quarter.						
	£	£	£ s. d.	£ s. d.	£	£ s. d.	£ s. d.	£ s. d.
—	6	8	—	—	14	3 9 6	—	3 9 6
—	6	8	—	—	14	3 9 6	—	3 9 6
—	6	8	—	—	14	3 9 6	—	3 9 6
—	6	8	—	—	14	3 9 6	—	3 9 6
—	6	8	—	—	14	3 9 6	—	3 9 6
—	6	8	—	—	14	3 9 6	—	3 9 6
	36	48	—	—	84	20 17 1	—	20 17 1

LEAD COMPANY'S DUE PAPERS in year ending October 1863.

	£	s.	d.	£	s.	d.
Earnings of A. B. and 3 partners	-	-	258 2 4			
7 qr. barrels gunpowder at 14s. 6d.	-	5	1 6			
31 doz. lb. candles at 6s. 10d.	-	10	11 10			
Tools	-	0	3 7			
Drawing 256½ shifts, at 4s.	-	51	6 8			
Cash, labourers	-	3	15 0			
Balance due to each partner :						
£ s. d.						
1 7 0	Cash, A. B.	-	45 2 0			
16 13 11	„ C. D.	-	28 12 0			
18 3 11	„ E. F.	-	28 12 0			
16 13 11	„ G. H.	-	28 12 0			
	School, A. B.	-	0 7 0			
£52 18 9	Funds, C. D. and G. H.	-	3 0 0			
			205 3 7			

Due - £ 52 18

	£	s.	d.	£	s.	d.
Earnings of I. K. and 3 partners	-	-	168 7 0			
14 qr. barrels gunpowder at 14s. 6d.	-	10	3 0			
24 doz. lb. candles at 6s. 10d.	-	8	4 0			
Tools	-	1	7 4			
Drawing 66 shifts at 4s.	-	13	4 0			
Cash, labourers	-	3	8 0			
Balance due to each partner :						
£ s. d.						
6 18 0	Cash, I. K.	-	26 2 2			
5 11 1	„ L. M.	-	27 4 1			
5 11 1	„ N. O.	-	27 9 1			
3 6 1	„ P. Q.	-	29 14 1			
	Rent, L. M.	-	0 5 0			
£21 6 3			147 0 9			
			Due - £ 21 6 3			

other moneys chargeable against him, then there is a balance coming to him, and that is paid over." (1) If there should be a deficit at the end of the year it was carried forward to be deducted from the following year's pay.

Actual accounts recording payments to individuals have not survived, but two examples submitted to the 1864 Commission by the London Lead Company and the Beaumont concern are shown as an illustration. (Plate 5.) The form of these accounts must have been fairly constant during the eighteenth and nineteenth centuries, for, as the chapter on the bargain system has already shown, the accepted rules governing contracts between employers and employed remained in general unchanged within the two major companies until the collapse of the mining industry.

Each miner then was paid a monthly or bi-monthly subsistence allowance, and received the remaining money due to him at periodical intervals. The chief source of evidence concerning the administration of these two forms of payment is the Blakett/Beaumont records, but those of the London Lead Company also give some related data: the 1842 and 1864 Reports give some information about the nineteenth century practices of the smaller companies. .

The mining year for the Blakett/Beaumont concern ran from the beginning of October to the end of September. (2) This was the period for which the miners received an annual pay. In the eighteenth century the pay was often much delayed, and held at

(1) 1842 Report (Mitchell.) p. 744.

(2) B/B 52. Sept. 23rd, 1833.

irregular times during the year. Sometimes a period of two years after the end of the mining year might elapse before the miners were paid. Statistical Table 1 shows the months of the year during which pays took place, so far as information exists. In the middle of the eighteenth century the date appears extremely irregular, although a letter of 1756 records that the pays would be held "as usual, sometime in September" (i.e., one year after the end of the mining year paid for). (3) By 1793 "the usual time of making the Lead Pays has been the last week in April". (4) In 1812 the miners of Coalcleugh complained when the pays were delayed until May instead of "in or about the first week in March as usual". (5) By 1842 the Beaumont miners were paid "generally in the month of January", (6) and Sopwith's diary shows that pays were regularly made from 1846 to 1860 in either January or February. In 1861 the system was changed so that the miners were paid twice a year, in May and November. (7)

The establishment of a regular month for payment, and the bringing of this month nearer and nearer to the mining year paid for, was aided by the gradual establishment of speedier and more efficient accounting systems. The main cause, however, was the increased ability of the mining concern to raise money for the pay, even when lead prices were low, and sales few. The early

(3) B/B 47. June 2nd, 1756.

(4) B/B 50. April 22nd, 1793.

(5) B/B 51. March 16th, 1812.

(6) 1842 Report (Mitchell.) p. 678.

(7) Sopwith, T. - Diary. June 24th, 1864.

Blackett/Beaumont records, particularly the chief agents' letter books, have many references showing the difficulties of raising money and the reactions of the workmen to delays in holding the pays.

In October 1730, the chief agent wrote "Mr: Peart [the Weardale agent] tells me, the miners in Weardale are grown so refractory for want of a pay that he is sure the greatest number of them will throw up if not pd. before Xmas: where money will arise to pay the Interest in arrear, make Weardale pay, and pay Mr Mowbray's ballance, I know not". In December he received a petition from the Weardale miners asking for a pay at once, "and since the beginning of last Month have been oblig'd to let Mr Peart have £1200 to make them easy, without which I am assured not half of them would have taken on his bargain now at Xmas: there is still owing to these groves about £4500 to Michas. last". In April of the following ^{year} _^ he wrote "I have been almost pulled in pieces in Weardale" by the dissatisfied miners. They apparently were paid off sometime during that year, 1731. In December 1732 matters had improved so greatly that the chief agent could write to Sir Walter Blakett that "After Weardale pay is made you will have paid off all your works this year, both mines and mills, which has not been done for 20 before." (8)

At this period - the seventeen thirties - the workmen in the different mining districts and those in the mills (including the carriers) were apparently paid off separately as money arose. By about 1760 the pays of all the different districts took place

(8) B/B B.M. Letterbook, Oct. 23rd, 1730: April 10th, 1731:
Dec. 8th, 1732.

on successive days in the same month. More will be said about this when the ceremony connected with the pays is described later in this chapter.

In the period 1758 to 1762, when lead prices were very low, there is another spate of references to the difficulty of raising money for the pays. In September 1758 the chief agent wrote to Sir Walter Blackett that it was impossible to borrow money on the security of unsold lead either in Newcastle or in London - "I therefore see no other way than to let the people have what subsistence money I can raise to the spring, in hopes of getting a quantity of lead sold against that time." (9) In March of the following year, 1759, he writes "I had some more of the Weardale people and some of the lead mills pressing for their respective pays, for want of which they alledge their landlds. threaten to break them up. I put them off in the best manner I can for the present and hope to be able to satisfy them all before Mayday if you can help me with £5000." (10) The Weardale pay was made during May; the Allenheads and Coalcleugh pays, where Sir Walter himself was the chief landlord, were left over until later in the year. In November, however, the agent wrote that he was forced to sell some lead at considerable loss to pay off Allenheads and Coalcleugh - "for the people here can't want the Money, but as far as the Workmen in Weardale they are in better circumstances and may be put off the next year with a little Subsistence".(11)

(9) B/B 46. Sept. 19th, 1758.

(10) B/B 46. March 2nd, 1759.

(11) B/B 46. Nov. 3rd, 1759.

One particularly unfortunate body of miners were those employed in the "partnership mines" in Weardale, leased jointly by Sir Walter and Mr. Bacon. These could not be paid until both parties were ready, and there are frequent references to failures to pay them. In 1761 - "As for the ptnership miners, there are 2 years due, which looks badly, but if I had the money I could not pay them without Mr. Bacon, who I do not find makes any preparation towards it." (12)

The sums of money required to make the pays were considerable. The Blakett/Beaumont accounts do not record wage payments as such, but in the letter books are occasional references to sums paid in wages between 1760 and 1811. Figures are not strictly comparable, since they do not refer to identical periods of time, (these not being stated). Nevertheless they are quoted here since they give a clear impression of the order of magnitude of the wage bill, and its growth during the eighteenth century.

1760	£14,000 for all the mines but <u>not</u> the mills.
1761	£6,000 for Weardale + £2,000 for the "Partnership" mines.
1767	£17,290 for all the mines.
1779	£7,000 for mills and carriers.
1781	£25,498.
1784	£36,000.
1786	£41,000.
1787	£43,722.
1788	£51,613.
1793	£45,000.

102.

1794 £65,550.

1796 £56,000.

1797 £53,000.

1799 £51,000.

1811 £68,622.

By the end of the eighteenth century, in spite of the increasing size of the amounts of money required to make the pays, a more regular annual date of payment had been achieved, as Statistical Table 1 shows. References to the pays in the letter books become less common, showing that the problem of raising money had lessened greatly. In 1812, so accustomed had the men become to regular payment, that a delegation from Coalcleugh protested when payment was delayed a couple of months - from March to May. This would have been nothing to the miners of the seventeen thirties and fifties. Later in the nineteenth century there are no references at all to delays in payment, so there presumably were none.

Unfortunately there is no similar historical record of payment practice for any other lead mining company. For the London Lead Company there is only a Court minute of 1785 recording a change of practice - "That the Company's pays in the North which used to be paid Half-yearly be in future paid only once every Year up to Michaelmas 1785 and so to be continued." (13) In 1833 the Beaumont chief agent wrote of the Company that "They make their great Pay in January, we in March or April." (14) As

(13) L.L.C. 13a. Oct. 6th, 1785.

(14) B/B 52. Oct. 3rd, 1833.

already shown the Beaumonts too were making their annual pay in January in the eighteen-forties.

The Blackett/Beaumont records show, therefore, that in the early and mid eighteenth century pays were infrequent and irregular; by the end of the century they were held regularly once a year. From 1861 onwards the men were paid every six months. The records of payment of subsistence between pays show a rather similar pattern. In the early eighteenth century payment was irregular, and of no fixed amount. By the end of the century bi-monthly payments of a fixed sum were usual. From 1801 onwards the subsistence was paid monthly.

Statistical Table 2 illustrates the changes in tabular form - so far as there is evidence available. There is rather more evidence about the London Lead Company than there is in the case of the pays; its employees received monthly subsistence from at least 1785 onwards.

The letter books in the Blackett/Beaumont records show the irregularity of subsistence payment in the early eighteenth century. Money was as difficult to raise for this purpose when lead was selling badly as it was to raise for the actual pays. In 1759, for example, the agent did "not know what can be done for money this year for the peoples' Subsistence". (15) In theory it was paid every two months by 1766. (16)

Statistical Table 3 is based on the only surviving account books recording the dates on which subsistence was paid, and the

(15) B/B 46. June 8th, 1759.

(16) B/B 48. Aug. 24th, 1766.

sums involved - for Weardale from 1790 to 1812. From 1790 to 1800 the money was paid roughly every two months. There was no definite day for payment, however, and there was sometimes a gap of as much as three months or as little as two between payments. After 1801 there was a regular day for payment every month. Monthly subsistence remained the practice from then until the abandonment of mining by the Beaumonts in the eighteen-eighties.

The amount of money paid ^{in subsistence} to individual miners in the earlier part of the eighteenth century was also apparently not standardized - such money as was available was divided up among the men. Concrete evidence of sums paid is not present until the end of the century. In 1790 each adult miner employed by the Beaumonts received £1. 1. 0. per two months. A London Lead Company miner received the same amount, but it was paid monthly - 10/6d. at a time. In 1796, after a strike in Weardale the Beaumont chief agent "thought it advisable at this time to increase their subsistence Money one half" to £1.11. 6. every two months. (17) The miners were still not satisfied. One of the requests in the 1796 Weardale miners' petition (Appendix Document 3) was that they should receive "one guinea per month each man". The Weardale accounts of subsistence show the enormous increase in payments that took place between 1795 and 1801. A miner working in 1801 received more than double the sum he received in 1795 - 30/- every month, instead of 21/- every two months.

Thirty shillings remained the standard sum for the monthly subsistence of the Beaumont miners until Sopwith raised it to

(17) B/B 50. Nov. 23rd, 1795.

40/- in 1846. In 1816, a year of severe depression for the lead trade, it was temporarily reduced to 20/- (18) but was back to 30/- again in the following year. In 1818 there was another strike in Weardale. In a petition dated October 2, 1818 (Appendix Document 4) the strikers wrote - "We find that our present Subsistence Money which is only 7/6 a Week, much too little to purchase the necessaries of life. We have therefore petitioned for 10/- a Week. Our requests have not yet been granted... Unless the Subsistence Money be advanced to 10/- a Week, it will be impossible for the greatest number of us to get the necessities of life, as our Credit is utterly gone." The earlier request had been rejected by the chief agent - "a demand so unreasonable cannot be complied with" (19) - in spite of the fact that the London Lead Company were paying their miners 40/- per month. When the strikers went back to work they still received only 30/-. (A full account of the strike is given in Chapter 6.)

A few scattered figures are all that survive in the London Lead Company records to illustrate changes in subsistence rates, and none of the reasons for the changes. In Midsummer 1816 the sum paid was the same as was paid by the Beaumonts - 30/- per month. At the end of that year the new chief agent, Robert Stagg, raised it to 40/- per month. In 1833 this sum was payable only "to Pickmen in Regular divisions and places... so long as they use due diligence and conduct themselves satisfactorily. The advances for old Pickings to be confined to the actual

(18) B/B 51. Sept. 4th, 1816.

(19) B/B 51. Sept. 25th, 1818.

Earnings, as near as the same can be ascertained, as heretofore". (20) This was a period of severe depression when low prices for lead prevented much new exploration, and quite a large proportion of the labour force were employed in the "pickings". Earnings were so low, however, that many miners left the area at this time.

Before going on to relate the changes which the subsistence system, as practiced by the two largest lead mining companies, went through during the middle and later years of the nineteenth century let us consider why it existed at all. It was obviously closely linked with the bargain system itself.

From the employers' point of view the system of annual pays and intermediary subsistence allowed them the time to raise the large amounts of money necessary. There was a considerable interval of time between the ore's extraction from the ground and its sale as lead. When demand for lead was low it was better to stockpile lead for as long as possible rather than sell at an uneconomic price. Irregular pays, made when money became available, therefore suited the eighteenth century mine owner.

For the miners, the system was a guarantee that they would receive some money during a year even if luck was poor and hardly any ore was raised. A partnership might get hardly any ore for three of the four quarters, and strike it rich during the fourth. Alternatively a man might be unlucky for two or three years, and finish all of them with a debt instead of a pay. But he would continue to receive his subsistence until, with luck, he had a

(20) L.L.C. 21. March 17th, 1831.

successful year and was able to repay the debt.

It was frequently alleged by the mine owners that the miners also benefitted from a system that (a) prevented them from having too much money in their hands at one time, and (b) gave them an extra annual sum to meet debts with. In 1766 the Blackett chief agent wrote to Sir Walter Blackett that "two months subsistence at a time proves a temptation to extravagance" (21) but that the system should be continued in spite of this. In December 1795, when the subsistence money for the Beaumont miners had just been increased from 21/- to 31/6d. per two months, the Weardale miners asked for 42/-. The chief agent wrote to T.R. Beaumont that the demand "would on no Account be prudent to comply with. Were you to do it their families would not be benefited by it and at the time of the pay the greater part of them would have little or nothing to receive, their creditors would be clamorous, and you would incur blame for the badness of the pay, as they term it, when they have little to receive". (22) A Beaumont agent told Commissioner Mitchell in 1842 much the same, when questioned about the difference between the London Lead Company's payments to its workmen (40/- per month) and the Beaumonts (30/- per month). "The Lead Company advances 40/- a month, which is good for the men at the time, but when the men reckon at the end of the year it is usually found that what has been advanced to them comes to as much as what they have earned, and they have nothing to receive. It is beneficial for the miner to have to receive a

(21) B/B 48. Aug. 24th, 1766.

(22) B/B 50. Dec. 17th, 1795.

sum of money, as he can then provide himself with necessities, which he would not have been able to save sufficient money for if on weekly wages." (23) Lastly, R.W. Bainbridge, the London Lead Company chief agent, told the 1864 Commission that the annual pays were useful to miners to provide money for cottages and stock for their smallholdings. "It comes to meet those annually accruing charges which they cannot escape, and our retaining the money in our own hands I believe is better than if they had it in their pockets, in many cases." (24) The unexpressed reason why the Companies did not wish to raise subsistence payments too much was that they did not wish to risk too large a proportion of men being in debt at the end of the year.

By the nineteenth century the system was under pressure from both sides. The mine owners were able to make use of the greater fluidity of the money market to borrow money when necessary to overcome any temporary difficulties. They were able to establish regular times for payment by the end of the eighteenth century. As has already been shown the bargain system itself changed greatly during the nineteenth century so as to give greater power to the mine owners over their miners. It became no longer a relationship between two contracting parties, but one between employers and employed. A regular monthly wage, disguised as subsistence, gave the mine owners far more extensive control over the miners than irregular pays and low subsistence. Both the big

(23) 1842 Report (Mitchell.) p. 766.

(24) 1864 Report (Vol. 2.) p. 381.

companies were willing to increase subsistence money greatly, and even partially to cancel out any debt owing to them at the end of the mining year, in return for the greater power these actions gave them.

The miners were always pressing for higher subsistence. In the two surviving petitions from Weardale miners (1796 and 1818) higher subsistence payments were among the most prominent demands. Subsistence was normally paid regardless of ore raised or fathoms dug. (However the London Lead Company during the depression of the eighteen thirties, as already related, and the Beaumonts after 1875, made subsistence depend upon success in raising ore.)

For the miners the great disadvantage of the subsistence system was that it detracted from the sum they would receive at the annual pay, or even cancel it out completely. Assistant-Commissioner Mitchell put the position well in 1842 - "But it may happen that, instead of having money to receive, the miner is found not to have earned as much as stands in the book against him. In that case the balance is struck, and entered against him in his next year's account, and it may go on year after year; but if he shall in course of time have a good year he may be able to extinguish all his debt, and even have something coming to him. It is very disheartening for a miner to go on year after year and have nothing to receive at the year's end; but still he has his lent-money on the first Friday of every month, and he lives in hope." (25)

In some ways the possibility of large scale debts after a bad year was helpful to the miners in bargaining with the masters. The latter did not want the miners to be in debt any more than they did themselves. In 1811 the Beaumont chief agent wanted to increase the bargain prices, in spite of the depressed state of the lead trade, as they were "let lower than they can be supported for twelve Months together, without disabling the Men to meet their advance Cash, and if so, will increase the Mining Debt".(26)

There are a few scattered figures in one of the Coalcleugh account books, jotted down by the agent on the reverse of the accounts proper, of debts owing in the period 1824 to 1835. The total debt outstanding in 1824 was £182. 1. 7½d. The oldest dated from 1806, the rest from 1813: the highest sum involved was £10.10. 6d. and the lowest, 14/6d; the total number of men owing money was 32.

In 1831, during the bad depression, the total sum amounted to £487. 4. 6d. 123 men owed money, the most being £15. At least £180.16. 2½d. of this was later deleted from the accounts as at "in all probability will never be got". By 1836, when the lead trade was more prosperous, only 7 miners owed money.(27)

These figures show that in normal times the amount of money owed to the mining companies was relatively small in relation to the labour force and the enormous sums paid out in pay and subsistence during the year. In periods of bad depression the debts inevitably rose, and a large proportion of these had to be written

(26) B/B 53. Oct. 18th, 1811.

(27) B/B 96.

off by the mining companies. They were in a position, therefore, to be generous to unlucky miners.

To return now to the account of the development of subsistence payments by the two largest lead mining companies; the London Lead Company kept 40/- as the usual sum payable for nearly 40 years. In 1856 it was increased to 44/- per month. According to the chief agent in 1864, this was the sum paid to an adult miner. New members of a partnership were paid 35/- a month the first quarter, and then 40/- per month until they were 21. (28) By 1872 the monthly sum paid had become 51/6d: in this year it was further raised to 54/-. (29) A very large proportion of their total earnings, therefore, was being paid to the miners in the form of subsistence. This was almost certainly linked with the Lead Company's practice, by the middle of the nineteenth century, of employing nearly all its miners on a fathom instead of a bing basis. By this means the earnings of the miner could be much more easily controlled, and the price paid per fathom, related to the hardness of the ground, judged so as to allow the partnership members to earn their subsistence money and a little over.

The Beaumonts continued the old practice of extracting ore by the bing. This was less efficient in that it was impossible to regulate the earnings of the miners so closely as when the fathom system was employed, but it did spur them on in the everlasting hope of striking it really rich. To make up for his

(28) 1864 Report (Appendix.) p. 326.

(29) L.L.C. 32. May 4th and June 4th, 1872.

relatively low subsistence payment the Beaumont miner could expect a larger pay than a Lead Company miner, and, in addition, after 1846, a guaranteed cancellation of half of any debt incurred during a single year.

When Sopwith became chief agent in 1845 he was immediately petitioned for a larger subsistence payment. (30) In the following year he increased the payment from 30/- to 40/- per month, and introduced at the same time a number of new conditions and provisions. The workmen of the different districts were told of the changes at meetings, and Sopwith published, for free distribution to them, a pamphlet entitled Observations addressed to the miners and other workmen employed in Mr. Beaumont's lead mines... February 2 1846.

This pamphlet records, in Sopwith's usual verbose style, a number of important innovations. Firstly, the monthly subsistence was to be raised to 40/-. Secondly, an elaborate scheme was introduced to cut down by half the amount of money an unlucky miner might owe at the end of a year. Thus if a miner finished the year owing £5., only £2.10. 0. was transferred to the following year's books. To pay off the other half of the debt every miner whose average earnings throughout the year exceeded 10/- per week was to contribute 10% of the excess money earned. Thus if his earnings were 25/- per week he would contribute 52/-, or 1/- per week. This sum was, of course, deducted from the money he was to receive at the pay, not from his monthly subsistence. If half the total debt was not met by this levy on the successful

(30) Sopwith, T. - Diary. Sept. 15th, 1845.

miners it would still be cancelled, and the Beaumont concern would bear the loss. All debts outstanding in February 1846 would be cancelled. (31)

This ^{part of the} scheme was welcomed by the miners. Sopwith's additional condition "that the advance of forty shillings has reference to actual work performed during five days of eight hours each; that is to say, forty hours per week... which at three pence an hour, ^{however,} amounts to forty shillings per month", was ^{the} basic cause of the unsuccessful Allenheads strike of 1849.

The same subsistence was paid to the Beaumont miners until the mid eighteen seventies, after Sopwith's departure. In 1875 some of the bargains taken out in the Weardale district concluded with the words "Money to be advanced according to Quantity of Ore raised." (32) There is no information within the Beaumont records themselves as to how this was interpreted. All that exists is a reference in a pamphlet issued during the last of a series of bitter strikes in Weardale in 1882, coinciding with the withdrawal of the Beaumonts from lead mining. (33) In this pamphlet a lengthy contrast is made between the "Old System" (Sopwith's) of paying subsistence, and the new system introduced by Sopwith's successor as chief agent, J.C. Cain. "The 'New System' " (or 'Cain's System' as it is often termed) is very intelligible. Any

(31) In his Diary for June 29th, 1871 Sopwith noted that in the 22 years, 1846 to 1867, £16,780. of arrears had been cancelled. Only £260. of this had been met by the Company: all the remainder had come from the 10% levy on successful workmen.

(32) e.g. B/B 154. April 1st, 1875.

(33) Quoted in Lee, J. - Weardale memories and traditions. 1950. pp. 267/268

miner working under it gets, or is supposed to get, 80 per cent of his earnings for his monthly subsistence-money, and the remainder at the half-year's end; so that you see that the poor miner's subsistence money is regulated by what he makes, if he is so unfortunate as not to make anything during the month, there is no subsistence money for him at the month's end, although he may have worked very hard all the month."

The late eighteen seventies were a time of rapidly falling lead prices: the "New System" was presumably introduced to save the Beaumonts from losses. For the lead miner, with his uncertain and irregular successes, it was utterly ruinous.

Nothing has been said about payment and subsistence in the smaller mines because no evidence exists save the few figures given in the Reports of 1842 and 1864. Quarterly settlement was apparently usual at more than one Alston Moor mine. (34) At the Derwent mines, where the Cornish system of bidding for "sets" was in operation, the miners were given 7/- a week subsistence in 1864. (35)

The few surviving records regarding the actual handing over of money at the annual pays show that this was the greatest festivity of the miner's year - in the eighteenth and early nineteenth centuries at least. The Blackett/Beaumont miners were paid in their respective districts on successive days. In the eighteenth century letter books there are a number of letters

(34) 1842 Report (Mitchell.) p. 744. Rodderup Fell. 1864 Report (Appendix.) p. 325.

(35) 1864 Report (Vol. 2.) p. 346.

from the chief agent in Newcastle to the district agents, instructing them as to procedure. Here is a typical one regarding the pays in 1778 - "Yourself accompanied by the rest of the stewards to be here on Friday Evening the 2nd of January - receive your money on Saturday the 3rd - go away on Sunday the 4th and make Dukesfield pay on Monday the 5th - Allenheads on Wednesday the 7th, Coalcleugh on Thursday the 8th and Newhouse pay on Friday the 9th... As these sums will amount to a Considerable Sum of Money you are desired to come well armed." (36)

The actual payment of the Weardale miners at Newhouse, the home of the resident agent, is very well and interestingly described by James Losh, who attended as auditor in 1828. "Newhouse (Mr. Crawhall) is large, old and inconvenient. The entrance hall is a long narrow room with a table the whole length of it, at which the pays are made. Mr. Crawhall sat at one end of this with one plate full of sovereigns, another of silver and a third of copper coin before him, with piles of bank notes (the large ones Batsons, the small Scotch) on one side of him under the care of a clerk. Three other agents or clerks assisted in keeping the cheque accounts so as almost to prevent the possibility of any mistake. The workmen were admitted in regular order and received their balances, upon respectively producing a ticket, shewing what was due upon work done under the original bargain, deducting what had been received for subsistence, etc... Near Mr. Crawhall's house there were about 40 tents pitched, many of them supplied with liquor and refreshments, cold meat etc, but many also

containing Yorkshire cloth, hats, shoes, trinklets, etc. for sale. A curious example how closely supply follows demand; how soon money makes a market. Many shopkeepers too from Newcastle who supply the retail dealers in this district with groceries, hardware, etc. were in attendance to have their bills discharged. The pay was made to the workmen: they paid their bills to shopkeepers of this district and they again the persons of whom they made their wholesale purchases. It is said that Mr. Featherstone (a grocer in N.Castle) generally receives during the pay about £8000... About 20 of the principal agents, etc. dined with Mr. and Mrs Crawhall and myself and I suppose not fewer than 100 of the inferior agents, farmers, etc. in the kitchen. Mr. Bolam, Mrs Beaumont's Land Steward, attended to receive the farm rents which also mostly are obtained from the pay at first or second hand." (37)

When Thomas Sopwith became chief agent in 1845 similar ceremony was maintained. In 1847 he received the money for the pay "With about 10 of the Smelting and Mining Agents who came down to Newcastle in conformity with an old custom when the object was to carry the money on horseback and secure safety by a numerous cavalcade." (38) Writing in 1862 he recalled the details of the pays when he first became agent - "of crowds of people - of rows of booths and tents - of gay and attractive performances by travelling actors - the banners flying and the band playing the White Cockade as the Money for the pays entered the village." [Allenheads]. (39) But this had become a thing of the past.

(37) Losh, J. - Diary. Vol. 2. (Surtees Society, Vol. 174.) 1959. pp. 58/59

(38) Sopwith, T. - Diary. Jan. 4th, 1847.

(39) Sopwith, T. - Diary. Nov. 12th, 1862.

Sopwith disapproved of the interruption to work, of the drinking, of the waste of money on inessentials... In 1858 there were very few tents - Sopwith "advised" the workmen not to assist in erecting them. (40) In 1861 "There are no booths in the village... Entire amount paid in less than two hours." (41)

Subsistence payments were similarly very badly organised from Sopwith's point of view. In September 1845 "owing to the want of methodical arrangement nearly the whole of the afternoon was occupied in making this advance. A number of men were thus kept waiting three or four hours with the only alternative of sauntering in the open air or of taking refuge from cold or inclement weather in the Public House." By March 1847 the "advance was made on the same day [as the money arrived from the bank] in less than an hour". (42)

It was a very common form of "truck" in some industries for the masters to pay their employees in groups with coins or notes of high denomination only. These could be changed at a shop or inn owned by the masters and much spent on drink. Writing in the eighteen seventies a Newcastle journalist described a pay at one of the small, independent mines on the slopes of Crossfell on Alston Moor. - "They work in gangs of six or eight, and are paid quarterly. One of the party is made cashier, and he receives the money for them all. On Receipt of payment they all adjourn to the nearest public house, when the cashier divides the money by

(40) Sopwith, T. - Diary. Feb. 10th, 1858.

(41) Sopwith, T. - Diary. Nov. 15th, 1861.

(42) Sopwith, T. - Diary. Sept. 25th, 1845: March 23rd, 1847.

handing each man a note, a sovereign, and so on through all the coin. Whatever odd money remains is spent in drink." (43) This was probably the method of payment employed by most of the smaller lead mining concerns throughout the eighteenth and nineteenth centuries.

Neither of the two largest companies appears to have been guilty of this practice - at least from the end of the eighteenth century onwards. Both paid their men at their respective company offices. Each miner was paid individually, and not jointly with other members of his partnership.

The London Lead Company codified these points in a Court resolution of Oct. 6th, 1785 - "That the monthly advance money and also what becomes due to them be paid to them themselves and no other person, in money and not in any kind of Bank Notes, nor any Trades people attend at the pay: nor to any order written or otherwise, except the miner is ill and cannot attend himself." (44)

The Blakett/Beaumonts did not work by any such rigid resolutions but it is apparent from the correspondence and accounts that their practice was much the same. Before every pay in the eighteenth century there was a desperate scramble for money - and it had to be the right kind of money, difficult to raise in the days before an adequate local banking system had developed. Banknotes were used, but low denominations were preferred. It was always a problem getting sufficient cash. In 1765, for example, Sir Walter Blakett's land agent in Hexham

(43) Allan, J.W. - North Country sketches. 1881. p. 46.

(44) L.L.C. 13a. Oct. 16th, 1785.

was asked to supply as "much silver as you can muster". (45) In 1792 the chief agent wrote that "neither the lead pays nor the Subsistence for the Workmen could be made in Bank of England Notes without a very considerable Sum in Cash; we have found that one third in Cash is required at the Lead Pays; and one half for the Subsistence". (46) For the lead pay of 1797 amounting to £53,000. the chief agent was able to obtain £37,000. in Notes of £5. each, £14,000. in Notes of £1. each, and £2,000. in Gold and Silver. "This was a totally inadequate proportion of cash and I much fear that it may not give satisfaction." (47) But the Blackett/Beaumont accounts show that the concern was as rigid as the Lead Company in paying each miner individually. In the subsistence accounts for the period 1790-1812 only members of the same family, fathers and sons, were paid jointly. (48)

The system of payment and the inadequacy of the surviving accounts do not allow a very precise historical narration of the earnings of the lead miners. It is possible to give a general account of rises and falls in income over a number of years, but precise statistics to compare with known wages in other industries are unobtainable. Here is given what evidence there is concerning earnings.

The miners received their income in two ways - a monthly or bi-monthly subsistence payment of a fixed sum, and a six-monthly

(45) B/B 49. March 19th, 1765.

(46) B/B 50. Nov. 8th, 1792.

(47) B/B 50. May 9th, 1797.

(48) Incidentally, "toddy shops" forcing men to buy company supplied goods at inflated prices did not exist at all in the region.

or annual (or at longer intervals in the eighteenth century) settlement of the remainder. It has already been shown that subsistence payments increased greatly from the end of the eighteenth century. These payments must then have formed the major part of the income of all but the most fortunate miners. In Featherston's book about Weardale, published in 1840, there are a number of 'reconstructions' of miners' conversations. One miner remarks to another that "I'm certain we have not cleared our powder and candles, besides sharpening and drawing; but we mun be content; it's better than being off work: ne lent-money coming in does not answer." (49) This must have been a common attitude among the miners. Dr Mitchell wrote in 1842 that the miner always "lives in hope" (50), but he also tells a rather good story about the illusory nature of most of these hopes - "Taking refuge one day from a heavy storm of rain, near the head of Weardale, I found the parlour of the inn full of persons connected with mines. I turned the conversation so as to inquire in what condition the working miners in that part were. An overlooker of work in the mines said to me 'Sir, the miners are exceedingly well off here. They earn a great deal of money. I could point out six men who each of them have made up £60 at the year's end, and they have done so for these nine years past.' I replied 'I am very glad that these men have done so, but I think I should have no difficulty in finding you 600 who have not earned half the money.' The company all said I was right, and the man

(49) Featherston, J.R. - Weardale men and manners. 1840. pp.60/61.

(50) 1842 Report (Mitchell.) p. 744.

himself admitted it; yet he would have passed his rare case as an ordinary sample if he could. Such a manner of acting is but too common with some masters, and the persons whom they put in office." (51)

The accounts of the Blakett/Beaumont mines give only some indication of the general prosperity of the miners: specific figures of annual earnings are unobtainable. The surviving accounts are the general accounts of the costs and production at each mine. There are no wage books or their equivalents. Thus it is recorded that "--- and partners" raised so much ore at such and such a price during a quarter, but the partnership's expenses - washing, drawing, candles, etc. - are not recorded, and the same partnership may appear elsewhere in the accounts for specific dead work or days' labour performed. It is thus hopeless to attempt to work out from these figures the actual year's earnings of an individual partnership.

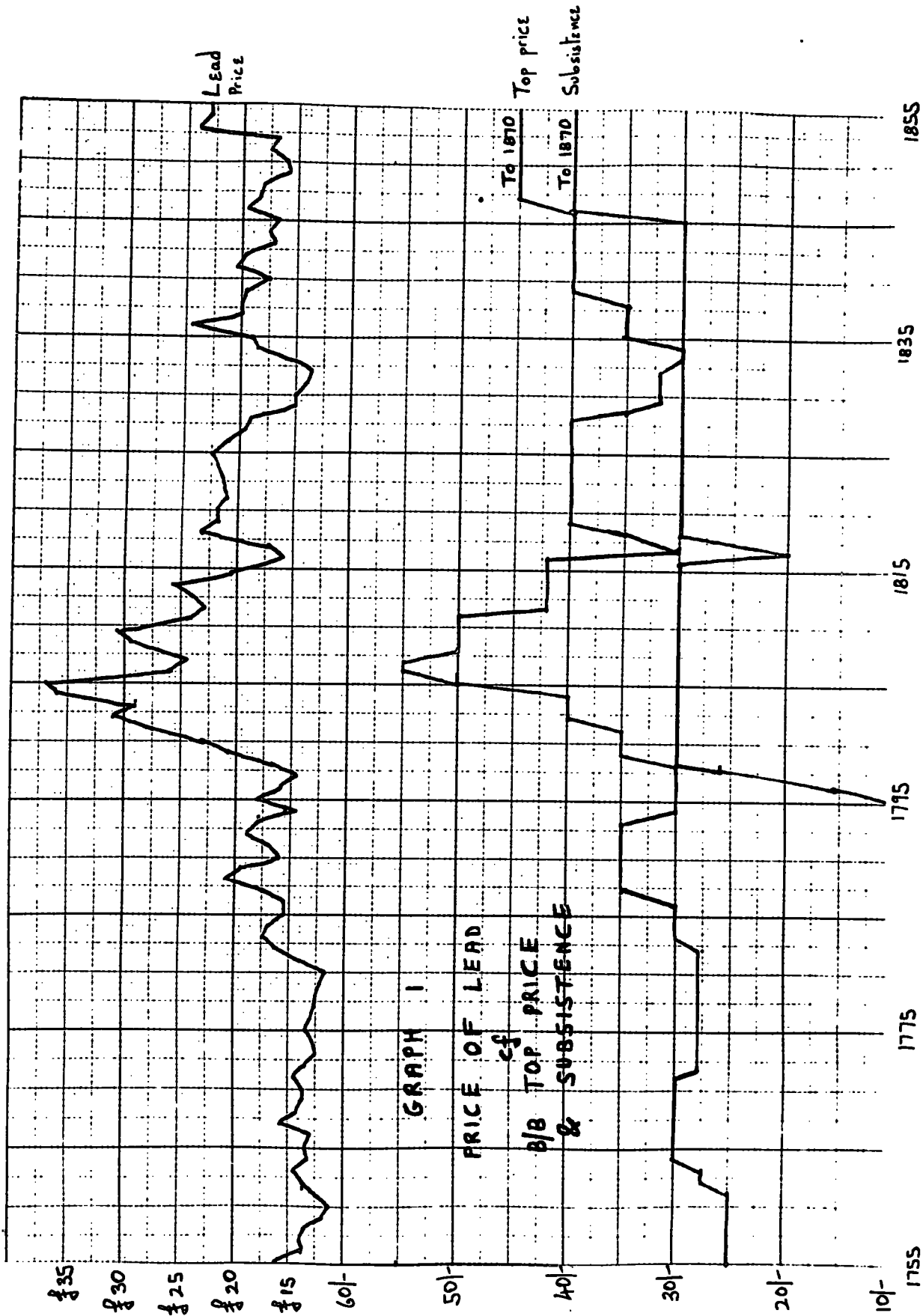
From the Blakett/Beaumont books, however, it is possible to obtain a picture of overlying trends - the general level of prosperity during different years, not allowing for individual cases. In Graph 1, three sets of figures are displayed. Curve 1 represents the average sale price of lead per ton during every year from 1755 to 1828 as obtained by the Blakett/Beaumonts, and from 1829 to 1855 as given by Tooke. (52) It is not here desired

(51) 1842 Report (Mitchell.) p. 745.

(52) The earlier figures are taken by permission from those quoted by Hughes, M. - Land, lead and coal. 1963. They give the average price of lead sold in every year. Tooke's figures are based on the prices obtained only in the last quarter of every year.

to enter into the ramifications of the lead market, which are dealt with thoroughly by Hughes. Suffice it to say that the price of lead, like that of most other metalliferous products, fluctuated enormously from year to year, or even from season to season. War, or the threat of war sent the price racing up: at the peace it came down again. The relevance of the market price of lead to the earnings of the miners is obvious. If lead prices were low the mine owners could not afford to encourage their workmen with high bargain prices: if lead prices were high bargain prices were also high to encourage the workmen to work as hard and as fast as possible before prices fell again.

The second curve is based on the highest price given per bing of ore at the Blakett/Beaumont Coalcleugh mines during the years 1755 to 1870. As has already been explained the price given per bing of ore was regulated according to the richness of the vein and the hardness and difficulty of the ground. Throughout this period, however, the individual mine agents were bound by a "top price", more than which they were not to give however poor the ground. This top price was altered according to the selling price of lead. At any one bargain letting there were normally more miners being paid on the basis of this top price than at any other. For example, at Coalcleugh in Michaelmas 1771 there were 25 partnerships employed at between 15/- and 26/- per bing, and 53 at the top price, 28/-. At Coalcleugh in Michaelmas 1792 there were 13 partnerships employed at between 18/- and 28/-, 41 at 30/-, and 46 at the top price, 35/-. The top price, therefore, is a somewhat crude, but none the less meaningful, indication of the relative prosperity of the miners. Its general



relationship to the lead price curve is obvious.

The third curve is based on the figures already cited (Statistical Table 2) of monthly subsistence payments to the Blackett/Beaumont miners. This again has a close relationship to the overall economic situation of the mines as dictated by the market price of lead. (There is no record that subsistence payments were reduced during the early eighteen thirties: it is quite possible that they were, but no record has survived.)

There are two other irregular series of figures concerning the general prosperity of the miners, given in Statistical Table 4. The first is the estimates given by various observers at different times of "average" weekly earnings. Jars does this in 1760, Eden in 1797, the Poor Law Commissioners in 1834, and so on. These figures are either pure guesses or based on the experiences of a single miner. Their value is in showing trends, rather than in their precise accuracy at a single moment of time.

The second record is of the intention of the mine owners as to what should be the weekly or annual earnings of their employees - the "basis" on which prices were fixed, as the London Lead Company agents called it. Unfortunately the record of these is incomplete, and again the bargain system did not allow the results of applying this method to be very uniform. A further reference to this is made later in the chapter.

From the statistical and other evidence, certain factors may be isolated as vitally affecting bargain prices and the eventual earnings of the miners. These are now considered.

The fundamental importance of the market price of lead has already been emphasized. Jars, who visited the mines when the

lead market was buoyant, wrote that this system "quoique profitable aux intéressés, tend absolument au désavantage de l'exploitation". Dead work, necessary for long term exploitation, was neglected to obtain a quick profit. "De ces prix-faits mal entendus, il résulte que les salaires des ouvriers sont fort souvent beaucoup plus considérables qu'il ne conviendrait; chacun d'eau gagne quelquefois dans trois mois de travail, depuis 12 jusqu'à 40 livres sterlings, ce qui est exorbitant. Les intéressés disent à cela qu'il leur est absolument égal, parce qu'ils ont fait leur calcul de manière que le produit du minéral est toujours de 50 pour cent, même au-dessus et jamais au-dessous, et que d'ailleurs cela fert d'encouragement; cela peut être vrai dans un sens, mais en général un ouvrier qui gagne trop est rarement bon ouvrier." (53)

Jars' opinion of the deleterious effect of higher bargain prices - his figures for annual earnings, however, are suspiciously high - were shared by the mining companies at times of a booming lead market. A London Lead Company agent wrote in 1808, just after a great boom in prices - "Since the advances in the Lead Markets many of the Mining Companies in this country have

(53) Jars, G. - Voyages métallurgiques. Vol. 2. pp. 544 / 545.

"though profitable to the interested parties is, in the long run, to the disadvantage of the mines".

"From these mistakes in fixing prices it follows that the earnings of the workmen are often much more considerable than is proper: each of them earns in the course of three months from 12 to 40 pounds sterling which is too much. The proprietors say in answer to this that it is perfectly equal to them, because they have calculated so that the produce of the ore is always 50 per cent or greater, never less, and besides the system serves as an encouragement. This may be true in one sense but in general a workman who gains too much is seldom a good workman."

advanced the price for raising ore in their Old Works to 70/- and some to 80/- per Bing which makes our way with the workmen very difficult." (54)

Such times of boom, however, were rare. The tone of the surviving letter and report books of the London Lead Company and of the Blakett/Beaumonts gives the impression that the lead trade was always passing from one depression to another. When lead prices fell the companies had the choice of three courses of action, all vitally affecting their employees. Prices could be reduced, sometimes to starvation level. In 1815 the London Lead Company chief agent wrote that "the prices were kept so low during the three last Quarters that the Workmen's earnings were quite inadequate to the support of their families." (55) They were to fall even lower during the following year.

The second step was to reduce subsistence payments. In 1816 the Beaumonts lowered the monthly subsistence rate from 30/- to 20/-. Around 1830 the London Lead Company paid a regular subsistence sum only to men in good places. Those working in the "pickings" received only the estimated value of the ore they raised.

The third step, which will be considered further in Chapter 9, was to cut down the labour force. If the depression were not too prolonged the men would remain in the area unemployed until trade revived and employment once again expanded. In a severe and long lasting depression, as in the early eighteen thirties, many families were forced to migrate. The labour force was cut

(54) L.L.C. 16a. Oct. 31st, 1808.

(55) L.L.C. 16a. June 24th, 1815.

down either by directly refusing to employ men, or by offering them a price too low to afford a living wage. At the small mines of Heartlycleugh and Keirsley Row, during the depression of 1831, the Beaumont Coalcleugh agent recorded "Have not been able to let a bargain at either of those Mines" the prices offered being so low. (56) Many of the smaller mines on Alston Moor were forced to close down altogether during depressions as they had insufficient capital to carry them over until trade improved.

In the eighteenth century, as already described, depressions in the lead trade frequently caused very long delays in the payment of the miners - both of their annual pays and of subsistence money.

The mines of the larger concerns were saved from being shut down altogether during depressions by the need to keep some labour together for the arrival of better times, and by the desirability of keeping maintenance and dead work going. It was of course cheaper to carry out dead work in such times - providing the company concerned had enough capital to do so - and lead which could only be sold at a price lower than it cost to mine and process was better left in the ground until trade improved. The Court of the London Lead Company in 1829 recorded that "however deeply they may be impressed in the necessity of practising the strictest economy in all branches of the Company's expenditure, cannot but concur with Mr. Stagg [the chief agent] in the propriety of continuing the different trials, now in progress, to their ultimate object, believing that it is necessary

(56) B/B 55. July 8th, 1831.

for the future prosperity of the Company to have numerous Mines ready for working when required, particularly as such work can never be so advantageously performed as at a period like the present when the price of labour is so materially reduced". (57) However, even the London Lead Company were not able to continue this policy for the whole of the depression of the late eighteen twenties and early thirties; dead work was almost halted before the depression was over.

Another important trend, that is frequently commented on in the surviving letter and report books, was the gradually increasing expectations of the miners, and their reluctance to give up increases in bargain prices when lead prices went down. A special committee of the Court of the London Lead Company reported on bargain price policy in 1793 - "In the Year 1788 (very unexpectedly) Lead rose to the astonishing price of £23 per fother, then the miners took advantages and rose the Bargains to 35/-, 38/-, and 40/- per Bing in the Years 1789 and 1790. The Lead Market had considerably fallen from £17 to £16 and tho' your Agents had not Lowered Bargains in proportion from 35/- to 30/-. Thomas Dodd [the chief agent] has had some consideration on the fallen state of the Lead Market by lowering the Bargains since Ladyday 1793 about 3/- per Bing. He has not nearly reduced the Bargains to the same as they were in the Years 1785 and 1786 when Lead sold at the same prices nearly as this year - £16-10. It may be justly observed by the Court that this ought to be done but we fear there will be some difficulty in accomplishing that object, tho' it is

the duty of the Court to attempt it, but it is worth considering whether the Company shall stain it a shadow upon the eve of perhaps a severe winter." (58)

In a joint Memorial to Government asking for a reduction in the export duty on lead all the northern lead mine owners stated that before 1793 "the wages of the Working Miner were 1/2 per day." But in 1814 their wages "tho' in some degree reduced since the Peace, are now 2/6 per day" with only a small increase in the price of lead compared with the earlier date.(59)

The statistics as illustrated in Graph 1 do show that the bargain prices and subsistence money given by the Blakett/Beaumonts had increased considerably by the middle of the nineteenth century compared with those given a century before, without an equivalent increase in the price of lead.

An interesting, but unfortunately brief, note in Thomas Sopwith's diary for June 23rd, 1866 complains about unexpected results of the building of the new railway from Hexham to Allendale Town. Dissatisfaction with wages and conditions was spreading among the Allendale lead miners through their conversations with the railway navvies. They were learning that more wages could be earned elsewhere, and Sopwith feared that the railway would greatly facilitate migration.

During the nineteenth century both major lead mining concerns attempted to maintain a steady bargain price policy, irrespective of fluctuations in the price of lead. From 1846 to

(58) L.L.C. 14. Nov. 7th, 1793.

(59) B/B 14 51. Dec. 31st, 1814.

1870 the Beaumonts maintained a steady top price and regular subsistence rate. Sopwith's system for equalising earnings has already been described.

The London Lead Company pursued a somewhat less subtle, but probably more effective wages equalisation policy. As early as the end of the eighteenth century the management attempted to base all bargain prices upon a theoretical weekly wage which all the miners should attain but not exceed - e.g., if 12/- per week were the agreed figure all bargains would be calculated to produce just that and no more. In 1800 the Company chief agent "Assured the Court that the price of Lead had no influence upon the price of Bargains". (60) That this statement was untrue is shown by the fragmentary figures of bargain prices reported to the Court in the period 1801 to 1815. In 1801 the price of lead was around £25. per ton; the average London Lead Company bargain price was between 33/6d. and 36/- per bing during that year. In 1806, when the price of lead was over £35., the average Lead Company price was between 39/- and 47/6d. In 1811 the lead price was back to around £25.; bargain prices were down to an average of 32/- by the end of the year. (61)

Nevertheless the London Lead Company Court minutes show that bargain price increases were reported to it as consequent upon the increase of food prices rather than a rise in the price of

(60) L.L.C. 15. June 20th, 1800.

(61) These bargain prices are so intermittently given as not to be worth reproducing in a table. They are not directly comparable with the Blakett/Beaumont figures, as they are average prices, not top prices.

lead. In 1800 - "the Bargains were let at present so as to produce the Men 12/- per Week in consequence of the high price of provisions instead of 10/- which is the customary Wages." (62) Bargain prices were reported to the Court as the "Wages" which they would produce. At this time - i.e. before about 1817 - this wage figure must have been a fiction. It was virtually impossible - bearing in mind the complexity of estimating the productivity and difficulty of a particular place within a mine - to engineer prices so that all partnerships would earn the same.

After 1817 the wage figures mentioned at irregular intervals in the London Lead Company minutes become more meaningful. From that date Stagg introduced the "New Fathom" system (63) whereby men were paid for the amount of ground they cut away regardless of whether or not it contained ore. Stagg particularly claimed as an advantage of this system that "the Wages will be more equalised" (64) because it was relatively easy to calculate the work that could be done in a quarter and to regulate the price so as to produce standardised earnings.

From 1817, save during the very severe depression of the early eighteen thirties, the London Lead Company maintained a steady wages policy, the wage basis varying "according to the state of the times and... the price of provisions". (65)

(62) L.L.C. 15. June 20th, 1800.

(63) See p. 67.

(64) L.L.C. 16a. Midsummer 1817.

(65) 1864 Report (Vol. 2.) p. 375. For an account of the different basic wages, see Raistrick, A. and Jennings, B. - History of lead mining. 1965. pp. 293-296.

Appendix 2 shows that by the eighteen seventies the London Lead Company's subsistence payments to their miners amounted to over 50/- per month, compared with the Beaumont's 40/-. By far the greater part of the Company's miners' earnings, therefore, came in the form of subsistence. The ruinous fall in the price of lead at the end of the eighteen seventies forced both the Beaumonts and the London Lead Company to abandon their wages policies, and, eventually, lead mining altogether.

One final factor to be mentioned before giving a chronological survey of the miners' fortunes is the increased productivity of the larger mines during the nineteenth century. The improvements in the overall design of mines, and the mechanisation of ore dressing, greatly increased output. It was this that enabled the mine owners to increase bargain prices without equivalent increases in the price of lead.

In spite of the fragmentary nature of the evidence available it has been comparatively easy to analyse the factors governing the earnings of lead miners. To give a chronological survey of their fortunes, however, is a very different matter: gaps in the evidence do not permit this to be done in any but a very perfunctory manner.

In the period 1720, when Weardale records start, to 1761, the normal top price in the Blackett concern (there were occasional individual exceptions, normally for ore raised while doing urgent dead work) was 25/-. The average price of lead when sold fluctuated between £14. in 1730, £10. in the early seventeen forties, and £12. in 1761. Unfortunately the letter books of the

Blackett concern do not survive for the period 1742 - 1748 when lead sold at the ruinously low price of under £11. per ton.

During more normal periods, for which letter books do survive, the miners complained of delays in payment - both of the general pay and of the periodical subsistence. This latter was apparently not a fixed sum, but a dividing up among all the miners of whatever money the mine agent could raise.

For the period from 1762 until the end of the eighteenth century there is more surviving evidence than for the earlier period - again, however, largely confined to the Blackett concern. Some of the apparent differences may simply be due to this discrepancy in the amount of surviving evidence. Top bargain prices rose higher than before, but, as Graph 1 shows, they fell again when lead prices fell. By the seventeen eighties subsistence was a fixed sum paid fairly regularly. The seventeen nineties saw a great increase in bargain prices and in subsistence. The Weardale petition of 1795 shows that the miners wanted improved financial conditions. The Beaumont chief agent wrote in the same year, when the miners of Allenheads asked that 5/- per year should no longer be automatically deducted from their earnings for the Allendale clergyman, that "the Wages of the Miners have for some years past, been advanced on a greater proportion than provisions have advanced in price and it has been found by experience that the more concession is made to them the more unreasonable they are". (66)

The period 1800 to 1810 was one of prosperity with only

minor slumps. Demands for lead because of the War sent its price up to unprecedented levels. All the mining companies raised their bargain prices accordingly.

From 1810 to 1825 the lead industry went through a severe slump, followed by a partial recovery. Lead prices dropped towards the end of the War, and fell disastrously in 1814-17. The Beaumonts cut their top price down to 30/-, the same as in 1770, and subsistence from 30/- to 20/- per month. Many men were forced to emigrate. Lead prices recovered before 1820, and bargain prices were again increased - although not to their war-time level - and the 30/- subsistence restored.

1826 to 1836 was another period of severe depression through low lead prices. Earnings went down to little better than starvation level, and a substantial proportion of the population emigrated from the district.

From the late eighteen thirties to the early eighteen seventies the two major mining companies achieved a fair measure of stability in the face of fluctuating lead prices. The London Lead Company gradually increased its monthly subsistence payments from 40/- in the eighteen thirties to 54/- in 1872. The Beaumonts, who preferred to pay the larger part of their employees' earnings at the pays, increased subsistence to only 40/-. Pays became half yearly instead of annual in 1860.

In the late eighteen seventies the market for English lead finally collapsed with the importation of foreign lead at a price which the English mineowners could not match. This table (based on Export Prices given in the Statistical Abstracts of the United Kingdom) shows the ruinous fall in price:-

1865	£21.05.	1880	£17.41.
1874	£22.63.	1881	£15.72.
1875	£23.17.	1882	£15.45.
1876	£22.55.	1883	£14.07.
1877	£21.49.	1884	£12.58.
1878	£18.74.	1885	£12.25.
1879	£15.42.	<u>per ton.</u>	

The mining companies were forced gradually to cut down the number of their employees, and the earnings of those that remained. The bitterness engendered by the "New System" in the Beaumont mines has already been described. Both the big companies virtually suspended operations in the early eighteen eighties.

In times of bad health and in old age the lead miners had three possible sources of income. The first, Parochial relief, will be dealt with in Chapter 9. Secondly, both the London Lead Company and the Blakett/Beaumonts gave pensions to retired agents, however inferior their status, and both also gave money to miners who had been badly injured while actually in the mines, or to their dependants if they were killed. Thirdly, miners could insure themselves against illness or old age by becoming members of friendly or benefit societies.

Broadly speaking there were three types of friendly society existing in the lead mining district in the eighteenth and nineteenth centuries. (67) Firstly, there were small, local societies, many probably being short lived. Secondly, in the

(67) For an account of the different types of friendly society see - Gosden, P.H.J.H. - The friendly societies in England 1815-1875. Manchester, 1961.

nineteenth century, there were larger societies backed or organised by the lead mining companies. Lastly, again in the nineteenth century, there were branches of national societies, such as the Independent Order of Rechabites, and the Manchester Unity of Oddfellows.

The names and rules of most of the small independent societies have not survived. The earliest may have been the Society of miners in Aldstone-Moor, whose rules, dated 1755, are printed by Raistrick. (68) This was not connected with any individual mining company, and similar societies probably existed in the other mining areas. By the end of the century many certainly existed. There are records of small payments to the Loyal Miners' Club at Allenheads in the Blakett/Beaumont records in the seventeen eighties and nineties. The St. John's Chapel (Weardale) Friendly Society was founded in 1787, and was still in existence in 1847, a much longer history than most of the small societies. (69) This was one of two friendly societies in Weardale in 1797, (70) and the number had risen to three by 1809. (71) Many societies were very small indeed, and might have been missed by surveys such as those of Eden and in the various Poor Law reports. In 1852 a group of miners at Coalcleugh, with the encouragement of Thomas Sopwith, published a pamphlet

(68) Raistrick, A. - Two centuries. 1938. pp. 42/47.

(69) Sopwith, T. - Substance of an address to the members of the St John's Chapel Friendly Society. 1847.

(70) Eden, Sir. F. - State of the poor. 1797. Vol. 2. p. 168.

(71) Bailey, J. - Agriculture of Durham. 1813. p. 327.

entitled Practical illustrations of the benefits to be derived from well-conducted friendly societies, with reference more particularly to the New Societies established in East and West Allendale, as compared with the old benefit clubs yet existing in the immediate district. (72) The names of the old societies are "Brown's Club", "Errington's Club", "Thornley Gate Club", and "The Private Club". The writers note that "the last named Society has obtained its title in a different manner from that of the others, being held at a private house... while the others expend a sixth part of their yearly contributions for intoxicating drinks in the public houses at which they are held, in lieu of rent".

Little information has survived about the size and administration of these societies. Broadly, they aimed to give weekly sums to sick members, to pay pensions to those over a certain age, and to give a few pounds to the widow on the death of a member. The 1755 rules of the Society of Miners of Aldstone-Moor laid down that members should receive 4/- per week the first ten weeks of sickness or retirement, and 2/6d. per week thereafter: widows were given £3. on the death of their member husbands. Nearly a century later, in 1847, the St. John's Chapel Friendly Society had precisely the same benefits for its members - the 2/6d. a week pension was given at the age of 60. Conviviality, on the occasion of the periodic meetings of the clubs, was also a prime aim, as the rules of the Aldstone Society show. It is unfortunate that the proportion of miners who were members of such societies in the

(72) A possibly unique copy of this tract is in the Cowen Collection, Newcastle University Library. There is no copy in the British Museum.

eighteenth century cannot even be guessed at.

The basic problem of the friendly societies was the achievement of financial stability, so that income and investments were enough to pay for the benefits offered. Unless the society achieved this stability, accompanied by a constant stream of new members, it would go "bust" and members who had contributed subscriptions for most of their lives had nothing to receive when they had hoped for benefits. The little surviving evidence shows that the lead mining friendly societies were constantly running into financial difficulty. The situation of the St. John's Chapel Friendly Society in 1847 is typical of the difficulties such societies got into. Its income in the four years before had been £1,076; its expenditure on benefits £1,080. There were virtually no savings so all income was immediately paid out as benefits. Young members were no longer joining. The Society had only 53 members under 30 years of age, and 259 above. Such financial difficulties encouraged the more progressive mining companies to step in and arrange the benefit societies' affairs for them.

Both the London Lead Company and the Blakett/Beaumonts gave occasional donations to the local friendly societies during the eighteenth century. In the early nineteenth century the Lead Company formed a society expressly for its workmen. In a Resolution of 1810 the Court of the Company established a fund for the "Relief of maimed and decayed Workmen employed by the Company"(73) This was apparently run on traditional benefit society lines by the men themselves, with an annual subsidy from the Company. In 1827 the fund became insolvent as "the payments out were too

(73) L.L.C. 17. Dec. 6th, 1810.

large for the fund". (74) An investigation by the Court followed, and in October the balance of the fund was transferred to the General Account of the Mines. (75) From then on membership of the Company's Benefit Society was made compulsory on all employees, and the superintendent of the Company and the district agents became ex officio members of its governing committee. (76) The Company made a regular donation to the Society of £200. per year. (77) Robert Stagg, the superintendent, told the 1834 Poor Law Commission that "though nominally maintained by the men, it is considered, and apparently with justice, to be in times such as the present [the severe depression of the early eighteen thirties] really supported by the masters, since, having come to be considered as a necessary item of outlay, it is provided for in much the same manner as candles, gunpowder, or any other article indispensable for working. (78)

All London Lead Company employees therefore had to be members of the Society. The annual subscription of 30/- for each man was deducted from their earnings at the pays. Benefits in 1834 were, to the sick, 8/- per week for the first six weeks, and 6/- thereafter: to members aged 65 or over, 5/- per week. (79)

(74) Bainbridge, R.W. in his evidence to the 1864 Commission - Vol. 2. p. 378.

(75) L.L.C. Court Resolution. 20 - Nov. 1st, 1827.

(76) 1842 Report (Mitchell.) p. 749.

(77) 1864 Report (Vol. 2.) p. 378.

(78) Poor Law Commission Report. 1834. (Appendix A.) p. 139A.

(79) Raistrick, A. - Two centuries. 1938. p. 52.

In 1864 benefits were the same, save that the initial sickness payments had gone down to 7/- per week. £5. was paid to widows on the death of a member. (80)

The pension was not often claimed, owing to the early deaths of the miners from pneumoconiosis. In 1864, out of 1083 members, only 16 were over 65 and receiving a pension. In 1885, when the Company was on the brink of dissolution, the fund had £58,170.14.7. in investments. (81)

After Sopwith's appointment as chief agent, the Beaumonts too took a closer interest in benefit societies, at least in Allendale. Two new societies were founded - the Allenheads Benefit Society and the Allendale and Whitfield Neisonian Benefit Society - on the basis of rules drawn up by Sopwith. They were subsidised by the mining concern - 5% of the total of the annual subscriptions and 2% of the total capital invested was given. Subscriptions were based on a sliding scale - those joining at the age of 15 paid 9d. per month: those at the age of 40, 1/6¹/₂d. (82) Benefits were in line with those of the London Lead Company, but no retirement pension was given until the age of 70. By 1864 not a single one had ever been claimed!

Membership of the societies was not compulsory, and it would appear that only a minority of the Allendale miners were members. (Membership of the complimentary medical scheme, providing free medical attention when sick for workmen and their families, was,

(80) 1864 Report (Vol. 2.) pp. 377/378.

