

British Mining No.46

THE GRASSINGTON MINES

by

M.C. GILL



A
MONOGRAPH
OF THE
NORTHERN MINE RESEARCH SOCIETY
MAY 1993

Dedicated to the memory of:

George Bradley and John Summers
(very dissimilar but special men)

COVER DESIGN

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CONTENTS

INTRODUCTION.....	8-11
Location.....	8
Geology.....	8
Publication history.....	10
Recent developments.....	11
Future work.....	11
HISTORY TO 1818.....	12-29
Early History.....	12
The Earl of Cumberland's Mines.....	13
Customary Mining Law at Grassington.....	14
The Earl of Burlington's Mines.....	15
The End of Customary Mining Law at Grassington.....	18
The Era of Private Leases.....	23
The Coalgrovehead Trespass.....	24
The Decline of Mining c1780 TO 1818.....	26
HISTORY 1818 TO 1882.....	30-43
John Taylor.....	30
Management of the mines.....	31
The Deep (Duke's) Level.....	33
The Introduction of New Technology.....	34
The Development and Drainage of the Mines.....	35
The Evolution from Pumping to Winding.....	39
The Winding System.....	41
Ore Dressing.....	41
MINING ON THE OLD PASTURE.....	44-59
The Development of Mining.....	44
New Rake.....	45
Yarnbury.....	50
Cockbur.....	55
Beever Mine.....	56
MINING ON THE NEW PASTURE.....	61-70
Frankland Fold.....	62
Pikehaw.....	63
Grove Sty.....	63
Hecklar Rake.....	64
Gill House Area.....	64
Fiddler Plet.....	67
Lord Nelson's Level.....	68
Green Bycliffe.....	69

7MINING ON THE OUT MOOR.....	71-112
Brown Bycliffe.....	71
Blow Beck.....	78
Turf Pits.....	78
Peru.....	81
Ringleton.....	85
Glory Mine.....	85
Derbyshire Founder Mine.....	88
Chatsworth Mine.....	88
Coalgrovebeck.....	89
Burnt Ling - New Ripon.....	94
Friendship Mine.....	96
Fourteen Meers.....	98
Coalgrovehead.....	99
Weather Gleam or Bagshaw's Pit Moss or New Moss.....	103
Pit Moss or Old Moss.....	104
THREE CENTURIES OF LEAD SMELTING AT GRASSINGTON..	113-135
Running the mills.....	113
Fuel.....	114
The Low Mill.....	115
The High Mill.....	117
The Moor Mill.....	118
The Cupola Mill.....	118
Smelting processes at the Cupola Mill.....	122
The efficiency of the Cupola Mill.....	128
Pollution and horizontal flues.....	129
Management of the Cupola Mill.....	133
TWENTIETH CENTURY MINING.....	136-141
Grassington Lead Mines Ltd.....	136
Frederick Walker.....	136
John and Thomas Grieve.....	137
Ernest Gregory.....	137
Dales Chemical Company.....	137
Houston and Brammall.....	138
Drake and Taylor.....	139
THE REMAINS.....	142-146
Option One (4.5 Km).....	144
Option Two (6.3 Km).....	144
Option Three (6.8 Km).....	145
Option Four (7.2 Km).....	145
REFERENCES.....	147-153
APPENDIXES.....	154-160
A- Mining Laws - 1642.....	154
B- Rara Avis in Terris - 1737.....	156

TABLES

1. Listed & Scheduled Sites at the Grassington mines	11
2. Income and expenditure at the Grassington lead mines	12
3. Cash received from the Grassington lead mines	13
4. Barmoots held at Grassington	23
5. Average annual output from the 1760's to the 1790's	27
6. Management at the Grassington Mines: 1796-1882	32
7. Principal leats at the Grassington Mines	38
8. Details of pumping and winding arrangements	42
9. Pig lead produced by Old Pasture mines: 1735-1823	44
10. Pig lead produced by New Pasture mines: 1735-1823	61
11. Pig lead produced by Out Moor mines: 1735-1823	72
12. Location and chronology of the Grassington smelt mills	115
13. Yield of metallic lead from mixed concentrates: 1826-27	128
14. Changing richness of the concentrates smelted: 1809-55	129
15. Amount of fume-lead recovered: 1792-1855	130
16. Tonnages of ore smelted at the Cupola: 1792-1855	131
17. Constituent costs of smelting	132
18. Management at the Cupola: 1792-1882	133
19. Foremen Smelters: 1792-1882	134
20. The Grassington Smelters: 1792-1882	135
21. Number of men employed by Grassington Lead Mines Ltd: 1916-20	136
22. Output of Grassington Lead Mines Ltd: 1916-20	137
23. Key to flowline of Coalgrove Mill, 1964	141