(81) L.L.C. 34. Sept. 17th, 1885.

(82) Practical illustrations of the benefits...from...friendly societies. 1852.

however, compulsory.) In Weardale there was no similar society supported by the Beaumonts: the miners would not agree to the rules proposed by Sopwith. (83) There, and in the other mining districts, any friendly society that existed was not supported by the owners.

In 1864 no friendly societies at all existed near the Derwent mines, or at Stonecroft and Greyside north of the Tyne. (84) In Weardale and Alston, however, there were still a number of small independent societies, and branches of the Rechabites, Oddfellows, and Ancient Druids. In Allendale too there were societies other than the officially backed ones existing in 1863. Some miners were members of more than one society. Some of the Lead Company's miners too were Oddfellows, although this was discouraged by the Company. (85)

In all, probably about two thirds of the lead miners were members of friendly societies by the second half of the nineteenth century. Only in the London Lead Company was membership compulsory. Their chief value was in the security they gave to the sick and maimed. The retirement pensions were of little use: Robert Stagg himself, the probable originator of the comprehensive London Lead Company scheme, told the 1832 Poor Law Commissioners that "the average duration of life" was "just twenty years less" than 65. There was no attempt to give support

(83) 1864 Report (Vol. 2.) p. 371.

(84) 1864 Report (Vol. 2.) p. 346: p. 355.

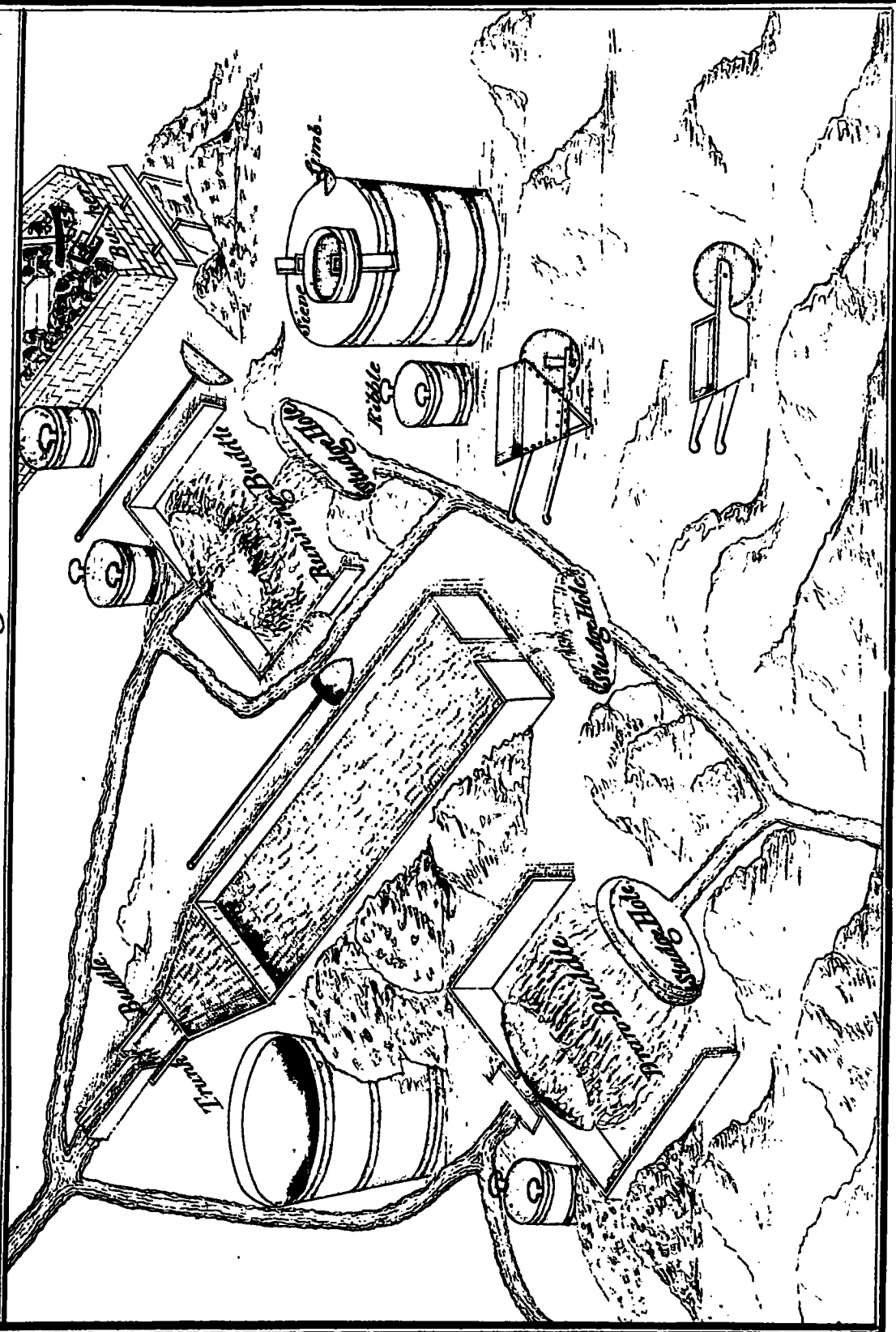
(85) 1864 Report (Vol. 2.) p. 331: p. 378.

to widows and fatherless children, of whom there were a large number, owing to the early mortality of the men. No money could be paid at times of unemployment. But even this limited amount of social security was better than the condition of the average industrial worker in nineteenth century England.

CHAPTER 5.Washers, Smelters, Carriers, and Agents.

The extraction of lead ore from the ground does not complete the processes of the lead mining industry, as does that of coal in the coal mining industry. The ore has to go through a number of processes before it becomes lead metal. Firstly all impurities have to be removed by dressing, or "washing" as it was universally called in the Northern Pennines. Then it has to be roasted and smelted, to change the ores, which were mainly lead sulphide, into lead. By the eighteenth century specialised groups of workmen were carrying out the latter process in the lead mining fields, and, by the third decade of the nineteenth century, washing too had become a specialised occupation. Washing operations were carried out as close to the mines as possible, to avoid the unnecessary transportation of worthless impurities; but most smelt mills were further away, on the edge of the lead mining area, to be near a sufficient supply of fuel. To carry the ore from the washing floors to the smelting mills there were the carriers, who used trains of packhorses called "galloways" to transport the ore over roadless fells, and small carts on the roads that were built from the end of the eighteenth century onwards. Before the coming of railways they were also responsible for getting the lead out of the mining area, to the marketing centres of Newcastle and Stockton. Both the actual extraction of the ore, and all these subsidiary operations were supervised by the officers of the various concerns interested in lead mining - the agents.

Draughts of the several Instruments necessary for the Dressing of Lead Ore so as to fit it for Smelting.



The process of washing the ore underwent a great and fundamental change at the beginning of the nineteenth century. In the previous century the methods employed were very inefficient and performed wholly by hand. By the mid nineteenth century a vast increase in efficiency had made many mines and veins previously considered too poor to bother with worth working, and machanisation had completely altered the organisational structure of the washing operations. Washing the ore became virtually a technology in itself, with its own specialised and technical vocabulary. Among the machines and implements used were "dolly tubs", "buddles", buckers", "colrakes", and "limps", whilst ore at different stages in the operations was known as "chats", "cuttings", "smiddum", "smiddum tails", and "slimes". It is necessary to give a brief account of this technological revolution in order to understand the consequent revolution in organisation which changed the labour force from many small groups of washers working independently at each mine to a single large group at each mine working as a team with factory conditions and hours of working. (1)

The object of washing the ore was to separate from it the useless stone and spar with which the Galena, or lead sulphide, was intermingled. To a certain extent this could be done by eye.

(1) The technical account of washing operations given in this chapter is based on the original sources cited in the notes. The writings of Dr. Raistrick have also been consulted, but I have found them misleading in parts, placing too great an emphasis on the London Lead Company's achievements without due mention of the technical innovations introduced by others.

alone, but much Galena would be lost if no further effort were made. The methods of separation employed were based on the fact that the specific gravity of the Galena was greater than that of the impurities mingled with it. If ore was dropped into a column of water it should separate into three layers, the Galena sinking fastest and forming the bottom layer, then would follow a mixture of Galena and stone, and lastly the stone would lodge on top. For this to work in practice, however, it was necessary that all the pieces of "bouse", as unwashed ore was called (when washed it was called "ore") should be of the same size, and it was also found that shaking the bouse in the water induced separation. The first operation, therefore, was to smash or crush the bouse into pieces of a uniform size; the next, to carry out the separation in water. The revolution in washing practices at the beginning of the nineteenth century consisted of, firstly, a vastly more efficient crushing process that produced a greater uniformity in the size of the particles of bouse and secondly of a more sophisticated (as well as mechanically driven) separating apparatus that allowed the steadily decreasing mixtures of Galena and impurities to be washed and re-washed again and again.

For most of the eighteenth century washing practices in the area were extremely backward, compared not only with those on the Continent, but also with those employed elsewhere in Britain. In 1762, M. Jars, inspecting mines all over Europe on behalf of the French Government, visited the lead mines at Leadhills in Scotland, and those on Alston Moor. At Leadhills he discovered that the washing was carried out with insufficient care, and the

techniques used were very inefficient compared with those used in Germany. Much ore was unnecessarily lost, or thrown away. In the Northern Pennines washing operations were carried on in the same way as at Leadhills, "mais encore avec beaucoup moins de précaution; de sorte que l'on quantité de minéral, indépendamment de celui que l'on jette au rebut". (2) The stamping mill, for crushing very hard ore, known to Agricola in the sixteenth century, and in use at Leadhills, was not employed at the washing floors of Alston Moor, or at Coalcleugh, although it was used in the smelting mills for crushing slag from about 1750 onwards. Jars noted, however, in fairness to the miners of the Northern Pennines, that the system of leases employed, whereby a certain percentage of the ore raised went to the landlord, made it uneconomic for the mining companies to wash bouse again and again for the sake of the ever decreasing, and qualitatively inferior ore remaining.

At this time the method of washing was as follows; the bouse was first broken up into fairly uniform fragments by beating the lumps by hand with a "Bucker", a mallet like instrument consisting of an iron head on a wooden shaft. The purer fragments of ore were then at once removed, ready to go to the smelt mill. From some "earthy" veins perhaps 60% or more of the ore could be separated ready for smelting after this one operation. From other veins, where the Galena was much mixed with stone and metallic

(2) "but with still less care; so that they lose a quantity of the ore, apart from that which is deliberately thrown away". Jars, G. - Voyages métallurgiques. Vol. 2. p. 545. Mulcaster MS. Lit. & Phil. Newcastle.

impurities, very little indeed was ready after this stage.

The crushed ore was then placed in a hand sieve and shaken in a tub of water, or a suitable pool in a stream. Within the sieve the bouse gradually stratified into three layers - at the bottom, pure ore: in the middle, a mixture of ore and stone known as "chats", on the top, stone. This top layer of stone was swept off with the piece of iron known as a "limp", the ore was put aside, and the chats again crushed and sieved. This process was continued until all the ore had been extracted, or the patience of the operator exhausted, the latter, according to Jars, happening very early by Continental standards. The "smiddum" or the fine particles that fell through the sieve to the bottom of the tub was then washed on a "buddle", which, in its simplest form was a few planks of wood laid at a slight angle on the hillside. Water was run down the buddle in a continuous stream, and the fragments of smiddum put down in the flow of water at the top, and stirred with a rake. This process again separated it into three parts, pure ore remaining at the top of the buddle, while the mixed stuff and waste was swept further down, or washed off altogether. As before, the pure ore was removed, and the "middles" washed again, as often as was necessary. More complex forms of buddle had been developed by the end of the eighteenth century, but the principle remained the same.

This was obviously a crude and imperfect method of dressing the ore. Much was lost, and sufficient remained in the heaps of deads and waste material for partnerships to be constantly kept busy re-washing them. This was done by the crude method of hushing

described in an earlier chapter, by which the violent flow of water separated ore and waste. Jars wrote that ore was found in stream beds miles below the actual mines and washing floors, and that bargains were taken for gathering this up. In a letter concerning the proposed Weardale enclosures in 1799, the Beaumont chief agent wrote that should it take place "we should not be deprived the liberty of hushing Wastes as it is not only the best way of working them, but also does least damage to the Ground, as by that means they are continually conveyed to some Burn or Rivulet, and by any other method of washing them they are spread, and left upon the Ground". (3)

At the end of the eighteenth century, in 1796, "an improved method of washing ores was introduced by Richard Trathan, a Cornish miner who came in search of employment, and proposed to obtain considerable quantities of ore from the refuse of the then inexperienced washers". (4) Working for the London Lead Company he introduced two fundamental innovations, long known elsewhere, into the area. Firstly, he used a stamping mill to crush ore too hard to be broken by the buckers. Secondly, he dug what were known as "slime pits" below the buddles to catch the fine particles of ore that had been washed completely off the buddles and previously lost. (5) Sopwith noted that Trathan's bargains "produced him such good wages that the agent endeavoured to reduce them". Upon his resisting Trathan was dismissed "and a

(3) Blackett of Wylam MSS. Northumberland County Record Office.

(4) Sopwith, T. - Alston Moor. 1833. p. 120.

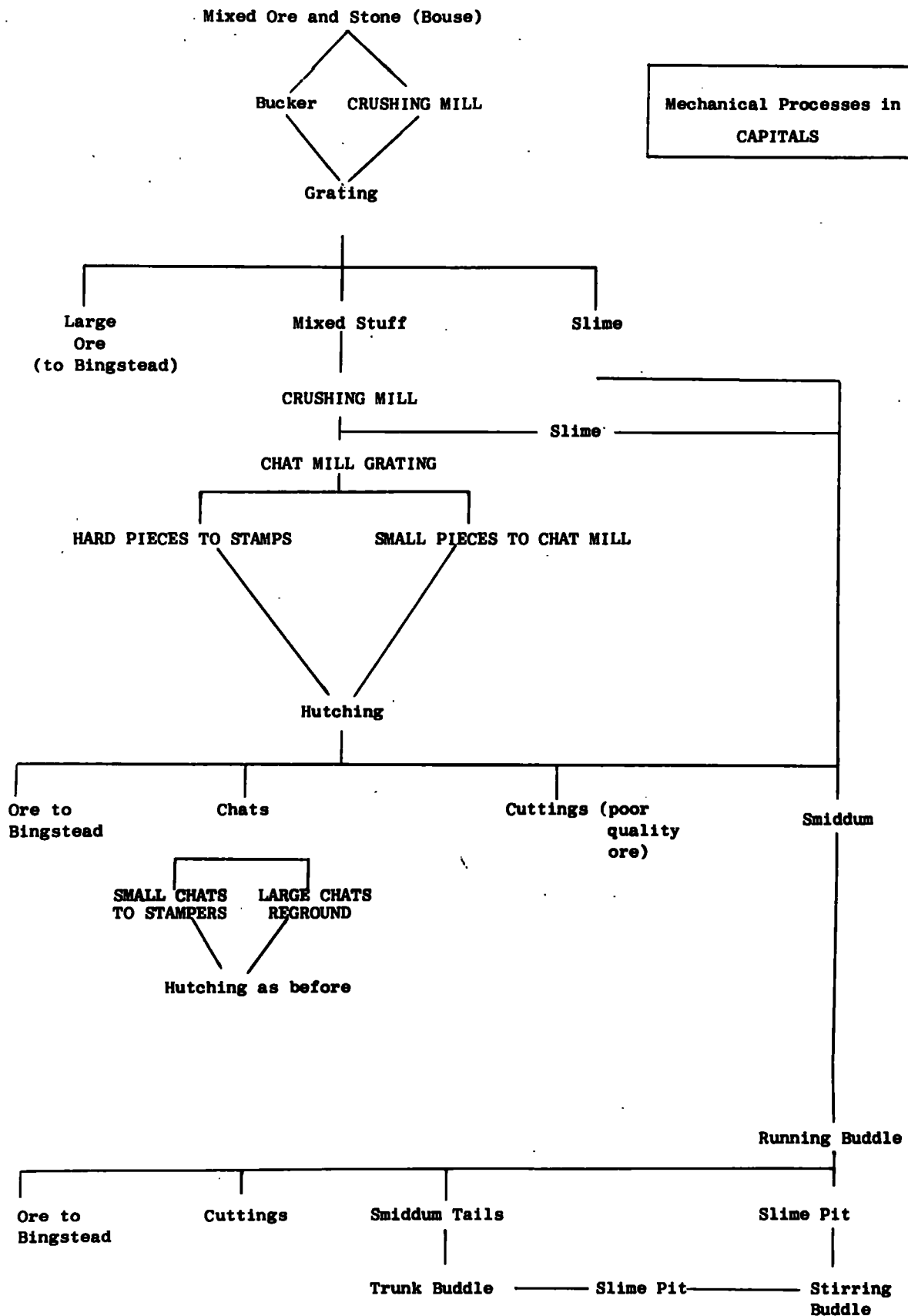
(5) Forster, W. - Section of the Strata. 2nd. ed. 1821. p. 351.

whole summer passed in the fruitless efforts of others to supply his place". He was then re-engaged. (Washing apparatus in use about 1800, including the slime pits, is shown in a photocopy of a drawing by James Mulcaster.) (Plate 6, p. 142.) Trathan's work was the foundation of a revolution in washing practices in the area which caused other French inspectors visiting it about 1830 to state that washing methods were practically as advanced as those used in Germany. (6)

By 1842, the processes used for washing the ore at mines belonging to the larger mining concerns had been mechanised and, compared with those used in the eighteenth century, were highly efficient in obtaining every scrap of smeltable ore. At the smaller mines, where the owners or adventurers had no capital to invest in expensive machinery, things went on much as they had done in the eighteenth century. A rough summary of the mechanical operations involved is given in diagrammatic form. (Plate 7.) It will be noted that the efficiency of the system in obtaining all smeltable ore lay, firstly, in the mechanical crushing apparatus reducing all the fragments of bouse to a uniform size, and, secondly, in the number of processes the "chats" or mixtures of ore and stone, were subjected to. At every succeeding operation the ore obtained was of slightly inferior quality to the ore obtained from the previous one, but improvements in smelting techniques meant that this could still be dealt with profitably.

To contemporaries it was the first operation, the crushing

(6) Dufrenoy, P.A. & Elié de Beaumont, J.B.A.L.L. - Voyage metallurgique. 2nd. ed. 1837 - 1839.



Mechanical Processes in
CAPITALS

that brought about the most striking improvements in productivity. Without this the more sophisticated machinery used in the separation of the ore and waste would have been far less effective. The "crushing machine", two or three fluted rollers driven by water power, revolving against one another and crushing ore fed in from above, was introduced by both the London Lead Company and the Beaumonts in the first decade of the nineteenth century. The Lead Company chief agent calculated in 1811 that the machine "will make at least 1/5 more of the ore than the common way of washing". (7) It was both more efficient than breaking up ore with buckers, and required a far smaller labour force. By 1830 machines existed at all the mines of these two large concerns, and also at many of the smaller mines on Alston Moor.

The separating methods were also partially mechanised, although a large labour force was still required as the actual sorting of the ore after each successive stage of treatment had still to be done by hand and eye. The use of a water-washed grating on which to sort ore lessened the labour necessary. The sieving in water, or "hutching" was now done easily by a single boy, as the sieve was suspended from above the tub, and was moved by means of a long pole which also acted as a counter-balance. Buddles became more and more sophisticated. By 1842 many different forms were in use, some power driven, all designed to separate the ore and wastes. By the late eighteen forties the cloth separator was in use; this consisted of a continuous belt which both moved along and shook from side to side, thus shaking

(7) L.L.C. 16a. July 13th, 1811.

off the wastes and carrying the fine smidden along with it. Also, by 1842, the washing floors at large mines were systematically planned to allow the ore to pass easily from operation to operation, with the railroad from the horse level bringing the bouse to the starting point. Dams were built to provide an adequate supply of water even in times of drought.

This mechanisation of the ore washing had three main effects. Firstly it made existing mines more profitable as far less Galena was lost. This happy result, however, was to the advantage chiefly of the large companies. The small groups of adventurers could not afford the expensive capital outlay for the necessary machinery, and continued to work in the traditional manner. Secondly, mines and parts of mines, previously too poor to work because of the low quality of the bouse obtained became worth while. This was to the good, not only of the masters, but also of the men, as it increased the potential employment available at every mine. The Weardale agent for the Beaumonts reported in 1828, after the erection of a crushing mill at Kilhope mine, that "The Workings are poor but the produce will be increased from that of last year in consequence of more Men raising Ore, a part of which have taken workings for the purpose of drawing old deads and washing them, which the use of the Crushing Mill has enabled them to do, and previous to the Mill being built, such places would not Work at the highest prices given". (8) The third effect was completely to change the organisation of washing. With the introduction of machinery it was necessary to have a specialised

(8) B/B 54. Ladyday 1829.

labour force performing the washing operations, instead of every partnership being responsible for the washing of its own ore.

As has been shown in Chapter 3 the bargain system required the miners to be responsible for washing the ore. The earnings of each partnership were based on the total number of bings of dressed ore raised. The system of payment persisted even after the partnerships raising the ore ceased directly to wash it themselves.

Because washing the ore was generally the responsibility of the bargain takers there is very little evidence in the existing records of the various mining concerns about practices in the eighteenth century. The masters were only concerned with the quality of the dressed ore, not with how the work was done. The washing agent watched to make sure that all impurities were removed, and that there was no cheating when it was finally weighed out in bings. His status was low; the Beaumont chief agent wrote of a washing agent in 1797 that "he is a poor ignorant fellow and is only fit to look after the Washers and to deliver out the Gunpowder and Candles." (9) Whenever the washing was unsatisfactorily carried out, however, it was the washing agent who was blamed - "as there has been repeated complaints of the Lead Ore being not well dressed... I took the opportunity to go round the different Mines with the Washing Agents and examined each parcel, and was sorry to find some of them so dirty that I was under the necessity of informing the Washing Agent that unless these parcels were again washed over (which they promised

(9) B/B 50. March 18th, 1797.

to see done) we could not receive them at the Mill." (10)

For most of the eighteenth century washing was apparently done either by the partnerships themselves, or by their directly employing others to do it. The distinction between these two systems is not as obvious as it would appear at first sight. It was often the sons or wives of the partnership members who did the washing. Jars said that in 1765 the partnerships themselves performed the washing operation. (11) A number of bargains in the Blackett bargain books instructed the workmen "not to wash their last Quarter's Work but the Agents let it to wash to whom they appoint". (12) At Fallowfield, where the payment record for 1769-70 shows how the partnerships spent their time during a given quarter, most men worked a number of days at the "Washg. Place at Middle Whimsey". This haphazard system went on into the nineteenth century. A London Lead Company note of 1812, recording the work of a particularly productive partnership, stated that "in the summer season they employ not less than 10 men and lads to wash the ore." (13) A year before, in 1811, the Company chief agent had reported that before the end of each bargain period "The Miners come out of the Mines to assist the Washers in making up all the Ore against that day." (14) Thus at the beginning of the nineteenth century the London Lead Company

(10) B/B 53. Oct. 20th, 1809.

(11) Jars, G. Voyages metallurgiques. Vol. 2. p. 543.

(12) e.g. B/B 136. March 29th, 1779.

(13) L.L.C. 16a. Jan. 18th, 1812.

(14) L.L.C. 16a. Nov. 1st, 1811.

partnerships were still directly responsible for either doing the washing themselves or employing someone to do it. According to Forster, writing in 1821, the miners were charged by the washers a price per bing of washed ore which fluctuated according to the difficulties involved in washing it - rich bouse requiring little washing was charged at a low rate; poor bouse, with many impurities in it, was charged at a high one. (15)

Washers' equipment in the eighteenth century, as has already been shown, was very simple. The miners apparently were normally expected to find this themselves, in the same way as they did tools for working inside the mine. One Blakett bargain for washing wastes in 1766 stated that the men were "to have four new Buddles allowed them but to find the rest of their Work Gear themselves". (16)

In the nineteenth century a change in the system was forced on the mining companies because of the new machinery which was too expensive to expect the miners to provide for themselves. Washing operations at every mine had to be properly and comprehensively organised to take full advantage of the potentialities of the new machinery and methods. There were two ways in which this was done. Firstly, the mining company could itself take over all washing operations, charging the partnerships for work done. Secondly, the whole of the washing at one mine could be allocated to one contractor, in the same way that drawing work was allocated.

The London Lead Company took over the business of washing

(15) Forster, W. - Section of the strata. 2nd. ed. 1821. p. 363.

(16) B/B 167. Oct. 14th, 1766.

about 1816. (17) The change is recorded in the reminiscences of one adult washer remembering conditions at the beginning of the century for the information of the Assistant Commissioner Mitchell in 1842 - "After some years [working as a miner] I left my brother and took to washing, and hired boys under me, and was paid by the bing. The people who employ boys get more money than the men. The Company after some years put us all upon wages, and employed the boys themselves." (18) The partnerships were charged for washing in the same way as earlier, according to the quality of the bouse and the amount of work needed. The charges were deducted from the sums due to each man at the "pays"

Other mining companies, "most" according to Dr. Mitchell in 1842, employed "the contracting system". "A contractor at the washing-floor of the Derwent Company was pointed out to me, and I entered into conversation with him. He told me that he had 40 persons working for him. I said to him, 'At that rate you ought to be making a little fortune?' He replied 'No, no, Sir, I am watched too closely for that; if they see that I am making more than they think fit that I should do, then when my contract for this quarter is out they will reduce me the next quarter'." (19) The contractor had to disclose to the mining company all prices charged, and all work done: his employees were paid at rates laid down by the company. "After all it is a complete disclosure of the amount of his profits, and he is not very likely to make

(17) See Railstrick, A. - Ore dressing (in Mine & Quarry Engineering). 1939. pp. 161/166.)

(18) 1842 Report (Mitchell.) pp. 763/764.

(19) 1842 Report (Mitchell.) p. 746.

beyond the wages of an overseer under engagements so made." Printed as an appendix (20) is an example of a Beaumont washing contract. These contracts first feature in the Beaumont records in the year 1833, at a time of extensive administrative change within the concern. The contract laid down the wages to be paid to the washers, the hours of work, some instructions as to methods to follow, and a clause prohibiting the miners "to render the Washers any assistance in the Washing of their own Bouse." The clauses governing the contract were so comprehensive as to render the washers virtually the direct employees of the mine owner.

One indirect effect of the mechanisation of washing concerned the bargain system, and has already been touched on in Chapter 3. The traditional system of payment by bing became very "inconvenient for dressing operations, as after each parcel produced by the several partnerships... is washed up, the different apparatus must be stopped and emptied." (21) Thomas Sopwith Junior calculated that the cost per ton of washed ore in 1870 was 7/6d. if this had to be done; if the ore could be treated as a whole, the cost went down to 2/6d. Thus an increasing number of the larger mining concerns went over to the fathom method of payment which did not require every partnership's work to be washed separately.

(20) "Rules and regulations to be observed and kept by the Contractors for Washing Bouse and Wastes at Barney Craig and Coalcleugh Leadmines entered into this 23rd day of April 1833." Appendix. Document 5.

(21) Sopwith, T. jr. - The dressing of lead ores. (in Mins.Proc. Inst. Civil Eng., Vol. 30, 1869/70. pt. 2. p. 108.)

The Blackett/Beaumont records show that both in the eighteenth and nineteenth centuries certain partnerships were specialist "waste washers" working outside the normal washing system. These were partnerships taking bargains to "wash up" the "Cuttings", "Slimes", "Deads", "Wastes", etc. They were on a ton-tale basis, presumably because the ore produced was of a poorer quality than that normally raised direct from the mines, and a given quantity would produce less lead than the same quantity of normal ore. These contracts are recorded from the early eighteenth century right through to 1880. The number of partnerships engaged in this work was far fewer than those doing the actual mining, averaging perhaps, about 3 or 4 per cent of the total. There were slightly more of these partnerships working in the eighteenth century than in the later nineteenth.

The actual work done by the washers remained in essentials the same before and after the introduction of machinery - i.e. it consisted chiefly of sorting wet lumps of stone and ore. Before the crushing machine was introduced a larger proportion of the labour force was engaged in manually breaking large lumps of ore with the bucker. A 41 year old washer told Assistant Commissioner Mitchell in 1842 that when he first went to work at the age of eleven - "At that time crushing-mills were not so much in use as now, and boys broke the stone to separate the ore with buckers...; buckers are now not much use except in small concerns." (22) Other witnesses told the Commissioner of their daily routines, - "I picked grating, that is, I took away the ore

(22) 1842 Report (Mitchell.), p. 760.

from the stones lying in the grate... I next went to hutch, that is, I took the stuff off the sieve after the ore was gone out of it." (23) "When I first went to washing I turned the handle of the thing in which they wash the stuff, the buddle. I next went to drawing slime. There is a trunk and water comes over it, and a boy puts in the slime, and we rub it with a colrake, and the water runs through it, and washes away all the mud, and leaves the lead." (24)

The work was not hazardous - serious accidents were virtually unknown - but it could be very uncomfortable. Dr. Mitchell commented that "the work is not too laborious". The younger boys employed were given jobs within their strength. The worst feature was the almost complete absence of protection from the weather. (25) On the exposed Pennine fells, working in the open, without any form of shelter, could be most unpleasant, even in the summer months. Work went on through the rain, and, even if the rain stopped, there was nowhere for the workers to get dry and warm. The winds were most uncomfortable for those working with their hands and arms constantly wet. The only place where Dr. Mitchell saw sheds over the washing floors was at Coalcleugh, but there were none at any other Beaumont mine. The London Lead Company occasionally provided boards to act as wind breaks, but never any overhead covering. The Commissioner strongly recommended that such covering should be provided. By 1864, however,

(23) 1842 Report (Mitchell.) p. 768.

(24) 1842 Report (Mitchell.) p. 766.

(25) 1842 Report (Mitchell.) p. 732.

little had been done except by Sopwith, who had built sheds at most of the Beaumont mines. The London Lead Company had shelters at some, but not at all mines. (26) The remainder had nothing at all.

By tradition, and because of the relatively light nature of the work involved, washing was not normally done by grown men, except in supervisory capacities. It has already been shown that in the eighteenth century washing was left to the partnerships raising ore to do or to organise in their own way. If the work were delegated, the washers were frequently the sons and wives of the members of that particular partnership. In the lists of waste washers taking bargains in the eighteenth century, in the Blackett records, many women were included. Some partnerships were made up entirely of women, others were husband and wife, or father and daughter partnerships. By the end of the eighteenth century, however, these feminine names become increasingly rare, and no woman is listed as having taken a washing bargain in the nineteenth. In 1817, at the time of a great food shortage, women besieged the London Lead Company agent, asking for work; this may mean that they had been regularly employed up to that time, or the action may have been forced upon them on this occasion by the unusual shortages of that year. (27) In 1834, no women were employed in washing within any of the lead mining parishes which furnished returns to the Poor Law Commission. (28)

(26) 1864 Report (Vol. 2.) p. 331.

(27) Raistrick, A. - Two centuries. 1938. p. 38.

(28) These included the parishes of Alston, Middleton in Teesdale, and Stanhope.

In 1842 the Commissioners found only two women employed at washing in the whole area, and miners, when questioned as to the reason why, considered the idea "very improper". (29) In 1842, therefore, it must have been many years since women had been generally employed at washing. The reasons for this discontinuance are not apparent, as early nineteenth century morality was not normally shocked by women working alongside men - at least not to the extent of ending the practice. There was no alternative occupation for women in the area, and in the Yorkshire lead mines, and in Cornwall, women were still employed to dress ore in the mid-nineteenth century.

The bulk of the labour force consisted of boys under the age of 19. It has already been shown that boys were not normally employed inside the mines save at a few jobs subsidiary to ore getting. The future miners started off their working career as washers. In 1842 most boys began work between the ages of 9 and 12. "Children under 9 are seldom so strong as to be of any use whatever, which is the best security against their being employed." The London Lead Company usually took no-one before his twelfth year, but "the importunity and poverty of the parents, particularly of widows, procures the relaxation of the strict rule". By 1864 most companies refused to accept children under 11. R.W. Bainbridge, the London Lead Company chief agent, gave the 1864 Commission an account of the normal career of a washer and his progress towards becoming a miner, worth quoting at some length - "From the age of 12 to 18, as a rule, they must attend

(29) 1842 Report (Mitchell.) p. 747.

the ore-dressing floors, and at 18 years of age they are allowed to be placed underground. At 14 years of age we allow them to go underground during the three winter months when the ore dressing is not in operation... He is placed with one of the mining partnerships as a labourer, and in that way he is serving a sort of apprenticeship, or obtaining knowledge that is likely to be useful to him in after life. At 18 years of age we consider these young men eligible to be placed as partners in the mines, and to become members of a partnership... In recent years, owing to the fact that we have had a greater amount of ore to dress than we had boys under 18 to dress it, they were kept out longer, so that the bulk of our boys may be said to be kept out of permanent underground working until they are 20 years of age, and even beyond that." (30)

The severity of the Pennine winter made washing impossible for some months in the year. Frost and snow impeded the working so that operations normally ceased between November or December and April. The weather was frequently bad enough to stop operations during the summer also. Before the construction of dams, summer droughts had the same effect. "Altogether a washer is prevented from working above 21 or 22 days in the month, and he works at washing from eight to nine months in the year. In the wintertime, when the washing becomes impossible, many of the young persons go to work in the mines and the young boys go to school." (31)

(30) 1864 Report (Vol. 2.) p. 376.

(31) 1842 Report (Mitchell.) p. 743.

The washing operations, therefore, had to be crammed into rather less than eight months of the year, while ore extraction went on all the year round. This was partly why the hours of work for the washers were so many and so long, compared with those of their fathers inside the mine. It was, however, also a feature of contemporary coal mining practice that the children should work many more hours than the adults. In the Beaumont washing contract of 1833 (Appendix 5) the normal working day was from 7 a.m. to 7 p.m., with an hour for lunch. On Saturdays (when the adult miners did not normally work) work ceased at 12, but if any time had been lost through bad weather during the week preceding, work could go on during the Saturday afternoon as well. The 1842 Report gives similar conditions and hours at all the mines. Towards the end of the washing year, about September, washing went on until midnight on fine days. At Allenheads "it falls on each boy once or twice-a-week, excepting some little boys, to stay till midnight, from 7 A.M." (32) In 1864 hours of work were apparently still much the same.

The miners were charged for washing by the piece, a charge based, as has already been said, on the amount of work involved in preparing each bin of ore. In 1821 this charge could be as little as 2/6d. for exceptionally clean bouse, or as much as 8/- for a very hard mixture. (33) When the mining companies took over the washing organisation they kept the old charging system (unless fathom working was also introduced) but normally paid

(32) 1842 Report (Leifchild.) p. 682.

(33) Forster, W. - Section of the strata. 2nd ed. 1821. p. 363.

the workers by the day. "When children go to wash at nine years of age the usual wages are 4d. or 5d. a-day, and it is customary to advance the child a penny a day for every additional year of his life. Some years there is a rise of 1½d or 2d a-day." (34)

The statistics of workers employed in the lead mines on Alston Moor, supplied by the different companies to the Greenwich Hospital (35) show that the proportion of washers to miners went up in the nineteenth century, compared with the eighteenth. Between 1738 and 1767 the proportion of washers in the total labour force (taking the quarter of the year when the greatest number of workers were active) varied from under 10% to as many as 20%. In the years 1818 to 1844 the washers were almost invariably between 30% and 36% of the total. This proportionate increase in the number of washers, in spite of the partial mechanisation of washing, shows that in the eighteenth century many miners washed their own ore themselves.

Once the dressing of the ore had been completed it was ready for smelting. The basic principle of smelting is to reduce the ore - mainly galena, or lead sulphide - into pure lead by heating it in a blast of air. The oxygen in the air oxidizes the sulphur, leaving the lead behind. It is not here desired to give anything more than a bare outline of the processes used, because, unlike the process of washing, there occurred no technological change in smelting that vitally altered the structure and administration of the industry. The smelters were specialist and highly skilled

(34) 1842 Report (Mitchell.) p. 745.

(35) Statistical Table 7.

workmen in the eighteenth as well as in the nineteenth century.

The smelting mills were frequently separated from the mines in a geographical as well as an administrative sense. The main factors involved in siting smelt mills were three in number; firstly, that smelted lead was roughly two thirds of the weight of the ore, and was thus cheaper to move: secondly, that fuel was not easy to come by on the high moorland where most of the mines were situated; and lastly, the ease of access to the marketing centre - Newcastle or Stockton - had to be considered. The smaller mining organisations tended to locate their mills as near to their mines as possible, to avoid extra transport costs, and to use only peat as fuel. The larger concerns either undertook the cost of getting wood and coal to their mills - as the London Lead Company did at Nenthead - or compromised by siting the mills where wood and coal were available but not too far away from the mines - as the Blakett/Beaumonts did at Dukesfield and Allen (Allendale Town) Mills, and the Greenwich Hospital at Langley. The Blakett/Beaumonts refined their lead at Blaydon, near Newcastle. The other concerns attached their refineries to the smelt mills. Most of the bigger mining companies had more than one mill, to cover activities in different districts. (36) The smelters themselves tended to live apart from the miners. At Nenthead they occupied a distinct section of the village. The 1851 census shows that smelters' sons became smelters also,

(36) For a list of smelt mills in the Northern Pennines see Raistrick, A. - Lead smelting. (In Univ. Durham Phil. Soc. Trans., IX, 1931/37 pp. 164/179.) Dr. Raistrick's list is far from complete, particularly for eighteenth century activity.

rather than transferring to the extractive side of the industry. In their boyhood they worked as washers alongside the miners' sons but as soon as they were old enough they became smelters.

All the smelting operations were carried out in furnaces within specially built smelt mills, sited near water which supplied the power for blowing the bellows. (37) The most common mode of working throughout the period was to smelt the ore in an ore hearth - a furnace where the ore and fuel were mixed up together rather than kept in separate chambers. The ore was first "roasted" to expel some of the sulphur. In the eighteenth century this was done by putting raw ore on top of that already in the hearth, and allowing it to "roast" before mixing it in with the rest. In the nineteenth century it was usual, in the larger mills, to roast the ore in a reverberatory furnace, that is, one where the fire was kept separate from the ore.

After roasting the smelting proper was carried out. Ore and fuel, usually peat, were mixed in the furnace and set alight. The bellows constantly blasted air into the furnace, and this had to be distributed throughout the burning mass. This was done by placing peat before the nozzle of the bellows, which helped to spread the current of air, but as the whole mass soon acquired a

(37) This account is based largely on those given in:-
 Mulcaster M/S. (Lit. & Phil., Newcastle.)
 Pattinson, H.L. - Account of the method of smelting lead ore in... Northumberland, Cumberland and Durham.
 (In Trans. Nat. His. Soc. of N/d, Durham and Newcastle upon Tyne., 2, 1831 pp. 152/177.)
 Percy, J. - The metallurgy of lead, 1870.
 Dr. Raistrick's writings have been useful, but again concentrate upon innovations claimed to have been introduced by the London Lead Company.

pasty consistency, much depended on the skill of the smelter in stirring up the "browse" and bringing it forward upon a large slab in front of the furnace known as the "workstone" where large lumps would be broken up, and expended ore, now known as "grey slag", removed. The liquid lead flowed from the furnace by a gutter across the workstone into a pot, from which it was ladelled to form pigs. More fuel and fresh ore would be added as necessary, and the smelting would go on for from 12 to 15 hours, after which the furnace became too hot, and had to be left to cool for a while.

Ore hearth smelting was universal in the eighteenth century in the Northern Pennines, and, except in the mills of the London Lead Company, continued in use with minor modifications and improvements until the end of the nineteenth. The London Lead Company adopted the reverberatory furnace for smelting proper, as well as for roasting. This was more efficient, in that the "black" slag remaining contained no combined lead, as did the "grey" slag from the ore hearth, and therefore did not need a second smelting. But reverberatory furnaces required coal to produce the necessary intense heat; ore hearths worked best on peat, supplies of which were immediately available in the district. The ore hearths would also deal economically with small packets of ore and would accept lower grades of ore than would the reverberatory furnace. But after each ore hearth shift there remained many "grey slags" containing combined lead, which needed further treatment, as was not the case with the slags from the reverberatory furnace. These slags were treated in a slag

hearth, which produced a more intense heat than the ore hearth. The fuel (coke) and slags were mixed and lit, and the whole mass became liquid as the heat increased. A blast of air was blown through by a bellows as before. When hot, the mixture was tapped into an ash filled pit. The lead ran through the ash into the pit below, and the black slag caked on top of the ash. When solid, it was removed and broken with a stamp mill to extract any particles of lead trapped in it. The pieces were washed, and the lead remaining re-smelted.

Some ores were rich in silver as well as lead. In smelting, the produce of different veins was kept rigidly apart, and, as the silver bearing veins were known, the lead from these only was refined to extract the silver. In refining there was a great technological advance in the eighteen thirties through the invention of "Pattinson's Process". Up till then refining had been done by cupellation, which was carried out in a reverberatory furnace. In brief, this was done by heating liquid lead in a container of bone ash until it was red hot, and blowing air across the surface with bellows, causing litharge to form. The litharge was blown out of the furnace by a channel, and fresh lead was allowed to melt into the "test-bottom". Four fothers, each of 21cwt. were worked in this way. At the end there remained in the furnace "rich lead" containing a high proportion of silver. The process was repeated with more lead until there was a large quantity of rich lead available. The rich lead was then treated in the same way, leaving eventually, pure silver. The litharge then had to be transformed back into lead by heating it

with coal in a reverberatory furnace. The "test-bottoms" of bone ash were also re-smelted.

Pattinson's Process avoided the second operation. Here the lead was melted and allowed to cool slowly. The lead crystallised before the silver, and was removed with a perforated ladle. Rich lead was left. When there was sufficient rich lead the process was repeated until pure silver was obtained.

To give an idea of the size and complement of a smelt mill, here are the statistics of the Greenwich Hospital's Langley Mill in 1822; it was probably the largest mill in the Northern Pennines at the time:-

	<u>No. of men.</u>		
3 roasting furnaces - 3 men each	...	...	9
7 ore hearths - 4 men each	...	...	28
2 refining hearths	...	...	5
1 reducing furnace (converts litharge to lead)			3
2 labourers for weighing ore	...	...	2
1 smith, 1 wright, 1 driver (of 3 carts)	...		3
			<u>50</u>

In addition there were 6 men dealing with zinc from one mine on Alston Moor. (38)

Unfortunately, no detailed accounts, wage books, etc. for smelt mills appear to have survived. Evidence for the economic and social conditions of the smelters is therefore far more limited than in the case of the miners. The sources available are the technical accounts of smelting already listed,

(38) Greenwich Hospital Report. 1822. pp. 15/16.

occasional references in the Blakett/Beaumont and London Lead Company records, and, most important, the letter books of the Receivers of the Greenwich Hospital Northern Estates, which contain a great deal of information about the establishment and early days of Langley smelt mill.

The smelters and refiners needed a high degree of skill successfully to carry out every operation without waste. There were no mechanical aids, or dials to indicate degrees of temperature or fluidity; all had to be estimated by the smelter on the basis of his skill and experience. In ore hearth smelting, for example, great care had to be taken that the blast was neither too weak nor too powerful, and "the same blast is not suitable for every variety of ore". (39) The blast had to pass equally through every part of the mixture of ore and fuel, and the ratio of fuel to ore, which varied with the quality of the ore, had to be correct. If the process went on too long, or not long enough, the result was to lose a great deal of lead. Refining was even more complex. Over all the operations the greatest care had to be maintained. In 1730 it was discovered after some pigs had been sold that someone at the Blaketts' Dukesfield Mill had put "lumps of slags into the pig pan, which will certainly be attended with the ill consequence of depressing our Lead and giving it an ill character at all marketts". The chief agent feelingly wrote of the culprit that "hanging is too good for him." (40) Normally, however, without carrying out assays on

(39) Pattinson, H.L. - Account of the method of smelting lead ore. pp. 152/177.

(40) B/B B.M. Letter Book June 10th, 1730.

every pig of lead produced, there was no way of checking on the skill and honesty of the smelters. The Greenwich Hospital Receiver wrote in 1769 that "giving an entire Confidence to the Workmen... is perhaps the only Method to keep them honest, as... should they incline to be dishonest... there is no preventing their taking advantages but by making Assays". (41)

A good smelter, therefore, was worth his weight in gold - or at any rate in silver - to his employers. A primitive system of industrial training was in use at all the mills. Boys were not employed. A young man started off as a labourer, and then became the second man in one of the two-man teams working at the furnace. If he were sufficiently good he would eventually become a refiner, the "highest branch" of the profession. (42) Both the Greenwich Hospital and the London Lead Company encouraged their chief smelters to tour other mills, and the latter sent some employees for courses in chemistry at Durham University in the mid-nineteenth century. (43)

There was competition between the mills of the different mining interests to get the best men, and many smelters changed from one mill to another - something that rarely happened on the extractive side of the industry. The inventor of the Pattinson Process, Hugh Lee Pattinson, for example, worked for the Greenwich Hospital, the Beaumonts, and the London Lead Company during his career. The Greenwich Hospital correspondence at the

(41) Adm. 66-96. p. 65.

(42) Mulcaster M/S. (Lit. & Phil., Newcastle.)

(43) Raistrick, A. - Two centuries. 1938. p. 69.

time of the setting up of Langley smelt mill in and after 1768 shows the difficulty of getting and keeping together the skilled labour force necessary. Workmen had to be attracted from other concerns, and those already secured kept happy to prevent their seduction by attractive offers from elsewhere. The best period for piracy was also the danger period when the Hospital's own workmen might leave; this was the winter time when no fresh ore was coming from the washing floors. In December 1770, Mulcaster, the Langley Mill agent, was told to allow the men to work as hard as they wished, and make themselves as much money as possible as "their being allowed now and at all times to make good Wages will induce them to keep themselves disengaged til new Ore does come in". (44) A year later, in 1771, the Receivers wrote to Mulcaster "that the persons who were employed at Fallowfield in running their slags were at or about a finish there. At the same time it was intimated to us that it was likely they might be got to Langley Mill if we had occasion." This would not only increase the Mill's labour force, but there was also "a prospect of our learning something from them". (45) The attraction of skilled workmen from other concerns had to be done in an underhand manner. The practical necessity of mobility of labour was recognised but it was still regarded as immoral openly to attract workmen from other concerns by offers of better wages and conditions. In 1771 the Receivers wrote to Mulcaster that "The Work now most assuredly requires rather a Workman of

(44) Adm. 66-96. Dec. 9th, 1770. p. 117.

(45) Adm. 66-96. p. 179.

experience than a learner and therefore the necessity of the thing must occasion our getting such a Person; indeed we see upon all things of this kind that other People are not so scrupulous as we are and if we don't take such steps as to be enabled to have proper Workmen we shall none of us have any credit in the Undertaking. I would however have us to be careful, but not so scrupulous to others as to neglect ourselves and upon the whole I look upon it under the present circumstances to be justifiable to take such person as thinks himself at liberty to offer himself to us and consequently it must be understood, that you should contrive to have it known in the Country, that a man is wanted but this with as little bustle as possible." (46) Open approaches were not altogether unused - in 1780 the Blacketts were asked if they would be prepared to exchange men skilled in one branch of smelting for some skilled in another. (47) In the nineteenth century the competition for skilled labour between different concerns probably continued, but documentation is lacking. As already mentioned, however, some, and probably all, big mills had a system of industrial training in operation by this time.

The competition was for good smelters; for the bad, as already said, "hanging was too good". The Blackett/Beaumonts, who operated several mills, were constantly checking smelters' ability by smelting ore from the same vein at different mills. In 1809 smelters at Rookhope Mill "left off their work alleging

(46) Adm. 66-96. p. 312.

(47) Adm. 66-97.

as the reason that they could not make sufficient Wages to keep their families, from the Ore being so bad." The chief agent wrote "that I was not sorry the Smelters had left their work as I believed they had some very bad ones amongst them". Similar ore was sent to Dukesfield Mill to see whether "it was the quality of the ore or want of skill in the Rookhope Smelters that caused the deficiency of their produce and Wages". In this case it was found that although the Dukesfield smelters did obtain slightly better results "there certainly was just cause of complaint in the quality of the Ore". (48) The men were given, therefore, some increase in wages.

The principal method of retaining smelters and attracting others from other mills was by the wages paid. There were other benefits; in Chapter 7 it will be shown that the smelters occupied the best houses in the London Lead Company's village of Nenthead, and that it was found necessary to allow the Langley smelters land for smallholdings, with the refiners getting the best - but wages were the most important factor. One of the Greenwich Hospital Receivers wrote in 1771 that "I am not pleased to hear the Company intend raising their Smelters' Wages... However if they do advance I see we must follow, or they may perhaps get our best workmen from us." (49) Comparative details of smelters' wages are unfortunately not obtainable as no wage books survive, only a few rates for jobs not comparable with those of other mines at different times. The evidence that does exist

(48) B/B 53. Oct. 20th, 1809.

(49) Adm. 66-96. p. 164.

shows that although all the mining companies paid their smelters on the basis of the weight of lead, or number of pigs produced, there were many marginal differences that could have attracted or repelled workmen.

The London Lead Company and the Greenwich Hospital paid their smelters by the fadders (21cwt.) of lead they produced; the Blakett/Beaumonts paid by the ton. This difference alone makes comparisons difficult, but in addition there were many others. The most important factor was the varying qualities of most of the ores worked. The interests of the miners/washers and the smelters clashed here. The miners wanted their ore to weigh as much as possible at the end of the washing operations - it should be washed just sufficiently to satisfy the washing agent and no further. The smelters, on the other hand, wanted the ore as pure as possible; impurities affected the quality of the final product and slowed down all operations. Some grades of ore, and ore from certain veins, always tended to be more impure than others. In 1800 the Greenwich Hospital was giving its men an allowance varying with the quality of the ore; the London Lead Company did not do this. (50) Another factor was the increasing efficiency of smelting processes which enabled more lead to be smelted in a given time. Reductions in prices were made because of this. Recessions in the lead trade also caused temporary cuts to be made in the price per fother/ton, in the same way as cuts were made in bing prices for ore raised. Another factor again was the number of men working at a hearth

(50) Adm. 66-100. 21st Feb. 1800. p. 188.

(more will be said about this shortly). Referring to the men's complaints of low wages at the time of the 1809 strike at Rookhope, the agent wrote "I find they have earned upon an average this year about 10/9 each per Week, but being now over many Men to each Hearth is part of the cause, the Wages divided among the proper number would be about 14/6 for each Man. There is now the proper complement of 4 men to each Hearth. The smelters' earnings at Dukesfield have been about 9/8 each per Week, but there they have also over many men... At Allen Mill the Smelters having constant work, and not over many Men earn about 14/6 per Week." (51)

In the Greenwich Hospital correspondence there are many references to the rates and wages of smelters that give a (very incomplete) account of changes and disputes from 1768 to 1830, at Langley Mill. In 1768, at the time of the establishment of the mill, the smelters at the ore hearths were to receive "about 6/-" per fodder, giving them "about 9/- per week wages". (52) In 1772 the standard rate was still 6/-, but, after some complaints from the men that the smelters at Nenthead were better paid, an allowance was given for "extra Labour" on poor quality ores. (53) The men were apparently not satisfied with this arrangement alone, and the mill agent was urged to impress on them that "tho' the Smelting Wages are the same now as twenty years ago, yet so much improvement has been made in the Smelting Art and Machinery for

(51) B/B 53. Oct. 20th, 1809.

(52) Adm. 66-96. April 20th, 1768.

(53) Adm. 66-96. p. 208.

that purpose that the dispatch of business will in some measure countervail the increased price of Provisions". (54) The smelters, however, remained unconvinced. In September 1763 "we had a formal application from the Smelters in a body for an increase of Wages... We found an increase necessary in order that we might keep our best Workmen who tho' they discreetly made no declaration of their intensions to leave us yet we could readily perceive a refusal would be productive of that effect." The men were given an increase of 8d. per fodder. (55) In 1779 the price was raised to 7/- per fodder, but in the next year it went down to 6/8d. again. (56) In 1802 the price paid was apparently less than the 7/6d. paid at Nenthead, and the Langley rate was increased accordingly. (57) In 1830 the price was still 7/6d. per fodder for ore hearth smelting, and every other job in the mill had a rate laid down for it. (58)

For maximum efficiency the furnaces had to be kept going for long periods at a time, with periodic stops to allow them to cool down. Smelters, therefore, were expected to work long and erratic hours. At the ore hearth the normal duration of a shift was from 12 to 15 hours. "At mills where the smelting shift is 12 hours, the hearths usually go on 12 hours, and are suspended 5... The two men, who manage the hearth, each work four shifts

(54) Adm. 66-96. May 29th, 1773. p. 255.

(55) Adm. 66-96. p. 305.

(56) Adm. 66-97. June 22nd, 1779, June 9th, 1780.

(57) Adm. 66-100. Aug. 21st, 1802. p. 187.

(58) Adm. 66-103. Feb. 23rd, 1830.

per week; terminating their week's work at three o'clock on Wednesday afternoon. They are succeeded by two other men, who also work four 12 hours shifts; the last of which they finish at four o'clock on Saturday. In these eight shifts from 36 to 40 bings of ore are smelted, which, when of good quality, produce from 9 to 10 fadders of lead. At other mills where the shift is from fourteen to fifteen hours, the furnace is kindled at four o'clock in the morning, and worked until six or seven in the evening each day, six days in the week... Two men at one hearth, in the early part of each week, work three such shifts, producing about 4 fadders of lead - two other men work each three shifts in the latter part of the week... Almost at every smelting mill a different mode of working, in point of time and quantity, is pursued..." (59) This was in 1831, but references in the Greenwich Hospital papers show that mid-eighteenth century conditions were much the same. Each roasting furnace, in 1831, was generally worked by four men, in partnerships of two, "each pair of men work 8 eight-hours-shifts per week, and are relieved at the end of each shift by another couple, who work with them alternately eight hours on and eight hours off". (60) The slag hearths and refining furnaces were similarly worked in long shifts. The 1842 Report gives other permutations of hours (61) but they are similar in that long shifts were worked by each man,

(59) Pattinson, H.L. - Account of the method of smelting lead ore. pp. 161/162.

(60) Pattinson, H.L. - Account of the method of smelting lead ore. pp. 154/155.

(61) 1842 Report (Mitchell) p. 735.

followed by a long break before the next set of shifts.

The 1842 Commission found that, generally speaking, the atmosphere of the smelt mills, although unpleasant, was less lethal than that of the mines. Proper attention was paid to procuring an adequate draught to carry fume away from the workers up very long horizontal chimneys that ran up the fell sides, with which most mills were equipped by 1842. These chimneys, introduced at the beginning of the century, were primarily intended to recover vapourised lead which was deposited on their walls as the fume cooled, but they had the indirect effect of improving ventilation conditions for the smelters. (62)

In the eighteenth and early nineteenth centuries smelting was, like washing, not a full-time occupation. The cessation of washing during the winter months, and the impassability of the carrier ways meant that the supply of ore normally dried up before spring brought new supplies. Fuel, also, was frequently scarce in the winter, and severe frosts prevented the water wheels that drove the bellows from functioning. At Langley Mill finding the men occupation during these periods of idleness was one of the mill agent's chief worries. In 1769 a local farmer was asked to employ the mill's refiners while the smelters were "busy with the Unrefinable Ore". (63) In 1797 the men were set to work to cut a drainage channel to the mill reservoir, (64) while in 1800 the agent was directed to "take great pains to

(62) 1842 Report (Mitchell.) p. 736.

(63) Adm. 66-96. p. 55.

(64) Adm. 66-99. Aug. 28th, 1797. p. 332.

make all our Workmen good Hedgers and peacable ones". (65)

A vital part of the labour force engaged in lead mining was concerned with transport - of ore from the mines to the mills, and of lead from the mills to the market, which for most of the Northern Pennines was Newcastle, although some Teesdale lead went to Stockton. The mountainous terrain of the area, the bad winter weather, and the paucity of roads have already been dwelt upon in the first chapter. The business of transporting many tons of lead was a serious and difficult one for the mining concerns. In the eighteenth century at least the Blacketts spent far more on transport than on smelting lead. (66) At the end of the eighteenth century, and in the first fifty years of the nineteenth, there was a revolution in transport methods and organisation; the transport history of the lead mining area from 1760 to 1860 would serve as a microcosm of land transport history generally in England at that period. In 1760 the roads were so abominable that packhorses or "galloways" were the normal means of transport. Gradually, as roads were improved and new ones built, horse drawn carts replaced the greater number of the galloways. Then, after some abortive canal schemes, the Newcastle and Carlisle railway was built in the eighteen thirties, followed, some years afterwards, by branch lines up most of the dales. Galloways remained in use as local transport until the end of lead mining but by 1870 the Beaumonts were using traction engines as well.

(65) Adm. 66-100. p. 89.

(66) Hughes, M. - Land, lead and coal. 1963. p. 72.

There is ^{described} ~~concerned~~ here only the pre-industrial forms of transport when great numbers of individual carriers were employed. (67) In the eighteenth century Blackett/Beaumont and Greenwich Hospital letter books there is much detail about the carriers - far more than about any other branch of the lead mining labour force. The growth of efficiency in the transport of ore and lead is well illustrated by the fact that in the eighteenth century there is letter after letter in both series of records concerning problems relating to the carriage; by the eighteen thirties, when both series end, there is very little indeed.

The general administration of the ore and lead carriage with the routes followed has already been described by Hughes (68) and Monkhouse. (69) It is desired here only to dwell on a few points not previously emphasized, together with more detailed evidence concerning the relations between the carriers and their masters.

Until the last years of the eighteenth century the ore and lead was carried out of the lead mining area purely by horses. In 1768 - "The Ore is carried from the Mines to the Mills entirely on Horseback; Galloways being employed carrying two Pokes of Ore, each weighing 1 cwt., that is $\frac{1}{2}$ of a Bing,

-
- (67) For an account of overall transport development see Raistrick, A. & Jennings, B. - History of lead mining. 1965. pp. 267/276.
- (68) Hughes, M. - Land, lead and coal. 1963. pp. 69-73.
- (69) Monkhouse, F.J. - The transport of lead... from Langley Castle to Newcastle, 1768-1779. (in Proc. Soc. Antiq. Newcastle, 4th series, IX, 1939/41. pp. 176-186.)

consequently a Bing is carried by 4 Galloways." (70) By 1805 the ore was carried to Langley "on galloways... or in small one-horse carts, containing a bing or 8cwt.each": (71) Bailey and Culley, writing on the agriculture of Northumberland and Cumberland about 1800, noted the use of these single horse carts for carrying lead, and recommended their adoption for general agricultural use throughout the area. (72) The use of carts increased as new roads were built, but some galloways were still employed right up to 1880.

The administration of the ore carriage caused many problems in the eighteenth century. The weather prevented much being done during the winter - the pack horse tracks were impassable in snow, heavy frost, or even heavy rain, which channelled down the tracks changing them into quagmires. In the summer, when the roads were at their best, the carriers subordinated the transport of ore and lead to the needs of the hay harvest. (73) They took their own time in carrying the lead. A Blackett letter of 1770 demanded that "This practice of the carriers of getting Lead into their hands and then taking their own time of bringing it must be broke through if possible." (74) In the

(70) G.H. Adm. 66-96. April 20th, 1768.

(71) Greenwich Hospital Report. 1805. pp. 49/50.

(72) Bailey, J. & Culley, G. - Agriculture of Northumberland, etc. 1813. p. 273.

(73) B/B B.M. Letter Book, May 28th, 1731 - A letter saying that as much carriage as possible should be completed before the hay harvest.

(74) B/B 48. July 8th, 1770.

same year, Mulcaster, the Langley Mill agent, made a special trip to Hexham to "make a particular enquiry whether there is any Lead left between Hexham and Newcastle". (75) As a result of this inspection the Hospital introduced a ticket system: the carriers who picked up the lead from the Mill to carry it to Hexham had to get it receipted by the carriers who took over from Hexham to Newcastle, or by the Newcastle agent if the lead were carried all the way. (76) By enforcing this system the Hospital knew which carrier was responsible for a given quantity of lead, even if it changed hands en route from Langley to Newcastle. A similar system was still in use both by the Greenwich Hospital and the Beaumonts in the eighteen thirties. (77) Another problem was that the lead pigs were indistinguishable one from another, and frequently had to be stored, or left by the roadside en route. Cobbett noted between Newcastle and Hexham in 1832 "loads of these pigs lying by the road-side, as you see parcels of timber lying in Kent and Sussex, and other timber countries. No fear of their being stolen: their weight is their security". (78) Singularly few, in fact, were stolen. Thefts are very rarely mentioned in the records (and a great fuss was made when they did occur). On such rare occasions the theft was normally by one set of carriers stealing from another" for the purpose of making up

(75) Adm. 66-96. p. 72.

(76) Adm. 66-96. p. 75.

(77) B/B 52. Sept. 5th, 1833.

(78) Cobbett, W. - Tour in Scotland. 1833. p. 62.

some deficiencies of the Lead they took from the Mill". (79)

One difficulty in the discussion of the carriers in relation to other parts of the lead mining labour force is that most of them lived outside the mining area. It will be shown in Chapter 7 that although most mining families had smallholdings, poor soil and bad weather conditions would not allow many horses or ponies to be wintered in the area. The bulk of the carriers dealing with the lead from Alston Moor, Allendale, and Weardale came from the farming lands near to, but off, the Pennines. Most of the Greenwich Hospital's carriers came from around Hexham and Corbridge; Hexham was the meeting place when the Hospital called a meeting of all its carriers in 1769, and it was there that most pays took place. In 1822 a Greenwich Hospital report noted that farms in the Hospital's Alston manor (off Alston Moor itself) were held at above their value "but being generally let to Persons who obtain part of their Livelihood by the carriage of Ore from the Mines to the Smelting Mills, they are thus enabled to maintain themselves". (80) The Hospital provided lodgings for those carriers in need of them, at Langley Mill. (81) The inhabitants of the lead mining area did not always co-operate with the carriers coming in from outside. In 1791 the Blackett land agent in Hexham found it necessary to warn the inhabitants of Allendale in a printed broadside that a new pound had been built near the Town "for the Convenience of the

(79) B/B 50. March 25th, 1797.

(80) Greenwich Hospital Report. 1822. p. 2.

(81) Adm. 66-103. Jan. 3rd, 1826.

Inhabitants of Allendale but not for Oppressing... ore and Lead Carriers" - ponies belonging to the carriers had apparently been impounded, and only released on payment of a fine. If the practice did not cease "the said Common Pound shall be pulled down". (82)

Most of the carriers, therefore, came from outside the lead mining area. They were mainly small farmers, frequently tenants of the land owning lead mining concerns, carrying lead as a supplementary source of income, although the evidence suggests that by the end of the eighteenth century an increasing number were virtually full time carriers, using their land only to graze their horses. There was a definite change of policy here on the part of the mining concerns. In 1771 the Blackett chief agent wrote that "care must be taken that by giving any Sett of Men an Exclusive Right to carry the Lead we do not put it in their power to carry only when it suits their own convenience without regarding the want there may be of the Lead at Markett". (83) Part time labour, with frequent changes of route, was preferred under the (mistaken) belief that this would avoid combinations among the carriers to force up the price of carriage. By 1795 on several of the routes from the different mills to Newcastle the carriage was undertaken by one sub contractor, responsible for the organisation of all the carriers on that route. At that time the Rookhope contractor was proving unsatisfactorily slow, and he was threatened that if he did not

(82) Hexham Estate Papers, Newcastle University Library.

(83) B/B 48. Jan. 22nd, 1771.

speed up transport "the Carriage from Rookhope must be made an open Carriage and advertised as such". (84) The two systems went on side by side until most of the work was taken over by the railways.

Carriers were obtained by the Blackett/Beaumonts and the Greenwich Hospital in two ways; by offering a given sum of money for taking ore, or pigs of lead from place to place, or, when this did not attract sufficient volunteers, by forcing tenant farmers to do so in lieu of rent.

The theoretical basis of the prices offered to the carriers for carrying lead a given distance was what the employer considered to be a fair sum for the distance involved, allowing for the price of corn for the animals. In 1808, for example, the Greenwich Hospital gave 5d. per pig for lead carried from Langley to Hexham: 10d. for lead from Hexham to Throckley; and 5d. from Throckley to Newcastle - or 20d. for the journey from Langley to Newcastle. These prices were an advance on those previously offered "in consequence of the high price of oats". (85) Earlier, in 1760, a Blackett agent wrote of a carrier that "It is unreasonable in him to insist on the same price now, that was paid when Corn was double the price". (86) Another consideration was the existence of "back carriage"; the Greenwich Hospital paid its carriers more for carrying ore from Alston Moor to Langley Mill in 1805 than the London Lead Company paid its carriers over

(84) B/B 50. Aug. 9th, 1795.

(85) Adm. 66-101. Oct. 29th, 1808.

(86) B/B 47. April 11th, 1760.

an equivalent distance as "their [i.e. the Company's] carriers derive considerable advantage in back carriage". (87)

These factors were those which the companies considered legitimate bases for fixing the price of carriage. The factors that really counted - the numbers of carriers available, the demand by different mining companies for their labour at any one time, and the urgency or otherwise of getting lead to market - were admitted to exist but it was considered very unfair practice if the carriers used them as arguments for higher payments. As a Blackett agent wrote in 1764, at a time of great competition for carriers' services, it was to be hoped that "they will not show themselves of a restless and imposing disposition". (88) He was very frequently disappointed!

The competition between the different concerns is frequently mentioned in the various records. A price rise by one forced others to raise their prices. In 1764 "the Quakers Co. have this week agreed to give 3/9 for their ten ps. so we cannot expect to get Sir Wr's 12 ps. carried for less than 4/-". (89) In 1771, however, the Blackett agent doubted whether prices should be raised as "the other proprietors will do the same and if they find we one Year get their Men from them they will try another Year to get the Advantage of us and so we shall have a fighting trade". (90) By the end of the century unofficial

(87) Greenwich Hospital Report. 1805. pp. 49/50.

(88) B/B 48. May 11th, 1764.

(89) B/B 48. May 11th, 1764.

(90) B/B 48. March 5th, 1771.

agreements obviously existed between the different concerns not to fight one another although, these were broken at times when there was desperate need to get lead to market.

In this situation, with the different concerns in rivalry with one another, and the carriers working for the highest bidder, the unfortunate farmers whose landlords had mining interests were used as a captive labour force to keep carriage prices down. In 1762 Blackett tenant farmers near Dukesfield were urged "to pay their rents by the Carriage". (91) Two years later the Blackett chief agent wrote to Sir Walter that he should not sell lands he owned around Winlaton as "Combinations among the Carriagemen for price" were often put an end to by "your Tenants... moving first with the Lead". (92) In 1796 there was a curious and revealing alteration in the terms of letting two Beaumont farms at Parkhead. These two farms had been let on a 21 year lease to a Mr. Simpson who had sublet them "obliging the Tenants to lead Coals from his Collieries... The farmers,... obliged to lead Coals the whole year, commonly neglect their farms... and they are in general bad Husbandmen." The 21 year lease having expired "I would recommend that the two Farms be advertized... and let to good tenants subject to... conditions... particularly that of not leading coals for any person and being obliged to lead Lead." (93)

However, there were not sufficient tenants for the big

(91) B/B 47. July 26th, 1762.

(92) B/B 48. Feb. 15th, 1764.

(93) B/B 50. March 22nd, 1796.

mining concerns to rely solely on their labour. Additional labour had to be obtained by bargaining within a free market. In the mid-eighteenth century, particularly in the decade following the establishment of Langley Mill in 1759, the Blackett/Beaumont and Greenwich Hospital records are full of references to the strife between themselves and the carriers. The carriers would combine, and refuse to carry lead unless higher prices were offered; the employers changed carriage routes, forced their tenants to carry lead, and attempted to exclude troublesome groups and individuals from the carriage to keep prices low. They would only raise prices in desperation. The arts of industrial bargaining were employed by both sides. "Do not be too Urgent with them," wrote the Blackett chief agent in 1762, when it was necessary to get lead to market quickly "lest you occasion a demand for more price". (94) But market conditions normally determined the victor of each contest; in times of high demand the mining companies were prepared to pay almost anything to get their lead to Newcastle; at other times the obdurate carriers could be reduced to beggary by giving them no employment.

To quote a few individual examples of these conflicts. - In 1757 the Blacketts urgently needed to get lead to market. The chief agent wrote - "I am told the Fairlams insist on an advance price, and they only; if others will lead it at the old price, imploy them, and let the Fairlams mind their Farm. But if nobody will lead it without an advance we must be forced to comply, for

(94) B/B 47. Sept. 10th, 1762.

the lead must be got to Markett with all expedition." (95) In 1762 the carriage route from Rookhope was changed to "teach Mr. Parker and his Confederates that they have not such a property in Rookhope Lead as they imagine and that the higher they raise the price of the Carriage the less they will have of it to carry." (96) In 1764, however, the Blackett concern was forced to submit to the demands of the Rookhope carriers - "For the great quantity that is there makes it necessary for Sir Walter to submit at this time." (97) In 1770 demand for lead was light, and the Greenwich Hospital Receivers could afford to write to their agent at Langley that "We are not now in any hurry at all and if another Pig does not come from the Mill this Season we are resolved not to alter the Terms." (98)

In the late seventeen seventies the amount of comment on carriage problems in the various sources of evidence starts to fall off. When they were mentioned, the problems were similar to those in the earlier period, but it would appear that the mining concerns were gradually increasing their control. Organisation had improved, and a "fighting trade" between the different companies was avoided. In the Greenwich Hospital correspondence there were frequent instructions that such and such a person should not be employed in the carriage again. (99)

(95) B/B 46. April 13th, 1757.

(96) B/B 47. July 26th, 1762.

(97) B/B 48. June 29th, 1764.

(98) Adm. 66-96. p. 78.

(99) e.g. Adm. 66-97. March 12th, 1792.

For those smallholders who depended on the carriage rather than farming for a livelihood such a prohibition had a devastating effect. In the correspondence of the clerk of the Hexham manorial court there are two letters, written by an unemployed carrier and his wife who had been dismissed for signing a petition in September and August of 1796, appealing to Mrs. Beaumont for reinstatement. If this were not done "it does entirely reduce us to great hardship and will be a means of bringing us into oppressing Want for the situation of our Countrey Depends upon Employment of some kind or other that arising from your lead mines to earn Wages by to procure for ourselves and our family's amentainance". (100) On relatively few occasions, compared with the mid eighteenth century, crises occurred. In 1809, for example, after a period of depressed lead prices when it was scarcely worth transporting lead from stores at the smelting mills to similar stores in Newcastle - the smaller companies simply had insufficient means to be able to afford to do so - prices suddenly went up. The Beaumont agent wrote that in spite of his increasing the carriage rates insufficient carriers could be obtained "as the Alston Moor Mine proprietors have more extensively advanced theirs and in all probability would continue to do so if Col. Beaumont's were again to be advanced, as many of these Miners are under the necessity of having their Lead Ore brought to market to procure money to carry on their Mines and therefore will give any price to secure the Carriers". (101)

(100) Deposited in Newcastle University Library.

(101) B/B 53. June 30th, 1809.

But the power of the carriers to oppose and disrupt the big mining companies was disappearing fast by the early nineteenth century, and had disappeared altogether by 1830. The new roads allowed the carriage to continue for most of the year; the carts now employed were quicker and required fewer men and horses than the strings of galloways. The coming of the railways greatly reduced the distances that had to be covered by non-mechanised transport.

In the larger lead mining concerns the complex operations and the numbers of men employed required organisation and supervision. Those responsible for doing this were commonly known as "agents"; very junior grades were simply "clerks" or, in the nineteenth century, "overmen"; also in the nineteenth century, the chief agents of the London Lead Company and the Beaumont concern were known as "superintendents".

The surviving evidence about the duties and remuneration of agents is limited, as usual, to the largest concerns, the Blakett/Beaumonts, the London Lead Company, and a very little about the Greenwich Hospital. Enough survives about them to show a clear difference between the eighteenth century and nineteenth century conditions. In the earlier period the number of agents was relatively low, their duties vague, their wages poor and subsidised by forms of truck; in the latter their numbers relative to the number of men increased with the appointment of more low grade overmen, their duties were more clearly defined, their wages improved, and truck vanished. In the London Lead Company the change came after Robert Stagg became superintendent in 1816;

in the Beaumont mines the reform was slower, starting at the beginning of the century and not being completed until after Thomas Sopwith's appointment in 1845.

In the Blakett/Beaumont mines in the eighteenth century the structure of administration was as follows:- In Newcastle was the chief agent, assisted by clerks, responsible for the general control of all mining, smelting, and transport operations, and the sale of lead. Each of the three major districts - Weardale, East and West Allendale - was under the control of an agent as was each of the smelting and refining mills. Each mine agent had a number of assistant agents, responsible for bookkeeping, general inspection of the mines, and washing operations. But in 1804 there were only six such assistants in the enormous Weardale district, and two and a half (the washing agent was shared) each at Allenheads and Coalcleugh. (102) Each district agent was naturally virtually supreme within his district, as the chief agent resided in Newcastle and only occasionally visited the mines. The implications of this paucity of local agents have already been mentioned in the chapter on the bargain system; detailed planning and control over all operations was virtually impossible.

When Thomas Sopwith took over the chief agency in 1845 a marked change was brought about. He was a resident chief agent, with his office not in Newcastle but at Allenheads. He commented

(102) See Appendix. "Arrangement recommended to Colonel and Mrs. Beaumont for the future Agency and Management of the Lead Mines." [1804 ?] This interesting document contains a summary of the numbers, duties, wages, and privileges of the Beaumont agents at the time.

on the situation as he found it, in his diary (unfortunately very discreetly). The structure of the administration led to "ruin and decay as regards material objects and to disunion and ill-feeling in the minds of all parties concerned... Three distinct and rival dynasties had grown up in the valley of the Wear and the two dales... of Allendale." (103) Sopwith ended the supremacy of the district agents - his diaries show that his rule was absolute, virtually every decision being referred to him. The vast improvement in communications that had taken place in the early nineteenth century made this possible. He also adopted the London Lead Company practice of employing overmen to supervise every aspect of underground work. In 1864 it was reckoned that every working was visited at least twice a week.

In the eighteenth century the London Lead Company had never been so loosely organised as the Blakett/Beaumont concern. Executive control over the whole of its operations in the Northern Pennines was in the hands of one agent whose headquarters were first at Nenthead, and then at Middleton. The district agents were responsible to him. The most important administrative reform introduced by Robert Stagg was the introduction of overmen to give local control over all operations. In a report of about 1820 it was stated that "the most important improvement made in the management of the concern was the introduction of Mine Overmen, taken from the ranks. Prior thereto, the mine workings were visited by an Agent very rarely, leaving the miners to play tricks, and take advantage of all kinds; but the daily

and hourly inspection of overmen puts a final close to all such, with an improved economy which scarcely admits of being fully estimated." (104)

Promotion to an Agency was a mixture of progress by corruption and progress by merit. A worthy man was far more likely to receive promotion in the nineteenth century (if only because of the greater number of openings) than in the eighteenth, although it was not impossible for him to earn promotion even in the earlier period. In the two largest companies the agencies - except the chief agency - were all limited to local men. On several occasions in the Blakett/Beaumont correspondence there is discussion about the appointment of a new agent or sub-agent. Throughout the eighteenth and nineteenth centuries it was felt that "It is not at all desirable to introduce Strangers into this Establishment." (105) When it was suggested by the owner in 1820 that a Cornishman might be employed as an agent the chief agent ponderously replied that he was convinced that "your Mine Agents are in ability well qualified for their situation, and highly respectable for integrity of Character; should however you and Mrs. Beaumont conclude that a person from the Cornish mines strongly recommended, altho' the produce of lead there is comparatively small, is more competent to conduct with greater advantage Mines in Northumberland and Durham in all respects different and of which he can have no practical (the most essential) knowledge, it will then be a subject for your

(104) Quoted by Raistrick, A. - Two centuries. 1938. pp. 72/73.

(105) B/B 51. April 7th, 1809.

determination, and how far the change, from a system hitherto successful, may in its application affect important interests at stake, is a consideration which deserves and undoubtedly will engage your most serious attention."(106) The Cornishman was not appointed!

All the mining concerns preferred to promote from within their own ranks. Virtually every vacant agency mentioned in the Blakett/Beaumont correspondence was eventually filled by promotion of someone else in the concern. The same appears to be true of the London Lead Company. The two main exceptions to this were the chief agencies and the mill agencies. The Blakett/Beaumonts normally preferred to bring in someone with mining or financial experience from outside to be chief agent. Exceptions to this were William Crawhall, who preceded Thomas Sopwith, and who had previously been the Allenheads agent, and J.C. Cain who succeeded him. The London Lead Company chief agent was generally promoted from the ranks of the lesser agents. The smelting mills required skilled men as agents. Such men were scarce, and the readiness of the different companies to pirate skilled smelters from other concerns has already been commented on. The Derwent Mining Company introduced Cornish miners, mining practices and presumably agents, around the middle of the nineteenth century. Neither of the big companies followed its example.

Meritorious conduct, and suitable experience, were always the reasons urged when an individual was promoted, but the numbers of members of the same family working as agents for one

(106) B/B 51. Nov. 21st, 1820.

company show that nepotism played an important part. The Crawhall family, for example, dominated the Beaumont mines from about 1810 to 1845. The brothers William and George Crawhall were agents of East Allendale and Weardale respectively. Their father had also been an agent, at Allenheads. The Stagg family similarly dominated the London Lead Company from the end of the eighteenth century to 1843. (107) Members of the Mulcaster family appear to have held nearly every smelting agency in the Northern Pennines! When Peter Mulcaster was appointed as the first agent of Langley Mill in 1768, it was noted that two of his brothers held similar positions under Sir Walter Blackett and the London Lead Company. (108) The Langley agency was held in succession by different members of the Mulcaster family until after 1830.

By 1864 promotion by merit rather than by nepotism was definitely established in both the largest mining concerns. Robert Bainbridge, the London Lead Company chief agent told the 1864 Commission how overmen and agents were appointed - "I apply to all the local agents to give me a list from time to time... of all the young men in the concern whom they conceive likely to make good inspectors. When I have obtained that list from them I keep my eye upon each of these parties individually, and form my own opinion of their character; and our test, of course, is intelligence, integrity, and independence of character." (109)

(107) See Raistrick, A. - Two centuries. 1938. pp. 141-147.

(108) G.H. Adm. 66-96. April 20th, 1768. p. 4.

(109) 1864 Report (Vol. 2.) p. 380.

196.

William Curry, the Beaumont agent at Allenheads, was asked by the Commission for a sketch of his career. He had begun work about 1820, aged 11 or 12, blowing air machines. Later he became "a hireling" of the bargain workers before he was admitted into bargains as an equal partner. He was 10 years a miner, and had been 27 years an agent of one rank or another. (110) In 1860 Sopwith jotted down in his diary a history of the career of the oldest Beaumont agent then in service -- Mr. Steel aged 77. He had spent 61 years of his life (i.e. beginning in 1799) working in smelt mills. He had worked as an ordinary smelter at Dukesfield Mill for 19 years: in Rookhope Mill for 17, first as a workman, then as a clerk, and finally 7 years as sub-agent: he had then gone to Allen Mill as agent, (succeeding H.L. Pattinson, the inventor of Pattinson's Process) and had been there 25 years. (111) All the indications are that these promotions from the ranks of the actual working miners and smelters were the rule rather than the exception.

The salaries of the agents, particularly in the eighteenth century, were not so very much higher than a reasonably successful miner would expect to make in the course of a year but the salaries were reliable and constant, unlike the earnings of the miner, and, as will be shown shortly, there were additional forms of remuneration, outside the salary structure. The few and scattered figures of salaries available do not allow a very complete picture to be given.

(110) 1864 Report (Vol. 2.) p. 367.

(111) Sopwith, T. - Diary. April 30th, 1860.

In 1760 a Blakett mill clerk, i.e., deputy to the mill agent, was paid £20. a year, together with a "little Farm and House which belongs to the Office". (112) In 1768 the Greenwich Hospital appointed Peter Mulcaster as agent at the new smelting mill at Langley; he was to receive the same salary and conditions as the London Lead Company gave its Nenthead mill agent - "£30 per year, an House to live in, and Coals for Fire; they generally have two or three acres of land at moderate price to keep a cow". (113) The new second agent at Allenheads mine in 1777 was paid £30: his predecessor had received £40. and both of them were charged £11.15.0. for the small farm they rented. (114) The "Arrangements... for the future Agency" of the Beaumont mines, quoted as Appendix 5, gives the salaries of all the agents employed at the beginning of the nineteenth century. The mine agents of Weardale and Allenheads received £100. a year. The agent in charge of the smaller Coalcleugh area was paid only £60. The Assistant agents were all paid either £50. or £60. per year. Unfortunately, figures for the nineteenth century are even more difficult to find than for the eighteenth. (The Beaumont accounts record irregular payments to agents, making it impossible for the figures to be expressed as a yearly salary.) The scattered figures available, however, do show that the London Lead Company agents were considerably better paid than those working for the Beaumonts. From 1817 onwards the London Lead

(112) B/B 47. Jan. 9th, 1760.

(113) Adm. 66-96.

(114) B/B 49. Feb. 9th, 1771.

Company chief agent was paid £1,000. per year; (115) in 1865 Thomas Sopwith's salary for his equivalent post in the Beaumont Concern was only £300. which had become £600. per year by 1870. In 1857 the London Lead Company overmen were paid on a progressive salary scale with a maximum of £80. per year; in 1865 this maximum had been increased to £100. per year. (116) Overmen in the Beaumont employ in 1857 were paid only about £50. An additional advantage for the London Lead Company employees was that the Company frequently paid them gratuities when lead was selling well. Raistrick gives a number of examples of this.(117)

However, the remuneration of the agents of different companies cannot be compared without taking into account the benefits they received other than payment of salary. The most important has already been mentioned - provision of a house and farm rent free or at a reduced rent. In the Beaumont mines, at least, this practice went on into the nineteenth century. Thomas Sopwith had a mansion built for him at Allenheads at the expense of the owner as a condition of his accepting the post of chief agent. Most of the other perquisites were forms of truck, which died out as the nineteenth century progressed, more quickly within the London Lead Company than within the Beaumont mine. They have nearly all been discussed already in Chapter 3.

To repeat the nature of these perquisites briefly. Most important was the privilege of owning horses and hiring them to

(115) Raistrick, A. - Two centuries. 1938. p. 144.

(116) L.L.C. 31. Sept 5th, 1865.

(117) Raistrick, A. - Two centuries. 1938. p. 54.

work the whimses and drag stuff out along the horse levels. In 1793 the London Lead Company chief agent asked for an increase in salary because of his losses now he was no longer allowed to keep horses for this work. In the Blackett/Beaumont mines agents were still allowed this privilege until sometime between 1807 and 1832. An earlier privilege that was stamped out about the middle of the eighteenth century by Sir Walter Blackett was that agents should take bargains in their own name and hire men to work them. Outright corruption presumably occasionally did occur. The Coalcleugh agent was dismissed for this in 1813. Both the London Lead Company and the Blackett/Beaumonts did not like their agents to be concerned in retail trade with their men, particularly in the sale of alcohol. This, however, did occasionally occur in the eighteenth century. The supply of mining materials was often undertaken by "parties connected with the mines", and this practice, although frowned upon, was not finally put an end to in the Blackett/Beaumont mines until after Sopwith's coming in 1845.

CHAPTER 6.Strikes and Industrial Disturbances.

The incomplete nature of the evidence makes any history of labour relations in the lead industry particularly difficult to write. An individual concern may appear to be free from disputes for a considerable period while another frequently suffers strikes. The apparent freedom of the first from strikes may be due simply to gaps in the evidence. Another disturbing factor is that virtually all the evidence for most of the disputes is from the side of the masters. In this chapter is given a brief survey of known industrial disputes followed by more detailed analyses of three strikes within the Blakett/Beaumont concern for which there is more evidence, including some from the side of the striking workmen. Lastly there is some general comment on why trade unions did not grow up in the lead industry.

There is no record of any strike or combination among the workmen in the lead industry until the last decade of the eighteenth century. The only exception to this was among the carriers of lead ore, who frequently combined to get better prices from their various employers. (1) Workmen in other branches of the industry apparently did not usually strike, although they sometimes rioted or sabotaged their employers' property. Letter books of the Blakett concern survive for various crisis periods in the eighteenth century when bargain prices were greatly reduced, and the labour force cut down. In

(1) These disputes have already been described in Chapter 5.

1731 the chief agent was "almost pulled in pieces in Weardale" by men who were some two years late in receiving payment. In 1760 after a "Tumult" at Allenheads, the chief agent ordered the ring-leader to be discharged and others to be cautioned "for Sir Walter is determined to have good order and discipline kept up". (2) In 1775 the bellows at Langley Mill were "every one of them, cut... It is not unlikely but that the Mischief has been done by some of the Workmen who have been discharged from the Hospital's Service on account of their ill-behaviour or want of abilities." (3) There is no record of any strike as such, however, before 1796.

The apparent absence of strikes may be due to lack of evidence - only the Blakett/Beaumont records survive in any detail - but mining in the eighteenth century was organised very much on a basis of contract between free parties, rather than between employer and employed. Strikes were unlikely in such circumstances. In the seventeen nineties, a time of war, of rising prices, shortages, and much unrest throughout England, a strike did occur in Weardale, caused mainly by discontent that bargain prices and subsistence payments had not kept pace with the rapidly increasing cost of living. This strike, together with the events preceding and succeeding it, is described later in this chapter. From references in the Beaumont records there were apparently disturbances among the London Lead Company's miners about the same time. In 1795 a number of Lead Company

(2) B/B 46. Jan. 16th, 1760.

(3) Adm. 66/96. Feb. 24th, 1775.

men were discharged for taking part in a strike. (4) In 1797 there was a riot on Alston Moor when "about 200" miners met and "proposed to lay that part of the country under Contribution and had named the persons and the sums they insisted on having". They dispersed after being addressed by the Lead Company's agents. (5)

In the nineteenth century the evidence is much more complete, and there is reasonable assurance that all strikes in the major concerns are recorded in some way, even if no details are known. It will be convenient to take the two large companies separately.

The London Lead Company suffered only two actual strikes during the whole of its mining history in the nineteenth century. There was a minor incident in 1811, when at Boltshaw mine the agent was "obliged to turn away all the workmen this quarter end and send fresh hands from Nenthead. Such a parcel of designing Men I have seldom met with." (6) About 1816/17 when Robert Stagg first took over the chief agency of the mines there was apparently a strike, about which no details are known, against his retrenching methods to deal with the low lead prices of that year. (7) From then on, including the difficult years of the early eighteen thirties, there were no strikes until 1872 when a

(4) B/B 50. Dec. 17th, 1795.

(5) B/B 50. Jan. 29th, 1797.

(6) L.L.C. 16a. July 13th, 1811.

(7) Not mentioned by Dr. Raistrick but referred to by Stagg's successor, R.W. Bainbridge, in his evidence to the 1864 Commission. (Vol. 2.) p. 377.

"prolonged strike" occurred in Teesdale. This is not mentioned by Dr. Raistrick, but the Mining Journal for 1876 records that subsistence money was much increased as a result of it.

Unfortunately these few facts are all that is known about industrial disputes in the Lead Company; there is also a certain amount of evidence, discussed more fully in Chapter 11, illustrating the paternalism of the Company. It was to the strictness of the moral rules enforced on the miners that Robert Stagg in 1847 "attributed the total absence of rebellions and insubordinations of every kind; and that chartism-radicalism - and every other abomination have for so many years been strangers to the concern". (8) Trade unions would not have been welcome in such an environment.

The Beaumont concern was nearly as free from strikes as the London Lead Company. Only three major strikes occurred in the nineteenth century, each restricted to a particular district. In addition there was a short strike at Rookhope lead mill, in 1809, because the smelters considered their earnings too low. (Described in Chapter 5.) Their complaints were found to be largely justified because of inefficient organisation at that mill, and the strike was soon settled. In 1819 there was a more serious strike in Weardale, the climax of some years of discontent. This will be described fully shortly. Like the London Lead Company the Beaumont concern passed through the eighteen thirties without any industrial dispute. In 1849 there was a strike lasting for four months at Allenheads. Fortunately a great deal of evidence

(8) Quoted by Raistrick - Two centuries. 1938. p. 65.

has survived concerning this very interesting strike, the cause of which was the effort of Thomas Sopwith to transform the miners from free men, contracting to get ore at an agreed price, to employees bound to work regular hours. This is described later in the chapter. Finally, the last years of the Beaumont concern were bedevilled by a series of strikes in Weardale over the reduction of the labour force and the new bargain system introduced by the very unpopular chief agent, J.C. Cain. The details of the new bargain system have already been outlined (in Chapter 3). Unfortunately virtually nothing survives concerning the course of events at the time. The strikes failed, for the employers could only save money by work being suspended, so disastrously had the lead market collapsed. (9) The Beaumonts abandoned their Weardale leases in 1883.

Three strikes are reasonably well documented - in Weardale in 1795-6: also in Weardale in 1818, and at Allenheads in 1849. These will now be considered in some detail.

It is obvious from the tone of the letters in the Beaumont letter book covering the period 1794 to 1800 that the agents were very much aware of discontent among the workmen. The seventeen nineties were a period of country wide depression and rising food prices. The price of lead fell at the beginning of the decade, rose in the period 1795/97 and then fell again. In December 1794 "some papers... of a riotous and seditious tendency" were in circulation at Allenheads, and numbers of

(9) See Lee, John - Weardale memories and traditions, 1950, for interesting but unreliable stories of this strike.

miners petitioned for subsidised supplies of rye. (10) This was supplied, but discontent continued. In November 1795 some lead miners from Rookhope seized flour from unpopular millers, and the chief agent received a deputation from Weardale with a petition signed by about 500 workmen who had stopped work at their bargains. "They request that their Wages may be raised, and their Subsistence Money every two months doubled. I had a good deal of discourse with them, and they were very sensible that you had done more for the relief of your Workmen than any other Proprietor etc... We thought it advisable at this time to increase their subsistence Money one half, to continue the supply of Corn at a reduced price... and to increase bargain prices. The Miners left me well satisfied, and... they promised me that the whole of them would be at work tomorrow, or next day." (11) The miners returned to work, but during the next month, December, the chief agent noted the presence of "a few Refractory Men in Weardale who I have directed the Agent to discharge". (12) These "dissatisfied turbulent men" were urging the other miners to stand out for double subsistence money.

In 1796 corn prices continued very high, and the discontent in Weardale did not die down. In April the chief agent again threatened to discharge "mischevious people" who were causing "disturbance". (13) In spite of this threat there was another

(10) B/B 50. Dec. 27th, 1794. See also Chapter 8.

(11) B/B 50. Nov. 23rd, 1795.

(12) B/B 50. Dec. 17th, 1795.

(13) B/B 50. April 2nd, 1795.

stoppage in August. Unfortunately the details of this have not survived - there is a gap in the chief agent's letter book at this time. What has survived, however, is the very interesting petition signed by some 180 Weardale miners (Appendix Document 3) which throws light on many aspects of their relationship with their employers. The concrete demands of the miners were for higher bargain prices and a further increase in subsistence money, but the petition is permeated by dislike of the agents - both the local Weardale agents and the chief agent who, they believed, had "intercepted" their November petition to Colonel Beaumont. The agents were accused of making excessive profits from horse-hire, etc., and the final request in the petition was for "such treatment as Rational beings are entitled to, which they have so long, so often but in vain expected".

The details of the strike and the results of this petition, if any, are not recorded. Subsistence was increased, but not until the following year. In January 1797 the Chief Agent wrote a long letter to Colonel Beaumont defending the Weardale agents from charges in a "Memorial of Ralph Coulthard and John Kidd, two of the Workmen who from my own knowledge have been the leaders in every disturbance amongst the Workmen of Weardale Mines". He defended the agents, saying that the story of their getting vast sums from hiring horses to work in the mines was "a great falsity". One of the younger agents had been "a little sharp with some of the Men for which I found fault with him, and he promised me to be more circumspect and cautious for the future." The chief agent urged Colonel Beaumont not to listen

to "these idle complaints which must give encouragement to these discontented fellows and weaken the authority of your Agents." (14)

After the beginning of 1797 there was apparently no more trouble in Weardale for a while. The lead trade was more prosperous, and bargain prices and subsistence payments were improved. The disputes of the mid seventeen nineties were remembered, however, and the miners tended to petition Colonel Beaumont whenever any cause of complaint arose. Thus the chief agent relieved his feelings about them in a letter to the Weardale agent in December 1799, after they had complained to Colonel Beaumont about corn prices - "I have always found the Weardale miners... the most dissatisfied, unreasonable and Turbulent Set of Workmen in the Concern." (15)

To comment on these "incidents" in Weardale in the seventeen nineties - firstly, they took place against the troubled background of the times. It is noticeable, however, that the discontent, or at least the active discontent, was not throughout the whole Beaumont concern. There was no united front between the miners of Weardale and those of Allenheads and Coalcleugh. The agent's letters state that in Weardale there was a group of "dissatisfied Turbulent Men" who urged others into militant action. The 1796 petition is headed as from "the Commetee of Weardale Miners". The burden of the miners' complaints was that the price of food was rising far faster than earnings. The particular complaints against the Weardale agents suggest that

(14) B/B 50. Jan. 17th, 1797.

(15) B/B 50. Dec. 17th, 1799.

the area was tactlessly managed. Lastly it should be noticed that the miners were largely successful in their agitation - subsidised food was sent into the area, bargain prices were greatly raised, subsistence payments trebled in the decade, and the chief agent felt bound to tell his subordinates to treat the miners with greater tact and discretion.

The second strike described at length was also in Weardale, and also at a time when fear of revolution existed throughout Britain. As in the seventeen nineties it was during, or rather immediately after, a depression in the lead trade. In December 1816 the monthly subsistence paid to the Beaumont miners was cut from 30/- to 20/-, and bargain prices correspondingly reduced. The chief agent and Colonel Beaumont were petitioned, and a delegation from Weardale visited Colonel Beaumont at his Yorkshire home. The agent was against resuming subsidised supplies of rye to the area, but here he was apparently overruled by his master. Rye supplies were to be resumed, but no advance was to be made in payments. The petitioning miners threatened not to take their Bargains unless higher prices were offered - "I told them that under the present depressed state of the Lead Trade they could not be doing their employers a greater benefit than desisting to raise Ore for three Months to come and the only regret that would arise by their so doing would be the distress they themselves would feel, and the impoverishment which it would produce to the Country. This observation appeared to surprise and stagger them." (16) In the same letter the chief

(16) B/B 51. Dec. 30th, 1816.

agent complained that the London Lead Company "by the introduction of new measures into their concerns have caused all this discontent among the Men". (This was the period of Robert Stagg's reforms of the bargain system and methods of payment, described in Chapters 3 and 4 of this thesis.)

The miners then, gained nothing from their threat to strike, save resumed supplies of rye. There was much truth in the observation of the chief agent that the men were in an impossible bargaining position at the very nadir of the depression, as threats to strike would then be no worry to their employers.

There was no more trouble until the end of 1818, by which time the state of the lead trade had greatly improved. The 30/- subsistence allowance had already been reintroduced when in September 1818 there was a renewed series of petitions and delegations from the Weardale miners demanding an increase to 40/- per month, as paid by the London Lead Company. The petition of September the 24th to the chief agent is given in full as Appendix Document 4. 10/- per bing extra for raising ore was requested, and 40/- per month subsistence, on the grounds that "Lead has considerably advanced" but the rise in its value had not been passed on to the miners. The chief agent told the delegation who brought the petition that "the present poverty of the Mines would not allow... the relief they sought for". The miners "expressed their determination not to Work unless their demand is complied with." (17)

A second petition from the Weardale miners, enclosed with a

(17) B/B 51. Sept. 25th, 1818.

210.

letter from the chief agent to Mrs. Beaumont at the beginning of October, reiterated the strikers petition - 40/- a month and an increase in bargain prices were demanded. Unless this was done "it will be impossible for the greatest number of us to get the necessaries of life, as our Credit is utterly gone". In his accompanying letter the chief agent told Mrs. Beaumont that he had just been to Weardale "at the solicitation of Geo. Crawhall [the resident agent] who became alarmed by the menacing tumultuous proceedings, of the largest assembly of Miners ever before seen there". He met "six of the Men" delegated by the others. They demanded "10/- per Bing advance and 40/- per month Subsistence Money". The agent offered them 5/- per bing advance. This was rejected by the strikers and the chief agent left Weardale, pausing only to offer "every protection" to men who chose to come to work, and to sign a letter informing local magistrates of the strike. (18)

The strike was now of so formidable a proportion that news of it found its way into a confidential report, dated October 6th, from the Mayor of Newcastle to the Home Secretary. The Mayor recorded that "the men have formed themselves into a large body controlled by what they call a committee, and after having published some inflammatory placards exciting to tumult, have threatened not only to desert their engagements and their work, but to do damage to the mines and to the works if their demands be not complied with". (19)

(18) B/B 51. Oct. 2nd, 1818.

(19) Printed in Aspinall, *A - Early English trade unions* [1949]. p.305.

However the Beaumont chief agent, writing to the Weardale agent on October 9th, thought that although the men were still holding out for their full demands he was of "the opinion that the Men will return to their Work soon and that an apparent indifference on your part to their proceedings may have a good effect". (20) On October 15th it was confirmed that the miners had returned to their work, "and the last quarter having expired for which the Ore Bargains were taken, it becomes necessary to enter into a new agreement with them". 5/- more per bing was paid at these new bargains. (21) The Mayor of Newcastle reported the cessation of the strike to the Home Secretary, giving the additional information that the miners were given subsistence money for the period during which they had been on strike. (22)

In a letter of October 24th the chief agent mentioned to Mrs. Beaumont (unfortunately full details appear to have been given in a letter that has not survived) the "proceedings of the Weardale Miners at Allenh. and Coalcl." These "proceedings" apparently took place after the settlement of the Weardale strike, so not all the strikers can have returned to work. He suggested that information should be laid before a magistrate against "Geo. Robinson and Stephenson for obstructing those who are inclined to work". He doubted, however, whether he could procure "a sufficient number of special Constables to act with

(20) B/B 51. Oct. 9th, 1818.

(21) B/B 51. Oct. 15th, 1818.

(22) Printed in Aspinall, p. 310.

212.

effect in Weardale". (23) A letter was sent to the Weardale agent that Colonel Beaumont was "willing to pass over the offence [of the strike] in the hope that similar disgraceful scenes will never occur again, yet it is with the exception of those persons who have been the chief instigators in the late transactions who are not to be employed again in his Works whenever you can discover or identify those persons". (24)

The strike was now apparently over as there is no further mention of trouble in the Beaumont records. Unlike the strikes of 1795 and 1796 the 1818 strike ended in almost complete failure for the miners. They had struck for similar reasons at a similar time - for more subsistence and higher bargain prices at a time when lead was rising in value after a depression. True, an extra 5/- per bing was obtained, but this was far short of their demands, and the strike ended in capitulation on the owner's terms, and the subsequent dismissal of "the chief instigators in the late transactions" who presumably included most of the "committee" mentioned by the Mayor of Newcastle. As in 1795/6 only one district was involved - Weardale. The miners of Allenheads and Coalcleugh were appealed to, but only apparently after the surrender of most of the strikers.

The 1849 strike at Allenheads, the last to be described, was rather different from the other two. It took place at a reasonably prosperous time when the miners were not greatly oppressed by generally adverse economic conditions. It was

(23) B/B 51. Oct. 24th, 1818.

(24) B/B 51. Oct. 26th, 1818.

against modernisation, against changes introduced by a dynamic new chief agent that limited the traditional freedom of the miners, rather than a demand for higher wages. The new chief agent was Thomas Sopwith. He was a very able engineer and geologist, and an enthusiast for social and educational reform. He mixed these good qualities with a heavy Victorian pomposity, an overwhelming belief in the rightness of all his actions, and complete inability to see the point of view of anyone else. He became chief agent in 1845 with specific instructions from the aging owner, T.R. Beaumont, to carry out what reforms he considered necessary to increase the productivity of the concern.

There are three main sources of evidence regarding the 1849 Allenheads strike. Firstly, there is Sopwith's diary. Most unfortunately the version that has survived for this year is not the original diary, written up daily, but a shortened version rewritten by Sopwith in 1877, a few years before his death. Thus, although the main facts are there, the drama has gone, and Sopwith, who was inclined to be sentimental at the end of his life, may well have toned down some of the incidents most distressing to him. Secondly, there is an extremely interesting series of letters to the Newcastle Guardian. Nearly three months after the beginning of the strike a letter appeared in the issue of this newspaper dated March 24th, signed "The Allenheads Miners" and stating that as "all available avenues of private communication have been closed against us, we are compelled to adopt this course as our last resort; and we trust that the decision of a discerning public, whose frown is ever

the most potent weapon against tyranny and injustice, will so influence the minds of our oppressors as to lead them to restore us to the privileges of which we have been unjustly deprived." The following week there was an answer to this letter signed "T. Sopwith" and then followed four further communications from the striking miners which continued after most of the men had returned to work - the last two letters being signed "The Ex-Miners of Allenheads". Lastly, memories of the strike were still green in Allendale fifty years later when George Dickinson wrote his history Allendale and Whitfield (2nd Edition, 1903) and he recounts a number of interesting anecdotes about it.

The history of the strike is as follows. Shortly before Sopwith took over the agency a time clause had been introduced into most bargain contracts - "to work five eight hour shifts per week per man". Efforts to enforce this apparently caused much trouble and brought Sopwith much unpopularity during 1847. (25) At the end of 1848 a "spy system" (as it was called by the strikers) was introduced at Allenheads - sub agents checked the time of entry and exit of all the miners to and from the mines. On October 28th "a meeting of the miners was held, to consider and trace, if possible, the origin of this unprecedented treatment, and to adopt means for its removal". A petition was sent to Sopwith complaining that the practice was unjustified and that the inspectors concerned were exercising "powers which they had hitherto not possessed, to invade the acknowledged privileges of

(25) A generalised account of the gradual enforcement of regular hours of working has already been given in Chapter 3.

the men, and to seize every possibility of causing annoyance." Sopwith returned no answer to the petition and no enquiry was "made into the truth or falsity of the charges made against the inspectors... He immediately ordered his name to be withdrawn from the Loyal Miners' Association [a local benefit society] declaring that he would not be associated with such a mobbish body; he denigrated the miners with all manner of opprobrious insults, as ignorant, indiscreet, Irish ruffians mobs &, and even went so far in his rage as to obtain, through his land agent, the immediate discharge from their houses of four of the deputation. He also subsequently discharged from their employment fourteen who had the hardihood to prefer their charges against the inspectors." (26) Sopwith, it may be added, in his single letter to the Newcastle Guardian, justified his not listening to the miners' petition by alleging that the petition demanded "not an investigation into any alleged cause of complaint, but the dismissal of two of the under agents". He went on to say "I consider the minds of the great bulk of the Allenheads miners to be inflamed by the ignorant and malicious conduct of a few demagogues, towards whom... I used the authority vested in me, to dispence with their future services."

The miners then appealed to a local magistrate, a friend of T.R. Beaumont who was ill in Yorkshire at the time (he died in December). A compromise was reached whereby every miner signed a declaration that he would work an eight hour day. The watchers were then withdrawn from the entrances to the mine. An enquiry

(26) Strikers letter to Newcastle Guardian, March 20th, 1849.

was promised into the causes of complaint against the sub agents. The dismissed men, however, were not reinstated, and they obviously had nothing to lose by upsetting the settlement. Sopwith gave them their opportunity. A week after the watchers were withdrawn "instead of the usual two, five time takers were present, book in hand, and noting the hours of our arrival and departure; together with a constable duly armed with staff, pistols, and handcuffs. And thus it continued till Christmas". As for the enquiry - the miners alleged that they were promised an enquiry under the chairmanship of an independent outsider. Instead, when going to the arranged meeting, "conceive our surprise at seeing our friend, Mr. Sopwith, with praiseworthy pertinacity, occupying the chair, and supported right and left, by - nobody. After a restriction that the old charges should not be entered upon (though that was the real object of the meeting) some minor topics were introduced, but the chairman soon found a pretext for dissolving the meeting, and thus nothing was accomplished." The new bargains, beginning in January 1849, were then due. "None of the 400 men (except four, and these from peculiar circumstances) would take bargains until the questions in dispute were settled."

Battle was joined, therefore. As Sopwith remarked in his diary it was not formally a strike - "strictly speaking it took the form of a refusal to enter into a new contract for the first quarter of the year. This of course was perfectly within the right of the Miners as free Agents whether to work or not." Sopwith had reintroduced the "Watching", he said, because in

spite of the agreement of Nov. 17th, "no improvement was attempted. The entrance to the Mines... being in view from my Office Window I had constant proof that instead of working 8 hours many miners only worked for 7 hours." (27) But Sopwith had another reason for being as ready to accept a strike as the dismissed leaders of the miners, which he does not express in his letter to the Newcastle Guardian, but does mention in his diary. That was "there were many more miners at Allenheads than were required by the condition of the Mines". One would be hesitant to suggest that Sopwith precipitated a strike as an excuse to dismiss supernumerary workmen, but it was obviously a factor of which he was conscious.

There was no violence, or even any threat of violence. In the early days there was some negotiation between the contending parties, but both sides were immovable in their attitudes. Sopwith noted his discussions with a delegation of miners on January 12th - or at least his own part in it. "I spoke to them at some length" he records, and his speech takes up some 4 pages of his diary, as against the two lines accorded to the reasoning of the delegates. "I persevered in my own course - firmly believing it to be right... They hoped for Concession and I made NONE" he wrote at the end of his entry for that day.

Sopwith's position was impregnable provided he remained firm. T.W. Beaumont died just before the strike, and his successor was a minor. No interference was therefore possible from that quarter. The other Beaumont mining districts did not

take part in the strike, or, apparently, aid the strikers in any way. Sopwith behaved in a manner that must have been highly infuriating to the miners, spending a great deal of his time away from Allenheads. He was in Allenheads for the annual pays on January 24th and he notes "that a Five Pound note given in excess of what was due to a partnership of men, now on strike, was immediately returned to me". After that he was away for much of the next two months. In April there was another attempt by the strikers to open negotiations but "Mr. Sopwith, after one of those fulsome orations, at which he is such an adept, and in which he equally complimented his own liberality, benevolence, disinterestedness, and our honesty and peaceableness told them that he had left the entire management of the matter in the hands of Mr. William Curry, and, suiting the action to the latter words, mounted and rode away, and we have not seen him since." (28)

The strike was not crippling the Beaumont concern, as all the other mines were working, and the strikers were forced gradually towards capitulation. The great majority of the men knew they could go back to work if they were prepared to accept Sopwith's conditions, and the miners in other districts were already working under those conditions. They had, of course, to abandon their leaders, some of whom had been discharged before the strike began, and who had no hope, even if they had the desire, to be employed again by Sopwith. However, these leaders were very influential. Even Sopwith admitted in his diary that one man, Joseph Heslop, "had considerable natural talents".

Their dominion over the majority of the men was complete.

Dickinson, in his history of Allendale, says that "men were afraid to be seen speaking to anyone who had remained at work, lest it should be thought that they were 'favouring the masters'." He quotes at length from a speech (probably by Joseph Heslop himself) given at a meeting of the strikers at Swinhope Primitive Methodist Chapel on March 21st. (29) Most of this speech is worth quoting here to show how strong was the feeling against "blacklegs"; (this term was actually noted by Sopwith as being used to describe men who had gone to work.) Something of the passion of the speaker does come over and his power over the minds of his hearers may well be imagined:-

"In the first place I wish you all to know that you all have liberty to go to work when you think proper. You have it in your power to either keep your old masters or to have a whole set of new ones. This I can assure you from the best authority. I have a letter in my pocket which I am not prepared at present to let you all see or else you would take courage anew and cry with one voice "the day is ours" (putting his hand into a pocket like pulling out a letter but did not.) Now lads, my orders out of this pulpit to this meeting is that every man has liberty to begin work, but it is my hope and earnest prayer that if any man do begin work in connection with them that has begun, that you will have the goodness to pass by them and their wives and

(29) Dickinson - Allendale and Whitfield. 1903. pp. 48/49. He says that his source "is a copy, given to the present writer, of a document which was itself stated to be a copy of a report given to the mining agents after the meeting by one who was present."

families without speaking to them, to have no connexion or communication with them. If they be sick do not visit them; if they are in need of a doctor do not seek them one; if they die do not bury them; if they are fastened underground in the mines do not assist in seeking them out but let them die, or be killed in the dark, and go from darkness to darkness into the fangs of the devil, to be kept by him without remorse in the fire of Hell for ever and ever. You are all to torment them while on earth, and when they die may the devil torment them to all eternity. Let them be like Cain, deserted by God and forsaken of men. Let them be like Judas, only fit for taking their own lives if none of you do it for them... and if they emigrate to Australia or America; if any of you should be there, be sure to treat them in the same way; for I can tell you for one that if I had a houseful of bread and every other necessary of life to take and to spare I would not give one of them a mouthful to save their lives if I saw them dying of want in scores and I hope you will follow my example."

But the strike leaders really had nothing to offer the miners. Sopwith was not prepared to negotiate: he wanted only capitulation. It was probably this feeling of powerlessness that prompted the series of letters to the Newcastle Guardian. Those parts of these letters already quoted will have shown how well they were written, with great argumentative skill, and cutting irony. Sopwith himself said in his diary that "they were drawn up with no common ability and it was shrewdly remarked by some that they were much more like the compositions of a barrister

than of working Miners". (He does not elaborate on this suggestion.) The later letters were almost entirely taken up by attacks on Sopwith. As well as tyranny he was accused (unfairly) of an almost complete lack of knowledge of mining. Some of the remarks, however, have more than a grain of truth in them - "The leading mental quality which has displayed itself during his whole career among us is vanity, and to this, is doubtless referable most of the evils to which we have been subjected." Sopwith's diary shows how greatly he was hurt by these letters. He was not a cruel or a vindictive man, but he was prepared to be utterly ruthless in pursuit of what he believed to be right. The letters in fact did cause him harm - "They contained specious arguments which went a long way in One very influential quarter to produce an unfavourable impression as to the discretion of my line of conduct in the Management of the Mines." This was apparently a reference to the new owner, W.B. Beaumont, one of whose first acts on attaining his majority in the following year was to dismiss Sopwith (reinstating him a few months later, however). To this extent, therefore, the striking miners gained a victory by publicising the strike in the press.

At the immediate time, however, the attacks of the strikers had no effect on Sopwith. In April some 30 men were brought in from Alston to join the few men who had already withdrawn from the strike. On May 3rd, 1849 Sopwith "observed several groups of Miners on the road near the Office. I went out and spoke to some of them. They said they had come to take their bargains !! and this I said they could do - the several contracts having been all

arranged for letting on the 1st of January last. And thus - after a period of Four Months and three days - the STRIKE came to an end and the several workmen who could be employed resumed their work." (30)

About one hundred of the strikers, however, were not re-employed, including all the leaders, who continued sending letters to the Newcastle Guardian until July 7th. Most of these emigrated before the end of the year - "While America and Australia spread their bosoms to welcome the oppressed, we are ready to brave the perils of the Atlantic or Pacific "they say in one of their letters. Dickinson recounts that "about sixty persons, men, women and children" left East Allendale on the one day, May 17th, 1849 "to seek a subsistence on the banks of the Illinois".

The great strike ended, therefore, with the complete victory of Thomas Sopwith and the enforced departure of all the "mere active and artful persons who had fermented the mischief". (31) Sopwith's only defeat was in that most of the miners refused to sign a document admitting their entire responsibility for the strike, circulated later in 1849. He did not press this point.

The ostensible cause of the strike was Sopwith's determination to enforce regular working on miners accustomed to work if, and when, they chose. More deeply, however, a very real cause was the clash of personalities between a very strong and determined chief agent and a small collection of equally

(30) Sopwith, T. - Diary.

(31) Sopwith, T. - Diary.

determined miners' leaders. If either side had been genuinely prepared to negotiate the strike might have been avoided - there was, after all, no trouble in the other Beaumont mining areas where similar regular hours were being enforced. As it was, both sides almost welcomed the conflict. However the scales were heavily loaded on the side of the management. Mining continued in the other areas, so Sopwith could afford to wait. If the Allenheads miners did attempt to secure the support of their compatriots in Weardale and at Coalcleugh no record of this has survived. Without such support, however, they were doomed. When money completely ran out the strikers had no choice but to capitulate or emigrate. All the strike leaders did emigrate, and Sopwith was left with a servile population which he dominated (benevolently) for the next 22 years.

This unfortunately incomplete record of industrial disturbances in the lead mining area has shown that each dispute was isolated, both geographically and historically. There is not a single example where miners of more than one concern, or even more than one district combined to fight the mine owners. Similarly there was never any continuity between one dispute and the next. Each strike was apparently run by a "committee" (to use the word of the Mayor of Newcastle in his report to the Home Secretary in 1819) but the organisation never survived the strike. The Webbs defined a trade union as "a continuous association of wage earners for the purpose of maintaining or improving the conditions of their employment". (32) By this definition no trade unions ever existed in the lead mining

(32) Webb, S. & B. - Trade Unionism. 1902. p. 1.

region, only temporary combinations, geographically limited, to gain a specific end.

Both the causes and the objectives of the strikes were nearly always fairly simple and specific, if the 1849 Allenheads strike is excepted. They were normally caused by severe economic depressions forcing down the earnings of the miners, and often coupled with increased food prices. This is certainly true of the strikes in Weardale between 1790 and 1820 which occurred after, rather than during depressions, at a time when the miners' bargaining position was stronger. It was pointless to strike at a time when this action would only serve to save the employers' money. The Teesdale strikers of 1872 probably had similar aims. The Weardale strikes in the late eighteen seventies and early eighties were rather different, being desperate expressions of anger at the hopelessness of the lead trade at this juncture. The strikers normally wanted higher subsistence, and/or bargain prices, which they sometimes succeeded in getting, and at other times did not.

None of the strikes was revolutionary in nature. There was no Luddism or machine breaking, and no connection with political issues, although national economic conditions obviously did affect the timing of the strikes. But the movement for Parliamentary reform caused no disturbance in the lead dales; there was no hint of Chartism amongst the miners.

There is just one hint that there were some potentially militant and trade-union minded men in the mining region. In Chapter 9 will be shown how the lead miners flocked to the North Eastern coalfield in 1831/2 to break the great coal strike. In 1844 there was a similar strike. In the Northern Star (April

13th, 1844) there is a report of a meeting of striking colliers at which "A letter was... read by the Chairman from the lead mining districts, requesting information on the subject of the Union and pledging themselves that whatever arrangements the coal miners may make for bettering their condition, they will give them their co-operation, and take care that no lead miners will come and take their places." It would be interesting to know from whom this letter came, but there is no further information - and no union of lead miners was ever formed.

The failure of the lead miners to form trade unions permanently to advance their interests was probably due to a number of inter-related causes. In the North Eastern coalfield it was those pits which contained the greatest number of migrants that were the most militant. The lead mining areas were inhabited by a stable population with a very low proportion of immigrants. A very pressing issue was required to stimulate the lead miners into militant action against the all powerful mine owners who controlled the only form of employment in the area. Another factor was the nature of the relationship between mine owners and miners in lead mining. The Webbs discovered that "Only in those industries in which the worker has ceased to be concerned in the profits of buying and selling... can effective and stable trade organisations be established." (33) Even in the later days of the Bargain System the lead miners were not orthodox wage earners. They were selling not their labour, but the proceeds of their labour. Strikes were desperate last resorts.

(33) Webb, S. & B. - Trade Unionism. 1902. p. 35.

CHAPTER 7.

The Pattern of Settlement.

The habitations of the lead miners were situated as close to the mines as geography allowed. In consequence the area of settlement in the region extended to a higher altitude than anywhere else in Britain. In spite of the altitude and climate many of the miners combined their occupations with the ownership or leasing of smallholdings, and part time farming was an important aspect of the lead miners' way of life.

The most important factor in the siting of settlements in the lead mining region was the location of the mines themselves. The entrances to these were high in the Pennines, normally at heights ranging from 1,200 to 2,500 feet. Settlements were as near to the mines as was climatically and topographically possible and, in the nineteenth century, these settlements existed at a greater height than those in any other area of the British Isles. In the Cheviot dales settlements rarely rose above the 700' contour. (1) In the lead mining region several villages were located above 1,000 feet, and scattered settlements were very much higher. The long established villages of the area were high, but not so high as those which were evolved mainly in the nineteenth century. Of these older villages, Alston is at 900 feet, Stanhope at 700 feet and Middleton in Teesdale at 750 feet. In the nineteenth century, after the Enclosure Acts had made more land available, and when the pressure of an increasing population was making necessary the use of every square yard of

(1) Smailes, A.E. - The dales of Northeast England. 1932. p. 113.

inhabitable land, "new" villages, which were in fact often centred on an already existing group of offices with some cottages around them, were placed much higher. Allenheads is located at 1,327 feet, Nenthead at 1,411 feet and Coalcleugh at 1,821 feet. (There were few houses actually at Coalcleugh; Carr Shield, 2 miles down the dale, was at 1,312 feet.) Dispersed dwellings, in the nineteenth century, were higher still. There was a lead miner's house in Teesdale at just under 2,000 feet, an incredible height by British standards.

Settlements at these heights required shelter, and the dwellings were sited in the valleys or on the valley slopes of the main rivers and their tributaries - long strips of cultivated land within a moorland waste. The 1842 Report described Weardale as having "houses... distributed over it on both sides of the river like a continuous scattered village". (2) These strips of dispersed habitations grew narrower as the heads of the dales were approached, and gradually disappeared altogether. Above Cauldron Snout the Tees flows from its source some 15 miles away through a vast plateau, without any shelter. On this exposed plain no habitations were built, in spite of the mines that were located there. Over the whole mining area the high land, between the settlement strips in the shelter of the river valleys, was left completely uninhabited.

The greater number of lead miners lived in scattered cottages, which were not gathered together into villages as was the case in the Durham coalfields. The maps of the Allenheads

(2) 1842 Report (Mitchell.) p. 722.

region illustrated show the large number of individual dwellings located along the sides of the East Allen and its tributaries. Villages and hamlets functioned chiefly as service centres for the dispersed dwellings. A traveller in 1859 stated that "Allenheads is to be regarded rather as the nucleus, containing a few shops and an inn, of the houses scattered over this part of the dale, than as a village." (3) In Allendale and Weardale the villages grew in a haphazard fashion, developing from long established parish centres as at Allendale Town and Stanhope, or around the offices of the mining company, as at Allenheads. The village of Nenthead was deliberately created by the London Lead Company in the eighteenth century to serve as the centre of its operations on Alston Moor. In the eighteenth century Nenthead remained little more than a group of mining offices and a smelt mill, with a few scattered houses and a school; in the nineteenth century it was systematically developed as a residential area for the Company's workmen. The Company also transformed the older villages of Garrigill and Middleton in Teesdale by the rebuilding of older dwellings and the construction of new ones. (4) Langley Mill, about which more shortly, was a planned settlement similar to Nenthead but on a smaller scale, built by the Greenwich Hospital. The older villages were inhabited chiefly by tradesmen and those engaged in "service" occupations. The 1851 Census M/S schedules (5) show that in Allendale Town, for example,

(3) White, W. - Northumberland and the Border. 1859. p. 456.

(4) Raistrick, A. - Two centuries. 1938. pp. 21/30.

(5) In the Public Record Office.

there were about 60 families in this sort of occupation as against only about 30 wholly lead mining families. There were 10 tailors, 9 grocers, 6 shoemakers, 3 drapers, and individuals in other trading occupations.

By the late eighteenth century there was an accute shortage of land suitable for habitation by the expanding population of the region. Two maps are reproduced showing the area around Allenheads, in about 1800, and in 1861. A comparison of the two shows the great increase in settlements in the 60 years between them. There were many more scattered dwellings at the later period and also far more houses in the villages of Allenheads and Distpot. Enclosure of the commons made this expansion possible. (6) In the Park and Forest Quarters (the Western area) of Stanhope parish, Thompson has shown that demand for land resulted in much fragmentation of copyhold holdings before the Weardale Enclosure Act of 1815. In 1762 there were 105 proprietors: in 1803, 185; and in 1856, 256. Between 1762 and 1803 there had been no legal expansion of the area available for occupation, so the increase represents mainly a greater dividing up of the same amount of enclosed land. (There were probably also, however, a number of illegal encroachments on the commons.) After 1815 there was very much more land officially available, and Thompson calculates that between 1815 and 1840 one quarter of the dwellings now existing in Stanhope Parish were built. (7) In 1852 Thomas Sopwith noted in his diary a

(6) Enclosure is considered fully later in this chapter.

(7) Thompson, D. - Rural geography of the West Durham Pennines. 1962. pp. 68: 134/136.

selection of the normal and frequent problems with which he had to deal. One was to find houses for those in need, "for in these Mountain wilds, inhabited only by Miners and those dependent on Mines population presses closely on habitations". (8) The London Lead Company in the nineteenth century solved the problem by themselves building cottages, and by letting land for their employees to build them in the villages of Nenthead, Garrigill and Middleton in Teesdale. The 1851 M/S Census schedules show that by this time the tradesmen of Nenthead, unlike those of Allendale Town, were greatly outnumbered by the leadminers living within the village. After 1860, with the beginning of the final decline of lead mining the problem disappeared with the enforced migration of many families.

The actual dwelling houses of the lead miners were all built of stone - mainly of the easily workable sandstone available from deposits all over the lead dales. Bishop Pococke stated that in the Stanhope area in 1760 "they thatch their houses with a thick coat of heath, and make the roofs steep that the melted snow may not soak into the thatch, and they lay loads across the top of it to keep out the water". (9) The 1842 Report said that the houses in the Stanhope area nearly all had slate (or "flag") roofs. (10) There appears, therefore, to have been a definite improvement in construction materials and methods in the intervening years. Few

(8) Sopwith, T. - Diary. March 29th, 1852.

(9) Pococke, R. - Northern journeys. (Surtees Society Publication, Vol. 204, 1914.) p. 209.