PLATES

I Portal of Duke's Level in Hebden Gill	29
II Brake House waterwheel pit	29
III The headgear and rope supports at Old Moss Shaft, c1885	43
IV Weigh-house and privy at Yarnbury	51
V Portal of Yarnbury Incline	53
VI Powder House at Cockbur	55
VII View of Bouse-team at Beever Mine from above	59
VIII Aerial view of Beever Mine, looking towards Yarnbury	62
IX Aerial view of the Ripley Vein – Burnt Ling area, looking towards Coalgrovebeck	70
X Ruins of the Cupola Mill	120
XI Part of the exposed smelt mill flue, showing its flagged floor	121
XII The main flue, with chimney in distance	121
XIII Remains of the condenser with the chimney in the background	125
XIV Condenser	125
XV Flue Shut-off door	125

FIGURES

1	Graph of output from Old Moss and Coalgrovehead	37
2	Mechanisation on Out Moor	38
3	Mechanisation at Yarnbury	40
4a	Old Pasture Mines – Surface features	47
4b	Old Pasture Mines – Meers 1781	48
4c	Old Pasture Mines – Workings	49
5	Section of Greenhaw Bottom Shaft	52
6	Transverse section of Devonshire Vein	52
7	Section on Beever’s Vein at Beever’s Engine Shaft	60
8	New Pasture Mines – North	65
9	New Pasture Mines – South	66
10a	Out Moor Mines (North) – Surface features	74
10b	Out Moor Mines (North) – Meers in 1781	75
10c	Out Moor Mines (North) – Workings	76
11	Section across Turf Pits Block	80
12	Section of Sarah’s Shaft on Cavendish Vein	84
13	Section on Coalgrovebeck Vein	93
14a	Out Moor Mines (South) – Surface features	100
14b	Out Moor Mines (South) – Meers in 1781	101
14c	Out Moor Mines (South) – Workings	102
15	Section on Slanter Vein	107
16	Section on Middle Vein (Moss to Cottingham’s)	110
17a	Section of reverberatory furnace at Grassington	124
17b	Plan of reverberatory furnace at Grassington	124
18	Flowline Coalgrovebeck Mill 1964	140

PLEASE NOTE: Visitors to the mines are asked to follow the Country Code at all times. They should also respect the privacy of the residents in the houses at Yarnbury. Apart from a few public Rights of Way and the Mineral Trail designated by the National Park, most of which is in the Old and New Pastures, the land is private. The Out Moor, whilst a Common, is also private. The Freeholders have grazing rights, the Duke of Devonshire has mineral rights, and the shooting rights are also owned. Visitors are asked to respect this by not wandering across the moor and also by remembering that mines and their remains can be dangerous places.

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INTRODUCTION

LOCATION

Grassington, in the Yorkshire Dales National Park, is on the north bank of the river Wharfe, 12 miles upstream from Ilkley. Until the early 1880s, Grassington and its neighbour, Hebden, were mining villages but, as the mines declined, then closed, their populations fell substantially owing to migration. Apart from agriculture, some limestone quarrying and tourism, the area now has little industry and acts largely as a dormitory for West Yorkshire and north-east Lancashire.

The upland area immediately to the north-east of Grassington village is crossed by numerous faults, many of which are mineralised. These occur in two distinct groups. One is at Yarnbury, in the Old Pasture, and the other on Grassington Out Moor and New Pasture. In both cases, the principal trend is north-west to south-east but there are cross veins running counter to this.

The Old and New Pastures and the Out Moor are no longer defined by Ordnance Survey maps, but, as they figure large in this text, it will help the reader if they are defined now. The Out Moor is about 2000 acres of common enclosed by the Moor Wall, which runs from the boundary with Hebden at Loss Gill, past the Cupola smelt mill, up the dry valley to How Gill, to the boundary with Conistone, then follows the township boundary along the watershed with Nidderdale and down to Blow (now Blea) Beck and back to Loss Gill. The Old Pasture is an area of old enclosures lying between Grass Wood and the wall which runs from Loss Gill to Yarnbury, along Bare House Lane, but to the south of Bare House, on the west side of Back Pasture to the boundary with Conistone. It also includes Grassington Mire. The New Pasture is the area of semi-moorland which surrounds the Folds Beck and lies between the Out Moor and Old Pasture.

The working pattern of any mining field is dictated by its geomorphology. The gentle slopes of Grassington Moor meant there were only two points, in Hebden Gill and the Wharfe valley, from which adits could be driven. Because the former was outside the liberty of Grassington and the latter meant a long drive through hard limestone, the use of shafts for pumping and winding were, therefore, the only alternative method of working the veins. The moor had streams, however, and, in the 19th century, these were dammed and linked to reservoirs, which fed water-wheels, by a network of leats. These water-wheels drove pumps in the shafts and later, when an adit was driven, were adapted to wind from them. Others drove crushers and machinery for preparing the ore for smelting.

GEOLOGY

The geological structure of the dales may be summarised as alternating layers of hard and soft sedimentary rock, disturbed by faults, or ground movements, and dissected by valleys. The veins formed along the fault lines and most of the ore was found where they intersected hard strata, called Bearing Beds. These were usually sandstone or limestone. Pennine ore-bodies were, as a result, restricted to short distances vertically but were often extensive laterally.