(10) 1842 Report (Mitchell.) p. 722.

domestic buildings now standing in the lead dales appear to date from a period much earlier than the eighteenth century. This impression is confirmed by the detailed architectural survey of "small house" architecture carried out in the near-by Eden Valley by R.W. Brunskill. (11) His examination of the homes of the Cumberland "statesmen", a class of small farmers bearing some resemblance to the lead miners with smallholdings, has shown that not a single house has survived dating from before 1660. It is probable that in both areas houses of the lower classes before this date were too insubstantial to survive.

The isolated dwellings occupied by the majority of lead miners were designed to serve as small farmhouses as well as homes. The usual pattern, as witnessed by surviving examples (most of which have been heavily rebuilt and altered) and from contemporary descriptions, consisted of a long two storied building. The ground floor was occupied at one end by a large kitchen-living room, and at the other by a cattle shed. Above the kitchen would be one or two bedrooms, and above the cattle shed a hay loft. (12) Sometimes there were two or more dwelling

(11) Brunskill, R.W. - Development of the small house. (in Cumb. & West. Arch. & Antiq. Soc. Trans., N.S. 53, 1952. pp. 160/189.)

(12) Descriptions of habitations are given in:-
 Nevin, J.G. - The general system of farming in Alston (in Proc. Durham College of Science Agric. Students Assoc., Vol. 1. pt. 1. 1900-01.) p. 23.
Depressed condition of the agricultural interests, Royal Commission Report. (Durham by Coleman.) 1881. p. 228.
 Thompson, D. - Rural Geography of the West Durham Pennines. 1962. p. 132.

houses set in a row, each with its associated outbuildings. A plentiful supply of lime made whitewash cheap, and it was used liberally. In Teesdale, according to Sopwith in 1833, the white-washing "partly redeems the poverty of their aspect, and this operation is said to be always performed, with becoming loyalty, on the approach of the most noble Duke, [of Cleveland] to the moors in the shooting season". (13)

When the Greenwich Hospital built its mill at Langley in the seventeen sixties a great deal of discussion took place about the design of the workmen's cottages, and the correspondence summarising this is worth quoting at length. In 1769 three types of house were considered. The prices given are for pairs of semi-detached houses.

"The first 50 by 10 feet Outside and 13 feet high is upon an Idea that the Persons living in them are to have Cows and the whole Apartment for each Family in this way will be:-

One room on the Ground Floor 16 by 15 feet.

A Milk house or Closet on ditto 4 by 6 feet.

A Byer or 2 stands for Cows on ditto 11 by 6 feet.

One Room above to communicate with the lower room

by a step ladder 22 by 15 feet. £152.13. 8.

The second have no Convenience for Cattle, but have a Stair Case Common to each House - The Apartments as follows for each Family:-

One Room on the Ground Floor 16 by 15 feet.

One room above 16 by 15 feet. £146. 0.10.

There will be a place under the Stair Case and another above it and it is proposed that the Familys living in two Cottages shall each take one of these Conveniences. You'll observe that in this way the two houses lye very much open to each other, which is an objection certainly and you'll see the only reason of doing the thing in this manner is to save expenses. But still to save more and surely more agreeable to mere Cottagers who like to live by themselves is the third. - The Apartments for each Family will be:-

One Room on the Ground Floor 18 by 15 feet.

One room above to communicate with the Ground Floor
by a step ladder 18 by 15 feet. £133. 9.10.

In every case the upper Rooms are to be Ceiled." (14)

It was decided to build houses of the latter two types, although, as we shall see, it was later found necessary to add the farm outhouses after all.

There is more evidence available about the design of the nineteenth century cottages in the lead mining areas, particularly those in the London Lead Company villages. In 1864 Dr. Peacock looked over examples of the cottages in Nenthead. (15) He found that the best houses, which were occupied by the smelters, had adequate drainage, a coal cellar, dustbin, and privy. But most of them had only two rooms, although the Company had just finished building some new houses with two rooms on each floor. The houses in the village which had been built by the

(14) Adm. 66/96. Jan. 25th, 1769.

(15) 1864 Report (Appendix.) p. 17.

workmen themselves on Company land were "defective, and some of them are most objectionable". There were never more than two rooms, sometimes very small and low. Some still had thatched roofs, without proper ceiling for the upper room. Sometimes there were no privies. References in the Company's Minute Books show that the Council was conscious of bad housing conditions and was attempting to improve them. (16) This was more than most of the other mining concerns were prepared to do, so that the conditions described as existing in Nenthead in 1864 were probably superior to those existing elsewhere in the lead dales.

The effects of overcrowding and bad sanitation were somewhat mitigated by the fact that all the settlements in the mining districts were surrounded by a wide expanse of moorland, and their situations were mostly healthy ones. The only form of industrial pollution of the air which occurred in them was caused by the fumes from the smelt mills, which were highly poisonous and destructive of animals and vegetation, both as a vapour and as a sublimate. After the establishment of Langley Mill many complaints were received that cattle were killed by the fumes. Two cottages had to be built very close to the mill to guard it against theft - "The situations will undoubtedly be extremely unwholesome, but by letting the Occupiers have them rent free, and allowing them Coals and Peats for their Fire, it is hoped that some of the Workmen may be induced to inhabit them." (17) This problem was largely removed at the end of the

(16) e.g. L.L.C. 31. Nov. 6th, 1866.

(17) Adm. 66/96. Feb. 24th, 1775.

eighteenth century by the construction of the long, horizontal chimneys taking the fumes far away from inhabited areas. Even in 1842, however, the wind sometimes carried fumes back from the mouth of the chimney to the village of Nenthead, which was most "disagreeable" to the inhabitants. (18)

Judged by mid twentieth century standards the housing conditions outlined above are not very good. Nineteenth century observers, however, found them better than those existing in agricultural districts in most parts of England, and considerably better than working class conditions in towns. The series of reports to the Sanitary Inquiry Commission of 1842 by Sir John Walsham (19) show that most of the agricultural labourers in the North lived in single roomed cottages. Around Alnwick many consisted of nothing but "a rough room of lime and stone, covered with thatch, and with nothing but an earthen floor, except a flag-stone or two near the hearth". Around Hexham the labourers' cottages "rarely exceed one room, with such division in it only as can be effected by the arrangement of the furniture of the occupant". The 1864 Hunter Report on rural housing concluded, "The majority of Northumbrian and Durham peasants, whether rich or poor, hind or collier, live in but one room, day and night, with all the family." In his visits to 224 rural houses in these two counties (he did not reach the lead mining districts), Hunter had not found a single example with more than one

(18) 1842 Report (Mitchell.) p. 736.

(19) The state of the dwellings of the labouring classes in Cumberland, Durham, Northumberland, and Westmorland. pp. 409/444.

bedroom. (20) Witnesses before both the 1842 and 1864 Commissions stated that housing standards in the lead mining area were superior to those in the surrounding agricultural districts. A dangerous error easily made in the study of working class housing conditions of the past is the assumption that well-built houses in villages laid out by philanthropic landlords in the eighteenth century were necessarily comfortable for the families living in them. Milton Abbas, in Dorset, for example, has rows of substantial eighteenth century semi-detached cottages with four rooms each. In 1841, however, in most houses every room was occupied by a single family, with an average of nine people to a room. (21) In Nenthead the 1851 census schedules reveal that this was not the case there, and that bad overcrowding was unusual. The average number of persons living in the 169 dwelling houses was 5: only 20 were inhabited by 8 persons or more, and only 6 by 10 people or more. The largest number of persons in any one house was 12. In Allendale the census schedules show similar figures. Sopwith, however, told the 1864 Commission that some overcrowding was caused by the households nearer the mines taking lodgers. (22) The houses of the lead miners seem to have been of considerably better quality than those of the colliers in the average pit village. Hunter said: "The lodging which is obtained by the pitmen... of Northumberland and Durham is perhaps on the whole

(20) In Seventh Report of the Medical Officer of the Privy Council. 1864. pp. 191/192.

(21) Mercer, E. - Houses of the people (Communist Party: Our History pamphlets, No. 84.) p. 2.

(22) 1864 Report (Vol. 1.) p. 261.

the worst and dearest of which any large specimens can be found in England." He based this judgment on "the high number of men found in one room, in the smallness of the ground plot on which a great number of houses are thrust, the want of water, the absence of privies, and the frequent placing of one house on top of another". (23) The lead miners' dwellings were mostly dispersed, on a mountainous terrain with plentiful supplies of water, and where the inconveniences of poor sanitation were not so noticable as in the badly drained pit villages. The high wages of the pitmen, however, allowed them to furnish their houses in a style far beyond the pockets of the lead miners. (24)

The tenure by which the lead miners held their houses and land was of three kinds - freehold, copyhold, and leasehold. On earning a substantial sum of money by a good pay, or by the steady accumulation of small sums, many lead miners bought or leased a small patch of land on which to build their own house. But when times were bad these homesteads frequently had to be mortgaged and possibly sold. In 1834 most owner-occupied small properties in Stanhope parish were mortgaged. (25) Relatively small numbers of miners owned their own houses and land, and it would appear from the evidence about enclosures, dealt with later, that in the nineteenth century their numbers decreased relatively to those who leased their land. Most landlords operated the system in use by the London Lead Company at Middleton in Teesdale. Miners were permitted to build houses at their own

(23) Seventh Report of the Medical Officer of the Privy Council, 1864. p. 180.

(24) 1842 Report (Mitchell.) p. 751.

(25) Poor Law Commission Report. 1834. Section B 1 - 2 - 160b.

expense on Company land, and were then subsequently charged rents for them. (26)

The great landlords in the lead mining area exercised an even stronger power over their tenants than was usual in the eighteenth and nineteenth centuries. The biggest landowner in each of the mining parishes was the lord of the manor concerned - in Allendale the Blckett/Beaumonts, in Alston the Greenwich Hospital, in Middleton in Teesdale the Duke of Cleveland, and in Stanhope the Bishop of Durham, succeeded by the Ecclesiastical Commissioners. In addition to their actual ownership of land, they owned the mineral rights, allowing them to search for lead, virtually disregarding any inconvenience caused to surface occupiers. The enormous acres of common land in these parishes belonged in law to the lords of the manors concerned, giving them the greatest influence on the vital question of enclosure. Copyhold tenure was more usual than freehold, and holders of land by this tenure still had to fulfill certain feudal obligations to the lord of the manor. In Weardale and Teesdale the landowners were not directly interested in the mines, contenting themselves with collecting royalties from those who did the actual mining. In Allendale the Blckett/Beaumonts extracted the lead themselves, and so their tenants were also their employees. The Greenwich Hospital's employees at Langley Mill were also the Hospital's tenants. On Alston Moor, and to a lesser extent in Teesdale and Weardale, the landowners leased much surface land to the mining companies, and so the latter

were frequently their employees' landlords.

Any concern the mine owners may have had for their employees' welfare, did not result in lower rents. In 1794 it was said that the Durham lead mines "do more than double the rent of all the small farms contiguous thereto, as the miners take these farms at extravagant rents, for the convenience of keeping two or three cows and a galloway". (27) Eden, in 1797, confirmed that rents were very high compared with those in the areas around. (28) But severe depressions caused rents to be lowered. In the early eighteen thirties the price of land had dropped with the price of lead, and many landlords had given up trying to collect their rents. (29) They would have gained nothing by ejecting the miners from their homes, as there would have been no tenants to replace them, who were any more capable of paying the rents than they were. It was this lack of competition for their houses and land from the local farmers that gave the lead miners their only source of strength in dealing with their landlords.

A Weardale writer in 1840, describing the normal routine and life of lead miners, said "Their work is among lead ore, sealing pastures, waiting upon and feeding cattle, mowing, winning and stacking hay, and carting fuel against the winter season." (30) In other words, most lead miners combined mine work with

(27) Granger, J. - Agriculture of Durham. 1794. p. 21.

(28) Eden, Sir F. State of the poor. 1797. Vol. 2. p. 169.

(29) Poor Law Commission Report. 1834. Sections B1-3-160c. B1-2-98b.
1842 Report (Mitchell.) p. 757.

(30) Featherston, J.R. - Weardale men and manners. 1840. p. 15.

agricultural labour on their tiny upland farms. Many contemporary writers commented on the lead miners' desire for land, leading to the high rents prevalent in the area for land that elsewhere would have been left as waste. The miners' farms were very small, contrasting with the larger farms further down the dales. "The great feature in Teesdale is the small size of the farms... As one gets higher up the dale the holdings diminish in size; a portion of the family or lodgers work at the lead mines." (31) In 1834 the Poor Law Commission was told that in Weardale and Teesdale the "miners' farms consist of about three acres of meadow, three or four of upland pasture, with a house and offices necessary for accommodating two cows, or a cow and a galloway, and are such as the miners have spare time to attend to without trenching on their ordinary labour". (32) This description might well be applied to farms in all the lead dales in the nineteenth century, although the average acreage of each farm was probably rather smaller. There appear to have been no noticable differences in the farming settlement from dale to dale. In the eighteenth century, before Parliamentary enclosure took place, there is less evidence, but the pattern seems to have been much the same with more grazing on the open moor instead of enclosed upland pasture.

Statistical detail as to the numbers and proportion of lead miners with smallholdings and the average size of their holdings

(31) Depressed condition of the agricultural interests. Royal Commission Report. (Durham by Coleman.) 1881. p. 228.

(32) Poor Law Commission Report. 1834. Appendix A, p. 138A.

has proved very difficult to assemble. The enclosure awards for the different parishes show the number of people holding land by free- or copyhold; they do not show those who held land by leasehold as did large numbers of the lead miners. The Tithe Appropriation surveys of the eighteen forties are also disappointing as evidence as they do not analyse the tenants holding small amounts of land, but merely note the landlord and state that the land was let to one named person "and others". The best source, analysing the leaseholders of carefully defined and mapped areas, proved to be an estate survey and rental of the Beaumont estates in Allendale, carried out under the direction of Thomas Sopwith in 1861. This consists of a specially surveyed and printed map, showing all structures and enclosures, together with a key listing all the tenants, giving the precise size of their holdings (analysed into meadow and pasture) and stating the number of stints, or grazing rights, they had on the unenclosed commons. As the Allenheads and Coalcleugh areas were completely owned by the Beaumonts the figures given in the survey for these areas have been analysed. (33) Of the 44 houses in the Coalcleugh area 25 had enclosed meadow or pasture land in connection with the house, although not necessarily immediately attached to it. In the Allenheads area the figure was 81 out of 123. Thus at Coalcleugh 56.8% of the houses had smallholdings, and at Allenheads 65.8%.

As regards acreage of the smallholdings, most of those at Allenheads and Coalcleugh seem to have been between 1 and 10

(33) See Table 5 and Map. The map of Allenheads is reproduced facing page

acres in size, with rather more under 5 acres than over. It is noticable that the larger holdings consisted of much more pasture than meadow, while the smaller were often only meadow. The allocation of stints bore no apparent relation to size of holding, although no house without any land at all had any stints.

It would be wrong to draw too general conclusions from these figures, relating to two areas only, both owned by the same landlord. Undoubtedly the position in the eighteenth century, before Parliamentary enclosure, would have been very different. (34)

But evidence from the various Parliamentary reports suggests that the proportions of miners with smallholdings, and the amount of acreage held, was much the same over all the lead dales in the nineteenth century. Unfortunately most of the statements on this subject made by witnesses before both the 1842 and 1864

Commissions tended to be very vague, such as "a great many of them have little farms". (35) In 1857 the chief agents of both the Beaumont concern and the London Lead Company were closely questioned by members of the Select Committee on the Rating of Mines as to the relative numbers of people engaged in mining and in agriculture in the lead mining region. Sopwith replied that "There are very few purely agricultural labourers; most of the farms are occupied by miners or smelters, and people connected with those works." (36) Bainbridge, the chief agent of the

(34) This point is considered later in this chapter, with the enclosure question generally.

(35) 1864 Report (Vol. 2.) p. 380.

(36) Rating of Mines Select Committee Report. 1857. p. 16.

London Lead Company, replied similarly that nearly all the farms in the upper dales were in the possession of lead miners, and further pointed out that "the population is so mixed up, the farming with the mining population, that they are almost all as one; it is scarcely possible to go into a family occupying half an acre in Alston Moor or Teesdale, without finding that one or more members of the family are workmen employed in mines." On Alston Moor, where the Greenwich Hospital was ready to let land on long leases, "many of these parties who are in possession of estates... are fortunate miners; miners who in past years have speculated and have been fortunate, and who have bought up little properties around them." (37)

The miners were able to work their small farms in addition to their normal occupation because of the short hours of work. In the eighteenth century a six hour day was common, and even when an eight hour day became usual in the nineteenth century the hours were sufficiently short by contemporary standards for plenty of time to be spent on agricultural work. Many of those miners who lived away from home in accommodation near the mine during the week arranged their shifts so as to finish work by Friday morning, to enable them to have a long week-end at home. In any case no adult miners normally worked on Saturday or Sunday in either the eighteenth or the nineteenth century. Miners were allowed to take a few days holiday at hay harvest time. In the mid nineteenth century "five weeks about the time of the hay harvest" were officially given as a holiday to all

children attending the Beaumont schools. Few of the miners' wives had any occupation. In the eighteenth century some female labour was employed on the washing floors, but by the beginning of the nineteenth century this custom had almost completely died out. Their labour was therefore available for the running of the farm. Older miners, whose health had been ruined by the respiratory diseases caused by their work, often 'retired' to their smallholdings, leaving their sons to be the wage earners.

The smallholdings meant to the lead miners not only the supply of a certain amount of food (38) but also a welcome contrast to their labours underground or in a smelting mill. They were also a concrete sign of success, and a buttress against bad times. "Occupations of this sort give the men something more than grooves, ore, lead, washing and smelting, to talk and think about: in short, they become small farmers as well as miners, and, so far as my observations have gone, interest themselves wonderfully in the practice of agriculture; so that in the intelligent management of their meadows and stock they compare favourably with professional farmers in some parts of the country." (39)

If the smallholding tradition and system was agreeable to the lead miners, it was also advantageous to the landlords and mine owners. To the former, the miners' desire for smallholdings made it possible for them to let land which in normal circumstances would have been left as waste at such high altitudes. To

(38) Their importance as a source of food will be considered in the next chapter.

(39) Macrae, D. - The improvement of waste lands. (in Journal of the Royal Agric. Soc., 2nd Series, Vol.4, 1868.) p.323.

the mine owners the existence of smallholdings attached the labour force to the district more strongly than did anything else. In his diary for 1866, Sopwith recorded his disquiet at the policies of the land agent of Mr. Beaumont in Allendale; he was raising rents steeply, and objecting to reasonable requests for repair and maintenance grants. Sopwith wrote - "If by raising rents and being chary of repairs the revenue of the land is increased, yet I much fear that in a still greater degree are the permanent mining emoluments endangered." The bulk of the estate should be considered as merely "a useful adjunct to the Mines." I think the small holdings of Cottages and of grass for a cow or even a small garden have had an important influence in making the people attached to the place - willing to work in it and unwilling to leave it. As regards the tenants I feel satisfied that many of them place a far higher value on a cheap holding of a farm or cottage which is dear to their associations than they would on the receipt of cash equal or even double or treble the value of their holdings." (40)

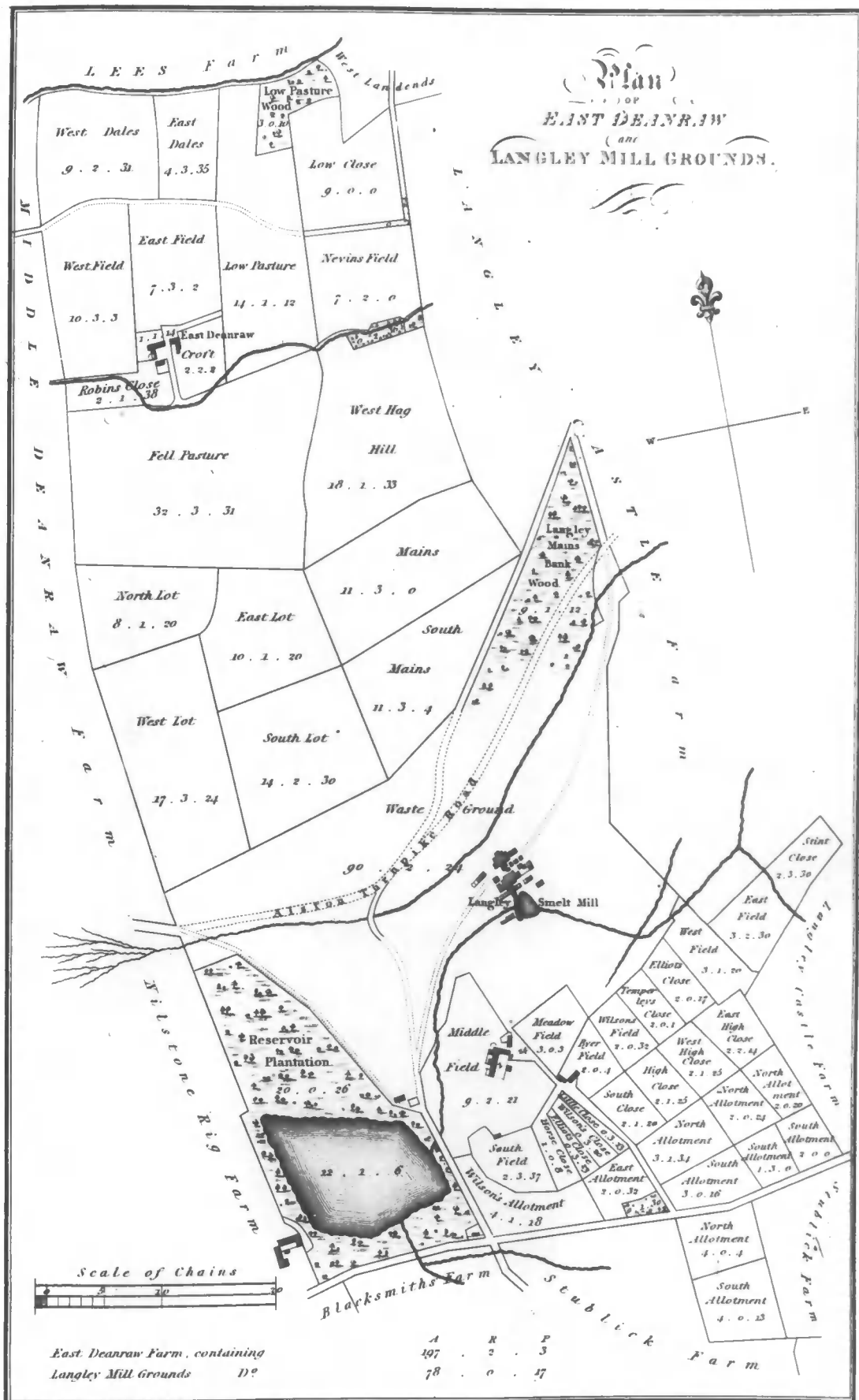
The landlords and mine owners normally encouraged the ownership of a little land by the miners. This was made easy for them in that there were few strong economic or agricultural arguments in favour of using the land in any other way. The greatest surviving amount of evidence showing in detail the policies of an individual mining organisation towards its employees' desire for smallholdings is contained in the Greenwich Hospital records relating to the establishment of Langley Mill.

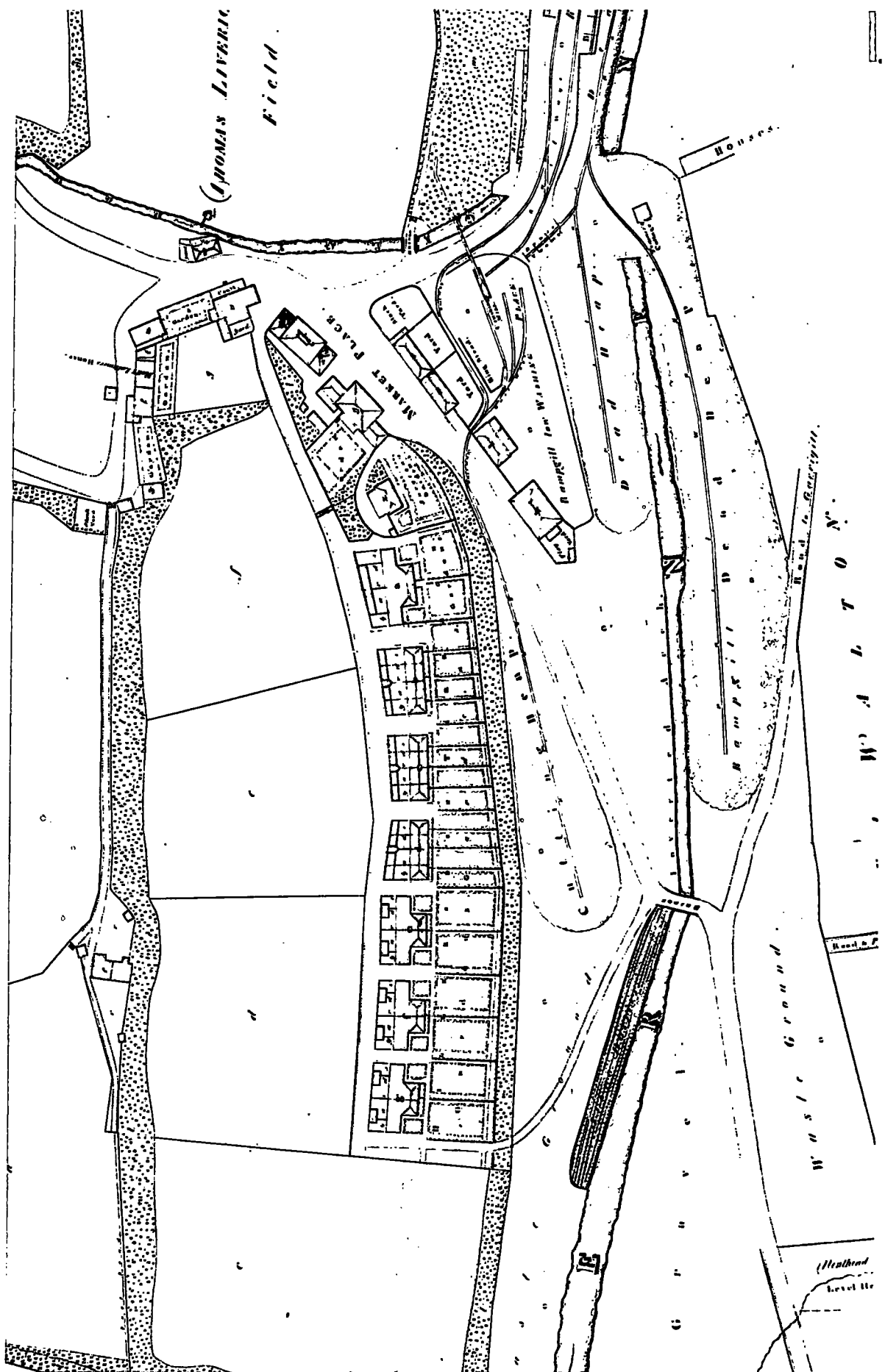
In April 1768, before the Mill had been built, the Receivers notified the Board of the Hospital that "as the Mill is at a distance from any village, it will not only be necessary to build an House for the Agent, but also some Cottages for the Smelters". (41) By January 1769 the time for detailed planning of the designs for the cottages had been reached, and the three alternative plans already quoted were submitted to the Board. In the covering letter the Receivers said that "the Men are some of them very desirous to have little pieces of Ground to enable them to keep cows". It was not advocated, however, that the cottages should initially be designed for this purpose, as "at this Rate every Workman must have a Farm and therefore it seems to me that we should only furnish conveniences such as Smelters etc. are content with where they have no Land... It may, and will it is most probable, be necessary to build more Conveniences of this kind, and as such it is the more proper for us to be Careful not to introduce a thing by which we may have a difficulty, and even supposing that it should hereafter be found an advisable thing to accomodate the Workmen with pieces of Land, Housing may be built for their Cattle without any material loss." (42) The houses were therefore built without any farm outhouses attached.

Once the cottages had been built and were occupied there was immediate pressure from the smelters for some sort of farm accommodation to be provided. Some of them apparently already

(41) Adm. 66/96. April 20th, 1768.

(42) Adm. 66/96. Jan. 25th, 1769.





policy to one of deliberately developing village centres. After 1820 Nenthead was systematically built as a planned village, ^(see Plate II) and the older village of Middleton, in the newly acquired Teesdale area, was rebuilt. Not only houses were built in both, but also such community centres as schools, chapels, and municipal buildings. (48) In 1851 Nenthead had a total of 872 inhabitants. By the middle of the century the Company was providing gardens with every cottage built, as a substitute for farming land. Cottages built by the miners themselves, within the Company villages, and some of the earlier Company cottages, did not always have gardens. (49)

The Blackett/Beaumonts never concerned themselves very much with the houses and small estates of their work people, except as a source of revenue. In the earliest of the mining records to survive, the land accounts for Allendale and the parts of Weardale owned by the Blacketts were given alongside the mining ones, and the mining and smelting agents were responsible for rent collecting. These agents had smallholdings as part of their emoluments. (50) By the end of the century the land agent at Hexham was responsible for the land estates. He submitted a long list of objections to small encroachments on the Allendale commons to the Commissioners appointed by the 1792 Enclosure Act which must have been the cause of much difficulty to the miners.

(48) Raistrick, A. - Two centuries. 1938. p. 30.

(49) 1842 Report (Mitchell.) p. 757. Regarding gardens see later in this chapter.

(50) B/B 47. Jan. 9th, 1760.

This splitting of authority in the mining area between two people was much regretted by Sopwith when he became the chief mining agent, but he could do nothing about it. He would have liked planned expansion of the settlement areas of the miners, as the London Lead Company was doing. As it was, however, expansion in East and West Allendale and Weardale remained as haphazard in the nineteenth century as it had been in the eighteenth.

Virtually nothing is known about the policies of the smaller mining groups. In the eighteenth and early nineteenth centuries, when there were many tiny groups of adventurers working on Alston Moor "the first profits of their success are laid out in the acquisition of a Cottage and piece of Land within the Manor, which secures to them a comfortable Home, and supplies to them the Means of conducting their speculations with increased confidence". (51) Later in the nineteenth century, when most of the groups were larger, many of them must have had land available to rent to their workmen. The Rodderup Fell Company, for example, was, in 1864, letting houses together with a right of pasturage for two cows on the common. (52)

To summarize - both the employers and the employees in the lead dales liked the system of smallholdings. The miners liked them because of the real assistance they gave towards supplying their families with food in an isolated district: because they provided a welcome relief and relaxation from underground and mill work, and their short working hours permitted them to farm

(51) Greenwich Hospital Report. 1821.

(52) 1864 Report (Appendix.) p. 327.

them; and because of the (perhaps illusory) feeling of independence that they gave. The landlords and mine owners approved of the system, partly because of the virtual uselessness of the land for other purposes, and partly because their employees were firmly attached to the area by their possession of smallholdings. The percentage of miners with smallholdings at any one time is impossible to calculate. Probably rather more families had holdings than there were those without them. Pressure for the limited amount of suitable land, particularly in the nineteenth century, with the growth in population within the area, made it impossible for all miners to have them.

The type of farming practised by those lead miners with smallholdings was largely pastoral in nature. The high altitudes reached by the settlements in the lead dales meant that most of the land was unsuitable for arable farming. Bailey and Culley described the soil of Alston Moor as "well known, by those whose lot it has been to cultivate it, to be an ungrateful and unprofitable soil". (53) This statement fairly describes the bulk of the land in the lead mining areas. There is, however, some good loamy soil along the bottoms of the valleys, and for some little way up the sides. The line of the outcrop of the Great Limestone formed the boundary between the cultivated and uncultivable land. Below the limestone the fields would grow lush grasses, suitable for cutting into hay, but above it the land consisted of heather covered moors with wide expanses of peat bog. The land utilisation pattern of the lead mining

(53) Bailey, J. & Culley, G. - Agriculture of Northumberland etc. 1813. p. 200.

parishes, was, at all times predominantly uncultivated moorland, suitable only for rough grazing. In Alston parish in 1834, for example, the Poor Law Commission was told that in its 25,000 acres there was "scarcely any Arable, not much Wood land; between 2000 and 3000 acres of Grass Land of different qualities, and the remainder Pasture and Wastes." (54) In the eighteenth and early nineteenth century there was some corn grown in the lower parts of the lead mining parishes, the farmers being tempted into so doing by the high prices obtainable for grain in the isolated lead area. These farmers, however, were all full time farmers, not part time lead miners. After the decline of lead mining, and the partial depopulation of the area corn growing was virtually discontinued and all the land was given over to grass.

The lead miners' small farms were devoted only to grass. Stock was kept to serve two main purposes - to provide food, and to act as transport. The choice of stock kept was limited by the food available - poultry and pigs, for example, seemingly obvious stock, being easy to rear, were not kept because all the cereals and potatoes that could be obtained were wanted to supply the miners' own diet, although geese which feed largely on grass were kept, as also were bees which could fend for themselves among the heather.

Most miners who had smallholdings kept at least one cow, many two or more, according to the size of their holdings. In the Hexham Manorial Papers lists of tithes in Allendale of the

(54) Poor Law Commission Report. 1834. Section B1 - 1 - 98A.

seventeen sixties and seventies show that nearly every person who payed tithe owned one or more cows. (55) These cows would supply the families with milk and its derivatives, butter and cheese. In the summer the cattle were grazed either on the open moor or in enclosed rough pasture. In the winter they were kept on enclosed land and supplied with hay. Calves were reared in the summer, when milk was most plentiful, or, if born in the winter months, on such makeshift food as oatmeal-gruel and hay tea. (56)

Horses, or rather the strong and hardy variety of pony known as the "Dales" pony, were reared in a similar manner. In winter they were frequently sent down to the farms at the foot of the dales, where, in 1842, farmers would keep them for a rate of 1/- or 1/3d. per week. (57) These ponies served the need of the miner and his family for any transport, either as a "galloway" or drawing a cart. In the eighteenth century at least, a horse was virtually an essential for those living in isolated parts of the dales "the Markets for Corn and other Provisions which they have to purchase for the support of their Families being at a great Distance, besides having their Hay and Peats to lead." (58) The lead Ore carriers lived mainly outside the higher parts of the lead district, where they could keep their animals during the winter. Often they also were farmers.

(55) Deposited in Newcastle University Library.

(56) Dickinson, G. - Allendale and Whitfield. 1903. p. 258.

(57) 1842 Report (Mitchell.) p. 748.

(58) Thomas Bell M/S, Newcastle University Library. Letter referring to smallholders in Swinhope, Allendale, in 1799.

Sheep were kept by some of the lead miners owning larger smallholdings, entries for them in the tithe registers being about one-fifth of those for cows. It would also appear that these miners made a little extra money by the sale of lambs and wool. Goats, which are more hardy than sheep, and also give milk, were common all over the lead dales. (59)

In the late eighteenth century and early nineteenth century vast amounts of land in the mining parishes were enclosed by private Acts of Parliament. (60) These Acts were the result of pressure from the large landlords in their desire for the improvement of their estates and more efficient agriculture, and not because of the wishes of the smallholders. The effect of these Acts however does not appear to have been entirely contrary to their interests, as the amount of land available for settlement was increased without, apparently, any mass expulsion of smallholders to engross estates. Farming efficiency was stimulated, particularly in the nineteenth century. Sufficient common, or stinted pasture, remained to satisfy the needs of the inhabitants for grazing and fuel. Against this there appears to have been a gradual decline in the numbers of small free- and copy-holders, and the transfer of their tenures into leaseholds.

(59) Teesdale Mercury - Tales and traditions. [c.1885] p. 164.

(60) The chief parishes involved were enclosed as follows:-
 Hexhamshire and Allendale commons
 date of Act, 1792: date of Award, 1800.
 Weardale (mainly Stanhope parish)
 date of Act, 1799: date of Award, 1815.
 Alston and Garrigill
 date of Act, 1803: date of Award, 1820.
 Middleton
 date of Acts, 1804 & 1834: date of Awards,
 1816 & 1841.

The basic pattern of farming was not changed by enclosure. It was impossible, in these upland dales, to keep animals without some land enclosed. The enclosed meadows were needed to provide hay in the summer, and as a winter pasture. The open moors would not support animals all the year round. There was consequently much demand for enclosed land by the increasing population of the dales in the late eighteenth century, without any legal method of satisfying it other than by the fragmentation of existing small-holdings. After enclosure the amount of land available to serve as meadow and winter pasture increased, and the number of settlements increased with it.

The terms of enclosure varied from Act to Act in minor details, but were sufficiently identical in the lead mining parishes to enable them to be discussed as one. (61) In each parish, land "best situated and most capable of Cultivation and Improvement" was to be set out and allocated to those already possessing right of common in proportion to the amount of land they owned, whether by free or copyhold. If land had been encroached from the common by a landowner in the past, it was to be regarded as his if he had held it for thirty years (that is, in Alston and Weardale; in Allendale the time was fifty years) without legal challenge; if, after examination by the Commissioners executing the terms of the Act, it was discovered that the land had been held for less than this period, it was to be given to the holder as part of his share of the land to be

(61) This account is based on an analysis of the Acts for Allendale, Weardale, and Alston.

divided, providing that it was not more than his fair share. The land which was left unenclosed was to be stinted pasture - stints, or grazing rights, were given to each landowner in proportion to the amount of his holding. These stints were calculated by the enclosure Commission to ensure that the moors were fully grazed, but not overstocked. Smallholders in Allendale and Weardale could receive either land or stints if they so wished. In Alston they could receive a monetary settlement instead if they wished to do so. The Commissioners were empowered to lay out routes for roads. All the allotments had to be fenced or walled within a certain period of time. Left for common use by landowners and their tenants were quarries for stone and lime. Peat could still be gathered from the stinted pastures, and the mineral rights of the lords of the manor over each parish were not affected by enclosure.

The immediate physical effects of the Enclosure Acts and the awards resulting from them were the building of many miles of stone walls, and a great impetus to road construction. The effect on the population was less obvious. In 1811, the London Lead Company chief agent wrote of Alston Moor that "the division of the Commons has brought the Country into a state of the most abject poverty". (62) Enclosures were a subject as hotly debated by contemporaries as by modern historians, and one man's opinion is not sufficient evidence on which to make any sort of judgment.

In the papers of the Commissioners for Allendale (63) there

(62) L.L.C. 16a. April 13th, 1811.

(63) Thomas Bell Collection, Newcastle University Library.

is a letter dated April 7th, 1799, from Peter Mulcaster, the Greenwich Hospital agent, who owned land in Allendale, making much the same statement as the Company agent; with it is the draft of the letter from the Commissioners, attempting to rebut the charge, and successfully pointing out the probable exaggeration in Mulcaster's claims for the productivity of his land before enclosure. Mulcaster possessed land which was let to four tenants, at a total rent of £38. a year. The four tenants concerned had eleven cows between them, and one horse each, together with a small number of sheep, with "no other Pasturage for either Cows, Horses, or Sheep except the Common". He had hoped that after the division he would have received, together with a small allotment, as many stints as were necessary "for as much Pasturage as the Farms would winter". In fact, he alleged, the allotment he received was much smaller than expected, and the stints far too few for this purpose, and his land would no longer be able to support as many animals as before enclosure. "I cannot help thinking myself worse used than any other tho' a complaint from most of them is made." Another piece of land he owned in Allendale received only $3\frac{3}{5}$ stints (enough for two horses); this was tenanted by "an Ore Carrier of Langley Mill who has always kept from Eight to Ten Galloways grazed upon the Common in the Summer Season, but now as soon as the Award is settled you see that must be over, he can keep no more Carriers and, I fear, it will be the same with nearly half of the present Ore Carriers".

These charges were answered in a letter from one of the

Commissioners, John Fryer, dated April 11th. He pointed out that Mulcaster's ancient estate contained only 35 acres of poor ground, and questioned whether in fact it could ever winter the stock Mulcaster claimed his tenants possessed. With regard to the size of the allotment, Mulcaster had received "for your estate of 35 acres we have given you 55 acres of the best and most convenient Common that we could possibly find, and 14 stints upon the undivided part". With regard to the other estate let to the "Ore Carrier of Langley Mill, who has always kept from 8 to 10 Carrier Galloways - This Estate contains 13 acres - 10 acres of which is the worst land in Allendale; for this we have allotted you 16 acres of Common, part of which is considerably better than the Inclosed Land." In a subsequent passage he quotes Mulcaster's letter saying that the "Division of Allendale Common will be a very great loss to the small proprietors of Lands there... I know the fact to be exactly contrary - I am convinced there is not a single small Proprietor in Allendale (yourself not excepted) but what will be considerably benefitted by the Division: this is my assertion against yours."

This exchange of letters illustrates the passions that were raised by Parliamentary Enclosure. Fryer's letter appears to be a convincing reply to that of Mulcaster, who almost certainly exaggerated the amount of stock his land was previously capable of supporting. If the figures he gives for the stock were correct his tenants would be losing a considerable amount of grazing on the commons which remained unenclosed, because of the stintage limitation. In Allendale one stint represented one cow:

or five sheep; or eight lambs. Two stints were needed for each horse. But as Fryer wrote, it was highly unlikely that Mulcaster's tenants, particularly the Ore Carrier, could have wintered the stock he claimed on their small holdings.

There is no evidence that the original enclosure Acts forced small free and copyholders to sell their land. In the terms of the Acts they were offered the choice between land and stints if they so wished, but there was no compulsion. The expense of walling, often alleged as a cause of great hardship to the poorer freeholders, may have caused some difficulties, but the miners had the free time available to perform this task themselves, and there were plentiful supplies of stone. .

There was one important source of loss to the smallholders which it is unfortunately impossible to estimate. This was the question of encroachments upon the commons before enclosure. In Allendale, the agent of the Lord of the Manor, Thomas Richard Beaumont, gave to the enclosure Commissioners a vast list of objections to certain pieces of land being recognised as the property of those who occupied them. The list totalled 136 items, the great majority of which were in the hands of smallholders. The encroachments varied from a "dwelling house in Allendale town" to individually named fields. This list shows how the Allendale commons had been encroached upon before Parliamentary enclosure. Presumably the same state of affairs occurred on all the commons in the lead dales. The extent to which these objections were upheld is unfortunately not indicated in the surviving manuscripts. If the encroachment had taken

place more than fifty years previous to the Act it was admitted; if subsequently it could be included as part of the free or copyholder's allotment. If, however, the encroacher had no other land it would have been taken from him completely. It is possible that this form of confiscation was what the London Lead Company agent was referring to in the quotation already cited alleging hardship on Alston Moor as a result of the enclosures.

Most of the land enclosed was allotted to the large land-owners in each parish. The maps of Allenheads reproduced ^(Plates 8 & 9) show what happened to these large allotments in the nineteenth century. They were broken up among smallholding tenants. The estate survey of 1861 shows that not only were more isolated individual cottages built within the new smallholdings thus created, but also fields away from their houses were leased to those actually living in the village settlements of Allenheads and Coalcleugh.

In the nineteenth century in Allendale there was pressure for further enclosure of the remaining commons by the landowners with large or medium sized estates. Sopwith noted in his diary the occurrence of many meetings on this subject in the eighteen fifties and sixties, and noticed the increased pressure by the larger landlords to buy up the estates of the smaller ones after 1850. In Allendale Parish in 1829 there were 236 stinholders, 212 having less than 20 stints, and 179 having less than 10. In 1851 there were 205, 149 having less than 10 stints. By 1856 the total number of stinholders had gone down to less than

180. (64) But in that year W.B. Beaumont resisted the calls for a new enclosure Act. The owner was naturally against curtailing his mineral rights, even in a minor way, and grouse shooting, an increasingly popular sport of the Victorian gentry, would be hindered by new enclosures. The smaller stintheolders were united against further enclosure. They did not want the trouble and expense of walling, and the smaller the area of open moorland became, the smaller also became the area where they could dig peats and quarry building stone. (65) In 1871 a Bill for further enclosure in Allendale, that would have compelled stintheolders whose number of stints did not exceed 30, to sell them to the highest bidder, was presented to Parliament. It was not, however, passed.

Enclosure did result in a reduction in the number of free and copyholdings. But, as the land was mostly unsuitable for large scale farming, this did not mean the wholesale dispossession of smallholders, but great increase in the number of leaseholders. The 1861 surveys of the Beaumont lands in East and West Allendale and Weardale show that nearly the whole of the upper parts of each dale were let to smallholders. Fragmentary evidence for Teesdale and Alston Moor shows that the same condition existed there.

The enclosures also stimulated the practice of good farming among the smallholders. By the nineteenth century there were three distinct types of land in the lead dales. First and

(64) Sopwith, T. - Diary. Aug. 16th, 1856.

(65) Sopwith, T. - Diary. Aug. 6th, 1856.

greatest there was the vast area of unenclosed and uncultivated moorland, surrounding in horseshoe shaped belts all the dales. Coming down the hill slopes there was a second belt formed of rough pasture grounds. Then, in the bottoms of the valleys, and reaching up the slopes on either side, there was meadow land, producing one crop of hay per year, and providing some winter pasture. After enclosure, and more particularly after the mid-nineteenth century, there was a concentrated effort on the part of many of the smallholders to transform their holdings from the second class of land into the third. Most fortunately, D. Macrae, in an article in the Royal Agricultural Society Journal for 1868 entitled the Improvement of Waste Lands, gives a detailed account of the methods used in improving lands in "one of the lead-mining districts of Northumberland" which, from internal evidence, must be Allendale. (66) The account refers to a period fifteen years before it was written.

The writer describes the contrast between the reclaimed and unreclaimed lands, although their soil was basically similar. "The process of reclamation consisted in burning and pulling the heather, paring off and burning the turf, and spreading the ashes thereof on the land. The draining, which was done with stones, only aimed at the removal of springs... A good dressing of lime was applied, as much as from 5 to 10 cart loads to the acre. Where peat-earth or any other good earth could be got conveniently, it was mixed with the lime to make a compost, and cowhouse manure was afterwards used." Some fields were also

(66) Vol. 4, 1868. pp. 321/334.

covered with a network of trenches, 3 to 4 feet deep. The result of all this work was greatly to increase the crops of hay the fields would grow, and to enable the stock of the smallholding to be correspondingly increased. Macrae noted that some fields had been treated in this way some fifty years before (i.e. shortly after the enclosure Act) but that work was still going on at the time he was in Allendale.

Similar work was done in the other dales, particularly in Upper Teesdale. In 1881 a Government Commissioner noted that "land so reclaimed originally worth 1/- to 3/- is now worth 20/- to 25/- an acre", and that it would "certainly graze three times the (previous) stock, and not only so, but the class of animals that can be kept is very superior". This "remarkable improvement" had taken place mainly in the previous twenty years. In Weardale, the Commissioner said, the process of reclamation had not gone nearly so far. (67)

This improvement in farming methods in the nineteenth century was matched by such external factors as better roads and new railways. In addition by the mid-nineteenth century there were energetic agricultural societies in all the districts, which were supported with great enthusiasm. Thomas Sopwith was constantly noting in his diary that he had given addresses at either the Allendale or the Weardale agricultural society meetings. The London Lead Company encouraged such societies in Teesdale and on Alston Moor.

(67) Depressed condition of the agricultural interests, Royal Commission Report. (Durham by Coleman.) 1881, p. 228.

During the rapid decline of lead mining in the eighteen seventies and eighties smallholdings gave the miners some sort of protection against the severity of the times. Undoubtedly the existence of such small farms made migration a particularly heartbreaking decision. But the smallholdings were essentially a part-time occupation only. Older members of a family unit might give all their time to farming, but no monetary income was produced by their labour. And, as will be shown in the next chapter, only a portion, and that not the largest portion, of a lead mining family's food could come from its smallholding. The existence of his small farm then, made no ultimate difference to a miner whose main occupation had gone. Unless he was fortunate enough to obtain alternative employment in the district, he had to emigrate from it. "When... the depression of the lead trade... set in, many of the small farms became rather a burden than otherwise to their occupants, who were compelled to find employment too far away from their homes to enable them to return there each day, and were consequently given up. The result is that one individual may now be found farming a combination of holdings which were formerly occupied by seven or eight different tenants." (68) This description is of Allendale at the beginning of the twentieth century, but the same state of affairs occurred in all the lead dales, and some of the very highest land was completely abandoned. The lead mining settlement pattern of smallholdings, however, has greatly influenced the twentieth century development of the former lead area. Smailes, in the

(68) Dickinson, G. - Allendale and Whitfield. 1903. p. 2.

early nineteen-thirties, showed that the percentage of agricultural holdings under 50 acres in size in the lead dales was far higher than that in the Cheviot dales. He also stated that "It is a really remarkable feature of social life in these dales how almost all of the labouring class families of old standing are found to keep a few cows in addition to their 'regular' occupation. Lead mining has left as its heritage the tradition of part-time farming." (69) In 1962 Thompson, studying the Durham dales, found that though there were still "many holdings of uneconomic size", the number of holdings had decreased sharply since the thirties owing to amalgamations. (70) This trend seems likely to continue until most traces of the earlier mode of settlement disappear.

By 1860 most miners without smallholdings had gardens. In Baker and Tate's New flora of Northumberland and Durham, published in 1868, there are lists of the plants found growing at unusually high altitudes. The authors comment on the remarkably high ground on which they found cultivated plants in the lead dales, contrasting greatly with the meagre heights reached in the Cheviot dales. (71) A smallholder at just below 2000' in Upper Teesdale was found to be growing rhubarb, potatoes and turnips "in the hollow of a disused limekiln". In Allendale, at over 1600', were found, in addition to the above, cabbage, lettuce, onion, carrot and other vegetables, together

(69) Smailes, A.E. - The dales of Northeast England. 1932.
App. IV and p. 125.

(70) Thompson, D. - Rural Geography of the West Durham Pennines. 1962. Fig. 32.

(71) pp. 64/66.

with such fruits as plum, raspberry, and currant bushes.

Vegetables, therefore, would grow at these altitudes, and were in fact grown there by 1868. It is not, however, clear for how long gardens had been commonplace in the area, nor the proportion of miners who had an opportunity to cultivate one.

It has been impossible to discover any eighteenth century evidence on these points. The earliest evidence is contained in the returns to a questionnaire of the Poor Law Commission of 1834. One of the questions, directed to the officials of selected parishes, asked to what extent the cottages possessed gardens. In the Forest district of Middleton parish (Upper Teesdale) the answer was - "None; gardens seldom pay for the seed and labour in this Siberian clime." In Stanhope parish about half the cottages were thought to have gardens, and in Alston parish "very few". (72) In 1842 Dr. Mitchell said of Weardale that "very often there is no cabbage-garden attached to the miner's cottage, but sometimes there is". (73) This evidence, although scanty and unsatisfactory, does suggest that gardens were either non-existent or uncommon amongst the miners in the early nineteenth century, and if this was the case at that time, then it must also have been true of the eighteenth century.

By the eighteen sixties gardens seem to have been much more common. Bainbridge told the 1864 Commission that "in order to compensate such of our men as have not farms we endeavour to

(72) Poor Law Commission Report. 1834. Sections B1-2-98B/149B/160B.

(73) 1842 Report (Mitchell.) p. 748.

provide them with gardens". (74) All of the London Lead Company cottages in Nenthead and Middleton had gardens attached. (75) Dr. Peacock, in his evidence to the 1864 Commission, remarked of the miners in Teesdale that "there are comparatively few of them who have not the opportunity of cultivating a garden". (76) The 1861 survey of the Beaumont estates in Allendale shows that, in the Coalcleugh area, of the 19 houses without smallholdings, 5 only had gardens. In the Allenheads area the figure was much better: 34 of the 38 houses without smallholdings had gardens attached.

From the scanty evidence about gardens available therefore, it appears that there was a decided growth in the number of houses with gardens in the nineteenth century. This growth, of course, coincided with the decrease in the relative number of houses with smallholdings or grazing rights on the commons. The Enclosure Acts made it easier for land to be made available for gardens than in the eighteenth century.

To obtain comfortable living conditions in the damp cold climate of the lead dales the inhabitants required plentiful supplies of fuel for fires. Wood was far too rare and valuable a commodity for household burning, so the main fuels used were coal, peat, and a poor quality coal found in the lead districts known as *craw*, or *crow coal*.

Peat and *craw coal* were the usual fuels in the upper Pennine

(74) 1864 Report (Vol. 2.) p. 380.

(75) Raistrick, A. - Two centuries. 1938. pp. 31/32.

(76) 1864 Report (Appendix.) p. 18.

dales in the eighteenth century. (77) Coal from outside the district was only used when weather conditions made it impossible to obtain burnable peat. The Allendale smallholders, mentioned by Mulcaster in his previously quoted letter protesting about the enclosure award, used their galloways to "lead peats... which being their sole Firing except in a year such as the last before this was when they could not get them Dry were therefore with their Galloways obliged to fetch Coals from your Colliery at Stubbick, which is the nearest Colliery they have". (78) In the nineteenth century roads improved, and the cart, rather than the pack-horse became the normal means of transport. By 1842 the inhabitants of the Durham dales, those nearest the coal mines, were abandoning peat for good coal.

On Saturday in Weardale were to be seen "many carts, conducted by miners, loaded with coal, for which they had gone to the nearest pit on the edge of the coal country". (79) By 1872, according to a Weardale writer, coal was uniformly used in the dale, supplemented occasionally by a few peats.

Peat was dug all over the moors, and the Enclosure Acts safeguarded the rights of the inhabitants to dig peats on the remaining unenclosed land. Their rights to obtain craw coal were also upheld in the Allendale and Weardale enclosure Acts; in the Alston Act it was laid down that this coal was only to be used for lime burning, and not for domestic purposes. This prohibition

(77) Bailey, J. & Cully, G. - Agriculture of Northumberland, etc. 1813. p. 168.

Bailey, J. - Agriculture of Durham. 1813. pp. 265/266.

(78) Thomas Bell Collection, Newcastle University Library.

(79) 1842 Report (Mitchell.) p. 722.

was apparently disregarded as the 1872 account cited above explicitly mentions that *craw coal* had previously been extensively used in the village of Nenthead. This account, by a local writer and historian, W.M. Egglestone, has a lengthy description of how this poor quality coal was mined and used "Thirty or forty years ago." The miners cut tiny levels into the hillside to get the coal. It was then manufactured into what were known as "cats". It was first crushed small and was put on the floor of the "Cat-house", "an outbuilding erected purposely to keep the cats in during the winter, frost being injurious to cat material". With the coal was then mixed a quantity of blue-clay, in a proportion of two parts of coal to one of clay. The two were then thoroughly mixed by a female "cat treader" who trampled it for hours in heavy clogs. When a fire was made it was started with dried heather and peats, and then kept going with the cats, moulded into balls "about the size of the common kitchen garden turnip". Egglestone says that once the fire had been lit it was normally kept alight all through the winter. (80)

The journey to work for many of the miners was often very considerable. Their homes were spread over the inhabitable part of the dales: the mines were mainly at the heads of the rivers on the very edge of, or far beyond, the cultivable areas. The older villages - Alston, Allendale Town, Stanhope, Middleton, - were at quite considerable distances from the main workings. The newer villages, - Allenheads, Coalcleugh, Nenthead, Hunstanworth, - were at the level mouths, but only Nenthead was of any

(80) Egglestone, W.M. - Weardale nickstick. 1872. pp. 85/88.

considerable size. Most miners, even in the mid-nineteenth century, lived in scattered dwellings, valuing their small-holdings more than easy access to their place of work. One Alston Moor miner questioned in 1842 described the distances he walked every day - "I work at the mine Harehope Gill, three miles and a half off; I have to walk there and back in addition to my work. We have to descend a shaft by ladders from one stage to another; I have to go down near fifty fathoms by about twelve ladders altogether." (81) This was a fairly typical distance for men who lived at home, though some walked much longer distances. Many miners, however, were forced to lodge away from their homes during the working week, and return to them only at weekends.

In the eighteenth century most miners lived in accommodation near the mines during the working week. Bishop Pococke, in 1760, described the miners on Alston Moor as regularly setting off on Monday carrying "their provision for the week to the mines".(82) The habitable area at this time reached less far up the dales than in the nineteenth century. Mines tended to be small, and "trials" at new places frequent. A "shop" for the accommodation of miners was one of the first things constructed on the new site by large concerns and tiny partnerships alike. (83) Lack of evidence prevents a detailed consideration of the eighteenth century conditions. There is no reason, however, to think that they were very different from those prevailing in the nineteenth

(81) 1842 Report (Mitchell.) p. 761.

(82) Pococke, R. - Northern Journeys. (Surtees Society Publication, Vol. 204, 1914.) p. 209.

(83) e.g. Swinhope in East Allendale, B/B 133. Aug. 22nd, 1753.

century, for which there is a fairly considerable amount of evidence, particularly in the 1842 and 1864 Reports.

The development of the Derwent mines at Hunstanworth between 1842 and 1864 illustrates the growth of a mining settlement. In 1842 the chief agent of the Derwent mines told the Commissioner that some of the workers lived in Blanchland parish, but that many came from "Stanhope and Allendale, 10 miles off" and lived in lodging shops during the week. The Commissioner himself remarked that around the mines "the fell is altogether uninhabited". (84) By 1864, however, most men lived near the mines, in the new village of Hunstanworth, and there were a sufficient number of cottages in the district for lodgings to be provided privately for any men who came from outside.

This growth of a settlement around an established mine did not always happen. At the small Stonecroft and Greyside mine west of Hexham, near the Roman Wall in 1864, miners were "what they call wallet men, that is men who carry wallets, from Alston and Allendale". There was one "shop" and a number of lodgings available in the neighbourhood. The company had built two cottages near the mine for any "Wallet men" who cared to take them, but, "we have had a great deal of difficulty in letting them; the men prefer going elsewhere". (85) In this matter of lodgings there was a contrast between the different dales, and at different periods within the same dale. In the two Allendales in 1842 and 1864 there were no "shops" at all. Most men lived at

(84) 1842 Report (Mitchell.) p. 722 & 758.

(85) 1864 Report (Vol. 2.) p. 355.

their own homes throughout the week, as the mine entrances were within the settlement area. For those that did not there were plenty of lodgings available in private houses. At Coalcleugh in 1864 - "They have to go a short distance; they come down the country about two miles or so, and they get to their own homes at night." (86) Ten years later, however, the mining area had changed, and miners who had been conveniently placed for working in one mine now had to lodge away from home to work at another, as the veins in the former mines had become exhausted. It was written of Coalcleugh in 1871 that "the mines which used to be so prosperous here, are now very poor, so that many miners have had to remove with their families, and others go and work all the week in other mines, and only come home from Saturday till Monday". (87) This exhaustion, sometimes temporary, sometimes not, of an individual mine was a common and frequent occurrence. It would have discouraged many miners from moving house simply to be near their place of work, as there was never any guarantee of continued employment.

In Weardale and on Alston Moor some mines were fairly near inhabited areas, others were further away. Lodging shops were not necessary along the main length of Weardale above Stanhope, save at the very top of the dale, and at isolated tributaries such as Rookhope and Killhope. On Alston Moor the large settlement at Nenthead supplied the labour needs of the biggest mine. Other mines were more isolated. At Rodderup Fell, on the slopes

(86) 1864 Report (Vol. 2.) p. 539.

(87) Spar from the high flat. 1871. p. 31.

of Crossfell in 1863, "many of our men are living at considerable distances; some live at Alston, and some up at Garrigill... but we have a rule that if they live more than a certain distance from the mine they must lodge either at the mine or in the neighbourhood." (88)

The shallow valley of the Tees above High Force made settlement impracticable around the most important mines in Teesdale. In 1864 more than two thirds of the London Lead Company's labour force in Teesdale lived in lodging shops during the working week. Houses around the mines were limited to the mining offices; the land was too barren and exposed to permit any private settlement.

The types of accommodation available for those miners living away from home were, firstly, lodgings in private houses: secondly, inns or boarding houses; and lastly, "shops" specially constructed by the mining companies for this purpose.

Private house accommodation was only available around mines where there were settlements. Allenheads and Nenthead were the prime examples of such settlements. In 1842 "the usual price is 6d. a week each, for which there is a bed between two of them, leave to make their crowdy on the fire in the morning, and they have their potatoes boiled for them in the evening". (89) By 1864 the normal price for a working week's lodging had risen to 9d. or 1/-, the lodgers still being responsible for finding their own food. The 1864 Commissioners found that this lodgings system was the main cause of any overcrowding that existed, but

(88) 1864 Report (Vol. 2.) p. 339.

(89) 1842 Report (Mitchell.) p. 740.

without building large quantities of new houses the companies could do little about it. As R.W. Bainbridge, the chief agent of the London Lead Company, said, "We find it needful to be blind occasionally." (90) The Rodderup Fell Company, however, had deliberately constructed houses "built larger than they would have been; they are better houses, in order to facilitate the taking in of lodgers". (91)

Large scale private provision of accommodation for miners in the shape of proper inns or boarding houses was unusual. Even in the eighteenth century mine owners were most unwilling for such houses to be associated with the sale of drink. In 1766 one of the Blackett agents requested "that in case Sir Wr. Blackett will give him a piece of ground anywhere in Killhope he will build a house upon it for his nephew... to serve both as an alehouse & a house for miners etc., to lodge in". Sir Walter was inclined to grant the request, but insisted on "his power to put a stop to selling Ale whenever he thinks proper under forfeiture of the Lease." (92) In the 1842 and 1864 Reports there seem to be no arrangements of this sort in operation, at least in the Beaumont and London Lead Company areas. All lodging houses were run directly by the mining companies - and in the case of the London Lead Company the penalty for introducing any alcoholic liquor was instant dismissal.

Lodging shops were established by the mining companies in

(90) 1864 Report (Vol. 2.) p. 380.

(91) 1864 Report (Vol. 2.) p. 339.

(92) B/B 48. June 25th, 1766.

all the areas where there was an insufficiency of private accommodation, in both the eighteenth and the nineteenth centuries. For the smaller mines the shop might be a building containing an office and a blacksmith's forge within two rooms, as well as sleeping accommodation. Many of the eighteenth century shops (for which there are no extant descriptions) must have been of this nature. (93) In the nineteenth century the two largest concerns built barrack-like buildings of two stories, purposely to serve as sleeping accommodation for their miners. In both the 1842 and the 1864 Reports there are many descriptions of these shops, the condition of which raised the ire of Assistant Commissioner Mitchell more than any other feature of lead mining life. (Plate shows the outward appearance of a shop.)

He gives a precise description of one shop he visited in Upper Weardale, presumably owned by the Beaumonts. It consisted of two rooms of identical dimensions, 18' x 15', one above the other. The lower room had two windows in one wall, and a large fire at one end of the room. Down the middle of the room was a long table, and some benches. Along one wall were 48 small cupboards, some lacking their doors, but most with them, and padlocked. Hooks and nails were provided for clothing. There was also a quantity of cooking utensils. The upper floor was reached by a ladder. It had no windows nor any other form of ventilation. There were altogether 14 beds, arranged bunk

(93) J.W. Allan describes a shop like this at one of the smaller mines on the slopes of Crossfell as late as the eighteenth seventies. - North country sketches. 1881. p. 46.

fashion, one above another. Each bed was about 6' long by about 4½' wide. Each was intended for at least two persons, with possibly a boy sleeping across the foot as well. Other shops he visited were similarly designed. "Though the beds had not been occupied for three preceeding nights the smell was to me utterly intolerable. What the place must be in the summer's nights is, happily for those who have never felt it, is utterly inconceivable. . . I should think it no hardship to have to remain 24 hours in a mine, but I should be terrified at being ordered to be shut up a quarter of an hour in the bed-room of a lodging shop." (94)

The Commissioner would probably have found it nearly as distasteful to be shut up in the bed-room of many private houses in the area in 1842. But the lodging shops do seem to have been especially bad; many of the statements of individual miners express as much abhorrence as the Commissioner. "The lodging shops are never washed; the beds and bed clothes are washed once or twice a year, being taken home by the men." (95) Accommodation was free, the fire and the furniture being provided by the owners, as well as the building: the miners provided their own bed-clothes and cutlery. (96)

By the eighteen sixties the lodging shops of the larger companies had improved considerably, possibly as a result of the comments in the 1842 Report. Ventilation was adequate in all the

(94) 1842 Report (Mitchell.) pp. 740/742.

(95) 1842 Report (Mitchell.) p. 770.

(96) 1864 Report (Appendix.) p. 20.

bedrooms. By 1861 the London Lead Company, whose shops seem to have been as bad as those of any other Company in 1842, had added "A library and reading-room at each mine-shop, and it is one of the rules that a portion of Scripture be read, and prayers offered at the most convenient hour every evening." (97) More materialistically, a flow of water was also available at all the Company's shops, but two men to a bed was still the rule.

The five day week in operation for the miners meant that they were able to have two complete days at home every weekend. They set off, with their week's provisions, early on a Monday morning, and returned on a Friday evening. Some mines, where night shifts were worked, allowed their men to leave in the middle of Thursday night, and so have even longer at home. The washer boys worked on Saturday morning shifts, and so they had less time at home than their fathers. (98)

The settlement pattern in the lead mining area of the North of England was based on a system of smallholdings. The altitude and poor soil of the area meant that there was no competition for the land from full time farmers. In other parts of England where a mining industry was located in poor agricultural land, such as in the Yorkshire and Derbyshire Pennines, a similar system developed. In Cornwall there was an insufficiency of suitable land and, by the nineteenth century, although some miners possessed smallholdings most of them lived in villages

(97) Popular Education Commission Report. 1861. (Vol. 2.) p.373.

(98) 1842 Report (Mitchell.) pp. 740: 758.
1864 Report (Vol. 2.) p. 355.

close to the mine. The lodging shop was unknown there; if a miner was forced to live away from home there was always lodging in a private house available near his place of work. The Durham colliers, working at mines situated in the middle of good agricultural land, lived in villages near to, or around, the pit. In the nineteenth century the pressure of an increasing population on the limited area suitable or available for settlement forced more lead miners to live in villages, but these remained a small proportion of the whole.

CHAPTER 8.Food and its Supply.

In spite of the part time agricultural activities of the lead miners the mining region was not self sufficient with regard to food. Its altitude prevented the growing of cereals, and despite its rural appearance it was an industrial area into which most foodstuffs had to be brought from outside.

In 1797 Eden published three examples of the expenses of lead miners; one of a family in Weardale, the other two of families in Nenthead. (1) These show an interesting uniformity in the relatively high amount of expenditure devoted to food. The Weardale family had a gross expenditure the previous year of £34.14.0., of which £27.2.0. was spent on food. The first Nenthead family spent £34.10.0. out of £44.0.0. on food, and the second £40.0.0. out of £48.0.0. In a similar budget of the family of a man employed by the London Lead Company, the 1842 Report cites a weekly expenditure of 7s.7d. on food out of a total of 9s.1½d. (2) These figures suggest that about 80% of each family's income was spent on food. Eden also published what he described as "the usual annual expenditure... of an agricultural labourer in the county of Cumberland". (3) This quotes a total annual expenditure of £18.18.6., of which £13.4.6., or slightly less than 70%, was devoted to food. The labourer quoted appeared to buy all his food, and not to receive

(1) Eden, Sir F. - State of the poor. 1797. Vol. 2. pp.87/89:170.

(2) 1842 Report (Mitchell.) p. 761.

(3) Eden, Sir F. - State of the poor. 1797. Vol. 2. pp.104/107.

any in lieu of wages, as was usual in the parts of Northumberland where the "bondage system" operated. It would be a mistake to draw too many conclusions from these notoriously unreliable "specimen" budgets, but the figures do suggest that lead miners were forced to spend a higher proportion of their income on food than the neighbouring agricultural labourers. The high altitude environment of the lead mining dales virtually prohibited the large scale growing of any vegetable food by their inhabitants. Much of this food, and all cereals, had to be imported from the arable lands further down the dales, and, until the coming of the railways in the mid-nineteenth century, transport costs kept prices high. At the end of the eighteenth century food prices in the rural north of Northumberland, where produce was more than was needed for local consumption were among the lowest in England; in the south-west of the county grain prices at Hexham market were higher than those in the city of Newcastle. (4)

The cost of food is, to a large extent, dependent on the type of foodstuff bought, meat for example being relatively expensive, and cereal foods being relatively cheap. Unfortunately, it is not easy, from the nature of the evidence available, to give a precise history of the content of a lead miner's diet in the eighteenth and nineteenth centuries, or of the changes and developments in diet during that period. There is virtually no evidence before the middle of the eighteenth century, except some rather unreliable memories recounted in such works as Eden's State of the poor. For the remainder of the period, some

(4) Bailey, J. & Culley, G. - Agriculture of Northumberland etc. 1813. pp. 166/167.

sporadic information is available from various sources, such as county agricultural surveys of different dates, the evidence presented to the various Government Commissions, and stray references in the correspondence of the different interests concerned with mining. One important factor that the Government Commissions emphasized strongly in both 1842 and 1864 was the deleterious effect of the poor ventilation in the mines on the appetites of the miners. An owner of one of the smaller mines on Alston Moor stated in his evidence to the 1864 Commission - "I have observed... that when a shepherd comes in off the fells to take refuge from the bad weather and to get his supper in a miners' hut, he will eat at a meal as much as four or five of the miners will eat; their appetite, generally speaking, being so much smaller." (5)

A working miner who had migrated to the coal areas in 1831 but subsequently returned, remarked in 1842 that one of the advantages of being a lead miner was that - "We can work... with less food, and food of an inferior sort from what is required in the coal mines; it is canny work rather than hard; our mines do not excite an appetite like the coal mines." (6) The same miner also noted that the washer boys had very much better appetites than their fathers, who worked inside the mines.

Bread and other cereal foods formed by far the greater part of a lead miner's diet throughout the eighteenth and nineteenth centuries. The grain employed to make bread appears always to

(5) 1864 Report (Vol. 1) p. 780.

(6) 1842 Report (Mitchell.) p. 762.

have been the cheapest available at the time. Writing to Sir Walter Blackett in 1772 about the bread eaten in and around Newcastle, Henry Richmond, his chief agent, divided bread into four classes according to its expense. The first and most expensive was "fine wheaten Bread", which was eaten by the upper classes, and by "the Keelmen and some of the other Workmen in the Coal Works whose Great Earnings set them above Eating any but the finest Wheaten Bread that is made". The second class was wheaten bread of an inferior quality, the third, maslin (a mixture of wheat and rye), and the last, rye bread.⁽⁷⁾ In a subsequent letter Richmond stated that the bread of the miners was "mostly Rye".⁽⁸⁾ This appears to be the earliest direct reference to the nature of the bread eaten in the lead districts, but in the Blackett/Beaumont accounts there are records of the purchase of foreign rye for use by the miners as early as 1728.

From at least 1724 until 1740 corn was regularly purchased in Newcastle for consumption by the lead miners in the employment of the Blackett family. In the ledgers recording its purchase it is usually just described as "corn", without any mention of its nature or quantity. However, for two successive entries in the accounts for 1734-35, the figure is broken down. In the half-year July to December 1734, the miners of Allenheads and Coalcleugh were supplied with 424 bushels of wheat: 2954 of rye: 340½ of pease: and 146 of beans. Thus rye formed about 75% of the food despatched in this period. In the 9 months January to

(7) B/B 48. Dec. 11th, 1772.

(8) B/B 48. March 1st, 1773.

September 1735 Allenheads, Coalcleugh and Weardale were sent 531¼ bushels of wheat: 7112½ of rye: 1235¼ of pease: 426½ of beans: and 796 of barley. Rye then formed about 70% of the total. Rye would appear, therefore, to have been the most used bread cereal, at least in the Blakett mining areas, in the early part of the eighteenth century.

At the beginning of the nineteenth century rye bread was described by Bailey and Culley as being "the most general bread of the labouring people" in the southern part of Northumberland. The description of its making states that "After being leavened, until it gains a considerable degree of acidity, it is made into loaves, and baked in a large brick oven, or made into thick cakes, called 'sour-cakes' and baked on the girdle: the bread is very firm and solid, dark coloured, and retains its moisture or juiciness longer than any other bread we know." (9)

Rye does not seem to have been very extensively grown in Cumberland where the usual bread at this time was made of barley, but Alston received most of its food supplies from Northumberland. Even in Northumberland the cultivation of Rye was lessening, and Bailey and Culley record that although it was formerly the principle grain crop of the county it was, by the beginning of the nineteenth century, grown only on soils suitable for nothing else.

In 1794 the Beaumont chief agent wrote to the Coalcleugh agent that one of the contributory causes of the scarcities of that year was that "the great Impotation of Rye at this Port

(9) Bailey, J. & Culley, G. - Agriculture of Northumberland etc. 1813. pp. 79/80.

[Newcastle] in 1790 and 1791 reduced the Price so low as to discourage the growth of that article, not only in this country but in the Southern Counties, where instead of growing Rye as formerly they now grow Turnips". (10) While this statement may not have been entirely true it is extremely interesting in its suggestion of the increasing difficulty of obtaining English-grown rye by the end of the eighteenth century.

In 1825 the bread of the Allendale lead miners was still described as made "mostly of Rye", (11) and some of the witnesses before the Commission of 1842 still ate rye bread, but a comment by one miner suggests that it was no longer the usual diet - "The London Company, in 1839 and 1840, imported a great deal of rye-corn, and had it ground and sold to the workpeople. The bread did not agree with many, and those who could possibly do without it gave it to the pigs." (12)

The county surveys printed in the Journal of the Royal Agricultural Society in the eighteen forties and fifties scarcely mention rye as a crop in the northern counties; and no example of rye on its own as a bread grain is mentioned by Edward Smith in his report to the Medical Officer of the Privy Council on the food of the poorer labouring classes in 1863. Rye bread, therefore, although it may well have been eaten in the lead dales when eaten nowhere else in England, appears to have been abandoned there shortly after 1841.

(10) Blackett of Wylam Papers, Northumberland Record Office.

(11) Mackenzie, E. - Northumberland. 1825. Vol. 1. p. 207.

(12) 1842 Report (Mitchell.) p. 762.

Maslin bread was being used rather later than bread made of rye on its own. Bailey, writing about 1800, stated that it was the usual bread of County Durham, (13) and in 1834 it was the main food in Weardale and Teesdale. (14) By 1862 Smith found that it had almost vanished from the labourers' diets, but he quotes some examples of farm labourers at Haydon Bridge who ate bread consisting of an equal mixture of maslin and wheaten flours.

The grain that appears to have replaced rye as the main constituent in the miners' bread was barley - at a time when the use of this grain as a breadstuff was dying out elsewhere in England. Barley had been the usual bread grain in Cumberland and north Northumberland throughout the eighteenth century, and in 1797 Eden listed it in his budgets of lead miners in Weardale and Nenthead. In the bread shortages of the seventeen nineties the Beaumonts purchased barley as well as rye for distribution to their workmen. It is mentioned in the evidence to the Commission of 1842. In 1862 Smith found that the use of barley bread had much diminished "even in Northumberland" (15) but it was evidently still the main breadstuff of the lead miners as late as the eighteen seventies. (16)

Wheaten bread, the use of which was almost universal in the south of England by 1800, and in the north by 1850, is scarcely mentioned in any of the sources relating to the food of lead

(13) Bailey, J. - Agriculture of Durham. 1813. pp. 124/125.

(14) Poor Law Commission Report 1834. Section B1 - B2.

(15) Sixth Report of the Medical Officer of the Privy Council. p. 240.

(16) Allan, J.W. - North Country Sketches. 1881. pp. 60/65.

miners. Its price was always too high, even when the coming of the railways brought down the transport costs. Allan records a conversation with Allendale lead miners, sometime after 1870, in which they passionately affirm the superiority of barley over wheaten bread. Conservatism in one's habits of eating is always very potent, particularly when enforced by financial stringencies.

Oatmeal apparently was never used as an actual breadstuff as it was in parts of Westmorland in the eighteenth century, but in the form of 'Crowdy' or 'hasty pudding' it was more frequently eaten than bread itself, right up to the closing down of the mines in the eighteen eighties. Both of these were really forms of porridge - their manufacture is fully described by Eden (17) - and they were eaten with milk, treacle, or butter. Purchases of oatmeal formed a substantial part of the expenditure of all the miners whose budgets are given by Eden, second only to purchases of rye and barley. According to the 1842 Report all the miners ate great quantities of crowdy. A miner stated that - "one man who worked along with me lived for three years on oatmeal and water, and never had anything else, unless the other men gave him bread." (18)

The reasons for this great consumption of oatmeal were that it was both cheaper than bread and more convenient to prepare for men who frequently lived away from their homes for four or five days in a week. The report of the 1864 Commission shows that oatmeal was then still as fundamental a part of the miners' diet

(17) Eden, Sir. F. - State of the poor. 1797. Vol. 2. pp.497/499.

(18) 1842 Report (Mitchell.) p. 772.

as it had been in 1842, although Smith had found that its use had declined greatly in such areas as Derbyshire, where it had previously been an equally important item in the labourers' diet (19) In 1878 the Commission on the Agricultural Distress was told that oatmeal was still the staple food of the agricultural labourer in the extreme north of England - nearly a century and a half after Dr. Johnson's famous definition of oats, which limited their human consumption to Scotland.

In the eighteenth century the bread of lead miners in the Northern Pennines was made chiefly of rye and maslin. Rye was used chiefly in Allendale and Alston Moor, which were supplied from Northumberland, and maslin in Weardale and Teesdale, which were supplied from County Durham. In the early nineteenth century these were gradually superseded by barley bread, when less and less rye was grown in England, although in times of scarcity much rye was still imported from the Baltic by the employers. Oatmeal was eaten throughout the eighteenth and nineteenth centuries, and there is no evidence that wheaten bread ever formed a staple part of the miners' diet. The factor deciding the type of grain eaten was its price. In the eighteenth century (so far as comparative statistics are available), wheat was about twice as costly at market as barley, rye cost slightly less than barley, and oats were cheaper still. For example, in 1767 London prices per quarter were - wheat, between 40/- and 51/-; barley, 23/- to 27/-; rye, 22/- to 23/-; and oats,

(19) Sixth Report of the Medical Officer of the Privy Council.
1863. p. 240.

13/- to 15/- (20) By the end of the eighteenth century rye and maslin had become more expensive than barley at northern markets, (21) and this was probably the decisive factor in enforcing a change from rye to barley in the lead districts. Throughout the nineteenth century wheat was far more costly than barley, which in its turn was more expensive than oats. (22) In the eighteenth century the bread of the lead miners was little different from that of the bulk of the agrarian population of Northern England but by the middle of the nineteenth century it was definitely old fashioned. Sir William Ashley, in his *Ford Lectures for 1923*, notes that although a writer in the south of England discussing agriculture in 1764 thought that maslin bread was extinct, its price was "regularly quoted in the returns of the Hexham market as late as 1841". (23) In his article on bread in the second edition of his Dictionary of Commerce (1840) J.R. McCulloch referred to Eden's statement that wheaten bread was virtually unknown in Cumberland, and added - "Everyone knows how inapplicable these statements are to the condition of the people of England at the present time. Wheaten bread is now universally made use of in towns and villages, and almost

(20) Baker, T.H. - Records of the seasons, prices of agricultural products etc. London. [c. 1880] p. 207.

(21) Bailey, J. & Culley, G. - Agriculture of Northumberland etc. 1813. p. 167.

Bailey, J. - Agriculture of Durham. 1813. p. 265.

(22) e.g. 1820 Wheat 67/10; Barley 33/10; Oats 24/2 per quarter.
 1837 " 55/10; " 30/4; " 23/1 " "
 1864 " 40/2; " 29/11; " 20/1 " "
 1873 " 58/8; " 40/5; " 25/5 " "

(23) The bread of our forefathers. 1928. p. 17.

everywhere in the country. Barley is no longer used, except in the distilleries and in brewing; oats are employed only in the feeding of horses; and the consumption of rye bread is comparatively inconsiderable." The lead miners' bread may have had as much, or more, nutritious value as the wheaten loaf, but it was certainly primitive by Victorian standards.

Potatoes were a very important item of the lead miners' diet from the earliest times, for which there is evidence. They would grow in the gardens of cottages at the highest altitudes and, where those grown at home were not sufficient, they were supplemented by purchase. All the lead mining families whose budgets were printed by Eden bought potatoes. This was at the end of the eighteenth century, by which time the potato had been an established article of food in the north of England for at least half a century. (24) Bailey instances a Durham village where potatoes had been grown as "an article of trade" and their cultivation had been "the principal employment of several families for upwards of eighty years". (25) In the nineteenth century, from the more extensive evidence available, it is clear that potatoes were almost as important a food to the miners as bread itself. During the recession in the early eighteenth-thirties a return to the Poor Law Commission of 1834 described the Alston miners as "subsisting chiefly on potatoes, with a little oatmeal". (26) Nearly every lead miner questioned by

(24) Salaman, R.N. - The history and social influence of the potato. 1949. pp. 508 & seq.

(25) Bailey, J. - Agriculture of Durham. 1813. pp. 165/166.

(26) Poor Law Commission Report. 1834. Section B1 - 2 - 98b.

Assistant Commissioner Mitchell in 1842 named potatoes as forming the chief meal of the day, sometimes eaten with meat, but normally without it. During the shortages of 1794 the Beaumont chief agent told the Coalcleugh agent to "recommend to [the miners] ... that they make use of a mixture of Potatoes with the Rye flour agreeable to the enclosed Receipt, which makes wholesome good bread." (27) Whether the miners heeded this recommendation is not recorded, but in normal times they preferred their potatoes either boiled, or made into a form of pie, and not mixed with flour.

Other fresh vegetables were probably eaten according to whether the miners possessed gardens or not, and only occasionally purchased. It is probably for this reason that they are not mentioned in any of Eden's budgets. In the seventeenth and eighteenth centuries the Allendale market was supplied with fresh vegetables from the Hexham area but the amount sent was apparently inconsiderable compared with what was sent to Newcastle. (28) This contrasts with Hexham's grain crops, most of which at this time went to Allendale and Alston Moor. Fruit and vegetables could be grown at remarkably high altitudes in the lead dales but full advantage was not taken of this until well on in the nineteenth century. In the eighteenth and early nineteenth centuries gardens were rare, and green vegetables were presumably equally uncommon, for there would be little money to spare for their

(27) Blackett of Wylam Papers, Northumberland Record Office.

(28) Bailey, J. & Culley, G. - Agriculture of Northumberland etc. 1813. p. 175.

purchase, and they were not regarded as an essential article of diet. By the mid nineteenth century, however, gardening was actively encouraged by the owners of the mines, and it is probable that most families either grew their own vegetables or had access to a local supply sometime during the year.

Milk, butter and cheese were similarly available for those mining families which possessed cows or goats. Nearly all the men and boys questioned in 1842 drank milk every day with almost every meal. Dr. Peacock, one of the medical witnesses who appeared before the 1864 commission, thought that the northern lead miners were "certainly a more robust race" than the Cornish miners, and that this was largely due to the greater amount of animal food in the form of milk that the northern miners consumed. (29)

Fresh meat was a luxury that could only be afforded at irregular intervals, except in prosperous times. Bishop Pococke, who visited Alston at a time when the lead trade was enjoying comparative prosperity in 1760, wrote "they have great markets here for meat every Saturday. From Christmas to Easter they kill weekly twenty calves and four beeves; from Easter to Midsummer 50 calves and 6 or 7 beeves; from that to the first of september 20 sheep and 40 lambs; for six weeks before Christmas 30 beeves and 20 sheep, being the time they lay in salt stores of beef; and at Christmas, 'tis said, they have been known to kill 17

(29) 1864 Report (Appendix.) p. 15.

beeves, 500 sheep, seventy calves, and a 1000 geese." (30)

In less prosperous times meat consumption was very much lower. In 1834, for example, the return to the Poor Law Commission relating to upper Teesdale stated succinctly "They get not Beef now." Even during better times most miners would only have fresh meat once a week, and on holidays. Many of the miners questioned in 1842, if they ate fresh meat at all did so only on Sundays, and in 1864 Dr. Peacock stated that the same state of affairs continued. In 1842 bacon was the meat most frequently mentioned, and it may be noted that this agrees with conditions in other parts of the country, including the south of England; Richard Jeffries stated that the labourer's usual meat was bacon, and "Butcher's meat" only an occasional delicacy. As for fresh meat in the nineteenth century it remained much as listed by Pococke in 1760, goose being the favourite luxury dish in Allendale until at least the end of the nineteenth century. (31)

"Their chief beverages are water and tea" was said of the drinking habits of Allendale miners in 1825. (32) This remained generally true for the rest of the nineteenth century in all the mining areas. The Government Commissioners in 1842 and 1864 commented on the comparative absence of alcoholic drinks from the miners' diet. In the eighteenth century more alcohol had been drunk, and lead miners were not renowned for their temperance. But the growth of Methodism and the increasingly

(30) Pococke, R. - Northern Journeys. (Surtees Soc. Publ., Vol. 204.) p. 211.

(31) Dickinson, G. - Allendale and Whitfield. 1903. p. 59.

(32) Mackenzie, E. - Northumberland. 1825. Vol. 1. p. 207.

puritanical regulations of the largest mining concerns effectively eliminated drunkenness from the region. (33) Tea took the place of alcohol as a stimulant. It was probably drunk as a substitute for milk by members of families without a cow or goat. Tea was purchased by all the families whose budgets were printed by Eden at the end of the eighteenth century, and was mentioned by most of the miners questioned in 1842, although by this latter date coffee was preferred to tea by many of the miners.

Other items of food were locally available to give occasional variations of diet. Salmon and trout from the rivers, and grouse, rabbits and hares from the moors, were there for the poaching. Bees were kept by many of the miners. Bilberries and Blackberries grew wild in the area.

The necessity for a large proportion of the miners to live away from home for four or five nights in the week affected their diets. The food taken had to be such as would remain fresh and could be prepared by the most primitive cooking methods. A washer boy employed by the London Lead Company described his week's food to Dr. Mitchell in 1842 - "I went on Monday morning, and took with me bread, white and brown, potatoes, bacon collop, half a pound, coffee an ounce, and sugar half a pound, and that supplied me till Saturday at twelve. I took with me on Monday three pints of milk, and we kept it up the level a little to preserve it sweet." (34) The only cooking done at the lodging

(33) The whole topic of temperance is treated at length in Chapter 11.

(34) 1842 Report (Mitchell.) p. 766.

shops was the preparation of crowdy for breakfast, and of potatoes and sometimes bacon for supper. However the men who lived at home seemed to eat in much the same manner. Typical was another London Lead Company washer boy - "I get crowdy and milk to breakfast; I get 'tatoes to dinner, and salt, sometimes butter; I take tea for supper and eat bread with it." (35) Another miner said - "A great many miners have oatmeal crowdy to breakfast, which is cheaper than bread. Men who have no cow have no milk to the crowdy, they have only a bit of sugar or a bit of butter." (36) Lunch, taken at about 11 or 12 o'clock, was normally eaten inside the mine and consisted of bread, and possibly a little bacon. The evening meal was again bread with hot potatoes. A better meal, with meat if it could be afforded, was eaten on Sundays.

The methods of cooking appear to have been rather primitive. The medical witnesses before both the 1842 and 1864 Commissions criticised the cooking as being ill-done, and productive of heavy indigestible foods.

The surviving evidence relating to the miners' food is mainly nineteenth century, with a few scraps of information from the eighteenth. What is available, however, does suggest that changes in diet in the century between 1750 and 1850 were less fundamental in the mining area than elsewhere in England. At the beginning of the period the diet of the lead mining families was backward when compared with the condition of labourers in the

(35) 1842 Report (Mitchell.) p. 769.

(36) 1842 Report (Mitchell.) p. 761.

south of England, but not when compared with those in the agricultural north. At the end, however, the lead miner's diet was backward even when compared with that of his agricultural neighbours, and when comparisons are made with the neighbouring pitmen of Northumberland and Durham, it is seen that the lead miners had always fared worse for food. As already quoted, in 1772 the pitmen ate the most expensive bread, and the lead miners, the cheapest. One lead miner questioned in 1842, who had worked in both coal and lead mines, said: "We do not eat so good victuals, nor near so much, nor do we drink so much beer, because we cannot afford to do these things." (37) By this time only wheaten bread was eaten by the coal miners. In Cornwall, however, the miners' diet appears to have been as impoverished as that of the northern lead miners. Barley bread, scarcely any meat, and a heavy reliance on potatoes were reported in 1842, (38) and in 1864 one medical witness thought that the northern miners ate "altogether more fresh animal food than the Cornish miners ordinary have." (39) The Cornish miners did have the decided advantage of plentiful supplies of fresh and salted fish, unknown in the northern Pennines. The Cornish mines were also situated in, or near, food producing areas. In the north, by far the greater quantity of food had to be imported into the mining region from some distance away.

Although many of the miners possessed smallholdings, they

(37) 1842 Report (Mitchell.) p. 762.

(38) Jenkin, A.K.H. - The Cornish Miner. 1927. pp. 249-252.

(39) 1864 Report (Appendix.) p. 15.

could not obtain all their food from this source. Their animals would supply milk and occasionally meat. Their gardens, and these were not common until well on in the nineteenth century, would supply potatoes, and a certain amount of other vegetables and fruits. But basic foodstuffs - the cereals - had to be supplied from elsewhere. Corn was grown at higher altitudes in the lead dales - by full time farmers - than it is to-day, but even so the entire mining population could not be supplied from near-by sources. The existence of this hungry population was very important to the farming economy of Northumberland and Durham. In 1794 the Durham leadmines "make a considerable difference in all the farms at a great distance as the farmer is always certain of a ready market for every article his farm produces, and at the best prices." (40) A farmer from Anick Grange (north of Hexham) questioned in 1829 as to the utility of the proposed Newcastle and Carlisle Railway said that he would not send his corn to Newcastle as he could obtain better prices by sending it to the lead mine districts. (41) At an earlier date (1797) it had been argued that the proposed canal between Newcastle and Haydon Bridge could be used to carry rye from Newcastle for the "poor and labouring persons" in the lead mines. (42)

The various Agricultural surveys and directories of the northern counties give a fairly clear picture of the marketing

(40) Granger, J. - Agriculture of Durham. 1794. p. 21.

(41) Newcastle and Carlisle Railway Bill evidence. 1829.

(42) Bell, J. - Greenwich Hospital Collections, M/S in Newcastle City Library.

arrangements in the lead mining districts before the coming of the railways. Large market towns in the farming land at the foot of each of the lead mining dales acted as suppliers to smaller markets within the actual mining areas. Hexham supplied both Allendale and Alston Moor: Wolsingham - Weardale; and Barnard Castle - Teesdale.

Alston, although in Cumberland, was more closely connected with Northumbrian agriculture than it was with Cumbrian because the roads westward over the Pennines were very bad until the eighteen twenties. (43) The Hartside pass on the road or track, to Penrith was impassable to carts in the eighteenth century, and any food brought into Alston from that direction had to be carried on pack horses. (44) Very little in fact was so brought for the road to Hexham was appreciably better, and it was from there that most of the food came to supply Alston's Saturday markets. By 1829, although Hexham remained the main supplier, more food came from the areas immediately west of the Pennines and around Brampton, which were now made more accessible by the new Greenwich Hospital roads. When railways were constructed the branch line from Haltwhistle to Alston, completed in 1852, encouraged the inhabitants of the former place to expand their market to act as suppliers to the Alston Moor Mines. (45)

(43) Bailey, J. & Culley, G. - Agriculture of Northumberland etc. 1813. p. 262.

(44) Housman, J. - Topographical description of Cumberland. 1800. p. 43.

(45) Broadside posters advertising Haltwhistle market in Northumberland Record Office.

Market day in Allendale Town was Friday. It was sufficiently central to be reached from both Allenheads and Coalcleugh, and there were no secondary markets in these places. It was supplied exclusively from Hexham. After the construction of the Hexham - Allendale railway line in 1858, the market in Allendale rapidly declined, the inhabitants presumably preferring to make their purchases in Hexham. By 1886 it existed "only in name". (46)

Markets in Weardale, which was larger, were more numerous. The Tuesday market in Wolsingham was the largest, supplying the smaller centres, and although east of the lead mining district it was sufficiently far up the dale for many miners to attend in person, even in the eighteenth century. (47) There was a sub-market held at Stanhope, in the middle of Weardale on Fridays, and a further one near the head of the dale, in the heart of the actual lead mining district at St. John's Chapel on Saturdays.

The Teesdale mines were supplied from the Wednesday market at Barnard Castle. "Corn is sold higher here, than in any market in the County, for the consumption of the mining districts to the westward" wrote Bailey in 1809. (48) There was a sub-market every Saturday at Middleton in Teesdale.

Corn was sold to the miners as either grain or flour. In 1829 it was the millers who bought the grain at Hexham market to

(46) Bulmer, T.F. - History of Northumberland. (Hexham Division) 1886. p. 381.

(47) Nicholson, J. - Wolsingham memoranda (in Newcastle Soc. Antiq. Proc., 3rd series, Vol. 2.) p. 208.

(48) Bailey, J. - Agriculture of Durham. 1813. p. 281.

send it to the lead mining districts as flour. (49) In the eighteenth and early nineteenth centuries, however, corn was also bought directly by the miners in the form of grain, and it was ground for them in the corn mills which existed in all the mining dales. The millers were very unpopular in times of shortage, being blamed by their customers for the high price of flour. In a corn riot at Wolsingham in 1795 lead miners destroyed the corn cylinders at the two local mills. (50) All the corn imported into the area by the mine owners was delivered to the miners in the form of grain. By 1840, in Weardale at least, the local corn miller supplied the grain, which was bought by his customers as flour.

The peculiar method of payment used in the lead mining industry virtually forced the miners to live on credit. An unlucky year left the miner owing instead of receiving at the "Pays". In 1840 the Burtreeford (Weardale) millers were praised by a local writer for their generosity in supplying flour to the unfortunate on credit, to be repaid "when fortune changed in their favour". (51) The local retailers adapted themselves to the conditions in the mining industry. The weekly markets were larger and better attended immediately after the payment of subsistence. In 1827 a directory of Durham noted that the St. John's Chapel (Weardale) market was best attended once a month, the Beaumont miners

(49) Newcastle and Carlisle Railway Bill Evidence. 1829.

(50) Nicholson, J. - Wolsingham memoranda (in Newcastle Soc. Antiq. Proc., 3rd series, Vol. 2.) p. 208.

(51) Featherston, J.R. - Weardale men and manners. 1840. p. 17.

receiving their subsistence monthly, but in Teesdale where the London Lead Company employees were paid fortnightly, the Middleton market was well attended once a fortnight. (52) The fairs during the week of the "Pays", that were a great feature in all the dales in the eighteenth and early nineteenth centuries have already been described.

By the mid nineteenth century both the larger mining companies were trying to discourage their employees from relying too heavily on credit. Thomas Sopwith told the Allenheads miners in 1846 to use their increased subsistence money to pay cash for goods, instead of living on credit, as he calculated that they were charged "thirty to thirty-five per cent" more for the credit. (53) More practically, the London Lead Company had already established "ready money shops", in Middleton and Nenthead, where the lessee of the shop was enabled to make use of the Company's transport facilities to obtain supplies, on condition that he would refuse to give credit. (54) In all the lead mining centres the number of shops increased during the nineteenth century, as is shown by the lists in directories of different dates.

The poverty of the lead mining communities together with the extra cost added to food prices by transportation charges

(52) Parson, W. & White, W. - History of Durham and Northumberland. 1827. pp. 270/272.

(53) Sopwith, T. - Observations addressed to the miners. 1846. p. 13.

(54) 1842 Report (Mitchell.) p. 749.
Raistrick, A. - Two centuries. 1938. p. 40.

meant that they were unable to support themselves all the time, particularly in times of national shortage caused by bad harvests. Apart from humanitarian motives the owners and lessees of the lead mines found it to their own advantage to give their employees help in bad times. Wholesale emigration from the area would have been forced on the miners if no help was forthcoming, and the mine owners did not wish to lose their labour. Until the new railways and better roads had lowered transport costs and brought prices in the lead mining area down to a more normal level, that is, to a level more nearly to the national one, by the mid nineteenth century, the owners helped their employees in various ways. Limitations of evidence here mean that we do not know if, or in what way, the smaller lead mining concerns on Alston Moor and in eighteenth century Teesdale aided the working miner and his family. But the Blakett/Beaumont organisation, the London Lead Company, and Greenwich Hospital all have spasmodic references in their records to aid given to their employees to obtain cheaper food. This aid took different forms at different times - regular wholesale importation of food into the district to supply quite a large proportion of the grain needed: occasional supplies in times of acute shortage; and encouragement of the miners to form their own co-operatives, or corn associations to buy corn in bulk more cheaply from Newcastle.

In the early eighteenth century the Blacketts sent large quantities of grain to their miners in Allendale and Weardale regularly every year. From the earliest extant accounts in 1724 until 1740 sums of money are recorded in the accounts every year

as paid for corn purchased in Newcastle, or abroad, to be distributed to the miners at cost price. The figures given often cover unstated periods, but until 1736 between £500. and £1,000. appear to have been spent in this way every year. From 1736 until 1740 the payments diminish, and no record of any payments can be found between 1740 and 1754. The amount of money involved suggests that the Blacketts were obtaining and distributing a sizable proportion of the grain needed by their miners. Certainly, in the years of occasional scarcity later in the century, the sums of money involved rarely approached the annual £500. to £1,000. mentioned here.

For the century following 1740 the mining companies sent grain to the mines only occasionally in times of bad shortage, often at the request of the miners or to avert threatened strikes. During the bad harvests of the seventeen fifties, culminating in the disastrous one of 1756, corn was sent to the Blackett mines. In 1757 a total of £1,041.4.11. was spent on rye imported from Danzig. (55) No record can be found in the Blackett/Beaumont accounts of corn again being sent until 1783 (1782 was another very bad harvest) when small quantities were sent to Coalcleugh, and probably to the other mines as well. In the same year Greenwich Hospital also supplied grain to their workmen commencing the Nent Force Level. In the mid and late seventeen nineties there was a series of bad harvests, and consequent shortages. In the correspondence of the Beaumont chief agent for these years there are many references to petitions from the

workmen for corn to be supplied to them. In december 1794 he received a letter signed by more than a hundred Allendale miners complaining of shortages, and alleging they were being given short measure in Hexham market and by local millers. He wrote to the Coalcleugh agent that he was buying corn in the south of England that should arrive in the following February; this should be distributed to the miners "in proportion to the Number of their respective Families taking care that they have the legal Measure and are not imposed on by the Millers." (56) This was done, but a year later the chief agent wrote to Colonel Beaumont "Notwithstanding what you have done towards the relief of the Miners and Smelters during the time of the high price of Corn (which example neither the Lead Company nor any other Proprietor have followed, that I have heard of) the Miners and Smelters of your Works stopt the Works and some of them... committed some depredations by seizing a Cart with Flour and Oat Meal which they disposed of at their own price..." (57) The reference is to the riot at Wolsingham, where the Weardale miners also damaged two corn mills. The grain supplies continued, however, both before and after the Weardale miners' strike of 1797. The miners were not satisfied with the quantity of food supplied, and in December 1799 the chief agent wrote to Colonel Beaumont:- "Should you have any Application made to you by the Weardale Miners about Corn, they really should not be listened to, for they are the most dissatisfied, troublesome Workmen that you employ and have

(56) Blakett of Wylam Papers, Northumberland Record Office.

(57) B/B 50. Nov. 23rd, 1795.

always been the foremost Promoters of any Mischief that is going forward. I send the Rye up to Weardale as fast as I can get the Carriers to take it, but not content with that they are perpetually coming down, some for two Bushels, others for four, which cannot be complied with." (58)

In 1800 there are records of action taken by the other two large mining concerns. In February the Greenwich Hospital Receivers ordered their Agent at Langley smelt mill to find out "what is doing by the Governor & Co., Colonel Beaumont, etc., for relief of the necessitous at this Time when Corn & all necessaries are so extravagant & dear." (59) In 1796 the Langley smelters had been given a temporary increase of wages on account of high food prices. (60) This time, however, the smelters and the miners employed in the Nentforce Level were sent corn from Newcastle, supplies continuing until after the good harvest of 1801. (61) In June 1800 the London Lead Company spent £500. on corn for their miners in Teesdale and Alston Moor. (62) According to Raistrick, in the same year, the Company purchased an old lead mill near Garrigill and refitted it as a corn mill, the new lessee being instructed to charge fair prices and to produce good flour. (63)

(58) B/B 50. Dec. 11th, 1799.

(59) Adm. 66/100. p. 84. Feb. 7th, 1800.

(60) Adm. 66/99. June 16th, 1796.

(61) Adm. 66/100. Feb. 21st, 1800.

(62) L.L.C. 15. June 20th, 1800.

(63) Raistrick, A. - Two centuries, 1938. pp. 35/6.

After 1801 corn prices dropped, and the lead industry itself entered on a temporary phase of prosperity. By 1808 the demand for lead was again falling, but it was not until 1816, after another disastrous harvest that there was a renewed demand for corn supplies from the miners. On Dec. 26th, 1816 the Beaumont chief agent wrote to Colonel Beaumont that "With regard to supplying the Miners with Corn from Newcastle, the subject had full consideration at the time, and from the little satisfaction which was expressed by them on a former occasion, it was not deemed expedient to interfere with the various establishments and dealers in Corn, that supply them, and who in receiving their Monthly subsistence in Money could it was supposed purchase on equally good terms, whatever their consumption required." Four days later, however, after a meeting with representatives of Weardale miners he had changed his mind. Rye was to be purchased in Newcastle, as "that which they were supplied was both very dear and unsound". Similar complaints had been made in Allendale so corn would also be sent there, "cheaper and of better quality than can be obtained in the Country". (64) The London Lead Company too sent rye and oatmeal to their mines from 1817 to 1820. (65)

During the eighteen twenties and early thirties no grain appears to have been despatched by any of the mining concerns. The severe depression of the late twenties and early thirties forced many lead miners to emigrate from the area; it is

(64) B/B 51.

(65) Raistrick, A. - Two centuries. 1938. p. 37.

probable that no sustenance was given at this time as the sharp drop in lead prices meant that all the mining companies were operating at a loss, and superfluous labour was not wanted. In 1838, when trade had picked up, the London Lead Company sent up a quantity of grain from Newcastle in response to a request from their miners. (66) This was apparently the last time that any company so acted; better transport conditions had reduced the relative cost of grain in remote areas, as against the cost in agricultural centres. The normal channels of trade were now considered adequate for the provision of corn for the lead miners.

Foreign corn was nearly always bought when the Corn Laws permitted its importation. Rye, in particular, was far cheaper when bought abroad than was that grown in England. Details of the administration of the distribution of corn to the workmen are rarely mentioned in the records. The Beaumonts tried to distribute the corn in Allendale in 1795 "in proportion to the Number of their Respective Families". (67) The Greenwich Hospital Receivers instructed in 1800 - "We know that it is impossible to make a distribution that is in proportion to want or even to earnings, but the Workmen must take it as it is settled." (68) The miners were generally charged the Newcastle bulk price for their grain, with nothing added for transport costs, and in 1816 the London Lead Company actually charged their miners less than

(66) L.L.C. 23. Nov. 29th, 1838.

(67) Blakett of Wylam Papers, Northumberland Record Office.

(68) Adm. 66/100. Feb. 21st, 1800.

the cost price of the rye. (69) Money owing for the corn was either deducted from the miners' earnings at the "Pays", as appears to have been done by the Blakett/Beaumonts in the eighteenth century, or corn given in lieu of some of their subsistence allowance.

Co-operation among the workmen themselves to obtain corn from Newcastle at a cheaper rate than from local supplies is first mentioned in a letter from the Greenwich Hospital Receivers to their agent at Langley Mill. "We have no objection to John Friend getting Corn for the Nent Force Level Workmen from Newcastle, but as we told him when he was here in December we wd. have nothing more to do with the furnishing the Corn ourselves... We however have no objection to their continuing to send to Newcastle for Corn as long as they find it any particular convenience to them (the workmen) to have it from there." (70) It would appear quite probable that other miners employed in relatively small operations on Alston Moor might have done the same. At a later date the London Lead Company deliberately encouraged their workmen to organise themselves in corn associations. These were formed in the eighteen forties, and were allowed to make use of the Company's transport facilities. Control of the corn mill near Garrigill was handed over to them. (71)

This survey has shown how the isolation of the lead mining area and the normal state of poverty of its inhabitants affected both the food eaten and the ways in which it was supplied.

(69) Raistrick, A. - Two centuries. 1938. p. 37.

(70) Adm. 66/98. p. 72, February 22nd, 1784.

(71) Raistrick, A. - Two centuries. 1938. p. 37.

Methods of distribution improved during the period covered by this thesis, and the nature of the food eaten also changed, although not as much as in England as a whole. Unfortunately information on the quality and amount of food eaten by the individual miner emerges only incidentally from the evidence available, but it is very clear that starvation and malnutrition were very near threats to the population of the lead dales, until at least after 1850. A rise in national food prices, or a decline in the demand for lead meant immediate hardship. "The price of provisions are so high, that many Families in this poor Neighbourhood are half starved," wrote a London Lead Company agent in 1810. (72) The population depended absolutely on work in the mines, and if circumstances were unfavourable it was a choice between starvation and emigration. Although many of the miners owned or leased small farms these could not provide a living in themselves if no money was being earned at the mines. The following extract is from a letter sent as an appeal to Mrs. Beaumont in 1796 by a woman whose husband had been dismissed from his work as a lead carrier for signing his name to a petition - "Deiar ladey... I humbly Beg that you will help us in our needs we having no oder way to get our Bread; and now we have no way; and do not know which way to persue for work to mentane our family. deir madem... in the name of god I hope you will take pity on our Small family that hath nothing Independent but what we must indever for; we farm A pese of ground; But it doeth not grow one Shef of corn to mentain them; and we having

(72) L.L.C. 16a. April 21st, 1810.

very little mony to take at your pay we cannot pay our Creadet.
I feir our little stok be taken from ous, if we get no mor worke
under you." (73)

(73) Hexham Manorial Records, Newcastle University Library.

CHAPTER 9.Population, Migration, and the Poor.

The greater part of the population of the Northern Pennine dales in the eighteenth and nineteenth centuries depended, either directly or indirectly, upon lead mining for a living. Fluctuations in the value of lead, by affecting the profitability and hence the extent of mining, caused changes in the population of the dales. In this chapter the available statistics relating to population are presented and commented upon, and the incidence and causes of migration are considered in some detail. The closely related topic of the working of the Poor Laws is also studied here.

Broadly speaking two distinct types of statistical evidence are available. The first type relates to the entire population of the region, or of its component parts; the second relates to employment only - the number of workmen employed at particular mines, or by particular mining companies.

The only series of general statistics of the first type is that contained in the decennial Census Reports from 1801 onwards. (Statistical Table 6.) (1) Unfortunately, the ten year intervals between Censuses conceal short term fluctuations. This disadvantage can be partially overcome by judicious use of employment

(1) The Alston Moor mining field is almost exactly comprehended by the Parish of Alston. Middleton parish contains the whole of the lead mining area of Teesdale, and Stanhope, of Weardale. Both parishes contained some land suitable for arable farming at their eastern extremes. Allendale parish comprehends the whole of the Allendale mining field but it too contained some farming population in the north. Most of the Derwent miners lived in the parish of Hunstanworth.

figures, and of the observations regarding population made by contemporary writers, based on personal impressions rather than accurate counting. For the eighteenth century even the Census figures do not exist. Parish records have been examined to see what light they throw on population changes.

In an area so dependent upon one industry, statistics relating to employment in the lead mines have considerable significance as indications of general population trends. If sufficient numbers of complementary series of figures can be assembled they can be used not only as guides to the expansion or contraction of the industry but also to show changes in the general population of the region. Such figures are available for the employees of the major concerns for some parts of the eighteenth and nineteenth centuries.

The most important series of employment figures available are from the Greenwich Hospital records where the numbers of miners, labourers and washers are recorded quarterly from 1738 to 1767 and from 1818 to 1844. (Statistical Table 7.) No such figures have survived for the intermediate or later periods. The London Lead Company's records contain irregular employment statistics covering the Company's mines on Alston Moor and in Teesdale and Weardale from 1800 to 1820. (Statistical Tables 8 and 9.) The Blackett/Beaumont concern's records contain no employment figures as such, but names in the payment records have been counted so as to produce yearly figures of the numbers employed at Allenheads and Coalcleugh. (Statistical Table 10.) (2)

(2) It is explained in a preface to Statistical Table 10 that

The 1842 and 1864 Reports contain isolated employment statistics relating to different mines and companies; these are cited in the body of this chapter.

What were the economic factors that governed employment in the lead mines? Firstly there was the degree of exploitation and the productivity of a particular mining field. It will be shown shortly that Alston Moor was heavily exploited in the eighteenth century; by the mid nineteenth exhaustion was not far off and employment (and population) declined. Teesdale, on the other hand, was little exploited in the eighteenth century and its population increased vastly in the nineteenth. The second factor was the state of the lead market. (3) Booms and depressions occurred in cyclic fashion. These, of course, affected the whole mining region. The final collapse of the English lead mining industry in the eighteen seventies and eighties led to the permanent migration of a large part of the population. Lastly, there were seasonal variations in the numbers of workers employed which had no effect on population. The most notable seasonal variation was the difficulty of employing washers in the winter months, the boys normally spending that period in the mines or at school. (4)

The population history of the lead mining region in the

these figures are estimates only, and not absolutely correct. The two series, however, do indicate periods of expansion and contraction.

(3) The influence of lead prices on earnings has already been considered in Chapter 4. The same chronological details will not be repeated here.

(4) See Chapters 3 and 12.

eighteenth century is obscure. It would appear that population increased, at least in the areas where the mines were fully exploited. The parish registers of Alston (excluding the chapelry of Garrigill) and of Allendale have been examined, and the number of baptisms that took place, counted, in regular four periods.

The figures are shown below:-

<u>Years.</u>	<u>Alston.</u>	<u>Allendale.</u>
1720-24 inclusive.	121	180
1740-44 "	142	300
1760-64 "	338	301
1780-84 "	638	498
1800-04 "	653	548

These figures are quoted with all reservations - i.e. What proportion of the inhabitants were baptized? At what age? How many children died before baptism? How many after baptism?...

Nevertheless the increase in the number of baptisms as the century progressed is impressive and, particularly in the case of Alston, the relative increase in different double decades coincides with the evidence of employment figures.

When the Greenwich Hospital took over the confiscated Derwentwater estates in 1735 the Alston Moor mines had been little worked for many years. In 1738 only 300 miners were employed on the Moor; in 1744, at the nadir of a slump in lead prices, there were less than 200. In 1766 over 1400 miners were employed. (5) Hutchinson stated that Alston had 386 houses in 1750; in 1781 there were 865 houses. (6) A Greenwich Hospital

(5) See Statistical Table 7.

(6) Hutchinson, W. - Cumberland. Vol. 1. 1794. p. 522.

Report of 1774 noted that the population of the town of Alston had "greatly increased of late owing to the flourishing state of the mines." (7) There seems, therefore, to have been a substantial increase in the population of Alston in the period 1740 to 1780. After 1780 until the end of the century the increase apparently slowed down. The seventeen nineties were a period of depression. Employment figures have not survived but in 1794 it was estimated that the mines employed "near 1100 men", i.e. less than in 1766. (8) In 1802 the London Lead Company chief agent recorded that the 612 men employed by the Company on Alston Moor and in Teesdale amounted to "more than have been employed for the last 10 years".

Sufficient reliable data has survived about Alston Moor to show that its population did increase in the mid and later eighteenth century, and that this increase was contemporaneous with the expansion of mining. The increase apparently slackened when mining became less prosperous.

Far less statistical material has survived for the other mining areas in the eighteenth century. The employment figures for Allendale, however, although no individual figure is absolutely reliable, do show that the overall trend was one of expansion. There were about twice as many men employed at Allenheads in 1790 as there were in 1760, and nearly three times as many at Coalcleugh. The number of Baptisms went up from 301 in the period 1760/64 to 548 in 1800/04. Teesdale was

(7) Adm. 79/57. p. 14.

(8) Hutchinson, W. - Cumberland. Vol. 1. 1794. p. 215.

comparatively little worked in the eighteenth century. The population of Middleton parish in 1801 was only 1383, compared with 4746 in Alston, a parish comparable in size. The Weardale and Derwentdale mines were worked more extensively, but there is no reliable evidence at all about population changes before 1801.

The eighteenth century evidence suggests that the population of Alston almost certainly doubled between 1740 and 1800, and possibly almost trebled. In Allendale the population appeared to increase considerably between 1760 and the end of the century. In neither case is there any evidence at all, in parish registers or other sources, to suggest that there was large scale immigration into the region in the later eighteenth century. A few skilled miners from elsewhere in Britain did come but not in large numbers. (9) The mining region of Teesdale (Middleton Parish), comparatively undeveloped in the eighteenth century, nearly trebled in population between 1801 and 1831, according to the Census figures. In this case there was almost certainly no significant immigration from outside the region, although there was probably some redistribution of population within it. In the region as a whole (i.e. the parishes listed in Table 6) population increased by 75.5% between 1801 and 1831 (compared with an increase of 56.3% over the whole of England and Wales). The inference is that in these years and in the eighteenth century population increases were due largely to natural causes, i.e. an increase in the birth/survival rate, a reduction in the death rate, or a combination of the two. "It seems clear that the rise

(9) Migration is discussed in detail later in this Chapter.

in the birth rate was closely connected with the process of industrialisation" in eighteenth century England. (10) In the lead mining region an expanding economy and an increasing population were closely linked; the distinguishing of which was the cart and which the horse is as difficult as in England as a whole.

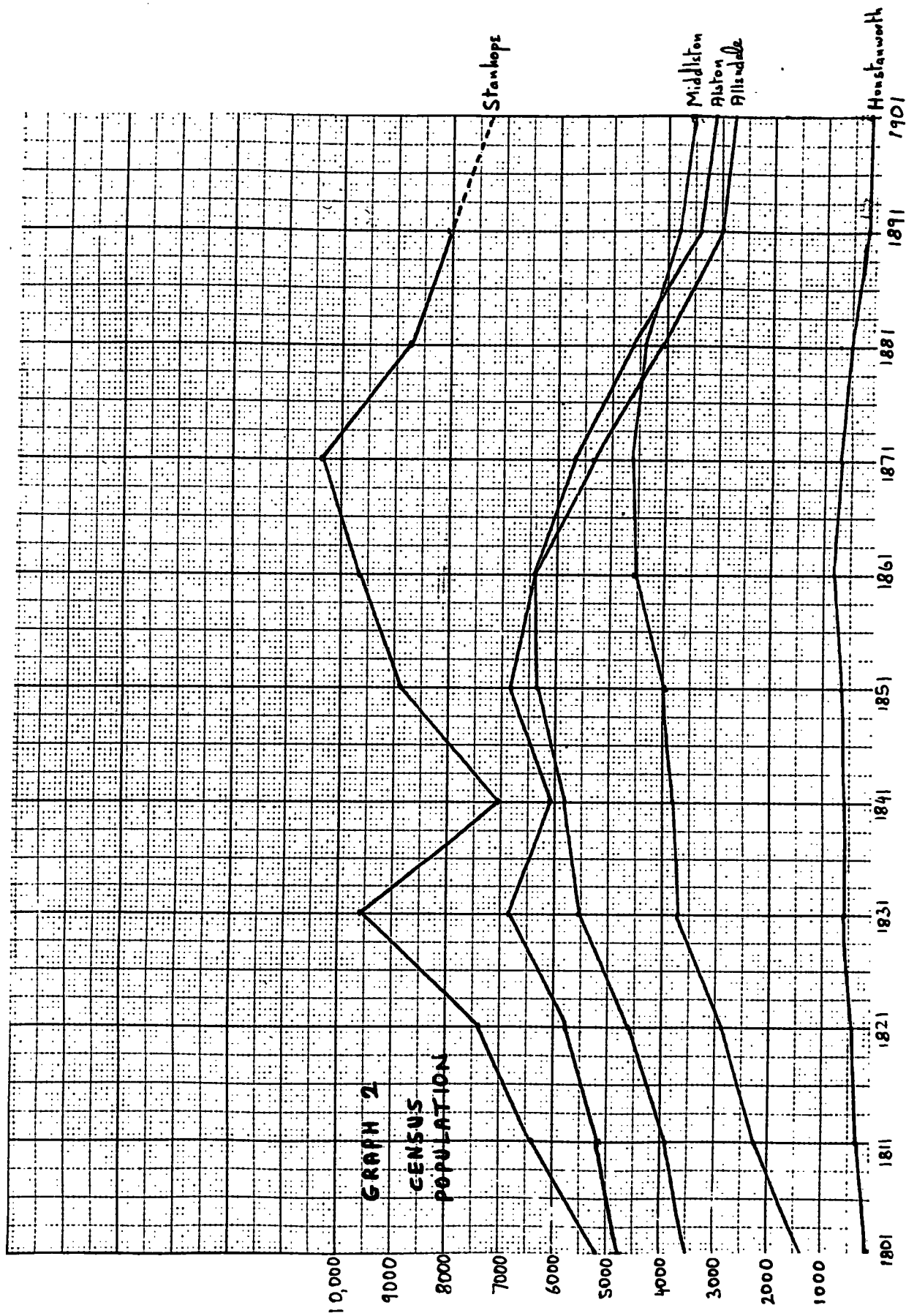
With the coming of the Decennial Census at the beginning of the nineteenth century the population history of the lead mining region becomes less obscure. (11) In every parish population increased substantially in the thirty years to 1831 - the population of Stanhope increased by 4386 (85.1%); Middleton, by 2331 (168.5%); Alston, by 2112 (44.5%); Allendale, by 2021 (57.4%); and Hunstanworth, by 296 (137.7%).

Migration into the region was not a factor in this increase; the evidence that this did not take place is now overwhelming,

-
- (10) Deane, P. and Cole, W.A. - British economic growth, 1688 - 1959. 1962. p. 134.

The authors of this work stress the need for "detailed local research" before any sense can truly be made of English eighteenth century population history. The eighteenth century evidence for the lead mining region is mainly inadequate for this purpose. The growth of population in the region is, however, strikingly similar to the contemporaneous, but of course much greater in scale, growth in the West Riding. (Deane and Cole, pp. 119/120). There too, growth was due almost exclusively to "exceptionally high rates of natural increase" in contrast to Lancashire which "relied more heavily on the immigration of the surplus population from surrounding areas." The explanation of this difference, according to Deane and Cole, was that while Lancashire was urbanised by the beginning of the nineteenth century "the West Riding was still for the most part a county of industrialised villages" with small attraction to immigrants.

- (11) Statistical Table 6. Graph 2.



although there was some movement from one dale to another. (12)

In the decade between 1831 and 1841 the increase in population was halted by the depression in the lead trade of the early eighteen thirties. The population of Allendale, Middleton and Hunstanworth increased very slightly, that of Alston fell slightly, and the population of Stanhope decreased substantially by nearly 2500 inhabitants. In the second quarter of 1830, 1499 miners were employed on Alston Moor: in the same quarter in 1833 only 863 miners were employed. The Poor Law Commission, collecting evidence in Alston in 1832, was told that some 2000 inhabitants had left the parish since the 1831 Census data had been collected. (13) Some 500 "heads of families" left Stanhope parish almost immediately after the 1831 census had been taken. (14) By 1841 the depression was over and, as will be shown later in this Chapter, many of the migrants had returned to the region.

Alston parish reached its population peak in 1831, although in 1851 its population was only 42 fewer. The populations of Allendale and Hunstanworth started to decline after 1861, and of Stanhope and Middleton, after 1871. In 1891 the population of Alston was 3020 inhabitants (47.1%) fewer than in 1861: of Allendale 3392 (52.7% fewer): of Hunstanworth 507 (65.2% fewer): of Middleton 753 (16.6% fewer): and of Stanhope 1623 (16.9% fewer). This tremendous population loss over 30 years was due to the virtual collapse of lead mining in the Northern Pennines with the introduction of cheaper supplies of lead from abroad.

(12) The point is discussed later in this Chapter.

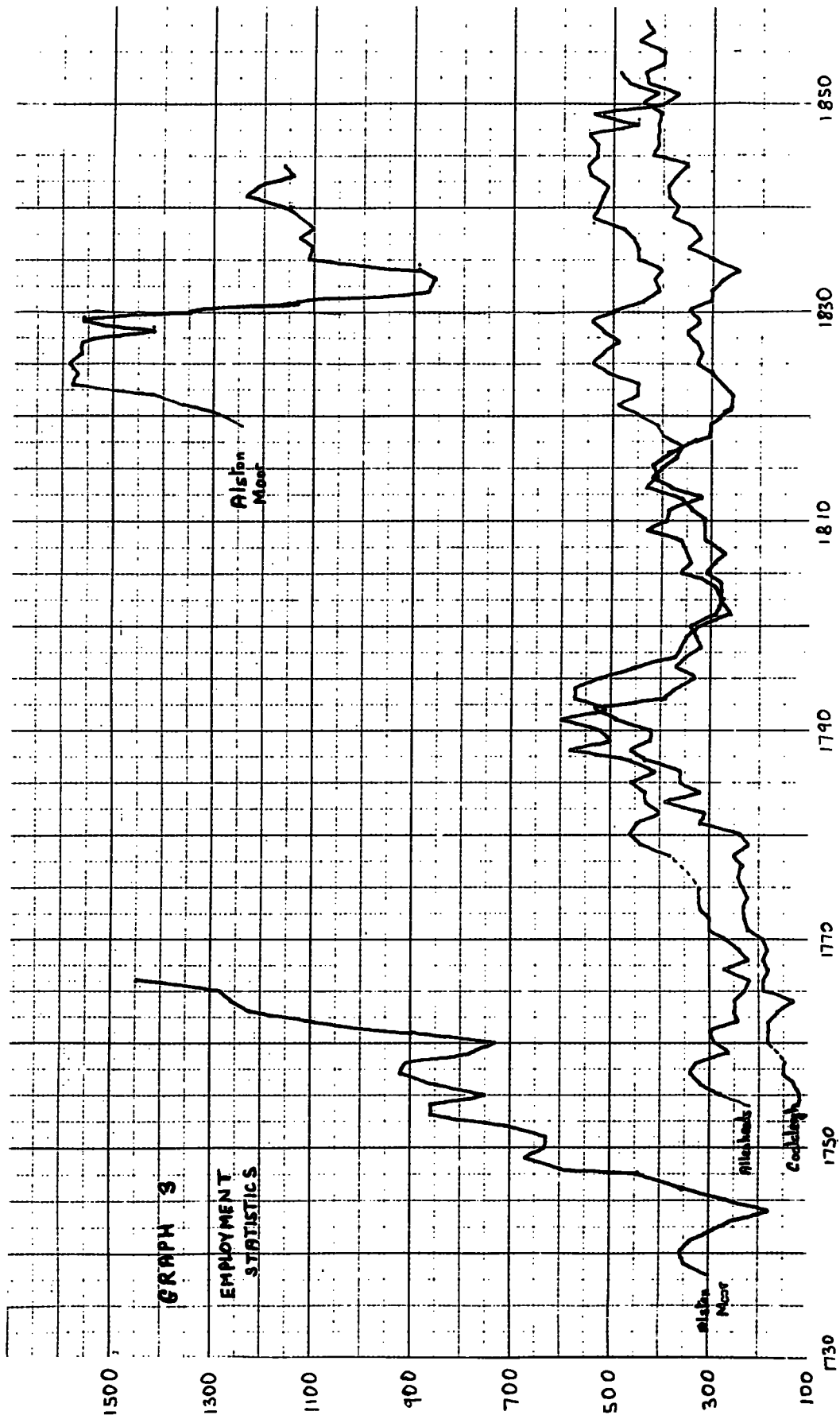
(13) Poor Law Commission Report. 1834. App. A. p. 320A.

(14) Poor Law Commission Report. 1834. App. A. p. 140A.

The price of lead per ton fell from £23. in 1875 to £12. in 1885. The Beaumonts abandoned mining in Weardale in 1883, and in Allendale in 1884. The London Lead Company abandoned its Alston Moor leases in 1883.

The Census figures illustrate the general rise and decline of population in the lead mining region in the nineteenth century, and the direct connection between population and the fortunes of the lead trade. They also show interesting differences between the dales. Why did the population of Middleton increase by 168.5% and that of Hustanworth by 137.7% between 1801 and 1831 while that of Alston increased by only 44.6%? Why did Stanhope and Middleton parishes lose a far smaller proportion of their inhabitants between 1861 and 1891 than did the other lead mining parishes? There are in fact two factors at work here - firstly the degree of exploitation and the productivity of particular mining fields, and, secondly, the growth of other industries in certain dales.

All individual mines went through periods of expansion and regression. Coalcleugh, one of the two mining centres in Allendale, was very much smaller than Allenheads for most of the eighteenth century. Briefly, in the seventeen nineties and again around 1812, more men were employed there than at Allenheads. After 1813 the mine entered a period of semi-exhaustion which extended to the eighteen forties. Employment figures remained low even when the lead trade was booming. In 1816 the Coalcleugh agent reported that "The mines at Coalcleugh are extremely poor... The earnings [of the miners] are now and will



be... very low, and without that we meet with something shortly more productive than we hope, it will be impossible to continue the number of Workmen that are now employed." (15) In 1820 - "A part of the Workmen would have been obliged to have left the field had we not been able to give them employment at Allenheads Leadmines." (16) Fifty years later Sopwith noted in his diary that "These mines, worked for centuries, were thought to be nearly exhausted... but since that time... a large quantity of ore has been raised." In the early eighteen fifties Coalcleugh was again employing more men than Allenheads. But by 1869, the Coalcleugh pay was "by the increasing poverty of the mines reduced to about a tythe of its amount ten years ago". (17)

The mining field of Derwent was abandoned by the London Lead Company as exhausted in 1806. The mines were re-opened by another Company a year or two afterwards. In 1811 the London Lead Company chief agent reported somewhat disconsolately that "The Mining Countries are getting into great distress and the people are flying in all directions for employment and none to assist them but Frederick Hall who employs all that go into Derwent." (18) In 1842 a Derwent miner recollected that immediately after the London Lead Company left the area there were only 8 men working there; in 1842 there were some 440

(15) B/B 53. Christmas 1816.

(16) B/B 54. Ladyday 1820.

(17) Sopwith, T. - Diary. June, 1869.

(18) L.L.C. 16a. Nov. 1st, 1811.

pickmen and labourers. (19)

The most striking example of the exhaustion of a whole mining area is the history of Alston Moor in the mid and late nineteenth century. It has already been shown that population increase in the first thirty years of the nineteenth century was relatively less than in the other mining areas, and that the final decline of population began earlier. In 1857 the London Lead Company chief agent told the Select Committee on the Rating of Mines that on Alston Moor "the body of the ore is already gone; there have been in past ages most extensive and spirited workings there, and the cream of the ore... is gone from the district, and we are now only left to pick the leavings of others." (20)

Teesdale, little worked until the nineteenth century, was so rich as to be worth working after the collapse of lead prices. The London Lead Company still employed 220 pickmen in that area when it disposed of its Alston Moor mines in 1884. (21) In Weardale, too, lead mining continued owing to the discovery of the extraordinarily rich Boltsburn "flats" in 1892.

These lately discovered riches were not, however, the major reasons why the population in Stanhope and Middleton fell less than in the neighbouring parishes at the end of the nineteenth century. The remaining workers employed in lead mining, and their families, were a comparatively insignificant part of the population. In Weardale, for example, the Beaumonts employed

(19) 1842 Report (Mitchell.) p. 758.

(20) Rating of Mines Select Committee Report. 1857. p. 28.

(21) L.L.C. 34. June 17th, 1884.

1003 men and boys in 1842 (22), 1163 in 1864 (23), 720 in 1873 (24) and 230 in 1882 (25). The great Burtree Pasture mine had employed 475 men and boys in 1864 (26): in 1880 those employed had shrunk to "about 40" (27). The most important reason why this crippling fall in lead employment is not reflected in the Census figures to such an extent as in the other mining parishes was because of the growth of other industries.

In Weardale there had been a boom in iron mining in the eighteen fifties. Iron was first discovered on the borders of Stanhope and Wolsingham parishes in 1845; by 1856 the Weardale Iron Company employed 1700 men. (28) The iron deposits were almost exhausted by 1880 but extensive limestone quarrying was now being carried out around Stanhope and in the eastern parts of Weardale. (29) In Middleton parish, too, limestone quarries were intensively worked by the eighteen eighties. The chief reason, therefore, for the comparatively small population loss suffered by these two parishes at the end of the nineteenth century was the increasing quarrying activity in their more easterly parts.

(22) 1842 Report (Leifchild.) p. 557.

(23) 1864 Report (Vol. 2.) p. 370.

(24) Egglestone, W.M. - The projected Weardale railway. 1887.

(25) Newcastle Weekly Chronicle, March 1882.

(26) 1864 Report (Vol. 2.) p. 369.

(27) Depressed Condition of the Agricultural Interests R. Com.Rpt.
App. to Pt. 1. 1881. p. 230.

(28) Whellan, W. - Durham. 1856. pp. 333/334.

(29) Egglestone, W.M. - The projected Weardale railway. 1887.

In their western extremities lead mining, and, in the twentieth century, fluorspar mining continued to a greater extent than in the other mining parishes, but population loss in these western areas was very much greater than in the parishes as a whole.

Migration has been frequently mentioned in this survey of the population of the North Pennine dales in the eighteenth and nineteenth centuries, but the evidence relating to it has so far been implied rather than documented. The uncertain fortunes of the lead mining industry and the absence of alternative work gave the lead miner no security of employment; movement within or from the region was something that could be forced upon him at any time. Because of its importance, therefore, it has seemed sensible to treat migration as a separate topic even at the risk of partial repetition. Migration will now be considered in detail - firstly, migration into the region: secondly, migration from and within the region, and lastly, an extended study of migration in the period 1830 to 1842 for which an unusually large amount of evidence exists.

There is no evidence of large scale migration into the lead mining region during the eighteenth and nineteenth centuries. What did occur, more than once, apart from the odd haphazard migrant, was an incursion of a group of skilled men from elsewhere, often brought in by a mining company. Some thirteen families of Derbyshire miners came to work Langdon Beck Mine in Upper Teesdale in 1758; some subsequently returned to their native country, but others stayed and intermarried with the

natives. (30) In 1796 a Cornish miner by the name of Richard Trathan came with his sons to Alston Moor, and introduced a number of technical innovations in the dressing of ore. (31) One of his sons and many of his grandchildren were living in Nenthead in 1851. (32) Cornish and Welsh miners were introduced to the Derwent mines in the eighteen fifties, on a scale sufficiently large for their presence to be commented upon in a note to the printed schedules of the 1861 Census. It has already been shown that the Derwent mines were run in accordance with Cornish practices in 1864.

These immigrants, however, came in relatively tiny numbers. In 1842, of 150 "boys and young persons" employed in the Beaumont Weardale mines, only one was born outside the parish of Stanhope. In Allendale, out of 252 boys, 12 came from outside the parish - but only from Alston. (33) Statistical Table 11 shows that in the village of Nenthead in 1851, only 58 or 6.6% of the inhabitants came from outside the lead mining region. More than half of these 58 were members of families in no way engaged in lead mining - professional and land owning people, shopkeepers, and lodging house keepers and their lodgers. Many of the remaining 27 were children of lead miners born while their parents were temporarily absent from the area during the depression of the eighteen thirties, or were from the other metalliferous mining

(30) The Lord Fitzhugh. [c. 1880.] u.p.

(31) Described in detail in Chapter 5.

(32) Enumerators' books. 1851 Census. Public Record Office.

(33) 1842 Report (Mitchell.) p. 724.

areas of Britain. The lead mining region of the Northern Pennines had little appeal for immigrants without previous mining experience, and was too isolated for many people to drift there accidentally.

Before discussing migration from and within the region, it is worth quoting two passages from official documents of the nineteenth century, illustrating the unusually powerful hold that the region had on its inhabitants. In the Poor Law Report of 1834, J. Wilson, with reference to Weardale and Teesdale, stated that "The leadminers in this district, like other mountaineers, cherish extraordinary attachment to the place of their birth, occupations, and habits... [The depression in the lead trade] throwing up on the surface of the soil a population which had previously drawn sustenance from its bowels, it would seem must end in a state of things unparalleled in wretchedness, amongst a people obstinately clinging to their native place, and in a tract of country quite unable to feed its own inhabitants." (34) And in 1842 Commissioner Mitchell wrote, also of Weardale - "Altogether the natives of the dale grow up with an attachment to their native land and their own people which nothing can overcome. Hence it is that, although by removing only 20 miles down into the coal country a young man might nearly double his income, and have the prospect of adding many years of health and strength to his life, he cannot remove. He clings to his beloved dale, and follows an occupation which in most instances allows but a short life, the last years of which are spent in sickness and

(34) Poor Law Commission Report. 1834. App. A. p. 138A.

sorrow." (35)

Why then did miners migrate? The most important cause - others will be considered below - was prolonged unemployment brought about by a depression in the lead trade, or exhaustion of a particular mine or mining field. Unemployment was not uncommon; the 1834 Poor Law Commission was told that in normal times, in Weardale "from the peculiarity of this kind of unemployment, there may be generally one tenth of them out of work". (36) When lead prices were low, one of the ways in which the mining companies customarily economised was by cutting down their labour forces. For example, in 1808, the London Lead Company chief agent reported "I have reduced the hands on the Dead Work List from 162... to 104... and have only kept in sight the preservation of the leases [which required a certain minimum number of men to be working at a given mine.] Under the circumstances, I flatter myself the Business at large will do well; although Poverty begins to stare the Country very much in the face, and the general murmur of the labouring Class renders the lives of public men very troublesome." (37) In 1815 the Company's Teesdale agent, Robert Stagg, wrote that there was "a Reduction of eleven pickmen this Quarter which are all I could dismiss with propriety... I expect to dismiss a similar number next Quarter, which will reduce the Workmen as low as I conceive

(35) 1842 Report (Mitchell.) p. 722.

(36) Poor Law Commission Report. 1834. B1 - 1 - 160a.

(37) L.L.C. 16a. Jan. 23rd, 1808.

to be advantageous. (38)

Examples have already been quoted, from the history of Coalcleugh in the nineteenth century, to show how the exhaustion of a particular mine caused unemployment. Weardale in 1822 was suffering from exhaustion, from which the area subsequently recovered. "A considerable part of the Mines which have for a series of years past been a great support to the produce of Ore, and given employment to a great number of Men, are very much worked out... These circumstances have caused a greater number of Men at this time to be out of employment than usual; and except some new trials should prove more productive than there is any appearance of at present, it will not be in my power to give employment judiciously to the increasing population of this district." (39) In the eighteen sixties Sopwith's diary records the difficulties he had when "the exhausted state of part of the Allenheads mines renders the discontinuance of some of the several men... a matter of hard necessity... The consideration of the principle of selection for workmen to be retained or discharged... is a duty which causes me no little anxiety." (40)

Miners sometimes relinquished their jobs voluntarily - when the bargain prices offered were so low that they would not cover their subsistence. In 1831, for example, at Sedlin mine in Weardale, it was "so extremely poor that not one half of the usual number of Men have taken bargains. Since last quarter 20

(38) L.L.C. 16a. March 23rd, 1815.

(39) B/B 54.

(40) Sopwith, T. - Diary. Nov. 8th, 1862.

Men have left and gone to the Coal works, etc., and 20 more have refused taking bargains at the price offered, and who are now in want of employment." (41) This was at a time when monthly subsistence payments had probably been reduced owing to the severity of the depression; at other times miners often preferred to work on, in full knowledge that they would not make enough to cover their subsistence debt - "several of the Bargains at different Mines I fear are taken with a View of having their advance Money continued." (42)

All the evidence, therefore, suggests that unemployment was no rare occurrence for the employees of the two largest concerns - the Blakett/Beaumonts, and the London Lead Company. It was probably even more common for the employees of the smaller companies. An Alston miner told Dr. Mitchell in 1842 that "Men working under the great companies have their work more regular." (43) Migration, however, did not automatically follow from unemployment, in spite of the almost complete absence of any other employment than in the lead trade.

There were three things that cushioned miners who were unemployed for short periods. Firstly, everyone knew how variable were the factors governing the level of employment. Lead prices could rise almost overnight, and labour would once again be in demand. A new vein or a flat might be encountered, turning a poor mine into a rich one. In view of these circumstances

(41) B/B 35. Sept. 30th, 1831.

(42) Weardale 1812. B/B 53. Jan. 10th, 1812.

(43) 1842 Report (Mitchell.) p. 761.

unemployed men were prepared to remain in the region for as long as possible. Secondly, many of them were members of families owning smallholdings, from which a poor sustenance could be eked. Lastly, at least up to 1834, there was the parish, and possibly sufficient outdoor relief to make it possible to exist for a time without mining employment. (44) Thus prolonged unemployment was necessary to force miners to leave their native region. It was the length of the depression in the lead trade that distinguished the early eighteen thirties from the period around 1816, when the price of lead reached a level which was nearly as low. There was great distress in the area around 1816 and some miners did migrate, but in the eighteen thirties the depression lasted much longer, and many more miners and their families were forced to leave. (45) As we shall see, however, many returned when the depression was over. (46)

Unemployment was the most important cause of migration, but there were sometimes other factors. The specialist workers - particularly the smelters and refiners - could often obtain a higher wage by moving to a different mining company. Some eighteenth century details of rivalry between the mining

(44) The Poor Laws and their operation in the lead mining region are considered at the end of this Chapter.

(45) Another factor, however, that caused the much greater migration in 1831 was the positive demand for men to break the strike in the North Eastern collieries. See later in this Chapter.

(46) It would appear from the minute surviving evidence (e.g. Eden, Sir F. - State of the poor. Vol. 2. 1797. p. 169) that there was considerable migration from the region during the depression of the seventeen nineties, which also lasted for several years.

companies to obtain the services of skilled smelters have been given in Chapter 5. It is most noticable that in 1851 only 13 of the 133 active lead miners in Nenthead were not born in the village, but 16 of the 31 smelters were not born in Nenthead. Also, miners were sometimes dismissed for committing disciplinary offences such as going on strike, drunkenness or having a bastard child. Dismissal "was considered the severest of punishments" the men, as Stagg, the London Lead Company chief agent expressed it, "haunting the place like ghosts for months afterwards." (47)

From about 1865 onwards there was something of a "wind of change" blowing through the lead mining region. Unfortunately this closing period of lead mining history is very poorly documented, but a few scraps of evidence gathered together suggest that the region no longer had so strong a hold over its inhabitants, and that the financial and other attractions of the outside world were beginning to be felt. Sopwith commented in his diary in 1866 upon what he considered to be a mistaken policy on the part of the Beaumont land agent in raising rents - "The old and infirm must linger. The young and active depart. But along with this is not increase of rent suggestive of the desire for increased wage, and this wish may gather strength as railway works afford demand for labour when they are in construction, and when finished will give facilities for movement and for interchange of opinions respecting wages such as have not hitherto been known in these secluded dales." (48)

(47) Poor Law Commission Report. 1834. App. A. p. 139A.

(48) Sopwith, T. - Diary. June 23rd, 1866.

This change in the attitude of the lead miners and the willingness of many to leave the district before they were forced to do so by economic necessity is illustrated by the surviving report books of the Derwent Mining Company, covering the period 1872 to 1879. The Derwent mines were, of course, particularly close to the coal mines and the iron works, so they may not be typical of the region as a whole. Here are a selection of quotations from reports in the period 1872-73 "... At the setting on Saturday there were five refusals - Some of our men have left us for other places where work is so plentiful... (29th January 1872)... And altogether our weekly liftings have recently receded a good deal, not altogether because of the Mines being poorer but also because of the scarcity of miners... We want more Men... (21 June 1872)... The Setting on Saturday was rather thinly attended, some half-Dozen bargains refused, some of which have since been set. Such great inducements are offered at the Coal Mines about Consett and further east, and also down the Wear that a few of our Men, the young ones especially, some of whose earnings have been between 20/- and 30/- a week the last month, keep drifting away. It puzzles us what to do to keep them... (30th September 1872)... Since the Setting we have lost 4 men, 2 of whom had been neglecting their work very badly, and when reproved for their negligence, they gave up their place of work, and left for the coal mines..." (13th January 1873) A very different feeling towards their native place and occupation is shown by these miners of the eighteen seventies compared with their dismissed predecessors of the eighteen thirties "haunting

the place like ghosts for months afterwards".

When the miners migrated where did they go to? It often happened that when the cause of unemployment was local exhaustion rather than general depression they did not leave the region, but went to work at a different mine. The lodging shop system permitted miners to work a long way from home, so there was frequently no need to move house. A note in a London Lead Company report book for 1810 suggests that it was regular practice at that time for Alston Moor miners to prefer working for small companies in times of boom, and return to the Company when times were hard. "Many parts of the Mines are much poorer this quarter than at Michaelmas last, though a great number more Hands are employ'd, by reason of the Mines in the surrounding Country being so poor, of course the Miners cannot get employment elsewhere." (49)

There are frequent notes in the Beaumont records of men going from a poor mine to a rich one within the same concern. Some examples of Coalcleugh miners working at Allenheads have already been cited, and in Weardale it was quite normal for miners to go where they could get work. In 1812 "Sedlin mine... may be compared to a Hospital, taking all those that hath not employment elsewhere." (50) In 1860 unemployed men were listed in the Weardale bargain book, to be put into any mine where there were vacancies. Similarly, London Lead Company employees moved around on Alston Moor and in Teesdale.

(49) L.L.C. 16A. Jan. 20th, 1810.

(50) B/B 53. Jan. 10th, 1812.

Movement from one company to another, particularly when they operated in different dales, was less common, but happened quite frequently. The movement to the Derwent mines in 1811 has already been mentioned. A year before a number of Nenthead men applied for work at Coalcleugh as they were dissatisfied with "the irregular behaviour of Mr. Dodd [the Lead Company's agent] of late". They were employed "to point out the different strings etc. about the end of the Boundary" between Coalcleugh and Nenthead. (51) In 1859 "troops of young men and boys" from Allendale went to work in Settlingstones mine in the Tyne valley every week, returning at the weekends. (52) In 1864 miners who lived in Allendale were working in Derwent. (53)

When miners left the region, they apparently generally took their families with them. The accounts of the large scale migration in the eighteen thirties frequently use the word families rather than miners to describe those leaving. R.W. Bainbridge, the London Lead Company chief agent, was questioned on this very point by the 1857 Select Committee on the Rating of Mines. He replied that if all the mines closed down "there would be no miners resident in the district: they would have emigrated and found employment elsewhere... The bulk of the able-bodied would take their disabled away with them. There are such family attachments... that very few able-bodied parties would leave their homes, and leave the infirm of their families behind

(51) B/B 53. Jan. 10th, 1809.

(52) White, W. - Northumberland. 1859. p. 452.

(53) 1864 Report (Vol. 2.) p. 363.

them." (54)

The normal destination of the miners was the coal area of the North East coast. Eden specifies "the coal-mines near Newcastle, Sunderland, etc." as being where migrant Weardale miners had gone to work in the seventeen nineties. (55) Of 10 miners who had left Coalcleugh in 1824 owing lent money, 5 had gone to other lead mining areas, 3 to the collieries and 2 to America. (56) In the eighteen thirties, as will be seen shortly, the enormous majority of migrating miners went to the North Eastern coalfield, and others went to the mines around Whitehaven, but some miners went to Spanish America, (57) and a fund was raised on Alston Moor "to assist such poor persons as may be desirous to emigrate to Canada". (58) In 1832 124 people left Alston for Canada. There is little evidence about the destinations of the mass of imigrants who left the region between 1860 and the end of the century. The probability is that the still expanding North Eastern and Cumberland coalfields absorbed most of them, but many would have left the country altogether. A "memo" in the Weardale bargain book for 1860 gave "a list of workmen who have left the works" in the previous quarter. Of the 28 who had gone, 14 went to Australia, one to Columbia, one to work on the Rookhope railway, and one to work in the ironstone

(54) Rating of Mines Select Committee Report. 1857. p. 28.

(55) Eden, Sir F. - State of the poor. Vol. 2. 1797. p. 169.

(56) B/B 96.

(57) Poor Law Commission Report. App. A. p. 320A.

(58) L.L.C. 21. March 22nd, 1832.

works. The destinations of the remainder were not specified.(59)

For the period 1828 to 1842 an unusually large amount of evidence regarding migration has survived - the severity of the depression at this time caused frequent references to distress among the miners to appear in the London Lead Company and Beaumont records: the Poor Law Commission, reporting in 1834, gathered evidence at the height of the crisis: the 1842 Commission found plenty of memories of the period among the miners questioned; and, most usefully, the coal viewer Matthias Dunn recorded in his diary many details about the employment of lead miners in the coal mines in the period 1831-34.

In Chapter 4 it has already been shown that during the early eighteen thirties the price of lead fell to a level lower than it had been for the previous 50 years. In the lead mining region the effect on employment was disastrous. Thousands of men were thrown out of employment. In the minute books of the London Lead Company for 1830 is a report of a sub committee deputed to treat with the Greenwich Hospital for a reduction in the dues payable "in order to enable the Company to employ as many Labourers as possible in the present distressed state of the Mining Population with the least injury to the Company." The Greenwich Hospital Commissioners, however, did not agree "to any alteration that might tend to increase the raising of Ore considering it a better Alternative that the Men now employed in mining should be reduced and obliged to find other employment which they thought would be practicable in making Roads and

(59) B/B 131. Sept. Quarter, 1860.

other public Works... From the tenor of the Conversation that passed, we are of opinion that the Company would be completely exonerated from any blame by taking such measures in the future Workings of the Mines in Alston Moor as may appear most beneficial to their Interest in accordance with the general Terms of their present Leases." (60)

The Lead Company dismissed many hundreds of men; smaller companies on Alston Moor virtually ceased operations. The Beaumont reports of the period chronicle for every mine "a number of men out of employment". The reference to the employment of the unemployed on public works in the Greenwich Hospital's reply to the Lead Company, cited above, shows one way in which some miners could find alternative employment - for a while at least. One of the Receivers of the Greenwich Hospital wrote, on Dec. 4th, 1830, "we propose the continuing of the Nent Force Level on a contracted scale and road improvements. These afford the best field for the employment of capital by those owners of property within the district who wish to combine a certain public benefit with a reasonable prospect of advantage to themselves." (61) This sentiment was shared by landowners in other districts. In Weardale the Poor Law Commission was told that "Many landholders, to furnish employment, have been extensively engaged in improving their land." (62)

These "public works", however, could not absorb everyone,

(60) L.L.C. 21. Dec. 30th, 1830.

(61) Quoted by Hughes, M. - Lead, land and coal. 1963. p. 56.

(62) Poor Law Commission Report. 1834. B1 - 3 - 160C.

and a mass migration started towards the end of 1831. In Alston nearly 2,000 inhabitants went out of the parish, "the population are obliged to disperse in all directions" as the Poor Law Commission was told. (63) In Weardale "some 500 heads of families" left. "The firm refusal of the parishes to make up insufficient wages forced numbers of the lead miners to transplant themselves to the collieries." The bad conditions in the lead mining parishes were, however, mitigated "by the fortunate coincidence of the grand strike in the collieries". (64)

The years 1831 and 1832 were a culmination of many years of discontent among the colliers on the Tyne and Wear. From April 1831 to September 1832 there was a series of bitter strikes ending, however, in the almost complete victory of the coal owners and the disruption of the colliers' Union. (65) The coal owners found in the unemployed lead miners a magnificent source of "blackleg" labour, and it was largely the ease with which they could acquire this that eventually utterly defeated the striking colliers. In 1831 lead miners were brought in, but few details survive. At Waldrige colliery on December 24th a body of "upwards of 1000 pitmen riotously assembled". There were 30 to 40 lead miners down the pit and the striking colliers "stopped the engine for pumping out the water, and threw tubs, corves, etc. down the shaft, until dispersed by a body of the military". (66)

(63) Poor Law Commission Report. 1834. B.1 - 1 - 98A.

(64) Poor Law Commission Report. 1834. App. A. p. 138A.

(65) See Welbourne, E. - The miners' unions of Northumberland and Durham. 1923, for details of the strike.

(66) Mackenzie, E. and Ross, M. - Durham. Vol. 1. 1834. p. CX.

From the end of 1831 the diary of Matthias Dunn, coal viewer of Hetton colliery, contains a series of notes recording how lead miners were attracted to the collieries, the ejection of colliers from their homes for the lead miners to replace them, and the unemployment of many of the "stranger colliers" once the strike was over. Here are some selected extracts from this diary:-(67)

"At Coxlodge Colliery endeavouring to procure Men for Hetton as they are discharging the Colliers from their Houses to prepare for Lead Miners..." (16th January, 1832.) "Lead Miners now determined upon..." (March 19th.) "W. Robson went off to the Lead Mines in search of Men, provided ours will not be bound..." (March 27th.) "Meeting of the Hetton Committee at Newcastle to consider matters generally - 1. To the getting down of London police. 2. Sending up to the Lead Mines for additional hands..." (April 10th.) "I started for Alston Moor - where I appointed an Agent and staid all night..." (April 11th.) "Crossed the Country to Middleton in Teesdale where I saw a number of Men willing to come, but who wish some time for consideration..." (April 12th.) "Turned out about 20 families chiefly marked men... No violence offered - women even quiet and submissive..." (April 21st.) "Sep. Redhead started for Weardale and George Lisle and I started for Teesdale and Arkendale in search of Miners. Turning out determined to be carried on successively at 20 and 30 per day, but difficulty is experienced in procuring assistance..." (April 23rd.) "At Middleton all day collected good many Miners..." (April 26th.) "A little Coal work beginning at Isabella Pit -

(67) The M/S is in Newcastle Public Reference Library.

sundry Lead Miners arriving who require to be escorted through the Pitmen by Military..." (May 3rd.) "Got the help of the police and ejected 80 families at No. Hetton. Lead miners gradually arriving. Isabella Pit now getting 20 per day..." (May 7th.) "Remainder of people ejected from their Houses, Hand Bills printed for Lead miners and every exertion now to be tried to supply the place of these foolish men - Events will prove that the Men of this Colliery will be more humiliated by the introduction of Strangers than any other as the work is so extremely simple and Comfortable. Measures are now taking for distributing Hand Bills in the Mining District for procuring men with all convenient despatch..." (May 8th.) "A good many Miners arrived with their Furniture and peaceably enough received..." (May 21st.) "George Pit started also Isabella having now more men than she can hold. Pitmen still stupid as ever and seem determined to stick out to the last notwithstanding the obvious Storm that is gathering around them..." (May 14th.) "Are now endeavouring to procure Men from Yorkshire, Wales, Lincolnshire, Derbyshire, Cheshire and Cornwall, etc... The Pitmen stand out firmly, about 40 or 50 persons only having come out of the Union..." (May 31st.) "Have now about 1200 Strangers, Men and Boys..." (June 16th.) "Number now upwards of 1700..." (June 26th.) "Union all but broken up..." (Sept. 18th.)

These diary entries have been quoted verbatim as they convey something of the drama of the situation. The following year, 1834, there was a mild depression in the coal trade and Dunn notes: "Great many stranger colliers going away in Consequence

of the reduction of prices... They are incited by the old pitmen evidently under the notion of a future stick." (April 14th, 1834.)

The movement of miners from the Lead Dales in 1831-32 was not then due only to the depression in the lead trade and resulting unemployment. It was also due to large scale attempts (Hetton was only one strike bound colliery) to attract men to the coal mines to replace the striking colliers. Once the strike was over there was superabundant labour on the coalfield. The incoming lead miners must have been regarded with hatred by the colliers who were expelled from their homes that they might be housed. Not unnaturally, therefore, there was a movement back to the lead region by some of the migrating miners. The 1834 Poor Law Commission was told of fears that "the migratory swarms" would return "partly from failure of employment, and partly the... attraction of the natale solum. Many may thus be expected to fall back on their original settlements, as from the terms of their hiring they cannot, for the most part, have gained settlements elsewhere". (68) Fortunately, the price of lead started to rise again in 1833.

The 1842 Commission recorded many examples of lead miners who had left the area and later returned to it in the eighteen thirties. Here is a Weardale miner telling the Commissioner why he went - and why he returned. "I have known when a young man working in the mines has got only 1/- a day; that was 10 years ago. Many went down to the coal district and got 3/- a day; some of them remain there, and some have returned. I went down

(68) Poor Law Commission Report. 1834. App. A. p. 138A.

myself, but my parents entreated me to return, and my heart softened and I came back. My brother was getting only 7/6 a week about three years last spring, and went to the coal pits and would average 50/- a fortnight; we persuaded him to return."(69)

To conclude this study of migration - up to the middle of the nineteenth century, before the coming of the railways to the region, migration from the region was small, unless forced by economic crisis. The industrial attractions of the region were insufficient for any large scale movement into it. When the miners did migrate they went mainly to the nearest large centres of population - most to the collieries and ironworks of Northumberland and Durham, some to those of West Cumberland. Those who had families took them with them. The existing evidence indicates that most continued as miners and did not become, say, shipbuilders. After the middle of the century there was a greater readiness to move, and, possibly, more emigration.

The amount of poor relief given to unemployed but able-bodied lead miners obviously greatly affected migration. Unfortunately the evidence here is particularly sparse. Not a single overseers' record book survives for any of the lead mining parishes, so the workings of the old Poor Law during the eighteenth century are virtually unknown. Fortunately, there is a fair amount of evidence, some of which has been quoted already, in the Report and appendices of the 1834 Poor Law Commission for the parishes of Alston, Middleton and Stanhope, and the Medical Officer of Health's records in the Public Record Office cast

some light on the working of the new Poor Law after 1834.

It should be noted that the parish was not the only source of poor relief. As is shown in Chapter 8 the larger mining companies supplied their miners with subsidised bread in times of high prices. All large companies but particularly the London Lead Company tried to keep mining going even when the price of lead made it immediately unprofitable. This was not only for humanitarian reasons, but also because dead work could be done more cheaply at such times, and a labour force had to be kept together for when the price rose again. The Lead Company sometimes would subscribe a sum towards the relief of the poor in Alston or Middleton Parishes. (70) Again, the Company was prompted into this by the fact that until 1874 lead mine~~y~~s were not chargeable for poor rates, much to the indignation of the landed proprietors of the various parishes who frequently petitioned the House of Commons to rectify this state of affairs. Those mining concerns which were also land owners had, therefore, an additional reason for seeing that mining did not collapse altogether in bad times, as otherwise their pockets would suffer through increased rates. This applied particularly to the Blakett/Beaumonts in Allendale, and the Greenwich Hospital on Alston Moor. The Greenwich Hospital Report of 1821 summed up the position nicely with a neat mixture of self-interest and humanitarianism. The Report argues that the Hospital should not levy so high a tribute from the mining companies as to cause any redundancies among the workmen - "They would ultimately be

(70) e.g. L.L.C. 17. Aug. 20th, 1812.

compelled to emigrate or fall upon the Parish, and the Commissioners and Governors of Greenwich Hospital would thus become answerable for an alarming amount of human Misery, which they have the power to prevent; besides thereby bringing on the Institution the entire loss of its Revenue from the Mines, and a heavy burthen upon the Parish towards which they must ultimately contribute the principle portion." As has already been shown, the Hospital tried to carry out large scale public works at times when there was heavy unemployment among the miners.

Parochial relief was given under the old Poor Law to widows, orphans, and disabled men. What is not clear is to what extent it was given to unemployed able-bodied men. The fractional evidence that exists before the eighteen thirties shows that most parishes did give some aid, though upon what principle is not known. A petition to the Justices of the Peace for South Northumberland from Allendale Parish in 1711 stated that the laying in of the mines "will increase the number of the poor" thus implying that assistance was given to the able-bodied at that date. (71) Jumping a century to the period 1810-1818 plenty of evidence exists in the records of both the Blakett/Beaumonts and the London Lead Company to show that unemployed men regularly applied for parochial assistance. At the Lead Company's mines in Weardale in 1816 the agent advised unemployed men "to apply to their respective Parishes". (72) A petition to the House of Commons from Alston parish in 1817 stated that owing to the very

(71) In the Northumberland Record Office.

(72) L.L.C. 16a. Ladyday 1816.

low price of lead "a great number of farmers of small tenements, who heretofore contributed to the parish fund, are fast increasing the list of paupers, and instead of paying to maintain others, apply themselves for parish relief". (73) Again in Weardale, in 1818, the miners still at work were apparently receiving relief because their wages were so low - "Great numbers of us are not making our Subsistence Money, and have been under the necessity of seeking relief, upwards of 400 of us (including their families) are on the parish." (74)

In the early eighteen thirties the principles on which relief was granted were different in the several parishes. In Alston relief was given "after an enquiry into the gains of the family, if it does not amount to 1/3 per head weekly, to make it up to that sum". At that time there were 216 families receiving such relief. (75) In Stanhope outdoor relief was not given on this Speenhamland system. It had been proposed that "the deficiency in the men's wages should be made up by allowances from the parish" but "this attempt was frustrated by the firmness of a resident magistrate, the present member for Gateshead". (76) Relief was only given through the workhouse. Outdoor relief was received by 288 individuals "two thirds of them widows and their children; the other third infirm Men and

(73) House of Commons Journal. Feb. 5th, 1817.

(74) Appendix document 4.

(75) Poor Law Commission Report. 1834. App. A. p. 320A: B1-2-986.

(76) Poor Law Commission Report. 1834. App. A. pp. 139/140A.

Orphan children". (77) In Middleton, too, the same principle was apparently followed, that outdoor relief should not be given to able-bodied men. (78)

The Poor Law Commission Report gives some information about how the laws relating to settlement were enforced. It was told that many of the migrating miners would return from the coal districts "as from the terms of their living they cannot, for the most part, have gained settlements elsewhere". (79) In Alston parish 70 of the recipients of out relief were not resident: "these are chiefly at Newcastle and Whitehaven, it brings less expense to the parish to pay them a small sum to remain there than to bring them back". (80)

After the enforcement of the 1834 Poor Law Act in the lead mining parishes, outdoor relief to able-bodied men ceased. In subsequent economic depressions wages were no longer made up by the parish, and men without work had no choice but to migrate if they had no other source of income.

An interesting exchange of letters concerning the relationship between income from membership of a friendly society (many miners of course, were members) and poor relief in Weardale Union is preserved in the Public Record Office. (81) In 1841 the Board of Guardians for the Union wrote about a miner named Colling,

(77) Poor Law Commission Report. 1834. B1 - 2 - 1606.

(78) Poor Law Commission Report. 1834. App. A. p. 138A.

(79) Poor Law Commission Report. 1834. App. A. p. 138A.

(80) Poor Law Commission Report. 1834. App. A. p. 320A.

(81) Public Record Office. MH. 12. 3333.

employed by the Lead Company, who had been "disabled from working for some time. The Lead Company has a Club or Sick Fund, for their Miners, the Members of which when of a certain standing, are entitled to receive 6/- a week during sickness. The annual subscription is £1-16-0. Colling is a Member of the Club, and has received the regular allowance from it since the commencement of sickness, and has been thereby enabled to exist without Parochial Relief. His subscription for the past year having lately become due, the non-payment of which would deprive him at once of any benefit from the Club whilst its payment would secure him 6/- a week for a year to come, an Application was made last week by Colling to the Board of Guardians to advance the ammount (£1-16-0) for him." The Guardians did advance the money but were told subsequently that their action was illegal. The unfortunate man had to enter the workhouse to receive any poor relief.

Most of the money given out under the New Poor Law went to widows, of whom, owing to the early deaths of the lead miners, there were always many, often with young children. In Alston parish on August 19th, 1841, for example, there were 100 widows receiving relief, of whom 88 were widows of miners. (82) Their children were working as washers as soon as they were old enough.

The change in the administration of poor relief brought about a real alteration in the lead miners' lives. After 1834 their ability to remain unemployed in the lead mining region was greatly lessened. Which was, of course, precisely the intention of the originators and administrators of the 1834 Act.

(82) 1842 Report (Mitchell.) p. 767.

CHAPTER 10.Health.

Vital statistics of lead miners are available only for the mid and later nineteenth century, when they were contained in one or other of the various official reports. These statistics show that the average expectancy of life of an adult lead miner was less than that of a worker at virtually any other trade in Britain. (1)

An analysis of deaths in the lead mining parishes from July 1st, 1837 to June 30th, 1841 is given in the 1842 Report. These figures are for adult miners only, i.e. those who were over the age of 19 at death. In Alston parish the average age of the 75 miners who died in that period was 45 years. In Allendale, of 79 deaths, the average age was 48 10/79. In Weardale, of 129 deaths, the average age was 49 62/129, and in Teesdale, of 57 deaths, 47 15/57. (2) By far the greater number of all these died from some form of respiratory disease. In 1864 a similar survey of the 72 miners who had died in the Allenheads region in the previous ten years showed that the average age of death was 44½ years. (3) Also in 1864, an investigation was carried out at various mines into the average ages of those employed underground (i.e. surface workers were excluded). The average age of the 339 men employed by the London Lead Company on Alston Moor was 32.86:

(1) This Chapter refers only to the health of lead miners (together with general medical services). It has already been shown that the health of smelters was little affected by their employment.

(2) 1842 Report (Mitchell.) pp. 751/752.

(3) 1864 Report (Vol. 2.) p. 362.

of the 77 men at Fallowfield, 30.68; and of the 289 men in the Derwent mines, 28.12. (4) Bearing in mind the fact that few miners were employed underground before they were 18, the statistics show that there was a surprising absence of older men.

In the Annual Report of the General Board of Health for 1858 there is a short but particularly interesting statistical survey of Alston, comparing it with Reeth (a Yorkshire lead mining parish), Haltwhistle (a Northumberland agricultural parish), and the city of Liverpool. (5) This survey found that while the mortality of children under five years of age from pulmonary diseases was distinctly greater in the two lead mining parishes than in Haltwhistle it was "immensely below that which is sustained by the infantile population of the great unhealthy city [Liverpool]. This advantage enjoyed by the younger inhabitants of the lead mining districts over those of Liverpool is altogether lost in more advanced life. The women of Liverpool perish from chest affection in a rather larger proportion than those of Reeth; in a slightly lower proportion than the women of Alston; but the men of Alston and Reeth die in a much larger proportion than the men of Liverpool. Thus a district remote from city influences, situated in the midst of a most salubrious district, and containing scarcely an appreciable urban character... loses a larger annual proportion of its adult male inhabitants from diseases of the chest than the unhealthiest city in the kingdom. That this is due to the nature of the prevalent

(4) 1864 Report (Appendix.) p. 434.

(5) pp. 63/64.

employment no doubt can now be obtained. It is the injurious character of the male occupation which causes Alston, the most exclusively lead mining district in England, to be the place in which there is a larger proportion of widows than in any other place in the kingdom."

It should be said that though these mid nineteenth century medical men recognised that the lead miners were dying from some form of respiratory disease, medical science was not sufficiently advanced to know either what caused the symptoms hereinafter to be described, or the precise nature of the disease itself. The miners were in fact infected mainly by silicosis, one of that class of diseases now known as the pneumoconioses, or dust diseases of the lungs. It is caused by the inhalation over a number of years of fine particles of mineral dust, causing minute scars (fibrosis) to form within the lungs. Once there these scars cannot be healed. A man suffering from silicosis is very liable to catch one of the infectious respiratory diseases, and most of the lead miners in fact died from a form of tuberculosis. (6)

Both the two major government Commissions reporting on the lead mining region (1842 and 1864) were before the discovery of the tubercle bacillus in 1882, and before the realisation that stone dust rather than "foul air", gaseous vapour from explosions, or changes of temperature or pressure, was the only cause of the respiratory condition resulting eventually in the premature

(6) For a modern account of dust diseases see the chapter by A. Meiklejohn - Silicosis and other fibrotic pneumoconioses in Industrial medicine and hygiene, edited by E.R.A. Merewether, London, 1956. Vol. 3. pp. 1-122.

deaths of most of the miners. (7) The disease was known commonly by the miners at the time as miners' complaint, and attributed by them to all or any of the above causes. Most of the medical evidence, therefore, regarding both the causes and the nature of the disease, is interesting only from the point of view of the history of medicine. In this chapter it is mainly the descriptions of the symptoms (as described by both the medical experts and the miners themselves in these two Reports) that are cited, and little of the theorising regarding their causes and nature. Particular attention is paid to the attitude of the employers towards the early deaths of their men, and the feelings of the miners themselves regarding their very obvious fate.

The answers of miners to questions regarding their health printed in the 1842 and 1864 Reports concentrate on the two most obvious symptoms of the disease - shortage of breath and "black spit". These symptoms first made their appearance three or four years after commencing work inside the mine. Wheezing and noisy breathing were customary among all such miners. They used picturesque terms to describe the expectoration of a bluish mucus, "an acknowledged concomitant of a lead miner's existence."

(8) A miner in 1842 said that he frequently spat "black stuff,

(7) See Rosen, G. - History of mining diseases. 1943, for a general account of the development of the study of miners' diseases. Particularly vital stages are chronicled in the classic paper by J.S. Haldane and R.A. Thomas The causes and prevention of miners' phthisis. (in Trans. Inst. Min. & Met. Vol. 13, 1903/4. pp. 379/438) and in the second Report of the Royal Commission on metalliferous mines and quarries, 1914.

(8) 3rd Report of the Medical Officer of the Privy Council. 1860. p. 144.

as black as the wine in your glass". (9) Another spat "as black as your hat". (10) An agent told the 1864 Commission that he knew of several instances "where men have vomited up what was just like a collection of dust". (11)

A good, if rather harrowing, description of the progress of "miners' complaint" was given to the 1864 Commission by Dr. W. Ewart, the London Lead Company's resident surgeon at Middleton in Teesdale - "A healthy young man enters upon work in a lead mine; in a few years, more or less, he begins to experience some degree of difficulty of breathing - nothing to hurt him very much so he continues an efficient miner; still, however, he is 'touched in the wind'. Along with this difficulty of breathing there is an increased expectoration of mucus, often tinged, more particularly after leaving work, of a bluish black colour. The difficulty of breathing continues, and generally increases as age advances, rendered worse, perhaps, by an attack of bronchitis now and then supervening. On recovering from these attacks he again resumes work; or should it happen that he has no acute attacks, he goes on working with increased shortage of breathing, expectoration, and failing strength. His appetite for food is impaired, and what he takes for breakfast is frequently vomited as he walks to his work in a morning. He has great languor, and frequently fits of severe coughing, and evidences of imperfect oxygenation of the blood in the blueness of the lips, etc. He may have now got to

(9) 1842 Report (Mitchell.) p. 765.

(10) 1842 Report (Mitchell.) p. 760.

(11) 1864 Report (Vol. 2.) p. 337.

40 or 45 years of age; he is low in health and strength, and is compelled to give up work, and stay at home as a worn out miner. But even at home his health cannot be restored. He may wander about for some years, incapable of work, from difficulty of breathing and debility; in the summer, improving a little, but in the autumn, winter and spring being very liable to acute diseases of the chest producing more copious expectoration... The poor worn-out miner now soon dies exhausted." (12)

The main cause of this distressing end was the dust inhaled while working in the mine, although this was not recognised in the Report of the 1864 Commission and hence no specific recommendations were made about it. (13) A peculiar feature of the Northern Pennine lead mining region was the existence of the mining "shop" as sleeping quarters at the more isolated mines. The cramped and unhealthy nature of this accommodation has already been described in Chapter 7. The discomforts of the "shops" were recognized, and unfavourably commented upon in the two Reports, but as they were made before the discovery of the tubercle bacillus the probable crucial role played by these "shops" in the spreading of the infectious lung diseases was not recognized. When men with a predilection for such diseases were sleeping in close contact with others who were already infected and who were coughing and expectorating all night it must have been very difficult for anyone to escape infection. (14)

(12) 1864 Report (Appendix.) p. 12.

(13) Although certain levels and districts were recognised as being more fatal than others. Sandstone was far more dangerous than limestone.

(14) Robinson, W. - Lead Miners and their diseases. 1893. p. 8.

The miners accepted their disease and shortened life as "a matter of course", according to a London Lead Company surgeon in 1842. (15) However, a number of medical witnesses in 1864 commented that the miners, when questioned, were reluctant to admit they possessed the symptoms of the disease. One witness reported that "Out of 100 men whom I examined... I found that scarcely one man would complain of any expectoration, although I am aware that nearly all the men do expectorate after working a few years in the mine." (16) Post mortem examinations were not carried out for moral reasons - "there is a great objection to that sort of thing here". (17)

When the miners felt their health was breaking down to such a degree as to make ladder climbing, drawing deads, etc., particularly exhausting they applied for easier places in the mine. For example, in the Weardale bargain book for 1860 is a note - "Jacob Hetherington wishes to be changed his work. He has been poorly for some time past. Josh Peart is working his work." (18) Such men were placed in "the shallower workings, where there is better ventilation and less fatigue". (19) Here, of course, they would be earning less. Others, who were working in family groups were helped by their sons. Eventually, however, badly affected men had to leave the mines, and indeed stop

(15) 1842 Report (Mitchell.) p. 755.

(16) 1864 Report (Vol. 2.) p. 361.

(17) 1864 Report (Vol. 2.) p. 341.

(18) B/B 131. June 23rd, 1860.

(19) 1864 Report (Vol. 1.) p. 281.

working altogether. Those who possessed smallholdings would retire to them until death: others would subsist on what they were given by the parish. (It should be noted that none of the elaborate benefit societies described in Chapter 4 gave pensions to members on the grounds of old age alone until they reached the age of 70, a nearly impossible age by lead mining standards.)

The questioning in 1842 and 1864 revealed some interesting attitudes among the employers, as well as among the miners. Most were rather reluctant to admit that there was any health problem, and some went so far as to deny its existence. In 1842 the agent of the Beaumont concern "boldly asserted that the miners lived even beyond the average duration of life". A paper was submitted attempting to prove that "the miners connected with his mine who have died for the 28 years past had averaged, one with another 51 years". (20) It is interesting to note that one Commissioner, Leifchild, accepted this and printed it as an appendix to his report. The other, Mitchell, made his own statistical investigation and found that the figures submitted had been calculated in such a way as to produce a misleading impression. Even Sopwith was reluctant to admit that lead mining was directly responsible for a killing disease. He blamed bad food, insanitary houses, intemperance and stupidity on the part of the men for their bad health. (21) His subordinate, agent for the Coalcleugh area, when asked if the miners were "at all affected in their breathing" replied "Some of them, after they

(20) 1842 Report (Mitchell.) p. 751.

(21) 1864 Report (Vol. 1.) p. 261.

arrive at about 50 years of age or so are affected a little".(22)
 The Derwent Mining Company agents followed the same line, even providing two miners to witness that they knew no-one under 50 years of age whose breathing had been affected by working in the mines. (23) Only the London Lead Company agents were completely honest about the early deaths of most of their miners.

Doctors were available in the lead mining dales even in the eighteenth century - although there was little they could do to help the sufferers from pneumoconiosis. In 1733 there was a surgeon living at Allenheads - he combined his professional function with that of publican! In June of that year he fell out with the resident agent and left the district. However "there is a very good surgeon not far from Coalcleugh, which many of the People have employed, and may be had on any occasion". (24)

In the nineteenth century both the larger lead mining concerns established comprehensive medical services, with compulsory membership for all miners. The London Lead Company, however, did so many years before the Beaumonts. The friendly societies, of course, provided some sort of an income for sick men, but not usually free medical expenses. The London Lead Company benefit fund, established in 1810, specifically allowed medical expenses. When it collapsed in 1827, and was replaced by a more directly Company controlled organisation, a separate "health service" was provided. Surgeons were employed by the

(22) 1864 Report (Vol. 2.) p. 359.

(23) 1864 Report (Vol. 2.) p. 353.

(24) B/B B.M. Letter Book, Jan. 5th and June 8th, 1733.

Company in all their mining districts to devote all their time to looking after the Company's workmen and their families without charge. (25)

The Beaumont concern provided a similar service from some time after Sopwith became chief agent in 1845. Workmen and their families were attended when sick by resident doctors in the different districts. This, however, was not free: each workman paid 5/- a year if he were married, 2/6d. a year if single. These charges covered some 45% of the costs of the scheme, and the remainder was met by the concern. Unlike the Beaumont benefit societies, membership of the medical service was compulsory for all workmen. (26)

How much did the health of the miners improve during the period of this thesis? The absolute absence of statistics for the earlier period makes this question really impossible to answer. We have already seen that, in the larger mines at least, there were definite improvements in ventilation practices during the period. It is possible that the average age of death of the mid eighteenth century miner was nearer 35 than 45. However, the vital part played by mineral dust in causing pneumoconiosis was not recognized even by 1864, and there was no attempt to make workmen wear masks while drilling and blasting.

(25) See Raistrick, A. - Two centuries. 1938. pp. 49/51 for a detailed account of the Company's medical services with long extracts from the rules governing the surgeons.

(26) 1864 Report (Vol. 2.) p. 359: (Appendix.) p. 19.

CHAPTER 11.Religion and Social Life.

During the last ten years of the eighteenth century and the first three decades of the nineteenth, great changes took place in the religion and social life of the lead miners and their families. By this period the Church of England had become a very distant institution, both in the physical and the spiritual sense. There was a vacuum in the religious life of the area. Methodism filled this vacuum; the closeness and exuberance of the Methodist teachings, preached in their own homes by men of their own class in language they could understand, converted most lead miners to the new faith. This conversion and the puritan spirit resulting therefrom, combined with the increasing economic efficiency and dominance of the mine owners over every part of their employees' lives, caused a corresponding reformation in the manners and social life of the area.

By the eighteenth century the Church of England, which had failed to keep pace with the expanding population, was not providing adequate services for its members in the large and isolated parishes of the Northern Pennines. The actual places of worship were often too far away down the dales for easy attendance by the lead miners and their families, who lived mainly in the upper parts of the dales, and burial of the dead in consecrated ground was a terrible labour, roads being so inadequate. In 1713 the incumbent of Hexham wrote a graphic description of the difficulties faced by the inhabitants of the Pennine parishes. "The people here and in diverse other Places... go to the nighest

Church or Chapel to Divine Service, some of them being compelled by a kind of necessity, to go... a begging the Bread of Life out of their own County and Diocese... It is much to be wished, there were some effectual care taken, to remedy these Inconveniences, least they may prove a Temptation or Pretence to some, to go no where to worship God, others to despise Infant Baptism, turn Quakers, and make themselves burying Places more convenient at home. For the carrying the dead upon Mens shoulders so many Miles, in such difficult way to the Parish Church, in some Places, in these Northern Counties, as Teasdale, Weardale, Hexhamshire, Allendale, etc., is such a heavy Burthen... as justly deserves to be redressed, and might effectually be done by enclosing diverse little Pieces of Ground, and having them consecrated for Christian Burial." (1)

Evidence for the activities of the Established Church among the mining communities in the eighteenth century is decidedly meagre. Fortunately the letter-books of the Blacketts and the Hexham manorial papers do give some indication of the conditions prevailing in Allendale at that time.

The Blacketts were the patrons of the living of Allendale, and the incumbents were encouraged to pay special attention to the spiritual needs of the miners. A new Perpetual Curate was presented to the living in 1756 "on condition of his...constant residence, and indulgence to the People of Allenheads and

(1) Ritchel, G. - An account of certain charities. 1713.
pp. 66/67.

Coalcleugh". (2) But the parish was so enormous that the single parish church, at Allendale Town, was too far away for the miners living at the southern extremities of East and West Allendale. There were indeed two chapels a little further up the dales, at Ninebanks, on the West Allen, and St. Peter's in the Forest, on the East, but these were apparently in a very decayed state in the early eighteenth century, and services were held in each only once in every month. In any case both places were still about five miles from the mines at Coalcleugh and Allenheads.

At the beginning of the century, Sir William Blackett contributed the necessary timber for chapels to be built at Allenheads, (1703, on the site of an earlier building) and Coalcleugh (1704). At each place was established a chaplain technically independent of the parish structure who "hath for his Salary half a Day's Wage of every Workman every month; which in time of Peace, when these Lead-Mines did flourish, amounted to between £70 and £80 a Year". (3) It appears that this money was not always easy to collect: one Allenheads chaplain resigned in 1732 because he considered that "he has been wronged of" about £70 in the previous six years by the agent's "refusing to secure it for him from the People". (4)

These new chapels existed rather uneasily within the old parish system, causing much jealousy and heartburning among the clergy. In 1732 some of the inhabitants of Ninebanks presented

(2) B/B 47. April 8th, 1756.

(3) Ritchel, G. - An account of certain charities. 1713. pp.16/17.

(4) B/B B.M. Letter Book.

a petition to Sir Walter Blackett's agent that all miners in the area should pay "half Shifts" to the curate who was officiating at Ninebanks chapel. The agent recommended to Sir Walter that the request should be refused, as the petition was inspired by the curate "for whose ease and interest the thing is calculated". Ninebanks was only two miles away from the parish church "all these Reductions are a burthen upon your works which ultimately must be paid by you. Allenheads, Coalcleugh are expected to pay shifts for very good Reasons, not one of which will be held in the present case". (5)

In 1764 the ecclesiastical settlement in Allendale was further complicated by the rebuilding of Ninebanks Chapel, and the granting of a licence for a burial ground there. A permanent curate was appointed, who was independent of the parish church, the incumbent of which had no say in his appointment. In the seventeen nineties there was a bitter quarrel between the chaplain at Coalcleugh, who was also the incumbent of Allendale parish itself, Joseph Carr, and the curate of Ninebanks, Nicholas Richardson. In the Hexham manorial papers there is a lengthy "impartial account" (undated) of this quarrel, submitted as a petition to Mrs. Beaumont by Joseph Carr. (6) This petition well illustrates the confusion that existed within the Established Church in Allendale. Joseph Carr stated that until the re-endowment of Ninebanks in 1764 the Coalcleugh chaplain "by

(5) B/B B.M. Letter Book. Nov. 21st, Dec. 3rd, and Dec. 8th, 1732.

(6) In Newcastle University Library,

ancient custom" performed certain duties at Coalcleugh for the miners, in addition to holding services. These included the Churching of Women and the Baptising of Children, for neither of which was any charge made. Marriage and burial rites had to be carried out at the parish church, seven miles away. It was largely to lessen the distance for the miners on these occasions that Ninebanks chapel was re-endowed, the curate there being able to both marry and bury the inhabitants of Coalcleugh. But Mr. Richardson, ever since his appointment in 1772, had been trying to make the miners "pay him for duty done gratis by their Chaplain... In case of refusal he threatened them with prosecutions in the Spiritual Court." Mr. Carr had told the miners not to pay any dues, and Mr. Richardson had complained to Mrs. Beaumont. Mr. Carr concluded his rebuttal of Mr. Richardson's charges by writing as Perpetual Curate of Allendale rather than as chaplain of Coalcleugh. "He begs leave further to add, that the separation of this Chapel from the Parish Church has been, and still continues a disadvantage to the Incumbent of the Parish, as well as a loss to the Patron... In all cases, in general, where the Parish Church is poor, as at Allendaletown, the Incumbent is made Patron of the Chapels in his Parish and by these means, the Patronage of the Parish Church is virtually increased, but in this case, neither can the Patron of the Parish Church get any benefit, or the Incumbent augment his income thereby, since neither has any power over it."

Mr. Carr had some justification in complaining about his poor income, for, according to the Allendale mining agent,

writing to Colonel Beaumont in 1795, "after paying his curate at Allendale I don't believe he has above £40 per Ann.; out of which he is under the necessity of keeping a Horse as he does Duty at a distant Chapel." (7) From these examples it appears that if Allendale was typical the Church of England was not in a flourishing state in the northern Pennine dales in the eighteenth century. The church accommodation was inadequate and inconvenient, and the clergy poorly paid, although the parish of Stanhope was an exception as regards the latter point.

When the mines were flourishing the Rector of Stanhope, by virtue of being, with the Bishop of Durham, joint owner of the mineral rights, was probably the best paid parish priest in Britain. In 1835, the year before the Commission on Ecclesiastical Revenues reported, the Rector received a gross income of £4,875. But the benefice was customarily held in plurality by a non resident priest, often a Bishop. In 1835 the two curates resident in the parish were together paid a total of £279. out of the Rector's vast income. Little, if any, of the income was spent within the parish. The Church was in as poor a state in Weardale at the beginning of the nineteenth century as it was in Allendale. An undated petition, apparently of about 1800, lists the ecclesiastical grievances of some of the inhabitants of St. John's Chapel, in which chapelry "nine-tenths of the whole Inhabitants of the Parish" lived. (8) "That in Consequence of these Circumstance your Petitioners have the strongest Reasons to

(7) B/B 50. Jan. 28th, 1795.

(8) Thomas Bell papers, Newcastle University Library.

believe (but which Delicacy will not permit them to state) that, altho' the Population of the Parish is not in any Degree diminished, yet that Marriages are not so frequently celebrated as would be the Case, was the Right of Marriage annexed to the said Chapelry of St. John... The burying ground belonging to the said Chapel... is by far too small for the internment of the Inhabitants and... on every Funeral the most indecent Violence is unavoidably done to the Remains of the Dead already deposited there."

There is unfortunately little evidence about Nonconformity in the dales before the coming of Wesley, but it would seem that the Nonconformists were in little better state than members of the Church of England at that time. In the late seventeenth century in Allendale there was a small and persecuted group of Quakers. In the eighteenth century the persecution lessened, but by the end of the century the Society of Friends was virtually non-existent in the dale. (9) In Weardale many miners were Presbyterians, and in 1769, Sir Walter Blackett contributed £10. towards a new Meeting-House - "it is represented that this meeting house is in the midst of many of Sir Wr's Miners, that are of the Church of Scotland, and therefore Sir Walter's willing to accomodate them with a place for orderly worship, rather than that Religion should be neglected among them". (10) By 1840 this chapel had been turned into a school, and no members of the Church of Scotland were left in Weardale. (11) Roman Catholicism was

(9) Dickinson, G. - Allendale and Whitfield. 1903. pp. 89/100.

(10) B/B 48. Dec. 28th, 1769.

(11) Featherston, J.R.- Weardale men and manners. 1840. pp.18/19.

virtually non-existent at all times in the dales in the eighteenth and nineteenth centuries.

The growth of Wesleyan Methodism is relatively well documented in Wesley's own journal, (12) in the various tractarian histories of the movement and biographies of the prominent leaders, and in occasional references in other sources. In 1840 in Weardale Wesleyan Methodism was described as "the established religion of the dale" (13), and the 1851 Religious Census showed that in every lead dale the movement had more members than the Church of England. Wesley's own account, and a few scattered statistics from eighteenth century circuit records, show however, that the early growth in membership was steady rather than spectacular and "revivals" were almost invariably followed by declines.

Methodism reached the lead mining area in the late seventeen-forties. Wesley himself first preached in the area in Blanchland, on March 24th, 1747, recording that his large congregation "gathered out of the lead-mines from all parts; many from Allendale six miles off". (14) The method of the early Methodist preachers was to travel over the country to preach wherever large gatherings of people might be expected. Wesley's visits seem to have often coincided with the pay-days of the

(12) Wesley, John - Journal. Edited by N. Curnock. "Standard Edition". 8 vols.

(13) Featherston, J.R. - Weardale men and manners. 1840. p. 30.

(14) Journal. March 27th, 1747.

mining companies. (15) Having sown the seed the leading Methodists would travel on, to re-appear some months or years later to re-vitalise their following. Wesley himself, of course, travelled the whole of England and Scotland in this way. Lesser men travelled more localised circuits. Enthusiasts from one dale would cross over to the next to spread the Word. One early northern preacher (Christopher Hopper, who was the first preacher actually to enter Allendale in July 1747) described his approach to a new area. "Our plan was to visit a town or a village, and ask permission to expound the word of God in one of their houses or cottages; if the people did not invite us to lodge and break bread with them, after repeating our visit two or three times, we took it as an indication, that we were not called to such a place." (16)

It does not appear that there was any very violent reaction to Wesleyan missionary efforts in the lead mining area from either the civil or the religious authorities. The only persecution recorded was in Teesdale, where, according to Wesley in 1761, many miners "a while ago were turned out of their work for following 'this way' By this means many of them got into far better work, and, some time after; their old master was glad to employ them again." (17) The reception accorded to Wesley himself was normally good. In Blanchland, in 1748 "at the desire of

(15) e.g. Blanchland Journal. July 27th, 1748.
Allendale Journal. July 29th, 1748.

(16) Quoted in Steel, A. - History of Methodism in Barnard Castle. 1857. p. 105.

(17) Journal. June 9th, 1761.

Mr. W., the steward of the lead mines" he actually preached in the house where the pays were taking place..(18) In Allendale Town, two days later, he disputed publicly with the Church of England curate, but the curate "skipped so from one point to another, that it was not possible to keep up with him" and so the disputation was abandoned. (19)

In these early days Wesley and his followers were aiming at a re-vitalisation of the Church of England, and not at the formation of a new sect. This meant that no organisation was created to follow up the work of the itinerant preachers. The converts met in each others homes for prayer-meetings, but frequently their enthusiasm disappeared with the preacher. Thus, after his very successful series of meetings in Allendale in 1748, when Wesley returned in 1752, he found "the poor society well nigh shattered in pieces. Slackness and offence had eaten them up." (20)

The Methodist campaigns in Weardale are particularly well described in Wesley's journal. He went there more frequently than to the other dales, having a particular liking for the scenery and people, and in two long entries in his journal, (21) he gives a brief history of the rise of Methodism in Weardale, and an analysis of the reasons for a great decline in membership in 1773/4.

(18) Journal. July 27th, 1748.

(19) Journal. July 29th, 1748.

(20) Journal. May 26th, 1752.

(21) Journal. June 4th, 1772, and June 12th, 1774.

Weardale was originally converted from Allendale. Two preachers from Allendale went to Weardale in 1749, and as a result of their efforts 4 inhabitants "found peace with God and agreed to meet together". By 1750 the society had about 20 members. It then gradually increased to about 35, and remained about that number for 10 years. Wesley noted that "they have been particularly careful with regard to marriage", marrying only with each other. In 1761 he visited the dale "just in time to prevent their all turning Dissenters, which they were on the point of doing, being quite disgusted at the curate, whose life was no better than his doctrine". (22) In November and December 1771 there was a great increase in membership. Meetings were held all over the dale, and there were many public and emotional conversions. Of the new members, who were some 120 in number, over 40 were children, their schoolmistress being a Methodist.

Two and a half years later, however, Wesley found a "grievous decay in the vast work of God". He asked to see one girl he had himself converted: she "was brought almost by force. But I could not get one look, and hardly a word, from her." In his journal Wesley wrote down what he considered were the five reasons for the sudden collapse of the movement in Weardale. They were, firstly, that the local preachers were poor and uninspiring. Secondly, the schoolteacher had married, and her ex-pupils, "there being none left who so naturally cared for them... fell heaps upon heaps". Thirdly, "most of the liveliest in the society were single men and women, and several of these in a

little time contracted an inordinate affection for each other, whereby they so grieved the Holy Spirit of God that He in great measure departed from them." Fourthly, there was doubt whether such rapid conversions as had taken place could be really sincere, and lastly, there had been much discontent and bickering between members.

In 1757 the Dales Circuit was founded. Based on Barnard Castle it ensured a regular circulation of preachers throughout the northern Pennines. Some statistics of membership were kept, which are quoted in Steele's History of Methodism in Barnard Castle. (23) These figures show that in most of the lead dales there was some rise in membership between 1760 and 1770 - from 57 to 80 in Teesdale: from 31 to 38 in Alston - but the only place with a dramatic increase in numbers was Weardale, - and we have already seen what subsequently happened there. Fluctuation in numbers was normal even later in the eighteenth century. Some detailed figures for individual areas in upper Teesdale are quoted by Steele for the years 1791-1800. Middleton itself, for example, had 20 members in 1791: 28 in 1794, and only 10 in 1800. These figures show fairly conclusively that it was not until the nineteenth century that Methodism attained the dominant position in the life of the dales that it possessed in 1851. Of Weardale, where Methodism was the "established religion" in 1840, it was said by Eden in 1797 that "the inhabitants are chiefly of the Church of England; but there is one

(23) See Statistical Table 12.

congregation of the Methodists, and one of Presbyterians". (24)

By the mid nineteenth century the predominance of the Church of England had completely disappeared. The numbers of Wesleyan Methodists increased steadily, and, from 1820 onwards, they were joined by another violently proselytising sect, the Primitive Methodists. In 1840 the Minutes of the Committee of Council on Education gave statistics of churches and church attendance in Alston parish. These show that of a total population of 6062 (1841 census figures) there were average Sunday congregations of 1030 Wesleyan Methodists, 700 Primitive Methodists, 250 Independents and 10 Quakers. The figures for the Church of England were not given. In the 1851 Religious Census, the numbers attending evening service on a given Sunday in Alston Poor Law Union were 357 in the Church of England, 663 Wesleyan Methodists, 892 Primitive Methodists, and 147 Independents. (25) Thus in these 11 years the Primitive Methodists seem to have gained at the expense of the Wesleyans and Independents. In Teesdale, in 1851, there were similarly more Primitive than Wesleyan Methodists. Only in Weardale, the only dale in which attendance at the Church of England had sunk below 100, were there more Wesleyans than there were Primitives.

In the nineteenth century the spread of Methodism is less well documented in the mining area than it is in the eighteenth, the period on which the Methodist historians concentrated. But

(24) Eden, Sir F. - State of the Poor. Vol. 2. p. 168.

(25) Both sets of statistics are given in full, Statistical Tables 13 and 14.

it was in the first half of the nineteenth century that the great period of expansion of Methodism occurred in the area. In 1797, in Weardale, the Church of England had been dominant; in 1851 there were 1441 people attending Methodist chapels, compared with 70 attending the Church of England. Featherston, writing in Weardale in 1840, summed up the changes that occurred in his lifetime, due, he said, mainly to the influence of Wesleyan Methodism - "They have been... the principal engine in effecting a moral change in this wild district, and instead of insult and a volley of stones, strangers are met with civility and good behaviour... They have reclaimed and reformed individuals who were enemies to their families and themselves, as well as a perfect pest and a disgrace to the neighbourhood." (26)

The success of the Primitive Methodists was even more rapid. Their "love-feasts" possessed greater appeal to many people than did the more sober services of the Wesleyans. Featherston, a Wesleyan Methodist, rather drily remarked that "it is a serious question for these serious people, if night meetings, particularly in the winter season, be for good or be for ill to the morals of young men and women, if unaccompanied by their parents and friends." (27) The movement spread into the lead mining area in the early eighteen twenties, resembling Wesleyan Methodism in its mode of propagation; travelling preachers provided the initial impetus, followed by local efforts to maintain membership. In Weardale the society was founded in November 1821: in March 1823

(26) Featherston, J.R. - Weardale men and manners. 1840. pp.31/32.

(27) Featherston, J.R. - Weardale men and manners. 1840. p. 47.

there were 219 members; by December 1823 there were 846. (28) Enthusiasm and membership fluctuated wildly, but the 1851 Religious Census shows that in Alston Moor and Teesdale the Primitive Methodists were probably more numerous than the Wesleyans. The hysterical nature of many of their conversions is shown by this extract from a description of an open air Weardale meeting in 1824 by one of the preachers. "While many spoke of the goodness of God, a mighty power came down. It struck one (a believer) speechless; two others fell to the floor in great agonies, and rose praising God for what they felt. Another man began to pray for a clean heart... and soon after he was so filled with the perfect love of God that he jumped up and down, shouting 'Glory' with all his might... Sinners then began to tremble before God, and presently five or six fell down and cried for mercy." (29)

The Church of England could offer little to compare with this enthusiasm. Its vicars and curates were of the upper and middle classes, without the sympathy for their parishioners possessed by the Methodist preachers, who were often ex-miners themselves. Sopwith wrote of the attendance in Allenheads chapel at a Sunday morning service in 1868; it consisted of "from twenty to thirty persons chiefly members of families connected by Agencies or other occupations with Mr. Beaumont's works." (30) The population of Allendale itself, he write on (28) See Statistical Table 15.

(29) Patterson, W.M. - Northern Primitive Methodism. 1909. pp. 161/162.

(30) Sopwith, T. - Diary. July 5th, 1868.

another occasion, was "nearly equally divided between Wesleyan and Primitive Methodists. In few places is the influence of Dissent greater - or that of the Church of England less." (31) In Weardale, in 1840, "Churchmen are so thinly sown" that "many a time the Wardens are either Methodists or Ranters". (32) Church accommodation in the nineteenth century was very inadequate compared with the chapels of the Methodists. In Alston parish, the population of which in 1841 was 6062, in 1840 there were two churches, with a total of 950 seats: there were 6 Wesleyan Methodist chapels with 1910 seats; and 4 Primitive Methodist chapels with 1155 seats. (33)

The other religions in the lead dales are not documented otherwise than in the 1840 Alston figures, and the 1851 Religious Census. The Independents were more numerous in Alston than were members of the Church of England. The Society of Friends was non-existent, save for a small congregation in Alston. It seems that the London Lead Company directors made no attempt to proselytise their employees. In 1840 there were a few Mormons in Alston parish, converted from Canada in 1837, but the sect apparently did not thrive. (34)

With a single exception there is no evidence that the growth of Methodism increased social friction between the employers and

(31) Sopwith, T. - Diary. Oct. 4th, 1863.

(32) Featherston, J.R. - Weardale men and manners. 1840. p. 70.

(33) See Statistical Table 13.

(34) Minutes of the Committee of the Council on Education.
1840/41. p. 149.

the workers, in spite of the polarisation of classes around church or chapel achieved by the mid nineteenth century. The exception was the bitter Allendale strike of 1849, where the leaders, most of whom were afterwards discharged and forced to emigrate, were Primitive Methodists, and the chapel was used as their rallying place. Nine years after this event, however, in 1858, W.B. Beaumont, on the initiative of Sopwith, began to pay an annual donation to both the Wesleyan and the Primitive Methodists in Allendale and Weardale. (35) Even before the 1849 strike, Sopwith had ended, against the strong opposition of the Allenheads chaplain, the enforced attendance of all children of whatsoever denomination at the Church of England Sunday School. (36) The London Lead Company impartially enforced the children at their schools or in their employ to go to church or chapel on Sunday. "Steady persons are stationed by the Company's agents at the door of every place of public worship, from whom the pupils of the Sunday schools receive tickets on entrance." (37) It would thus appear that Methodism was not seen as a revolutionary threat to industrial relations by the mining employers, for it was not only tolerated by them, but also given active encouragement.

Serious crime was never common in the lead mining area, even in the eighteenth century. Dismissal, and consequent loss of livelihood, was a greater deterrent than legal penalties. With

(35) Sopwith, T. - Diary. Nov. 19th, 1858.

(36) Sopwith, T. - Diary. March 9th, 1847.

(37) Poor Law Commission Report. 1834. App. A, p. 139A.

the exception of poaching, the subject of crime is hardly ever mentioned in the correspondence of the Blakett/Beaumont concern, or of the Greenwich Hospital in the eighteenth century. It is true that there were sporadic outbreaks of lead stealing, but when this did occur it was usually embezzlement on the part of a carrier, rather than outright theft, in spite of the pigs of lead left "lying by the road sides and in the fells as much exposed as so many stones". (38) In 1842 it was said that the office of constable in the parish of Alston was virtually a sinecure - "There have been no riots for very many years, and very few breaches of the law of any sort; robbery and housebreaking are now never heard of." (39)

The great exception to this record of law abidingness was poaching, which, in a moorland district like the lead mining area was bound always to be a serious temptation to the inhabitants, both as a sport and as a supplementary source of food supply. The eighteenth century letters from the Blakett chief agent in Newcastle frequently contained admonitions to the local agents to warn their men of the consequences of being caught poaching, but in spite of this, poaching continued, for, in bad times, grouse and snipe were an invaluable source of food for the miners:-

"Now the times being hard and provisions being dear,
The miners were starving almost we do hear;
They had nought to depend on, so well you may ken,
But to make what they could of the bonny moor hen.

(38) 1842 Report (Mitchell.) p. 752.

(39) 1842 Report (Mitchell.) p. 767.

There's the fat men of Oakland, and Durham the same,
 Lay claim to the moors, likewise to the game;
 They sent word to the miners they would have them to ken,
 They would stop them from shooting the bonny moor hen.

O these words they were carried to Weardale with speed,
 Which made the poor miners to hang down their heads;
 But sent them an answer they would have them to ken
 They would fight till they died for their bonny moor hen."

These verses are from a famous ballad recounting an exploit that took place in the lean year of 1818 when the Bishop of Durham's men arrested a number of Weardale miners for poaching, which miners were subsequently forcibly released by their colleagues. (40)

The early eighteen twenties were bad years for landlords in the lead mining area. The steward of the Wallace estates and Featherstone Castle, to the north of Alston, had much trouble from frequent poaching by large bands of miners. He had difficulty in supplementing his staff of gamekeepers, as local men "Would be afraid to go to Alston afterwards". In one incident "upwards of 100 people were assembl'd to take 12 poachers. and they bid defiance to them all, they plac'd themselves back to back, threw down their Game, and dar'd any of them to come within a certain distance, if they did, 12 of them should be dead men that instant, and consequently they were suffer'd to go away without any further molestation." He thought of writing to the London Lead Company agent but "I am told applying to the Company will be of no use and that some of the Poachers are employ'd to shoot Game for them". A neighbouring landlord "sent some

(40) The full text is given in Egglestone, W.M. - The Weardale nick-stick. 1872-1874.

summon's the other day by a Constable to serve upon some Poachers in Garrigill who had been seen upon his Manor... but he was oblig'd to return without serving them, about 40 of the Poachers assembled as soon as it was known he was there, and he was glad to make his escape". (41) After these stirring events, however, the poaching lessened, the miners being frightened of the threat of prosecution.

These outbreaks of violence were apparently the last large scale acts of poaching by large bodies of men. In the nineteenth century poaching became more the purview of individuals. Most miners were deterred by their new Methodist faith, and by the increasing efficiency of the mining companies in searching out misdemeanours and punishing them by dismissal.

The influence of these two factors - the growth of Methodism and the increasing paternalism of the companies - is also seen, and that most strikingly, in their effect on the drinking habits of the miners. In 1800 the Alston miners were said to "work hard about four days in the week, and drink and play the other three". (42) In the eighteenth century strong drink was the favourite relaxation of most lead miners. The letter books of the Blakett mining concern show that the provision of alcohol was condoned by the company, although care was taken that there should not be too many places where alcohol could be obtained at the actual mines. In the seventeen fifties the Coalcleugh agent received an allowance for supplying his men with ale at the

(41) Wallace letters, Northumberland Record Office. Sept. 7th - 25th, 1820.

(42) Houseman, J. - Topographical description of Cumberland. 1800. p. 70.

letting of Bargains. (43) Earlier, in the seventeen twenties, drink was regularly supplied to men working in one of the Derwent mines, when specific jobs were completed. (44) In 1733 the man who kept the public house at Allenheads left the district, and there was some discussion between the chief agent and Walter Blackett as to who should be permitted to succeed him in this lucrative position. "There are choice of Candidates for the House, but to let it any more to a Trader, experience shows, is neither for yours nor the Workmen's interest. I mean not to lett it to a shopkeeper, for I think its very necessary to have a publick house there, if it can but be kept under proper Restriction." It was not advisable however, to let it to the son-in-law of the Allenheads agent, who was one of the applicants. (45) In 1795 the then chief agent advised Colonel Beaumont to close an alehouse at Allenheads, formerly kept by the recently dismissed second agent, Westgarth Forster. This had been opened in spite of the existence of the "old accustomed public house kept by Nicholson the Engine Man... It has been a rule laid down by the late Sir Walter Blackett... not to allow more than one public house at Allenheads for reasons too obvious to mention. The breaking thro' this has been attended with very bad Consequences not only to the Concern but to the Health and Morals of the Workmen." (46)

The men also drank on every social occasion connected with

(43) B/B 98. Entries for Sept. 30th, 1753, etc.

(44) Parlour M/Ss, Northumberland Record Office.

(45) B/B B.M. Letter Book. Jan. 5th and June 8th, 1733.

(46) B/B 50. Sept. 24th, 1795.

their work. After the letting of bargains and the payment of subsistence the miners would "adjourn from the office to the public-house, and it not infrequently happens that a battle ensues before they part". (47) The washer boys were introduced early to the custom. Sopwith recounts a pleasant little story about the drinking habits of the Allendale washer boys, worth quoting because of the light it throws, both on these customs, and on the Victorian reaction to them. "In two successive years I found that on a certain day about midsummer many of the washing boys... were intoxicated - some loudly quarreling - others lying about apparently insensible. On enquiry I found that on the 29th June it was usual for these boys to be indulged not only with a holiday (i.e. Holy-day!!!) but also with superabundant refreshment leading to the above results. This, and this only, was the last remnant (for I destroyed it) of the annual feast or festival of St. Peter the tutular saint of the Parish." (48)

By the eighteen forties there had sprung up many forces opposed to excessive drinking, or indeed to any drinking at all, by the lead miners. The Methodists, of course, regarded alcohol as the root of most evils. A medical witness quoted in the 1842 Report remarked on the extensive and effective teetotal propoganda being circulated among the miners, and many witnesses testified that the amount of alcohol consumed in the area was much less than in former times. This beneficial happening,

(47) Featherston, J.R. - Weardale men and manners. 1840. p. 64.

(48) Sopwith, T. - Diary. Aug. 25th, 1856.

commented the Commissioner, was "caused partly by poverty as well as principle". More than half of the Weardale miners he interviewed, were teetotalers. The inns kept teetotal drinks for the abstainers who came to enjoy "the sociality of the public-house". These drinks were "coffee, soda-water, ginger beer, lemonade, black-beer and peppermint". The concentrated solution of peppermint was the most popular, and cost the same as rum - one landlord regretting "that poor men should be deluded to spend their money on such stuff, when they might get good wholesome invigorating beer". (49) But the inns themselves were disappearing. Allendale in 1827 had 17 public houses. (50) By 1863 there were only 2 public houses in the whole of East Allendale, while in West Allendale "we have had the people petitioning, for the only public house at the principle village of the district, to be done away with". (51)

At least as important a cause of the decline in the consumption of alcohol as the growth of the temperance movement was the attitude of the mining companies. As we have seen, in the eighteenth century, the Blakett/Beaumonts did not attempt to do any more than regulate the consumption of alcohol. There is no evidence for the attitude of the London Lead Company, but it was probably very similar. Eden states that in 1797 there were no fewer than 46 ale-houses on Alston Moor. (52) By 1832, when the

(49) 1842 Report (Mitchell.) p. 753.

(50) Parson, W. & White, W. - History, etc. of Durham and Northumberland. 1827.

(51) 1864 Report (Vol. 1.) p. 264.

(52) Eden, Sir F. - State of the poor. Vol. 2. p. 89.

Company were in a position to force their employees to obey virtually any regulation they chose to lay down, because of the surplus of men over jobs available, "strict discipline" had been established "for the prevention of drunkenness and debauchery". A first offence was visited with an admonition or a fine, the second by dismissal. (53) By 1842 London Lead Company employees were prohibited from entering public houses, and the penalty for drunkenness was instant dismissal. (54) The Beaumont concern had followed the Company's example by 1861, when Sopwith noted in his diary the dismissal of 6 men for drunkenness and rowdiness in a public house, although regretting that this meant they had to migrate from the district. (55)

The London Lead Company had declared war upon other vices than drunkenness. Swearing was punished in 1842 by fines of 1/- for a man and 6d. for a boy, to be paid into the benefit fund. (56) An employee found guilty of fathering illegitimate children was made to marry the mother or be dismissed. (57) It is interesting to note that one of the witnesses before the 1864 Commission declared that, while there was little drunkenness, and virtually no theft "the prevailing vice of this country, I am sorry to say, is want of chastity". (58)

(53) Poor Law Commission Report. 1834. p. 139A. Quoting the London Lead Company chief agent.

(54) 1842 Report (Mitchell.) p. 758.

(55) Sopwith, T. - Diary. Aug. 20th, 1861.

(56) 1842 Report (Mitchell.) p. 765.

(57) Poor Law Commission Report. 1834. p. 139A.

(58) 1864 Report (Vol. 2.) p. 383.

There was a similar toning down of the sports and pastimes of the lead mining community. In the eighteenth century the rougher blood sports were common - cock and dog fighting, badger baiting - as well as the milder sports of wrestling and hare hunting. The early Methodists preached at cock-fights, as the places where they found the greatest congregations of people. By the eighteen forties cock- and dog-fighting had disappeared, and even wrestling was dying out. Hare hunting and hound trails still continued, however. "A hound is as requisite to complete a miner's establishment at one stage of his life as a wife" wrote Featherston in 1840. (59) Sopwith noted in his diary his horror on discovering that his position as Allenheads agent demanded that he should also be "Master of the Hounds" and lead his men in pursuit of the hare. (60) He soon contrived, however, to pass on this honourable post to the chief smelting agent, who held it until after his eightieth year. Before Sopwith left Allendale in 1871, hare hunting too had almost vanished from the scene. Horse races were held regularly at such centres as Alston, Stanhope, and Allendale Town, in the eighteenth and early nineteenth centuries, but by 1850 the races had been abandoned at all three places.

The new and more disciplined amusements that replaced the blood sports of the eighteenth century included cricket, which both the Beaumonts and the London Lead Company supported generously, and a volunteer corps in each of the dales, again

(59) Featherston, J.R. - Weardale men and manners. 1840. p. 15.

(60) Sopwith, T. - Diary. Sept. 27th, 1845.

much patronised by the mine owners. Each tiny community also had its own town band. As well as being a symptom of the restraining and civilising influences of Methodism, these changes illustrate the greater power the mining employers had gained over all aspects of their employees' lives.

Other features of the social life of the lead miners which were declining by the mid nineteenth century were the great fairs and merry-makings which had formerly accompanied the pays, and annual hiring fairs. Agricultural and horticultural shows took their place. Even dancing had declined, and was regarded as a worldly amusement by the Methodist preachers. Also disappearing was the custom of holding great feasts to celebrate funerals as well as weddings.

Thus the social life of the lead miners changed with the gradual triumph of Methodism, and the increasing economic power of the mine owners. In the coal mining areas, too, Methodism acquired a dominant position. But there, the economic power of the landlord was not so great. The coal miners organised themselves in unions to stand up to their employers, and, if discharged, there were nearly always other mines ready to take them on. Here, the rough sports and riotous conduct continued well beyond the mid nineteenth century. A well-known Punch cartoon of 1854 called a "Further illustration of the mining districts", shows two coal miners watching a well-dressed man approaching them - Says one "Who's 'im, Bill?" "A stranger." " 'Eave 'arf a brick at 'im." This symbolises the Mid Victorian middle class attitude towards the coal miner - an apparent

savage, outside the pale of civilisation. The Victorian commissioners and others visiting the lead mining district, however, found the state of affairs there a virtually ideal industrial society. In 1859 a guide book writer commented "The miners are, for the most part, sober and industrious; there appears to be something in their metalliferous employment which makes them, as a class, more respectable than coal-miners." (61) It was not, however, the metalliferous nature of their employment, nor even the influence of Methodism which produced this appearance of sober respectability, but rather the grimly paternal discipline insisted upon by their all powerful employers.

(61) White, W. - Northumberland. 1859. p. 49.

CHAPTER 12.Education.

"As to the intellectual condition of the people, it is decidedly superior to that of any district of England of which I have any knowledge." (1). This comment is one of many similar ones made by Assistant Commissioner Mitchell in the course of his account of the lead mining districts in 1842. A.F. Foster, the Assistant Commissioner who reported on the area for the 1861 Newcastle Commission on Popular Education, also stated that "the lead miners are remarkably intelligent, and generally well educated". (2) Other nineteenth century writers express themselves in a similar manner, contrasting the lead miners favourably, not only with the neighbouring agricultural and coal mining communities, but with the "labouring classes" elsewhere in England. This relatively advanced educational state of the lead mining area was brought about by not one but many factors. Three of these have already been discussed. The first was the fact that the hours of work of the miners were relatively short, and the second, that even in the eighteenth century children did not normally start working on the washing floors and in the mines before the age of ten; and the washing floors, on which most of the future miners commenced their occupation, suspended operations during the winter months. The third was the influence of Methodism, discussed in the previous Chapter. To these must be added the important but rather nebulous influence of the whole

(1) 1842 Report (Mitchell.) p. 754.

(2) Popular Education Com. Report. 1861. (Vol. 2.) p. 323.

environment of the lead miners, and the apparent stimulus to intellectual pursuits given by the needs of their occupation. Lastly, there were the schools and libraries of the area, which were no better or even a little worse than those of any other rural area in the eighteenth century but which, in the period immediately following the end of the Napoleonic Wars, expanded in number and quality to a degree greater than in most other parts of England.

At the very end of the eighteenth century it was commented that the lead miners were "less profligate" than coal miners, and "mostly better informed". (3) This was at a time when schools in the area were no better than those of anywhere else in England. In 1821 a Greenwich Hospital report said much the same thing of the Hospital's mining tenants on Alston Moor, explaining that "the nature of their Occupations as Miners, leads them to enquiries, which greatly quicken their understandings and urges them to seek from Books such facts of practical Philosophy as are applicable to their profession." (4) Even when employed by the large companies the lead miners worked as independent bodies of men, every partnership performing complex mining and engineering operations. All miners needed to understand the geology of the area if they were to be successful, and the actual work of extracting the ore using explosives required skill and courage. Hydraulic and other machinery was assembled and often designed by the miners. Most important of all in furthering their

(3) Eden, Sir F. - State of the poor. Vol. 2. 1797. p. 170.

(4) Greenwich Hospital Report. 1821.

intelligence was the complex bargain system governing employment. To be successful a miner needed to know how to estimate the potentialities of the ground where he was working, and to be skilled at calculating and bargaining. For this latter an elementary knowledge of arithmetic and accounting was a great asset. The miners "generally possess a degree of shrewdness and intelligence rarely found in a labouring class of people" wrote Sopwith in 1833. (5) The smelters and refiners also required a high degree of mechanical and chemical skill and knowledge to carry out their work.

The advantages of possessing an elementary education as a means of acquiring the skills outlined above were as obvious to the eighteenth century miners as to their nineteenth century successors. In even the earliest "Bargain books" of the Blackett/Beaumont concern, dating from the seventeen twenties, it is most rare to find a Bargain signed "X John Doe his mark". Nearly all were signed with a proper signature, and the same man did not necessarily sign for the whole partnership every time a Bargain was renewed. In 1842 Dr. Mitchell pointed out that the "children in the lead country have the benefit of the example of their parents, and their encouragement to attend to their education; whilst in many other districts the fathers, never having learnt to read themselves, make no effort to stimulate their sons". (6) In 1861, Foster found books in nearly every

(5) Sopwith, T. - Alston Moor. 1833. p. 128.

(6) 1842 Report (Mitchell.) p. 753.

home he visited in the area. Some miners even wrote books about their profession. Westgarth Forster, the author of A section of the strata from Newcastle upon Tyne to Cross Fell, first edition 1809, a work which became a geological classic, was a mining agent on Alston Moor, the son of another at Allenheads. John Leithart, who wrote Practical observations on... mineral veins: with the application of several new theoretical principals to the art of mining, published in 1838, stated in his introduction that "a large portion of his time, from his infancy, was spent in the mines. He had not the good fortune to obtain the usual advantages of education... A Sunday School... was the only school... that the author ever attended."

The educational history of the lead mining area in the eighteenth century, and in the nineteenth century until the passing of the Education Act in 1870, divides up fairly logically into three periods of unequal length. In the first, up to about 1818, what schools there were led a precarious existence, supported inadequately by private charity with some little help from the mining companies. In the second period, from 1818 until the early eighteen forties, occurred the foundation of the London Lead Company schools, originated by the reforming genius of the Company's chief agent, Robert Stagg. At the same time there was a great increase of support for the other schools in the area, and the foundation of new ones by the Church, the ground landlords, and the other mining companies. Statistics and comments on education in the 1842 Report and in the early Privy Council reports on Education give a picture of the educational state of

the whole mining area at the end of this period in the early eighteen forties. During the late eighteen forties and fifties educational facilities were greatly increased within the Beaumont mining districts, due to the exertions of Thomas Sopwith. A.F. Foster's report to the Newcastle Commission on Popular Education, published in 1861, contains lengthy accounts of the schools of the two chief mining companies, with comparisons between them.

Educational institutions in the lead mining area in the eighteenth century existed under the same conditions and suffered the same disadvantages as did the Established Church with which nearly all were connected. The parish areas were enormous, and the inhabitants' dwellings scattered. A single centre in a parish was not accessible from all parts of it. In Allendale and Weardale in particular most of the lead miners lived at the opposite end of the parish to the parish church.

The eighteenth century schools in the area were of two (broad) types. The first consisted of schools founded as charities and endowed with land and/or a regular income. This income was rarely at all adequate, and the schools either had a minimum of pupils, if they existed de facto at all, or fees were charged to supplement the teacher's salary. The other type consisted of private schools, where a school teacher was employed by groups of parents to educate their children. These could vary from a dame's school, the teacher being nothing but a child minder, to a school where some teaching of an elementary nature was attempted. Evidence for the first type of school is meagre enough - consisting chiefly of lists of schools existing at a

particular time, with their endowments, in local histories and Charity Commission reports - and evidence for the second is virtually non-existent. Enough however does survive to give an outline picture of educational facilities in the mining area in the eighteenth century, and to consider whether there was a demand for better provision from either the mining companies or from the miners.

In each of the chief mining parishes - Allendale, Alston, Blanchland, Middleton and Stanhope - there was at least one charity school in existence in the eighteenth century. A typical institution was that in Garrigill, founded by a legacy left in 1685. This left "Twenty Shillings a Year to a Schoolmaster at Garrygill, towards his Maintenance; and forty shillings a Year to the said Schoolmaster for teaching six poor Children of the poorest Inhabitants in Garrygill, gratis, till they can read the Bible through, and then others to be put in their stead." (7) Alston itself had a grammar school, about which more will be said later. In Middleton parish there were three charity schools founded in the eighteenth century, in Middleton itself (from 1729), and in two outlying settlements in the east of the parish - Harwood (1724) where the incumbent of the Church of England chapel of ease received £4. a year from an endowment for teaching a number of poor children free, together with another £5. from the Lord Crewe Charity, and Newbiggin (1799) where a teacher received £11. annually from an endowment to pay his salary and for fuel. The first and last of these three schools also

(7) Ritchell, G. - Account of certain charities. 1713. p. 19.

accepted paying pupils in addition to the number taught free by the terms of the charity. In Stanhope parish there were four charity schools, three of them in the centre or eastern parts of the dale, whereas most lead miners lived in the west - Stanhope (1724), Westgate (1681), Boltsburn in Rookhope (1762), and St. John's Chapel (apparently virtually defunct by 1800, but in existence again in 1820). In Blanchland a school was founded by the Lord Crewe Charity about 1750. In Allendale Town a school was endowed with both land and income in 1692 and 1700. In the early nineteenth century this income amounted to about £50; the master was not allowed to take any fee-paying pupils, and he sometimes had to teach single-handed as many as 250 children. At Ninebanks on the West Allen the incumbent of the chapel received £1. a year "for his encouragement and provision to teach a school at the said chapel". (8)

The existence of the endowments for these charity schools is recorded in the sources already named. Whether the schools themselves existed from the date of the endowment is less certain. At Blanchland, for example, the difficulty of finding a suitable teacher, or even a teacher at all who would work for the money available, was never really solved in the eighteenth century. The post was intermittently vacant for considerable periods over a number of years. In a petition from the inhabitants in 1778, one teacher was alleged to be incapable, and children "who went

(8) Based on the Reports of the Charity Commission, Vol. 21, 1829, and Vol. 23, 1830. For an extended account of Weardale charity schools see Dobson, J.L. - Charitable education in Weardale. (In Durham Research Review. 2. 1955/59. pp. 40/53.)

many years to that school, not being able to read or write fit for business". This teacher was actually in prison for a time for theft. (9) Situations like this probably occurred in many schools in the area in the eighteenth century.

The private schools of that century are virtually undocumented. Fortunately in 1805 three of the Directors of the Greenwich Hospital included in their printed report of an inspection of the Hospital's estates in the North a survey of schools on Alston Moor giving more details than the customary lists of endowments, for both charity and private schools (though not dames' schools(10)

There were five schools altogether within Alston Parish. The largest was Alston school, founded as a grammar school in the sixteenth century. In 1805 the school had 72 boys: "three of whom have a classical education; twenty-eight are taught reading, writing and arithmetic; and thirty-one reading only." The Vicar was the head of the school, with an assistant master. £16.7.0. was the school's endowed income, with £53.4.0. given by the boys' parents in the form of quarterly payments. From this the Vicar received £39.3.0. annually, and his assistant, who probably did most of the work, £30.8.0.

Nenthead school was erected "about 30 years" before 1805, by voluntary subscription. There were then 27 boys, 15 being taught reading, writing and arithmetic, and 12, reading. The master received £40. a year, "which was intended to be raised by small monthly payments from the parents... of the boys, but they

(9) Dobson, J.L. - Charitable education in Weardale. pp. 47/48.

(10) Greenwich Hospital Report. 1805. pp. 202/206.

always fall short; this School is patronised by the Governor and Company and the deficiencies in the monthly payments are made good by them or their agents."

The charity school at Garrigill, already mentioned, had 44 boys. These included the 6 "poor children of the poorest inhabitants" being taught to read free. 32 more were taught reading only, and 6 writing and arithmetic also. The master's income was £27.6.0. a year, £7.8.0. from endowments, and the remainder from monthly payments by the parents.

Nenthall school, built in 1789 by voluntary subscription, contained 35 boys divided into "twenty-six readers, six writers, and three arithmetical scholars". The income was £20.4.0. a year, £18.14.0. from quarterly payments by the parents, and £1.10.0. from the rent of a cottage over the schoolroom.

The last school, at Leadgate, was "erected by voluntary contributions about thirty years ago". Of the 31 boys, 14 were taught reading, 12 writing, and 5 arithmetic.

The London Lead Company was supporting the Nenthead school, and it will be noted that the master's income there was higher than at any of the other schools mentioned. In doing this the Company was copying the practice of the Blaketts in their mines in Allendale, at Allenheads and Coalcleugh. In 1703 Sir William Blackett started making annual payments to a schoolmaster at each of these places - £10. a year at Allenheads and £5. a year at Coalcleugh in addition to the quarterly or monthly payments by parents of pupils. (11) The schools at each place continued into

(11) Ritchell, G. - Account of certain charities. 1713. p. 17.

the nineteenth century. At Coalcleugh sums paid to the master every quarter were recorded in the official quarterly accounts of the mine. (12) At Allenheads it became customary for the chaplain to be responsible for teaching in the school, and the annual subscription of the produce of four days' work per year from each workman due to him for his spiritual duties became conditional on his teaching in the school. (13) As late as 1840, when the Allenheads chaplain was also the incumbent of Allendale parish, he was still nominally responsible for the school, and inspected it daily. (14)

At Langley Mill in 1780 the Greenwich Hospital ordered a school to be built for the new settlement there. In 1783, however, the building so constructed was converted into a cottage. (15) Unfortunately the letter book recording this latter decision has become illegible through damp, and the reason for it cannot be deciphered.

This survey has shown that in the eighteenth century the schools were provided chiefly by the private generosity of individuals, together with efforts by parents to give their children some sort of an education. The mining companies assisted these efforts to a very limited degree. Their support of schools was probably due less to educational zeal than to a desire to keep the children out of mischief and inculcate some

(12) e.g. B/B 8. 1754: "Edwd. Coats for teaching school £2."

(13) See Chapter 11.

(14) Minutes of the Committee of Council on Education.
1840/41. p. 151.

(15) Adm. 66-97. June 9th, 1780.

sense of discipline. In 1796 the Beaumont chief agent wrote to Colonel Beaumont about the school at Allenheads - "All that is necessary for the Boys to be taught is reading, writing, and the common rules of arithmetic... When the boys are instructed in Mensuration, Trigonometry, etc., it frequently unfits them for Miners; they sometimes get into the Excise, and in case of being discharg'd for neglect, etc., they turn Poachers." (16)

The deficiencies of the eighteenth century schools are obvious. The masters were ill-paid, being worse paid than most of the lead miners, and their incomes similarly fluctuated with the price of lead, as paying pupils were withdrawn when times were bad. In consequence it is probable that the standards of teaching were very low, even by eighteenth century standards. "Children of the lowest classes of the poor are not taught even to read, from the inability of their parents to pay the quarterly sums." (17) Worst of all was the inadequate number of schools. The total number of children in the schools of Alston parish in 1805 was 209: the population of the parish in 1801 was 4746. It is therefore obvious that most children never went to school at all. Girls were apparently not provided for at all in any of the Alston schools in 1805. Surviving petitions, however, show that by the end of the eighteenth century at least there was a real desire among the lead miners for the education of their children. Two petitions survive, from the inhabitants of upper Weardale asking for the provision of more schools. The first,

(16) B/B 50. Jan. 4th, 1796.

(17) Greenwich Hospital Report. 1805. p. 205.

sent to the Crewe Trustees in 1778, was from the inhabitants of Killhope and Wellhope. (18) - "That your Petitioners as being poor mechanic people labouring in the Lead Mines for our livelihood and many of us having large families of children to provide for, are in general hard put to it to procure for them a Scanty Subsistence, even of the bare necessities of Life - And indeed if we can, from our hard labour, but get their necessary want of food in some measure supplied, together with a verry scanty Pittance of Cloaths, it is, in general, the stretch of what we can do. As for learning to our dear Offspring, of this (Melancholy to say it) they must really be destitute; as we cannot send them to a distance, and no man will come amongst us for this end, from the small encouragement that we ourselves can afford him; of consequence our Posterity, from one generation to another, must be brought up in a State of Ignorance, not many degrees removed, in point of religion, above the wild Indians. For how can it be otherwise - We ourselves as soon as we could be of the least service to our Parents in bringing in some little Aid for the family from the Mines, we were set to work therein - our children must follow the same Method - their Offspring must do the same, and so on to future generations." It may be said in comment that whoever the unknown person responsible for the composition of this petition might have been, he was far from being an illiterate.

Phrased in a more formal manner, a petition of about 1800 to the Bishop of Durham from some inhabitants of St. John's

(18) Printed in Dobson, J.L. - Charitable education in Weardale.
p. 44.

Chapel shows the deficient coverage of charity schools in the enormous parish of Stanhope. "That there being only three free Schools within the Parish, viz. at Frosterley, Stanhope and Westgate and consequently none within 10 Miles of the most distant Parts of the Chapelry where the greater Number of the labouring Poor reside, the Necessity of additional Schools is so strongly impressed upon the Minds of your Petitioners as to preclude the necessity of urging any Arguments in Favour of such Establishments." (19)

In the years 1818 and 1819 the educational structure existing in the lead dales was enormously improved. The inhabitants wanted better educational facilities, and were prepared to help themselves so far as it was possible. In 1811 a new school building for 200 children to be educated on the Lancastrian pattern was completed in Alston. Funds had been raised by public subscription. (20) But outside help was needed if there were to be adequate schools all over the region. This help came from the Church and from the London Lead Company followed, with less eagerness, by other lead companies.

In 1807, after threatening an action in the Court of Chancery, the Bishop of Durham, Shute Barrington, had received a total of £70,000. from the Beaumonts on account of non-payment of royalties due to the Bishop as owner of the mineral rights in Weardale. (21) Barrington was a member and eventually President

(19) Thomas Bell Collection, Newcastle University Library.

(20) Jollie, F. - Cumberland Guide. 1811. Appendix, XXV.

(21) See Hughes, M. - Land Lead and Coal. 1963. pp. 47/48 for an account of the action.

of the Society for Bettering the Condition of the Poor, which was primarily concerned with education; he determined to use part of this money for founding schools for the poor in county Durham. In 1809 he founded a school in Bishop Auckland which became a great success. In 1819 he began work in Weardale, the place whence his money had originated. In making this decision on behalf of the Church he was urged into action by reports of the plans of the Quaker London Lead Company to build and finance schools in the areas where their employees lived.

In 1816 the London Lead Company had appointed Robert Stagg as their new superintendent of mining works in the north. He was himself a Quaker, apparently unlike his predecessor, and keenly interested in social reform as well as business efficiency. (22) Also, by this time, the experiments in education of Joseph Lancaster, also a Quaker, were well known everywhere in England. In February 1818 the Court of the Company passed a resolution agreeing that the "two schools recommended by Mr. Stagg" should be established. (23) These schools were to be constructed at Nenthead and Middleton the centres of the Company's two chief mining districts. But as the Company had been acquiring leases of mines in Weardale since 1800 it was obvious that it was also interested in education there. That a Quaker company should initiate educational reform in the richest parish in England (judged by the Rector's stipend), was not acceptable to the Church.

(22) For an account of the London Lead Company's educational policies see Raistrick, A. - Two centuries. 1938. pp.58/76.

(23) B/B 18. Feb. 19th, 1818.

Bishop Barrington bought sites for four new schools in Weardale, one at Stanhope, one at Boltsburn in Rookhope, and two in the main Wear valley west of St. John's Chapel in 1819. He spent £2,000. on the construction of schools on these sites, and a further £2,000. was invested to provide a regular income for the new schools. (24) The trust funds of the older Weardale schools were amalgamated with the new fund, and these schools as well were supported by it, save for two that were entirely superseded by the new foundations. All the schools were brought under a uniform set of regulations. The teachers were to be members of the Church of England, and the children were to attend Church twice on a Sunday. The parents of each child were charged 1/6d. per quarter but there were twelve free places at each school. Examinations were to be held in the winter to enable "the washer boys or such other children as are absent during the summer months to attend". A particularly interesting regulation enabled the trustees to close down one school and open another "in case the precarious nature of mining adventures should at any future period render it necessary to remove the present schools to a part of the dale more convenient to the workmen".

The two schools established by the London Lead Company were both opened in the year 1819. From the beginning they were governed by a set of regulations remarkable for their comprehensiveness. (25) The most notable rule was that "all children

(24) For the founding of the Barrington schools in Weardale see Dobson, J.L. - Charitable education in Weardale. pp.46/50. Report of the Charity Commission, Vol. 21, 1829.
Whellan, W. - History, etc. of Durham, 1856.

(25) Printed by Raistrick, A. - Two centuries. 1938.

belonging to the Lead Company's Workmen, and the Widows of deceased Workmen, shall be required to enter the Company's Week-Day School at Six Years of age... The Boys to attend from Six to Twelve years of age; and the Girls from Six to Fourteen years of age, if they so long remain under the paternal roof." In case of extended absence every child had to complete the "required time of attendance, viz. Six years in case of a Boy, and Eight years in case of a Girl." No boy would be employed by the Company "who cannot produce a certificate from the Company's Teacher, stating that he has complied with the... regulations". R.W. Bainbridge, the London Lead Company's chief agent, was asked by the 1864 Commission what happened to a parent who did not obey the regulations. He replied that he would first inflict a fine, and then "if he still remained obstinate I should not hesitate to dismiss him from the service". No employee, however, had been dismissed for this reason: fines had been levied occasionally. (26)

Parents were charged one shilling per quarter for each child, and children of parents not employed by the Company were charged two shillings and sixpence per quarter. Any children of employees who lived too far away to attend the Company's schools at Middleton and Nenthead had to attend the nearest school to them that had been approved by the Company's school inspector, and to attend for the same period of time. The Company would contribute two shillings per quarter towards the education of each child in these cases.

The school teachers were at first to be members of the

Church of England. This regulation was later dropped after a quarrel in 1849 with the Bishop of Durham. The schools were, however, non-sectarian in character, each child being required to attend "twice every Sabbath such place of religious worship as his or her parents may think proper". The masters were each paid a salary of £100. a year, a far higher sum than was normal both in 1819 and during the remainder of the nineteenth century up to 1870. The method of teaching was, as in all schools in the district at this time, monitorial, one master instructing senior pupils, and they instructing the junior classes under his supervision. These monitors were also paid small sums. (27) As to the curriculum, Stagg told the Poor Law Commission in 1834 that "all that is professed to be taught in the Lead Company's schools is reading, writing, and so much of arithmetic as suffices to enable the men to check the overlooker's accounts by keeping accounts of their bargain-work themselves". (28)

The new educational projects of the Bishop of Durham and the London Lead Company stimulated the other mining concerns to action. In March 1819 the Beaumont chief agent wrote to Mrs. Beaumont that the London Lead Company had publicised its intention of giving £400. towards the support of Bishop Barrington's new Weardale schools: "I have considered it my duty to transmit the same for your information" he wrote. In February 1820 the agent promised the Bishop's school officer that Colonel and Mrs. Beaumont would give an annual donation towards the

(27) Popular Education Com. Report. 1861 (Vol. 2.) p. 367.

(28) Poor Law Commission Report. 1834. Appendix A. p. 139A.

upkeep of the Weardale schools. (29)

A Greenwich Hospital report stated that on Alston Moor in 1822 the schools "are increasing in number and improving in management. There are already One Thousand Children under instruction". (30) The Hospital gave annual contributions for the financial support of all the schools on the Moor. By 1842 the Hospital was giving 5 schools each £10. per year, and a sixth £20. per year. The Hudgill Burn Company endowed the school at Nenthall with £200. (31) The London Lead Company also gave regular sums to schools on Alston Moor and in Teesdale which were attended by children of their employees. (32)

Contemporaneously with the expansion of day schools around 1820 there was a rapid development of Sunday schools. The recently formed Newcastle Sunday School Union sent a delegation to Teesdale and Weardale in 1823 in response to a request for aid in the shape of money and books. In Teesdale there was but one firmly established Sunday school, together with one recently formed by the Methodists in the far west of the inhabited part of the dale, which was "upon the point of being given up for the want of a room to teach in; that in which they had before taught having been filled with hay". One new school was established there. In Weardale which was "far beyond Teesdale in regard to

(29) B/B 51. March 6th, 1819 and Feb. 5th, 1820.

(30) Greenwich Hospital Report. 1822. p. 22.

(31) 1842 Report (Leifchild.) p. 686.

(32) 1864 Report (Appendix.) p. 18.
Raistrick, A. - Two centuries. 1938. p. 60.

education and means of grace" 3 new schools were established, making a total of 9 all told, with a total of 152 teachers, as against only 15 in Teesdale. Alston parish had 12 schools and 180 teachers, and Allendale one school, and 25 teachers. (33) The London Lead Company established Sunday schools in association with both their day schools, attendance at which was compulsory for all the pupils at the latter. They were expected to continue attendance at the Sunday schools after they had started working, and were only excused when they had "passed a satisfactory examination in scriptural knowledge". (34) By 1842, in Alston parish, "To every place of worship, I believe without exception, there is attached a Sunday school." (35)

In 1840 a survey was made of the schools and pupils in Alston parish, giving figures to compare with those already quoted from the Greenwich Hospital report of 1805. There was a total of 15 schools in 1840, as against 5 in 1805. (36) There were 702 pupils, to compare with 209 at the earlier period. The population of the parish in 1841 was 6062: in 1801 it had been 4746. (37)

(33) Newcastle Sunday School Union Report. 1823. pp. 20/22: 38/39: 47.

(34) 1842 Report (Mitchell.) p. 750.

(35) 1842 Report (Mitchell.) p. 768.

(36) The 1840 figure includes dame schools which may not have been included in the 1805 figures. Excluding the dame schools there were 9 schools and 532 pupils.

(37) Minutes of the Committee and Council on Education. 1840/41. pp. 148/151.

The 1842 Report quotes several statistics and many individual statements about education. A return from the Beaumont concern surveys the educational abilities of the younger employees. "Of 432 boys and young persons under 18... 419 are stated to regularly attend public worship; 270 attend Sunday schools; 415 are stated to be able to read an easy book; and 291 have signed their names. Many of these who have not signed their names are still attending to their education in winter, and may yet acquire the art of penmanship." Dr. Mitchell commented on these figures that they showed "a much more favourable state of things than in other parts of England". He also found that virtually all miners giving evidence were able to sign their statements. (38)

Outside the London Lead Company's area of operation the pattern of school attendance was seasonal. "There is always an interval of a few months (generally November to April) every year, during which the boys are unemployed, and at this time they are generally sent to school. They are also in general sent to school at an early age before beginning to work, and the rudiments of education there received are improved, year after year, during the interval of washing." (39) Twelve was the normal age of beginning work at the washing floors over the whole area. Most washer boys individually questioned had been to school before commencing work, but only those employed by the London Lead Company had attended for as much as six years. Two or three

(38) 1842 Report (Mitchell.) p. 752.

(39) 1842 Report (Leifchild.) p. 686.

years was the more normal time. Most of the boys continued part time schooling in the winter until they were about fifteen, at which age they were generally sufficiently well-grown to accompany their fathers into the mine in winter.

In 1849 there began a complete reorganisation of the educational system within the areas controlled by the Beaumonts, the largest of the mining concerns. According to A.F. Foster in 1861 "these plans were organized immediately after the last great strike among the workmen, and, as I understand, in consequence of the conviction which then forced itself, that their education was necessary as a means of safety for their employees". (40) In 1849, however, when the Allenheads strike had occurred, Thomas Sopwith had been chief agent for 4 years. His diary shows that from the beginning of his tenure of office he possessed a keen interest in education. The strike was a useful excuse for extracting from his employer the necessary money for carrying out his plans. Between 1849 and 1861 seven new school buildings were constructed in Allendale and Weardale, some replacing existing buildings, others being completely new foundations. (41) Voluntary contributions were requested from the workmen towards the new schools, but the mining concern provided most of the necessary capital.

All the schools were brought under a uniform set of regulations drawn up by Sopwith. (42) The owner, W.B. Beaumont,

(40) Popular Education Comm. Report. 1861 (Vol. 2.) p. 347.

(41) Popular Education Comm. Report. 1861 (Vol. 2.) p. 345.

(42) Printed in Popular Education Comm. Report. 1861 (Vol. 2.) pp. 387/392.

retained ultimate control of the schools, but policy could be recommended by an elected committee - "Two agents, and four miners or other workmen, are to be elected in each district on the first subsistence day in each year, to act as visitors to the schools along with the resident agent of each district." These individuals could inspect the schools when they wished, entering comments in a Visitor's Book kept at each school. The whole committee could meet on request by any two of its members to recommend any specific action required. Membership of the schools was open, but not compulsory, to all children of workmen, and others could attend with the permission of the agent. The fee was sixpence per month per child. The schools were non-sectarian, and very precise instructions were laid down concerning the time and content of religious instruction.

About one-third of the regulations were taken up by an outline of the disciplinary system to be employed. "Corporal punishment is disapproved of, but is not entirely prohibited. Every case of its infliction is to be specially reported in writing by the master in the visitor's book... Rewards are given daily, weekly, and monthly by means of tickets, and the punishments chiefly consist in the forfeiture of such tickets as described in the following regulations..." Tickets were given for everything - punctuality, good conduct, prompt payment of fees, etc. - and were confiscated in proportion to the magnitude of the offence. The greatest number of tickets capable of being gained by an individual in one month was 110 - "80 tickets a month for four consecutive months places him in the first class

or order of merit, 50 in the second, and less than 50 in the third. Those of the first order receive their books, slates, etc. gratis, those of the second at half price, but those of the third must pay for them in full." (43) School records were passed on to the mining concern when a boy entered employment.

Sopwith retained his interest and concern with education all his life and published several pamphlets on the subject. He was always greatly concerned with detail as well as principle. Here is an extract from his diary in 1852 recording a daily routine. - "At 9 o'clock I employed, as I often do, the telescope to see the children enter School, which they usually do to a second, and rarely indeed is it that one or two are as many seconds beyond the proper time. One boy was about 3 seconds late... but it turned out that he had been hindered by an elder boy employed at the Washing Floors, and who is to come to the office on Wednesday to be reprimanded." (44) Sopwith knew precisely what he wanted the schools to do. "I do not think it either practicable or useful to aim at any high cultivation of mental energy [on the part of the miners] beyond those which can be directed to the advancement of their health, the management of their ordinary matters of business, and the desire to occupy their leisure time in temperant and innocent occupations. I would teach them punctuality, prompt payment, cleanliness, observance of the rules of health, moderation and aptitude in drawing." (45)

(43) Popular Education Comm. Report. 1861 (Vol. 2.) p. 346.

(44) Sopwith, T. - Diary. March 29th, 1852.

(45) Sopwith, T. - Diary. Jan. 27th, 1858.

In Foster's 1861 report there is an account of, and a comparison between, the educational systems of the London Lead Company and the Beaumont concern. Both had an elaborate system for regulating the children and linking their educational record with their working life. Both compared very well indeed with the Government schools inspected - the identical mechanical routines of the latter contrasting greatly with the individual idiosyncrasies of each of the lead mining schools, where a good teacher was given far greater freedom in method and curriculum. Educationally the London Lead Company schools were "decidedly superior" to the Beaumont schools in "more intellectual" subjects, but the latter were better in "singing, drawing, and other matters of taste". (46) But the great distinguishing point of superiority of the London Lead Company's system was that schooling was strictly compulsory. In Middleton in Teesdale Foster found the best educational conditions in the whole of the north-eastern region he had inspected. (47)

Thus by the mid nineteenth century the two largest lead mining concerns had extensive educational facilities for their workmen. Charity schools existed in all the areas and were supported by the ground landlords in Weardale and on Alston Moor. Smaller companies may have had similar educational schemes - the Rodderup Fell Company in 1864 automatically deducted six shillings per child per year from a parent's wages to pay for

(46) Popular Education Comm. Report. 1861 (Vol. 2.) p. 370.

(47) Popular Education Comm. Report. 1861 (Vol. 2.) p. 373.

education - but evidence for these has generally not survived. The schools were provided for genuinely charitable and moral reasons, backed up by self interest as they provided a means of disciplining the future workmen in their impressionable years. The standard of education was higher than in most other areas of England. Foster's report of 1861 quotes statistics of the reading and writing abilities of parents in the coal mining areas of Durham and Auckland Unions, and of the lead mining areas of Allendale, Weardale, and Derwentdale (48) -

<u>Coal mining area.</u>	<u>Fathers</u>	<u>Mothers</u>
Can read	78%	72%
Can write also	64%	47%
Can neither read nor write	22%	28%
<u>Lead mining area</u>		
Can read	95.7%	90%
Can write also	90.4%	82%
Can neither read nor write	4.3%	10%

These statistics are a striking demonstration of the superior educational environment of the lead dales in the mid Victorian period. The 1870 Education Act coincided with the final decline of the lead mining industry and the gradual migration of a large proportion of the inhabitants of the dales. The numbers of schools contracted instead of expanding after this date.

Parallel with the growth of the number and quality of schools in the lead mining area there developed other opportunities for self education and intellectual recreation in the form of libraries. Of collections of books made by individuals no record survives, but there is some evidence about libraries.

(48) Popular Education Comm. Report. 1861 (Vol. 2.) p. 332/333.

built up by co-operative effort for general use. In the eighteenth and early nineteenth centuries these libraries, if they existed at all, did so on a subscription basis. Then, after the end of the Napoleonic Wars, the larger mining companies and big landlords in the area began to contribute money and accommodation for books, helping, and in some cases superseding, the subscription libraries.

There is virtually no evidence for the existence of libraries in the area in the eighteenth century. By the end of it, however, they certainly did exist in a primitive fashion. At Westgate, in Weardale, a subscription library was founded that lasted at least until the end of the nineteenth century. Others probably existed of which no record remains. (49) One primitive form of library, gathered together by co-operative effort, was the book-club - "A few join in contributing two-pence or three-pence per week for the purchase of books, which are lent out to subscribers; and when the club breaks up, the books are divided by lot." (50) Book clubs of this nature were still in existence in 1842. (51)

After about 1820 there was a great expansion in the number of libraries. In a Greenwich Hospital report of 1821, the foundation of a library in Alston itself was recommended, as

(49) There was a printer resident in Alston by the seventeen nineties. A periodical entitled The Alston Miscellany commenced in 1799 and ran until the end of 1800.

(50) Mackenzie, E. - View of Northumberland. Vol. 1. 1825. p.207.

(51) 1842 Report (Mitchell.) p. 757.

"there is still much want of a parochial library in the village". The Hospital agreed to give this project financial support, and by 1842 there were no fewer than four libraries in Alston itself, and three others elsewhere in the parish. (52) One of these was a library in the new Mechanics Institute. In Weardale two more subscription libraries opened in the parish between 1820 and 1840, in addition to the one at Westgate. Bishop Barrington contributed £50. to the support of these libraries. (53) The Sunday schools generally had a collection of books for the children to take out. (54)

But the greatest contribution towards the provision of libraries in the area came from the mining companies themselves. The leader in this field was, as usual, the London Lead Company. Coinciding with the foundation of the schools at Nenthead and Middleton the Company bought books to form libraries in them. From time to time later in the century money was donated towards a further supply of books. (55) The Company also aided the subscription libraries. By 1850, according to Raistrick, it was subscribing annually to sixteen libraries in its area of operation. The libraries at Nenthead and Middleton lent books without charge to all workmen and their families. (56) In addition at these places reading rooms were built at the

(52) 1842 Report (Mitchell.) p. 753.

(53) 1842 Report (Mitchell.) p. 757.

(54) 1842 Report (Mitchell.) p. 769.

(55) Raistrick, A. - Two centuries. 1938. p. 70/71.

(56) 1842 Report (Mitchell.) p. 750.

Company's expense as social centres for the men. "The members attending the room contribute 3d monthly towards the purchase of newspapers and periodicals; an exception being made to youths under 18, who only contribute 2d monthly." (57)

The Beaumont concern did not provide libraries for its work people until after the coming of Thomas Sopwith as chief agent. He founded four libraries in Allendale and Weardale, three in 1848 and one in 1850. Money was given to provide a building and furniture at each place, the library being conceived as a club rather than as a mere collection of books. Members had to pay an annual subscription of one shilling per quarter for the first four years of membership, subsequently reduced to one shilling per year. (58) Sopwith noted with some pride in his diary that he had established alongside these adult libraries "what I have called Children's Libraries... the object of which is to afford young children a good selection and frequent change of amusing books." (59) No charge was made for use by children. In Weardale the library was associated with another Sopwith foundation, the Weardale Miners' Improvement Society, which combined "the principles of a temperance society and a night school with those of a Mechanics' institute and public library". (60) Both here and in the ordinary Beaumont libraries in Allendale there were programmes of lectures - Mr. Sopwith himself, however, being

(57) 1864 Report (Appendix.) p. 18.

(58) Bookplate of Allen Mill library, in the possession of the writer.

(59) Sopwith, T. - Diary. July 1st, 1865.

(60) Popular Education Comm. Report. 1861. (Vol. 2.) p. 355.

the most frequent lecturer on all subjects from astronomy to the history of Egypt. (61)

As to the numbers and contents of books in the libraries little evidence survives. In a survey of the numbers of volumes in selected libraries printed in Foster's 1861 report the largest library was the old subscription library at Westgate with 1387 volumes: Middleton had 1189: Allenheads, 1177; and Nenthead, 937. Stanhope parochial library had only 150 volumes, while another Weardale library listed in the 1851 Educational Census had only 12 volumes. (62) These totals are not very high, and membership of the libraries was apparently only taken up by a small proportion of the workmen and their families. Foster lists the number of members in each of the two London Lead Company libraries, and the three Beaumont libraries in Allendale. The highest membership was at Middleton, with 139 members: the lowest at Allenheads, with 102⁰. Books were probably mainly of the type intended to convey "moral and other useful knowledge". No Catalogues now appear to survive. Sopwith, however, noted in his Diary that books were explicitly bought for the Beaumont libraries to provide recreation as well as instruction. (63)

(61) In an interesting note in his Diary for 1849 Sopwith recorded that "Mr William Chambers [the Edinburgh educational publisher] and I had it under consideration to publish a series of pamphlets under the name of Allenheads Tracts but this intention was not carried out. The general policy at the W.B. lead mines... has been to aim at privacy and to avoid publicity in the eyes of the world."

(62) Popular Education Comm. Report. 1861 (Vol. 2.) p. 396.

(63) Sopwith, T. - Diary. June 5th, 1860.

The Victorian managers of and visitors to the lead mining area eulogised the miner's intellectual condition. Here was an apparent rural area, with a population scattered over many square miles, that had schools and libraries as good as those in a closely knit urban community - yet without too many of the physical disfigurements of industrialisation. This picture is undoubtedly exaggerated. Sopwith wrote in his book of 1833 of the surprise a friend of his received when hearing a miner working at the face quote Blackstone's Commentaries "both with accuracy and direct reference to the subject of discussion". (64) The story may be true, although it is hard to believe. But an undoubted example of unusual intellectual activity by these isolated miners was the publication of a book in 1851 entitled The Poetic Treasury: being select pieces of poetry from one hundred different authors... Designed for the benefit of the working classes. The preface inscribed "West Allendale, June 18th 1851" expresses the wish that the work "may be of some service to members of the working classes wishing to read at the end of the day". It would be interesting to know how many of their fellow miners bought it.

(64) Sopwith, T. - Alston Moor. 1833. p. 139.

CHAPTER 13.

Conclusion.

In the period covered by this thesis the lead mining industry passed through a social as well as an industrial revolution. Superficially, life in the lead mining dales changed less between 1750 and 1850 than in the neighbouring coal fields and shipyards. The wild and romantic Pennine scenery remained little corrupted by industrialisation. Mining continued to be governed by apparently the same elaborate system of sub contract. But population increased by a factor of three or four, and below the surface (metaphorically speaking) social institutions changed fundamentally.

Technological advances in underground haulage and in ore dressing at the beginning of the nineteenth century forced organisational changes on the mine owners. In these fields sub-contracting was either abolished (the London Lead Company) or regulated so closely that the sub-contractors were direct employees in all but name (the Beaumonts and the Derwent Mining Company). The contracts governing actual ore getting became tighter, reducing the practical status of the theoretically independent bargain taker to that of an employee. The proportion of agents to workmen increased, allowing greater supervision. The miners were paid more regularly - and were expected to work more regularly. Outside working hours there was little of their social life not influenced by the mine owners by 1850. Education, churches and chapels, benefit societies, even organised amusements were provided or subsidized by the mining

companies. But- misdemeanours in private life - drunkenness, fathering a bastard child, etc. - were as much the province of managerial discipline as any offence during working hours. At work and outside the lead miner was dominated by his employer.(1)

The employers' object was to increase profits. Benevolence was a factor in the welfare services provided, but it was scarcely altruistic. It was good management to control the labour force at home as well as at work, and to educate the next generation into a proper sense of discipline. The London Lead Company, the most efficient employer, introduced the changes earliest; the other large companies gradually followed suit. The lead miners wanted higher and more secure remuneration for their labours. In exchange for greater security they were prepared to surrender many of their traditional freedoms.

All the changes that did occur within the mining industry in the hundred years from the mid eighteenth to the mid nineteenth century took place within the bargain system. Only the Derwent Company abandoned this completely - and replaced it with a Cornish variant. Except in the case of this Company there was never a major influx of either new management or new labour from outside the region. Both masters and men were conservative, used to traditional forms. Revolutionary change was disguised by old convention. The employers dominated the evolution because of their exceptionally powerful position vis-a-vis their

(1) I have been much influenced, in making this analysis, by the writings of Professor Sydney Pollard particularly The genesis of modern management, 1965 and The factory village in the Industrial Revolution (in English Historical Review, Vol. 79, 1964, pp. 513/531.)

employees. There was no alternative work available and population was increasing faster than jobs. The lead miner cooperated or got out.

It has proved impossible to measure quantitatively changes in the standard of living over the period. Qualitative judgments, however, can be made. The lead miner of 1850 received his wages more regularly and securely than his predecessor of 1750; most of his chances of making a fortune by a rich strike had gone. He was in less danger of near or actual starvation in 1850, but most of his feasts and festivities had disappeared. Life was more secure, but also more regulated; "Big Brother" was very close. In the eighteen seventies and eighties, with the collapse of the lead mining industry, the security disappeared as well.

A P P E N D I C E S

Documents	1 - 5
Statistical tables	1 - 15
Bibliography	

DOCUMENT 1.

Resolutions setting down rules for the London Lead Company's
chief agent to follow in administering mines and estates.

6. Oct 1785.

The Court came to the following Resolutions

That the Company's Pays in the North which used to be paid Half-yearly be in future paid only once every Year up to Michaelmas 1785 and so to be continued; and that the following instructions be sent to their several Agents there.

That the following regulations be adopted and carried into execution as soon as can be done consistently.

Viz that the full pays be made once a Year at Michaelmas and that no One be paid for but what is Washed and Weighed up, and none sent but with printed tickets of the quantity from the Mine to the Mill.

That no Agent be permitted to deal in any Commodity made use of by the Miners or Smelters; nor that they be permitted to be concern'd underhandedly with any person who shall deal in such goods: nor be concerned in Whimseys or Letting Horses to draw Waggons, or Wood, or any thing of that kind for the Company: or have any allowance of Coals or Candles.

That the monthly advance money & also what becomes due to them be paid to them themselves & no other person, in money and not in any kind of Bank Notes, nor any Trades people attend at the pay: nor to any order written or otherwise, except the Miner is ill & cannot attend himself.

6. Dec. 1810.

The Court have unanimously agreed to the following resolutions:

- 4th. That a Fund be established for the Relief of maimed & decayed Workmen employed by the Company upon such Plan and under such Regulations as shall be agreed upon...
- 8th. That no Gunpowder be used by the Company's Workmen but what is furnished by Order of the Court & to be charged to them at prime Cost, with only the addition of Freight & Carriage.
- 9th. That the Candles be purchased upon the best Terms, paid for Quarterly and charged in the same Manner as the Gunpowder.
- 10th. That in letting of Bargains no person whatever shall have an hireling employed on any account in the Company's Works, except a Workman who may fall sick and has taken a Bargain previous to his sickness; and he shall only be allowed this till that Bargain be finished.
- 11th. That no Bargain be let for a longer Term than a Quarter of a Year.
- 12th. That as few Wagemen as possible be employed, but that in every instance where it can be accomplished, the work to be done by the Peice, of what nature soever.

- 13th. That for engaging of Whimsey or Level Horses used by the Company, Notice to be given to the parties letting the same for receiving proposals for yearly Contract; the proposals to be given under seal and forwarded to the Superintendent.
- 14th. That all Stores such as Wood, Rope, Iron etc. necessary for the Company's Mines, shall be purchased of the first wholesale houses at Newcastle at the short Credit, & the benefit of the discount taken...
- 17th. That the Storekeeper shall keep a correct Account of... Wood, Rope, Iron, Gunpowder, Candles and other Stores; keeping a similar account of the same, making a distinct Account of what is to be reckoned for with the Workmen from what is paid for by the Company...
- 20th. That no Agent, Clerk or Assistant, or any party on their behalf shall have any concern, directly or indirectly, in selling Gunpowder, Candles, or any other material used in the Company's Mines, or be concerned in the Corn Trade, or in the sale of Shop Goods to the Company's Workmen, or any others, either directly or indirectly.
- 21st. That no Agent, Clerk, or Assistant, or any party on their behalf, shall have any Mine or Shares of Mine, or be concerned either in Mine adventuring, or in the purchase of Ore, directly or indirectly, or in any shape whatever...

22nd. Coals and Candles are not allowed to any Agent or otherwise.

7th March 1812.

25. That no Agent, Clerk or Assistant or any party on their behalf shall have any Mine or Shares of Mine or be concern'd in Mine adventuring or in the purchase of Ore, directly or indirectly or in any Shape whatever or be concern'd in the Farming Business or employment except keeping a Horse or Cow or two for the use of their Families.
28. That every charge against the Workmen for Drawing Work, Tools, Crushing Mills etc. as well as advances, Candles & Gunpowder, to be passed thro' the Due papers & no part to be reckoned or taken off them in any other way whatever...

DOCUMENT 2.

Arrangements recommended to Colonel and
Mrs Beaumont for the future Agency and
Management of their Lead Mines. viz:

[From Blackett of Wylam Papers, Northumberland Record Office.]
 At Weardale.

Mr. Emerson	Principal Agent	£100 salary
Mr. Geo. Crawhall	Assistant to Do.	£60 "
Mr. Josh. Harrison	Clerk or Bookkeeper to Do.	£50 "
	Inspector of Mines at	
	Breconsike	£60 "
	Do. of Mines at distant	
	places.	£60 "
Martin	Do. of washing ore at	
	Breconsike.	£50 "
	Do. of Do. at distant	
	places.	£50 "

Joseph Potts and John Foster to be discontinued - also
 George Dixon except he be thought a proper person to be
 inspector of the Miners at distant places.

At Allenheads.

Mr. Crawhall	Principal Agent	£100 salary
Mr. Wm. Crawhall	Clerk or Bookkeeper to Do.	£50 "
	Inspector of Miners	£60 "
	Do. of washing ore (the same	
	Person as at Colecleugh)	£25 "
Mr. John Crawhall to be discontinued.		

At Colecleugh

Mr. Joseph Dickinson	Principal Agent	£60
until he be succeeded by Mr. Thos. Dickinson.		
Mr. Alec Prothero	Clerk or Bookkeeper	£50
Mr. Thos. Dickinson.	Inspector of Miners until)	
	he succeeds Mr. Josh.)	
	Dickinson.)	£60
	Inspector of washing ore,)	
	the same person as at)	
	Allenheads.)	£25

Westgarth Forster and Josh. Dickinson Senr. to be discontinued.

It being the practice at Allenheads to pay £10 per ton for Tontail ore the washers finding Fuel - or 9-10-0 per ton, when Coll. Beaumont finds it, we recommend in future, that it be made a General Rule for the Coll. to find the fuel at all times, likewise that in all future bargains with the workmen no Shifts be allowed at any of the Mines (which has been the practice at some of them) but that all the Deads be -- removed and cleared away at the Expencc of the contracting workmen -- so that Coll. Beaumont may not be put to any Costs in removing Deads except in the revival of old workings.

The Principal Agent at each of the three Mines to have the privilege of employing Horses to draw all the Lead Ore, Bouse Ore, Dead work &c from their respective Mines, also for the Carriage of Timber or other Materials, at such rate or price per Shift or otherwise as may from time to time be deemed fair and

reasonable, taking into consideration the nature of the work, the price of Hay and Corn and every other circumstance attending it, but such Agent not to have or receive any other privilege advantage or perquisite whatsoever.

No Agent, Clerk, Inspector or other person to have the privilege of nominating a Hireling or Wageman, so as to derive a benefit from any Bargain or contract for raising ore, driving levels or otherwise but such persons only who may contract for that purpose and -- whose names may be inserted in the Bargain Book at the time of contracting, to be intitled to the benefit or advantage arising from such Bargains.

A general Inspector is also recommended, whose duty it will be to examine the state of the different Mines in the course of working previous to the expiration of such Bargain, so as to determine the proper price to be given at each letting, which letting he must attend - he must also point out all such neglect, or other observations may occur to him on such inspection - likewise point out such places of Trial for Ore as he may think advisable and view such other places as may be recommended by the Principal Agent, whose duty it will be to point out to him every favourable and encouraging prospect of Trial upon which he must state his opinion in writing, along with every other matter or thing that he may from time to time recommend to be done, to the principal Agent at each mine and also to the Chief Agent C. Blackett Esqr. at Newcastle.

Duty of Principal Agent. Altho in all well regulated Systems every department should be appropriated to a proper Agent so as

that in case of any neglect it may be known on whom the blame should fall, yet such principal Agent must in the present instance take upon himself the whole responsibility, consequently consider himself the inspector of every department within his district, and if any of the assistants neglect to perform their duty, he must acquaint Mr Blackett the Chief Agent therewith, but not discharge or appoint any assistant Clerk or Inspector without the direction of such Chief Agent - He must also apply to the Chief Agent upon all occasions when anything material occurs or is wanting, and observe and execute such orders and directions as he may from time to time receive from him or the general Inspector of the Mines, to whom he must point out from time to time such fresh or neglected places as he may think deserving of a Trial for Ore -- He must also prepare a plan delineating the present state of the workings at each Mine in his district, in order that the Inspector of Mines may continue the description of the workings on such plan according to the directions given to him.

An Assistant to the Agent at Weardale is also recommended on account of the Mines there being so extensive and at so great a distance from each other, as to render the undertaking too much for one Agent to pay proper attention to, it will therefore be the

[Remainder of document is missing.]

DOCUMENT 3.Petition from the Weardale Miners, 1796.

[From the Hexham Manorial papers, Newcastle University Library.]

St John's Chapple Weardale Augst. 16th.

To the Hon Col. Beaumont M.P.

The humble Petition of the Commetee of Weardale Miners

Sheweth/ That your Petitioners did in Novm. last forward a Petition to you which they believe was intercepted by C. Blackett Esq. Newcastle that your Petitioners have boath before and since that time received various insults from your agent at Newhouse and weare we to inumerate all the advantages resulting from the workes to the agent and his friends you would realy be astonished; Suffice it to say that the Money he receives for one horse employed in drawing the Ore and Strata amounts to the enormous sum of 120£ per annm and the number of horse's imployed in the mines at one third less price would aford comfortable livings to Several poor famleys of which a great many have no employment at present. And not withstanding the exorbitant price of Candles and Gunpowder and other Utencels and your petitioners have Candles of an inferiore Quality and on account of the long carriage they are much brok which renders them worse by 2/6d per Doz. than those which other miners use and we are even bereft of the wrappers in which the Barrels are contain'd for the safety of the Powder and Convenience of carriage which wrappers are delivered in barter at 8d per Stone to sellers of earthenware. That your petitioners are very assiduous workmen and not envious of any

good to any Man, but at the present Juncture are utterly incapable of supporting themselves and families by reason of the low prices given them for working in the lead mines, and when we turn Our eyes to the envious prospect of labours our Brethren in business receiving an advance of prices from the London Co. so far as 35s to 40s and upwards per. Bing, while ours remains Parallel with the times when the necessities of Life were not half the value they are now. But at the same time a certainty remains in us that all this is unknown to your wise wisdom and goodness fills us with hopes of relief. They therefore humbly pray that you will interpose your authority in their behalf and order them Sufficient wages for their work. - And one guinea per month each man for their present support, a pay three months sooner than the wanted time and such treatment as Rational beings are entitled to, which they have so long, so often but in vain expected from the agent here with such regulations as you may think expedient. Then shall the name of Col. Beaumont be recorded in the annals of futurity as the Saviour of the oppressed and dwindling Country. The weeping mothers shall suppress their tears and teach their lisping offspring to bless the preserver of their lives, while they themselves invoke the Almighty to shower down innum. Blessings on the head of their Benefactor and long containe him in that exalted station for which Heaven has selected him to defeat the cruel Designs of unfeeling Individuals.

And your Petitioners as in duty bound shall ever Pray.

Edward Byeres

John Robson

Thos. Dixon.

and 181 others.

DOCUMENT 4.Petitions from the Weardale Miners, 1818.[B/B Records, Newcastle University Library.]

To Martin Harrison Esq.

The humble petition of the Miners in Weardale - Sheweth that your petitioners are suffering and have long suffered the greatest distress owing to the pressure of the times and the low price given for raising Ore - this they have endured with great patience and fortitude in expectation of better times - We have continued working a long time confiding in Lady Beaumont's promise that our Wage shall be advanced, as soon as the price of Lead advanced. Lead has consistently advanced since that period, but we have only received five shillings more per bing, and that only for the poorest parts of the mine, great numbers of us are not making our Subsistence Money, & have been under the necessity of seeking relief, upwards of 400 of us (including their Families) are on the Parish. Mr. Crawhall says that he has not power to give more at present, our strength and spirits are gone, numbers of us nearly without food and raiment suffering extreme poverty. - We feel ourselves obliged from these distressing circumstances to humbly request that you will have the goodness to advance the price for raising Ore not less than 10/- per Bing and other work in proportion; in order to enable Men to make 15/- or 16/- per week, and to advance our Subsistence Money to 40/- per Month - from your wonted goodness & generosity we humbly hope you will grant our reasonable request & your petitioners will ever pray &c.

To W. Beaumont Esq. M.P.

Honourable Sir

We the Miners in Weardale having long laboured under the greatest distress, have felt ourselves obliged to petition for an advance of Wages. We find that our present subsisting Money which is only 7/6 a Week, much too little to purchase the necessaries of life. We have therefore petitioned for 10/- a week - our requests have not yet been granted. - Mr. Harrison has made us an offer of 5/- per Bing more than we have had, but it is too little, as those places which wo'd have the 5/- advance cannot be worked under 10/- to enable Men to make a sufficiency to support themselves and families, and unless the Subsisting Money be advanced to 10/- a Week, it will be impossible for the greatest number of us to get the necessaries of life, as our Credit is entirely gone - We have taken the liberty of enclosing the petition, which we sent to Mr. Harrison and humbly beg the favour of you to interfere in our behalf - We hope that your influence will prevail on your worthy Mother, to grant us our requests, - We feel fully assured from your known generosity & benevolence, that you will do whatever is in your power, to render our situations more comfortable than they have been.

DOCUMENT 5.The Washing Organisation at Coalcleugh in 1833.[B/B Records, Newcastle University Library.]

Rules and regulations to be observed and kept by the Contractors for Washing Bouse and Wastes at Barney Craig and Coalcleugh Leadmines entered into this 23rd day of April 1833.

1. We the undersigned Contractors for Washing Bouse and Wastes do agree to give the Boys the wages specified in the returns made at the Office for working the following Hours viz: each Boy to commence working at 7 o'clock in the morning and continue to 12, to be allowed one Hour for dinner and commence work at one o'clock and continue till 7 at night, in case any should neglect working the above Hours, to forfeit so much of their day's labour as hereby set forth, if an Hour behind time in the Morning to have a quarter of the day's wages deducted or work two Hours overwork, and if two Hours behind the specified time, not to be allowed to commence till 12 o'clock with $\frac{1}{2}$ a day's work (at the approbation of the Contractors) and the same forfeits to be exacted in the same proportion against defaulters at any period of the day, this to be in force for every working day in the week except Saturdays when the Boys will be allowed their shifts for working from 7 to 12 in the Morning while the days admit of working the above specified time, and in the Autumn when the days will not admit of working so late, the Boys to work on the afternoon of the Saturdays at the discretion of the contractors to make up the deficiencies.

2. A Person will be appointed to Ring the Bell at the

above precise times when every Masterman washer is expected to be on the spot and see the Boys are in readiness to commence, all defaulters to be reported to the Ore inspector. The Contractors to make a return of the exact time they are employed together with their Boys with each separate heap of Bouse to the Ore inspector, in default of this compliance the contractors will no longer be considered workmen of Mr. B.

3. It has been a regular practice with the Barneycraig washers to knock a considerable part of the pickings taken from the Grate which cost them $\frac{3}{4}$ d a Kibble, we can have it taken to the Crushing Mill and Grinded at $1\frac{1}{2}$ d per Waggon and can save the sludge or slime Ore equally well, it being exposed to a similar stream of water in both operations, the Ore from the Crushing Mill is generally better dress'd particularly the round part or sieve Ore it being freed more from ends or chats by being more regularly sized and I could recommend as much of the poorer Bouse as possible to be taken direct to the Crushing Mill it being washed at less expence and also improves the quality of the Ore very much.

4. The Miners not to be allowed to render the Washers any assistance in the Washing of their own Bouse, except in two or three instances with the top sill work. The Miners generally complain of the Washers dressing their Ore finer than necessary which makes it unple asant for the washers themselves as well as the Ore Inspector, and that every facility be afforded in getting the Bouse regularly brought to the surface to keep the washers in employment.

5. Henry Bell & Partner to have 2/3 per Bing for all the Breaking sent to the Crushing Mill after being sufficiently wash'd.

6. Each Boy to have 10/- per Month subsistence Money advanced so long as his wages does not exceed 5/- per Week, from 5/- to 8/- per Week 15/- per Month - from 8/- per Week upwards 20/- per Month provided the contractors certify they have the same earned.

TABLE 1.The months in which Blakett/Beaumont mine"Pays" were held, 1755-

1755	November.
1756	"as usual" in September.
1759	May.
1760	July.
1761	March.
1762	June.
1765	October.
1767	November.
1770	December.
1772	December.
1778	January.
1784	May.
1786	April.
1787	April.
1788	April.
1789	April.
1793	May.
1794	May.
1796	May.
1799	May.
1809	March.
1811	March.
1812	May. (Petition from men before this protesting against Pay being delayed until May instead of in March "as usual".)
1814	March.
1828	March.
1833	April.
1842	"Generally" in the month of January.
1846	January.
1847	January.
1858	February.
<u>From 1861</u> Half yearly pays, in May and November.	

N.B. The mining year ran from October to September. In the eighteenth century payment in, say, November, was not for the immediately precurrent year, but for the one before that. In some calendar years no pays took place at all. The establishment of a regular month for payment, and this month being brought forward earlier and earlier in the year, represents a gradual improvement in the speed of accounting, as well as a greater ability on the part of the mine owner to raise money even when lead sales were few.

TABLE 2.Frequency and Amount of Subsistence Payments.London Lead Company and Blakett/Beaumonts, 1766-1875.

<u>Year</u>	<u>Blakett/Beaumont.</u>		<u>London Lead Company.</u>	
	<u>Frequency of payments</u>	<u>Amount paid (per month)</u>	<u>Frequency of payments</u>	<u>Amount paid (per month)</u>
1766	Bi-monthly.			
1778-1784	Bi-monthly.			
1785			Monthly.	
1790/94	Bi-monthly.	10/6d.		
1795	Bi-monthly.	10/6d.	Monthly.	10/6d.
1796	Bi-monthly.	15/9d.		
1797	Bi-monthly.	26/3d. (at the end of the year)		
1798-1800	Bi-monthly.	31/6d.		
1801-1812	Monthly.	30/-		
1816	Monthly.	Reduced to 20/- at end of year.	Monthly.	From 30/- to 40/-
1818	Monthly	30/-		
1833	Monthly.	30/-	Monthly.	40/-
1842	Monthly.	30/-	Monthly.	40/-
1845	Monthly.	30/-		
1846	Monthly.	40/-		
1854	Monthly.	40/-	Monthly.	Increased to 44/-
1862-c.1875	Monthly.	40/-	Monthly.	44/-
1872			Monthly.	Increased from 51/6d. to 54/-
c. 1875	Introduction of "New System."			

TABLE 3.

Subsistence Payments to Individual Miners in the
Beaumont Mines in Weardale, 1790-1812.

<u>Year.</u>	<u>Number of Payments in the Year.</u>	<u>Sum Paid on each occasion.</u>
1790	6	£1. 1. 0.
1791	7	£1. 1. 0.
1792	6	£1. 1. 0.
1793	7	£1. 1. 0.
1794	6	£1. 1. 0.
1795	5	£1. 1. 0.
1796	7	£1.11. 6.
1797	6	2 of £1.11. 6. 2 of £2. 2. 0. 2 of £2.12. 6.
1798	7	3 of £2.12. 6. 4 of £3. 3. 0.
1799	6	£3. 3. 0.
1800	6	£3. 3. 0. (with a few lesser sums at other dates.)

From July 1801 to 1812 regular monthly payments of
£1.10. 0. were made.

TABLE 4.

Contemporary Estimates of the Annual Earnings of Lead Miners.

N.B. Each figure is almost meaningless by itself, as the "average lead miner" did not exist, but the estimates are interesting as showing the general trend of earnings. All the estimates - originally expressed in daily, weekly, monthly, etc. terms - are here expressed in yearly terms.

<u>Source.</u>	<u>Year.</u>	<u>Estimate.</u>
1.	1762	Between £48. and £160. (Almost certainly a very excessive estimate.)
2.	1797	"From £5. or £6. to £50. or £60. a year; the average is about £25."
3.	1800	London Lead Company "basis" raised from £26. to £31.4.0.
3.	1802	London Lead Company "basis" £31.4.0.
3.	1805	London Lead Company "basis" £39.
3.	1815	London Lead Company "basis" £30. to £35. "which is really less than they can live on."
	1815	London Lead Company "basis" £31.4.0.
	1816	London Lead Company. Would make £31.4.0. if they worked a six day instead of customary 5 day week.
4.	1816	Beaumont miners earning between £15.12.0. and £31.4.0.
5.	1822	A Greenwich Hospital report estimated that pickmen on Alston Moor earned between £39. and £52. (Too high an estimate?)
6.	1828	Allenheads miners average £39.
3.	1831	London Lead Company miners averaging under £26.
4.	1832	Weardale miners in worst places earning less than £18.4.0.
7.	1834	<u>Poor Law Commission Report</u> published some time after figures gathered - Miners in Alston parish earning between £18.4.0. and £20.16.0.
3.	1836	London Lead Company "basis" £32.10.0.
8.	1842	London Lead Company estimate between £31.4.0. and £39.
8.	1842	Beaumont estimate between £37.14.0. and £39.17.0.
8.	1842	Derwent Company estimate between £23.8.0. and £26.

<u>Source.</u>	<u>Year.</u>	<u>Estimate.</u>
9.	1846	Beaumont "basis" £39.
3.	1848	London Lead Company "basis" £31.4.0.
3.	1854	London Lead Company "basis" £39.
10.	1864	Beaumont estimate from £39. to £44.4.0.
10.	1864	Rodderup Fell Company estimate from £40. to £50.
10.	1864	London Lead Company "basis" £39.
11.	1874	Derwent Mining Company actual average earnings during July (from a calculation in a report book) 21/6d. i.e. £55.18.0. per year.
3.	1878	London Lead Company "basis" <u>reduced</u> to £41.12.0.

Sources.

1. Jars, G. - Voyages metallurgiques. 1774-1781.
2. Eden, Sir F. - State of the poor. 1797.
3. London Lead Company records.
4. Blakett/Beaumont records.
5. Greenwich Hospital records.
6. Losh, J. - Diaries and correspondence, 1959.
7. Poor Law Commission Report. 1834.
8. 1842 Report.
9. Sopwith - Observations addressed to the miners, 1846.
10. 1864 Report.
11. Derwent Mining Company Records.

TABLE 5.Houses with and without Land attached, Allendale 1861.(1861 Survey of Beaumont Estates in Allendale,
Allenheads Estate Office.)

	<u>Allenheads and Dirtpot area.</u>	<u>Coalcleugh and Carr Shield area.</u>
Number of houses.	<u>123</u>	<u>44</u>
Number with farming land.	81	25
10 acres + (max. 19.)	6	2
5/9	29	9
3/4	18	-
1/2	25	12
Less than 1	3	2
Without farming land.	42	19
With gardens.	38	5
House only	4	14

TABLE 6.Decennial Census Population Figures.

<u>Date</u>	<u>Alston</u>	<u>Middleton</u>	<u>Stanhope</u>	<u>Allendale</u>	<u>Hunstanworth</u>
1801	4746	1383	5155	3519	215
1811	5079	2218	6376	3884	386
1821	5699	2866	7341	4629	411
1831	6858	3714	9541	5540	511
1841	6062	3787	7063	5729	567
1851	6816	3972	8882	6383	615
1861	6404	4557	9654	6401	778
1871	5680	4579	10330	5397	704
1881	4621	4412	8793	4030	502
1891	3384	3804	8031	3009	271
1901	3134	3574		2763	220

Note: The boundaries of Stanhope parish were changed several times in the nineteenth century. The figures for 1901 are omitted as the change was so great. The 1851 figure for Alston is swelled by navvies building the Railway.

TABLE 7.Alston Moor Lead Mines.Persons employed each quarter, 1738-1767.

N.B. The quarters are numbered thus:-

1. Christmas (of year previous) to Ladyday.
2. Ladyday to Midsummer.
3. Midsummer to Michaelmas.
4. Michaelmas to Christmas.

<u>Period</u>		<u>Pickmen</u>	<u>Labourers</u>	<u>Washers</u>	<u>Total</u>
1738	2	207	34	40	281
	3	218	34	45	297
	4	228	47	30	305
1739	1	243	46	26	315
	2	279	73	64	416
	3	248	49	51	348
	4	271	37	42	350
1740	1	275	29	4	308
	2	268	31	61	360
	3	256	33	65	354
	4	273	39	61	373
1741	1	275	40	19	334
	2	256	35	49	340
	3	251	34	62	345
	4	260	42	45	357
1742	1	238	40	26	305
	2	217	41	36	294
	3	211	39	46	296
	4	243	34	32	309
1743	1	218	24	18	260
	2	167	20	42	229
	3	176	41	44	261
	4	176	34	37	247
1744	1	172	30	24	226
	2	150	22	33	205
	3	132	20	28	180
	4	135	24	28	187
1745	1	130	10	16	156
	2	169	26	20	215
	3	193	36	38	267
	4	206	36	33	275
1746	1	219	54	25	298
	2	235	60	57	352
	3	245	57	53	355
	4	271	73	52	396

<u>Period</u>		<u>Pickmen</u>	<u>Labourers</u>	<u>Washers</u>	<u>Total</u>
1747	1	280	75	40	395
	2	290	55	66	411
	3	302	68	74	444
	4	319	60	44	423
1748	1	337	70	38	445
	2	318	58	51	427
	3	414	104	78	596
	4	430	102	73	605
1749	1	493	93	61	647
	2	495	102	79	676
	3	487	96	85	668
	4	484	98	68	650
1750	1	497	85	58	640
	2	478	83	65	646
	3	470	88	71	629
	4	476	102	56	634
1751	1	473	97	66	636
	2	507	94	79	680
	3	451	89	90	630
	4	466	107	35	608
1752	1	500	116	60	666
	2	526	116	63	705
	3	552	103	53	708
	4	490	120	60	670
1753	1	622	128	69	809
	2	606	119	78	803
	3	635	133	90	858
	4	660	130	76	866
1754	1	No return available.			
	2	671	126	78	875
	3	665	126	76	867
	4	686	133	37	856
1755	1	630	122	52	804
	2	585	120	58	763
	3	568	120	60	748
	4	639	123	62	824
1756	1	653	108	68	829
	2	624	123	80	827
	3	643	134	79	856
	4	654	122	76	852
1757	1	645	118	64	827
	2	670	118	101	889
	3	697	120	104	918
	4	746	136	104	986

<u>Period</u>		<u>Pickmen</u>	<u>Labourers</u>	<u>Washers</u>	<u>Total</u>
1758	1	666	144	88	898
	2	673	117	88	878
	3	693	120	90	903
	4	647	109	110	866
1759	1	659	121	100	880
	2	607	104	90	801
	3	605	106	76	787
	4	626	100	66	792
1760	1	651	94	65	810
	2	573	88	67	728
	3	584	85	62	731
	4	653	100	98	851
1761	1	693	110	96	899
	2	698	114	100	912
	3	707	99	93	899
	4	783	124	118	1,025
1762	1	830	128	132	1,090
	2	744	124	93	961
	3	848	124	152	1,094
	4	820	130	156	1,106
1763	1	925	118	142	1,185
	2	954	143	136	1,233
	3	893	139	186	1,218
	4	938	143	169	1,250
1764	1	915	165	145	1,225
	2	894	168	182	1,244
	3	898	167	191	1,256
	4	870	171	185	1,226
1765	1	958	171	130	1,259
	2	1,301	151	209	1,661
	3	879	178	222	1,279
	4	887	183	222	1,292
1766	1	857	237	216	1,310
	2	914	210	257	1,381
	3	962	215	275	1,452
	4	1,013	234	260	1,487
1767	1	1,076	264	264	1,604

Cited by permission from Hughes, M. - Land, lead and coal. 1963.
Based on returns contained in letters P.R.O. Adm. 66/105 to 66/

Persons employed each Quarter, 1818-1844.

1818	4	673	118	183	974
1819	1	730	126	152	1,008
	2	766	122	366	1,454
	3	758	111	370	1,239
	4	768	123	191	1,082

<u>Period</u>	<u>Pickmen</u>	<u>Labourers</u>	<u>Washers</u>	<u>Total</u>
1820	1 784	144	262	1,190
	2 766	158	463	1,387
	3 717	137	429	1,283
	4 749	143	164	1,056
1821	1 814	132	307	1,253
	2 799	121	427	1,347
	3 801	123	436	1,360
	4 824	125	394	1,343
1822	1 858	135	186	1,179
	2 839	130	449	1,418
	3 813	156	450	1,419
	4 859	137	383	1,415
1823	1 919	125	117	1,161
	2 906	162	488	1,556
	3 902	155	520	1,577
	4 906	164	399	1,469
1824	1 956	137	326	1,419
	2 937	151	487	1,575
	3 899	159	512	1,570
	4 908	137	413	1,458
1825	1 928	133	314	1,375
	2 928	140	504	1,572
	3 917	121	540	1,578
	4 933	123	517	1,573
1826	1 901	128	231	1,260
	2 885	148	489	1,522
	3 924	136	502	1,562
	4 910	132	361	1,403
1827	1 916	164	217	1,297
	2 949	160	454	1,563
	3 964	123	472	1,559
	4 949	109	420	1,478
1828	1 952	120	118	1,190
	2 903	111	448	1,462
	3 878	108	441	1,427
	4 917	113	438	1,468
1829	1 946	135	127	1,208
	2 902	175	480	1,557
	3 893	173	495	1,561
	4 899	160	467	1,526
1830	1 934	153	206	1,293
	2 903	144	452	1,499
	3 749	148	445	1,342
	4 752	140	417	1,309
1831	1 799	143	178	1,120
	2 769	129	384	1,282
	3 656	109	367	1,132
	4 638	107	351	1,096

<u>Period</u>		<u>Pickmen</u>	<u>Labourers</u>	<u>Washers</u>	<u>Total</u>
1832	1	620	105	128	853
	2	502	101	262	865
	3	491	100	278	869
	4	497	93	287	877
1833	1	526	93	86 (?)	706
	2	503	92	259	854
	3	503	77	283	863
	4	534	84	259	877
1834	1	580	98	100	778
	2	558	83	219	860
	3	545	99	247	891
	4	554	100	238	892
1835	1	576	100	140	816
	2	630	115	280	1,045
	3	643	110	287	1,040
	4	645	120	297	1,062
1836	1	702	120	153	975
	2	704	104	300	1,108
	3	698	109	304	1,111
	4	708	110	307	1,125
1837	1	726	119	165	1,010
	2	692	110	329	1,131
	3	666	106	335	1,107
	4	681	106	335	1,122
1838	1	739	124	64	927
	2	704	122	311	1,137
	3	702	115	308	1,125
	4	700	114	320	1,134
1839	1	724	135	70	929
	2	699	109	320	1,128
	3	670	111	319	1,100
	4	686	109	299	1,094
1840	1	722	130	75	927
	2	696	111	320	1,127
	3	704	119	325	1,148
	4	690	111	350	1,151
1841	1	712	130	158	1,000
	2	722	119	357	1,198
	3	738	108	389	1,235
	4	742	99	360	1,201
1842	1	773	117	160	1,050
	2	736	103	359	1,198
	3	740	101	372	1,213
	4	732	105	396	1,233

446.

<u>Period</u>		<u>Pickmen</u>	<u>Labourers</u>	<u>Washers</u>	<u>Total</u>
1843	1	772	121	137	1,030
	2	736	112	358	1,206
	3	702	114	320	1,136
	4	734	107	334	1,175
1844	1	728	112	69	909
	2	719	102	327	1,148
	3	727	106	327	1,160
	4	736	104	326	1,166

Based on figures contained in P.R.O. Adm. 79/56.

TABLE 8.

Selected employment figures cited in London Lead Company
Minute Books, 1801-1814.

<u>Date of minute.</u>	<u>Referring to:</u>	<u>Total pickmen employed.</u>
7th May, 1801.	Christmas 1800.	570
30th July, 1801.	Midsummer 1801.	552
4th March, 1802.	Christmas 1801.	612 (more than have been employed for the last 10 years.)
12th August, 1802.	Midsummer 1802.	606
11th August, 1803.	Midsummer 1803.	676
16th August, 1804.	Midsummer 1804.	554
4th August, 1805.	Midsummer 1805.	561 (+ 30)
21st August, 1806.	Midsummer 1806.	564
27th August, 1807.	Midsummer 1807.	498
17th November, 1808.	Midsummer 1808.	506
3rd August, 1809.	Midsummer 1809.	620
26th July, 1810.	Midsummer 1810.	669
25th April, 1811.	Ladyday 1811.	696
25th July, 1811.	Midsummer 1811.	539
20th August, 1812.	Midsummer 1812.	530
22nd July, 1813.	Midsummer 1813.	593
10th February, 1814.	Christmas 1813.	602
28th July, 1814.	Midsummer 1814.	452 + 134

TABLE 9.London Lead Company Quarterly Employment Figures, 1815-1820.

<u>Date</u>	<u>Alston Moor</u>	<u>Teesdale</u>	<u>Weardale</u>	<u>Total</u>
1815 Michaelmas. (includes Weardale.)	364	192	-	556
1815 Christmas. (includes Weardale)	448	177	-	625
1816 Ladyday.	300	144	106	550
1816 Midsummer.	341	182	120	643
1816 Michaelmas.	301	198	135	634
1817 Ladyday.	319	192	152	663
1817 Midsummer.	382	190	122	694
1817 Michaelmas.	386	207	118	711
1817 Christmas.	416	213	146	775
(Confusion.)	324	173	146	643
1818 Ladyday.	351	170	142 + 4	667
1818 Midsummer.	336	205	109	650
1818 Michaelmas.	361	158	141	660
1818 Christmas.	304	178	151	633
1819 Ladyday.	299	204	150	653
1819 Midsummer.	276	189	118	583
1819 Michaelmas.	318	229	136	683
1819 Christmas.	339	258	129	726
1820 Midsummer.	314	237	122	673

TABLE 10.

Persons employed at Allenheads and Coalcleugh Lead Mines,
Midsummer Quarters, 1754-1854.

These figures include only men listed in the Quarterly Accounts of these two mines - i.e. washers and smelters are not normally included. They are based on a count of all the persons and partnerships listed in the five sections of the original accounts - Wagemen: Fathoms: Bingtale: Tontale: Contingencies. Errors in these figures may well arise from the double entry of a particular person or partnership under more than one head, although an attempt has been made to allow for this. Wagemen are only counted if they have worked more than 25 days during that quarter. The figures, therefore, are not strictly accurate but they serve as a guide to phases of expansion and contraction.

<u>Year</u>	<u>Allenheads</u>	<u>Coalcleugh</u>
1754	216	118
1755	281	114
1756	323	131
1757	343	149
1758	329	145
1759	254	Calculation impossible.
1760	284	181
1761	299	c. 176
1762	246	c. 175
1763	250	157
1764	248	133
1765	233	186
1766	222	192
1767	269	180
1768	216	186
1769	239	176
1770	267	186
1771	298	218
1772	300	226
1773	314	230
1774	314	225
1775	313	231
1776	-	238
1777	-	231
1778	380	
1779	436	219
1780	457	239 (June)
		384 (Sept.)
1781	435	319
1782	399	310
1783	426	386
1784	426	321

<u>Year</u>	<u>Allenheads</u>	<u>Coalcleugh</u>
1785	460	360
1786	409	356
1787	454	429
1788	577	454
1789	500	414
1790	514	416
1791	599	486
1792	508	531
1793	574	386
1794	572	373
1795	517	333
1796	451	364
1797	373	350
1798	363	320
1799	348	330
1800	326	335
1801	253	286
1802	271	274
1803	282	277
1804	314	273
1805	367	306
1806	348	294
1807	361	271
1808	365	308
1809	426	315
1810	390	311
1811	384	340
1812	319	362
1813	372	429
1814	418	411
1815	398	416
1816	370	378
1817	362	356
1818	399	302
1819	409	304
1820	444	283
1821	486	260
1822	450	261
1823	451	280
1824	511	300
1825	538	328
1826	517	323
1827	487	326
1828	519	348
1829	541	324
1830	492	342
1831	438	299
1832	406	295
1833	414	274
1834	403	248
1835	453	312

<u>Year</u>	<u>Allenheads</u>	<u>Coalcleugh</u>
1836	454	349
1837	461	324
1838	474	340
1839	538	385
1840	529	368
1841	524	391
1842	508	394
1843	545	373
1844	548	356
1845	528	419
1846	532	414
1847	549	414
1848	450	411
1849	541	407
1850	405	437
1851	376	410
1852	428	467
1853	435	484
1854	401	
1855	403	
1856	448	
1857	425	
1858	436	
1859	462	

TABLE 11.Non-native Inhabitants of Nenthead, 1851.From 1851 M/S Census Schedules.

Total inhabitants of Nenthead.	872	
Total not born in Nenthead.	193	22%
Total born elsewhere in Alston Parish.	60	7%
Total born in neighbouring lead mining area of the Northern Pennines.	75	9%
Total born outside lead mining region. (31 of these 58 not in the lead trade or dependants of those in lead trade, e.g. Surgeon and family: Curate and family: Lodging house keeper plus family and lodgers: various Shopkeepers.)	58	6%
Total in lead trade or dependants of those in lead trade born outside the region. (Many of these 27 obviously born during period of temporary migration by their families during the eighteen thirties.)	27	3%
Of 133 active lead miners	13 not born in Nenthead. 9 born elsewhere in the lead mining region. 2 born in Yorkshire lead mining region. 1 born in Leadhills, Scotland. 1 Irish	
Of 31 active smelters	16 not born in Nenthead. All of these born within lead mining region.	
1 retired smelter	From Cornwall.	

TABLE 12.Statistics showing the growth of Methodism.Membership of Local Societies.

From Steele, A. - History of Methodism in Barnard Castle.
1857. pp. 118: 189.

	<u>1760</u>	<u>1770</u>	<u>1772</u>
Teesdale.	57	80	83
Alston.	31	38	39
West Allendale.	22	18	25
East Allendale.	44	35	45
Weardale.	34	109	266

<u>Teesdale</u>	<u>1791</u>	<u>1792</u>	<u>1793</u>	<u>1794</u>	<u>1795</u>	<u>1796</u>	<u>1797</u>	<u>1798</u>	<u>1799</u>	<u>1800</u>
Newbiggin.	30	27	28	39	36	33	33	35	27	22
Middleton.	20	18	19	28	21	16	14	13	12	10
Egglestone.	12	11	11	20	15	14	14	13	13	12

TABLE 13.Churches and their Congregations in Alston Parish, 1840.(From the Minutes of the Committee of Council
on Education. 1840/41. p. 149.)

<u>Church</u>	<u>Seats available</u>	<u>Average Congregation</u>	
<u>Church of England.</u>			
Alston	650	Not given.	
Garrigill	300	Not given.	
<u>Wesleyan Methodists.</u>			
Alston	600	350	} 1,030
Nenthead	500	200	
Nentsbury	250	150	
Garrigill	340	220	
Tynehead	120	70	
Leadgate	100	40	
<u>Primitive Methodists.</u>			
Alston	375	200	} 700
Nenthead	300	200	
Nentsberry	200	100	
Garrigill	280	200	
<u>Independents.</u>			
Alston	450	220	} 250
Garrigill	250	30	
<u>Society of Friends.</u>			
Alston	150	10	

TABLE 14.

Church Attendance at Evening Service in Alston Poor Law Union,
(slightly larger in area than Alston Parish), 1851.

(From the 1851 Religious Census.)

	<u>Alston.</u>	<u>Weardale.</u>	<u>Teesdale.</u>
Church of England.	357	70	355
Independents.	147	111	845 (inc. Baptists.)
Society of Friends.	0 (6 at morning service.)	-	0 (35 at morning service.)
Wesleyan Methodists.	663	1,441	1,148
Primitive Methodists.	892	1,190	1,205

Notes.

- (a) Teesdale and Weardale Unions both included the lower, non-mining parts of the dales. Allendale was within the Hexham Union.
- (b) Neither of these sets of figures (Tables 13 & 14) purports to show the total membership of Churches, as some people would attend church only once on a Sunday, and others all three services. They do indicate, however, the proportion of the inhabitants belonging to different churches.

TABLE 15.Growth of Primitive Methodism in Weardale.

(From Patterson, W.M.- Northern Primitive Methodism. 1909,
quoting circuit records.)

Society founded	November 1821.
17 members	March 1822.
219 "	March 1823.
308 "	June 1823.
625 "	September 1823.
846 "	December 1823.

Bibliography.

This bibliography lists the principle sources - M/S and printed - used in the writing of this thesis. It includes only material directly about the lead mining region of the Northern Pennines. Books about other regions and general economic histories are not included even if cited in the text. Local histories, gazetteers and directories, etc. are listed only if they contain relevant and novel information; many local historians of Cumberland, Northumberland and Durham have simply copied information about the lead mining region from their predecessors.

1. M/S Sources.

BRITISH MUSEUM DEPT. OF M/Ss.

Blackett lead mines in Allendale and Weardale.
Chief agent's letter book. Sept. 1728 to June 1734.
Add. M/S 27420.
[A "stray" from the Blackett/Beaumont records now in
Newcastle University Library. Abbrev. as B/B B.M.
Letter Book]

PUBLIC RECORD OFFICE.

Greenwich Hospital records relating to the
administration of the Hospital's Northern Estates.
Adm. 66.
Census Papers. Enumerators' Schedules, 1851.

NEWCASTLE UPON TYNE UNIVERSITY LIBRARY.

Blackett/Beaumont lead mining records in Allendale
and Weardale. 1723/1888.
B/B 1-175.
[Includes letter books, bargain books, accounts etc.]
Hexham manorial papers.
[Includes parish of Allendale]
Thomas Bell Collection of estate and enclosure
records.
Diary of Thomas Sopwith - 1823/79.
[A microfilm of the 167 volumes in the possession of
Mr. Anthony Sopwith, Bradfield College, Berks]

NEWCASTLE UPON TYNE PUBLIC LIBRARY.

Diary of Matthias Dunn, 1831/35.
John Bell Collections relative to the estates of the
Greenwich Hospital

NEWCASTLE UPON TYNE LITERARY AND PHILOSOPHICAL SOCIETY
LIBRARY.

An account of the method of smelting lead ore. By
James Mulcaster. [c.1805]

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL
ENGINEERS LIBRARY, NEWCASTLE UPON TYNE.

London Lead Company records 1692/1899.

L.L.C. 1-37.

[Includes Court Minutes, Plans, One Report Book]

NORTHUMBERLAND RECORD OFFICE. GOSFORTH, NEWCASTLE UPON
TYNE.

Blackett (Matfen) M/Ss.

[Includes mining records relating to Fallowfield]

Blackett (Wylam) M/Ss.

[Includes some papers of John Erasmus Blakett, chief
agent of the Beaumont mines at the end of the
eighteenth century]

WIGAN PUBLIC LIBRARY.

An account of the method of smelting lead ore. By
James Mulcaster. [c.1805]

[Another copy of the M/S in the Newcastle upon Tyne
Literary and Philosophical Society's Library with
a slightly variant text]

Greenwich Hospital. Reports on the mines on Alston
Moor, 1821, with copies of those made in 1778.

ALLENHEADS ESTATE OFFICE.

Various M/Ss relating to the administration of the
Blackett/Beaumont mines and estates.

SETTLINGSTONES MINE.

Various M/Ss and plans relating to mining in Allendale.

HUNSTANWORTH MINE.

Derwent Mines Co. Ltd. records.

[Includes Tutwork lists, reports and plans
1820/81]

2. Parliamentary Papers.

These are listed in accordance with citations in Ford,
P. & G. - Select list of British Parliamentary Papers,
1833-1899. Oxford, 1953. Individual Papers are given
their sessional nos.

Journals of the House of Commons.

Census of Great Britain. Decennial. 1801-1901.

Charities in England and Wales for the Education of the Poor. Commissioners. Vol. 21, 1829: Vol. 23, 1830.
1829 (349) VIII.
1830 (462) XII.

Administration and practical operation of the Poor Laws.
R. Com. Rep. 1834.

[Especially - Appendix B.1. Answers to Rural Queries.
Appendix A. Report of Assistant Commissioners, Pt. 1.
Cumberland by Capt. Pringle. Northumberland and Durham
by John Wilson.]

1834 (44) XXVIII.
1834 (44) XXIV.

Minutes of the Committee of Council on Education. 1840/41.
[pp. 148/151. "Statistics having reference to the...
inhabitants of Alston Moor."]

Children's Employment (Mines) R. Com.

Appendix. Pt. 1. Report by J.R. Leifchild. [Abbrev. as
1842 Report (Leifchild.)]

Appendix. Pt. 2. Report by Dr. J. Mitchell. [Abbrev. as
1842 Report (Mitchell.)]

1842 (381) XVI.
1842 (382) XVII.

State of the Population, Education and Schools in the
Mining Districts. H.S. Tremenhere, Commissioner.
Annual Reports. 1844/1859.

[The Commissioner visited Allenheads in 1851.]

Geological Survey. Mineral Statistics. [Collected] by
Robert Hunt. 1848/1881.

Rating of Mines. Sel. Cttee. 1857.

[Includes evidence from the chief agents of the Beaumont
concern and the London Lead Company.]
1857 Sess. 2.(241) XI.

Sanitary State of the People of England. Papers. 1858.
[Paper by E.H. Greenhow includes evidence relating to
Alston.]

1857/8 (2415) XXIII.

Medical Officer of the Privy Council. Third Report. 1860.

State of Popular Education in England. R.Com. Vol.2. 1861.
[Includes A.F. Foster on "The mining districts of Durham
and Cumberland."]

1861 (2794-II) XXI. Pt.II.

Conditions in Mines to which the provisions of the Act 23 and 24 Vict. c. 151, do not apply, with reference to the health and safety of persons employed. 2 Vols. 1864.

[Abbrev. - 1864 Report (Vol. 1.) 1864 Report (Vol. 2.)
1864 Report (Appendix.)]

1864 (3389) XXIV Pt. 1.

1864 (3389) XXIV Pt. 2.

Depressed Condition of the Agricultural Interests. R. Com. Digest and appendix to Pt. 1. 1881.

[Report by John Coleman on Durham describes contemporary conditions in Teesdale and Weardale]

1881 c. 2778-II XVI.

3. Books and periodical articles.

Allan, J.W. - North Country sketches. Newcastle, 1881.

Armstrong, C. - Pilgrimage from Menthead. London, 1938.

Aspinall, A. - The early English trade unions. Documents. London, 1949.

[Includes documents relating to strikes in Weardale]

Bailey, J. - General view of the agriculture of the county of Durham. London, 1813.

Bailey, J. Culley, G. & Pringle, A. - General view of the agriculture of the counties of Northumberland, Cumberland and Westmorland. London 1813.

[These two Board of Agriculture County Surveys were written mainly in the seventeen nineties with minor modifications in successive editions.]

Baker, J.G. & Tate, G.R. - a new flora of Northumberland and Durham. London, 1868.

Bulmer, T.F. - History, topography, and directory of Northumberland (Hexham division). Manchester, 1886.

Clough, R.T. - The lead smelting mills of the Yorkshire Dales. Leeds, 1962.

Cobbett, W. - Tour in Scotland and in the four northern counties of England in 1832. London, 1833.

Coombes, L.C. - Lead mining in East and West Allendale. (In Archaeologia Aeliana, 4th series, Vol. 36, 1958. pp. 245/270.)

Crawhall, T. - An account of certain instruments formerly used for the purpose of blasting in the lead mines at Allenheads. (In Archaeologia Aeliana, Vol. 1, 1822. pp. 182/186.)

Dickinson, G. - Allendale and Whitfield. 2nd. ed.
Newcastle, 1903.

Dickinson, J. - Lead mining districts of the north of
England. (in Trans. of the Manchester Geological Society,
Vol. 27, 1900/1902. pp. 218/268.)

Dobson, J.L. - Charitable education in the Weardale
district of County Durham (1700-1830).
(in Durham Research Review, Vol. 2, 1955/1959. pp. 40/53.)

Dufrenoy, P.A. and Elié de Beaumont, J.B.A.L.L. - Voyage
métallurgique en Angleterre. 2nd. ed. 2 vols. Paris,
1837/1839.

Dunham, K.C. - Geology of the northern Pennine orefield.
Vol. 1, 1948.
(Memoirs of the Geological Survey of Great Britain.)

Dunham, K.C. - The production of Galena and associated
minerals in the Northern Pennines.
(in Trans. Institution of Mining and Metallurgy, Vol. 53,
1944, pp. 181/252.)

Eden, Sir F. - The state of the poor. 3 vols. London, 1797.

Egglestone, W.M. - The projected Weardale railway.
Stanhope, 1887.
The Weardale Nick-Stick. Stanhope, 1872/1874.

Featherstone, J.R. - Weardale men and manners. Durham, 1840.

Fordyce, W. - The history and antiquities of the County
Palatine of Durham. 2 vols. Newcastle, 1857.

Forster, W. - A treatise on a section of the strata from
Newcastle upon Tyne to Cross Fell. 2nd. ed. Alston, 1821.
3rd. ed., revised and corrected to the present time by
the Rev. W. Nall. Newcastle, 1883.

Graham, J.J. - Weardale past and present. Newcastle, 1939.

Granger, J. - General view of the agriculture of the county
of Durham. London, 1794.

Greenwich Hospital - [Printed] Reports and surveys of the
estates. London, 1805, 1813, 1815, 1821, 1822.

Greenwich Hospital - Report on the state and condition of
the roads and mines on the estates of the Greenwich
Hospital. [Edited] By E.H. Locker. 1823.
[Includes Reports on the mines by John Taylor, and on the
roads by J.L. MacAdam]

Hodgson, J. - History of Northumberland. Part 2, Vol. 3.
Newcastle, 1840.

House, J.W. - North eastern England. Population movements
and the landscape since the early 19th century. [1954]
(King's College Department of Geography Research Series 1.)

Housman, J. - A topographical description of Cumberland,
Westmoreland, Lancashire & Carlisle, 1800.

Hunt, R. - British mining. London. 1884.

Hutchinson, W. - The history of the county of Cumberland.
2 vols. Carlisle, 1794.

Jars, G. - Voyages metallurgiques. 3 vols. Lyons & Paris,
1774/1781.

Jollie, F. - Cumberland Guide and Directory. Carlisle, 1811.

Lee, J. - Weardale memories and traditions. Consett, 1950.

Leithart, J. - Practical observations on mineral veins.
Newcastle, 1838.

The Lord Fitzhugh... or the parish magazine, localised for
both sides of the Tees. Barnard Castle. [c. 1880]

Losh, J. - Diaries and correspondence. Vol. 2, Diary,
1824-1833. Edited by Edward Hughes, 1959. (Surtees
Society Publications Vol. 174.)

Louis, H. - Lead mines in Weardale. (in Mining Magazine,
Vol. 16, 1917. pp. 15/25.

Lysons, D.& S. - Magna Britannia. Vol. 4. Cumberland.
London, 1816.

Mackenzie, E. - A historical and descriptive view of the
county of Northumberland. 2 vols. Newcastle, 1811.
Second edition. 2 vols. Newcastle, 1825.
[There are significant differences between the two
editions.]

& Ross, M. - An historical, topographical and descriptive
view of the County Palatine of Durham. 2 vols. Newcastle,
1834.

Macrae, D. - The improvement of waste lands. (in Journal
of the Royal Agricultural Society, 2nd series, Vol. 4,
1868. pp. 321/334.
[Largely dealing with Allendale])

Mannix, - & Whellan, W. - History, gazetteer, and
directory of Cumberland. Beverly, 1847,

Methodism in Allendale. By W.F.S. (in Methodist Magazine, 1872. pp. 710/719.)

Monkhouse, F.J. - The Greenwich Hospital Smelt Mill at Langley, Northumberland, 1768 to 1780. (in Trans. Institution of Mining and Metallurgy, Vol. 49, 1940. pp. 701/709.)

Monkhouse, F.J. - The transport of lead and silver from Langley Castle to Newcastle, 1768/1779. (in Proc. Society of Antiquaries of Newcastle upon Tyne. 4th series, Vol. 9, 1939/41. pp. 176/186.)

Nall, W. - The Alston mines. (in Trans. Institution of Mining Engineers, Vol. 24, 1902/03. pp. 392/412.)

Neasham, G. - North-country sketches. Durham, 1893.

Nevin, J.G. - The general system of farming in Alston, Allendale, Weardale, & the south-west part of Hexhamshire. (in Proceedings of the Durham College of Science Agricultural Students Association, Vol. 1, 1900/01. pp. 21/31.)

Newcastle and Carlisle Railway Bill. Copy of the evidence taken before a Committee of the House of Commons. Newcastle, 1829.

[Includes comment on the value of a railway to carry provisions to the lead mining region]

Newcastle upon Tyne Sunday School Union. Fifth report. Newcastle, 1823.

Nicholson, J. & Burn, R. - The history and antiquities... of Westmoreland and Cumberland. 2 vols. London, 1777.

Page, I.E. - Walks round Alston. Carlisle, 1893.

Palmer, W.J. - The Tyne and its tributaries. London, 1882.

Parson, W. & White, W. - History, directory & gazetteer of the counties of Durham and Northumberland. 2 vols. Leeds, 1827.

Parson, W. & White, W. - History, directory and gazetteer of Cumberland and Westmoreland. Leeds, 1829.

Patterson, W.M. - Northern Primitive Methodism. London, 1909.

Pattinson, H.L. - An account of the method of smelting lead ore and refining lead, practised in the mining districts of Northumberland, Cumberland, and Durham, in the year 1831.

(in Transactions of the Natural History Society of Northumberland, Durham, and Newcastle upon Tyne, Vol. 2, 1831. pp. 152/177.)

Percy, J. - The metallurgy of lead. London, 1870.

Pococke, R. - Northern journeys of Bishop Richard Pococke (1760). 1914.
(Surtees Society Publication, Vol. 204.)

Practical illustrations of the benefits to be derived from well-conducted friendly societies, with reference more particularly to the New Societies established in East and West Allendale. Newcastle, 1852.

Raistrick, A. - Lead smelting in the North Pennines during the 17th and 18th centuries. (in University of Durham Philosophical Society Transactions. Vol. 9, 1931/1937. pp. 164/179.)

The London Lead Company, 1692-1905. (in Transactions of the Newcomen Society, Vol. 14, 1933/34. pp. 119/162.)

Ore dressing in the 18th and early 19th centuries. (in Mine and Quarry Engineering, 1939. pp. 161/166.)

Two centuries of industrial welfare. The London (Quaker) Lead Company, 1692-1905. London, 1938.

Raistrick, A. & Jennings, B. - A history of lead mining in the Pennines. London, 1965.

Richardson, B.W. - Thomas Sopwith. With excerpts from his diary of fifty-seven years. London, 1891.

Ritchell, G. - An account of certain charities in Tyndale-Ward in Northumberland. Newcastle, 1713.

Robinson, W. - Lead miners and their diseases. Newcastle, 1893.

Smailes, A.E. - The lead dales of the Northern Pennines. (in Geography, Vol. 21, 1936. pp. 120/129.)

Smith, W.H. - Walks in Weardale. Durham, 1883.

Sopwith, T. - An account of the mining districts of Alston Moor, Weardale, and Teesdale. Alnwick, 1833.

Observations addressed to the miners and other workmen employed in Mr. Beaumont's lead mines. London, 1846.

On the lead mining districts of the North of England.

(in Trans. North of England Institute of Mining and Mechanical Engineers, Vol. 12, 1863/4. pp. 187/199 & Vol. 14, 1864/5. pp. 9/14.)

Substance of an address to the members of the St. John's Chapel Friendly Society. Hexham, 1847.

Sopwith, T. Junior - The dressing of lead ores. (in Mins. Proc. Institution of Civil Engineers, Vol. 30, 1869/70 Pt. 2. pp. 106/135.)

Spar from the high flat: a Christmas annual for Allendale and surrounding dales. No. 1 Allenheads, 1871.

Steele, A. - History of Methodism in Barnard Castle and the principal places in the Dales Circuit. London, 1857.

Teesdale Mercury, Tales and traditions. Barnard Castle. 3 pts. [c. 1885.]

Turner, W. - Account of a short tour through the lead mine districts, in 1793. (in Trans. Literary & Philosophical of Newcastle upon Tyne, Vol. 1, Pt. 1, 1831. pp. 66/81.)

Visit to the Stonecroft and Greyside lead mines... and the Settlingstones lead mines. Oct. 19, 1877. (in Trans. North of England Institute of Mining and Mechanical Engineers, Vol. 27, 1877/78. pp. 15/22.)

Wallace, W. - Alston Moor: its pastoral people: its mines and miners. Newcastle, 1890.
The laws which regulate the deposition of lead ore in veins. London, 1861.

Wallis, J. - The natural history and antiquities of Northumberland. 2 vols. London, 1769.

Walton, J. - The mediaeval mines of Alston. (in Transactions of the Cumberland and Westmoreland Antiquarian and Archaeological Society, N.S. Vol. 45, 1945.

Watson, R. - Poems and songs of Teesdale. Darlington, 1930.

Welbourne, E. - The miners' unions of Northumberland and Durham. Cambridge, 1923.

Whellan, W. - History, topography and directory of Durham. London, 1856.

White, W. - Northumberland and the Border. London, 1859.

Wilson, P.N. - The Nent Force Level. (in Trans. Cumberland & Westmoreland Antiquarian & Archaeological Society, N.S. Vol. 63, 1963. pp. 253/280.)

Wright, A.B. - An Essay towards a history of Hexham. Alnwick, 1823.

4. Theses.

Hughes, M. - Lead, land, and coal as sources of landlord income in Northumberland between 1700 and 1850. Durham Univ. (King's College, Newcastle.) PhD Thesis, 1963.

Jennings, B. - Lead mining industry in Swaledale. Leeds University M.A. Thesis, 1959.

Smailes, A.E. - The dales of Northeast England. London University M.A. Thesis, 1932.

Thompson, D. - The rural geography of the West Durham Pennines - Derwentdale, Weardale and Upper Teesdale. Manchester University M.A. Thesis, 1962.