In the Grassington area, to the north and north west, outcrops of Great Scar Limestone form the lower valley slopes and terraces. To the east of the river, the fells reach elevations in excess of 1800 feet and are capped by Yoredale rocks overlain by Millstone Grit, all dipping gently towards the east.

BED	THICKNESS IN FATHOMS	COMMENT
Top Plate	5	
Top Grit	6	
Plate	3	Including a bed of coal 6" thick.
Bearing Grit	16	
Plate	9	With tumblers of limestone.
Top Limestone	4	
Plate	2	
Limestone	Unknown	

The Main Limestone, which correlates with the Great Limestone in the Northern Pennine Orefield, was the source of most of the lead ore in the Swaledale and Arkengarthdale lead mining region of North Yorkshire. Owing to an unconformity, however, which cuts it out just to the north of Kettlewell, that bed is absent at Grassington, where most of the ore came from the siliceous rocks of the Grassington Grit. The latter, resting unconformably on the Middle Limestone, is parted, by a bed of shale, into two (or more) leaves of variable thickness. The Bottom or Bearing Grit which, as its name implies, produced the bulk of the ore, averaged about 12 fathoms in thickness, whilst that of the less important Top Grit was only six fathoms. Trials proved that mineralisation in the Middle Limestone was restricted to the top 10 fathoms or so and failed at depth. The shale rarely carried oreshoots.

At Yarnbury, the principal veins are in a narrow belt, 500 metres wide, of brecciated fissures. These have considerable dolomitisation of the limestone walls, and all, excepting New Rake, are thrown down to the south. Although the top of the limestone produced some ore, most of it came from the grits, where it was associated with a gangue of barytes, calcite and fluorspar. It was Eddy's opinion that, for every 20 shillings spent on making trials in the limestones, they had not yielded 2s 6d worth of ore.¹

In the New Pasture, a belt of veins, 1.5 Km wide, outcrops in limestone and, owing to the dip of the strata, was followed eastwards for 3.5 Km, under an increasing cover of Bearing Grit and barren shale on the Out Moor. Here nearly all veins are thrown down to the south, with those ranging north-west to south-east tending to be stronger than those running from east to west.

Unlike veins further north, the lateral extent of oreshoots was limited, while the relatively thin bearing beds restricted their vertical extent also. At Grassington, a throw of 2 or 3 fathoms was felt most favourable for lead ore, but veins were seldom productive where the displacement was so great as to cause grit or limestone, on one

wall, to be opposed to shale on the other. The largest oreshoot, on Coalgrovebeck Vein, was eventually stoped out over a distance of 400 metres horizontally and 43 fathoms vertically. Another rich one, at Sarah's Shaft, on Cavendish Vein, was stoped for about 200 metres horizontally and 43 fathoms vertically.

Galena, or lead sulphide, with some cerussite, was the main source of lead at Grassington and, other than to mineralogists, its other minerals had no importance. This lead was poor in silver and, c1815, William Sheffield, the Duke of Devonshire's Mineral Agent, conducted eighty different assays and found that it varied between 0.5 oz and 4.5 oz per ton of lead.^{2,3} An exception to this rule was a parcel of ore raised from the New Rake Vein, in 1856, from which 611.5 oz of silver were recovered.

PUBLICATION HISTORY

The Grassington mines are referred to by various writers, the first of whom is T.D. Whitaker, in his *History of Craven*. In the late 1820s, a group of graduate mining engineers, from France, visited them and wrote a detailed report about the smelting and crushing operations, a translation of which is now available.⁴ John Taylor remarked on the mechanical innovations being made there in 1831 and, in the mid 19th century, Stephen Eddy, the Duke of Devonshire's Mineral Agent, wrote two brief papers on the mines. He also presented a model of the Beever Shaft workings to the Royal Geological Society of Cornwall.⁵

The first real attempt to record the archaeology and the history of the Grassington Mines started in the 1920s, when Dr Arthur Raistrick began to record the remains. It was Dr Raistrick's painstaking fieldwork and his interpretation of the findings which established the broad outline of the mines' history and placed it in a local context. This broad historical outline was presented in his book "*Lead Mining in the mid-Pennines*".⁶

Michael Dickinson wrote about the recovery of fluorspar and barytes from the dumps by the Dales Chemicals Company during the 1950s and 1960s.⁷ As Recorder of the Northern Cavern & Mine Research Society, he also began the Grassington Moor Survey which recorded remains and sought to relate underground to surface features. Michael Dickinson, Adrian Finch and the present author were co-writers of "*The Mines of Grassington Moor and Wharfedale*".⁸

The present writer, as Recorder of the Northern Mine Research Society, continued the Grassington Moor Survey and has written papers describing the mechanisation of dressing, pumping and winding at the mines.^{9,10} He has also written about the customary mining law, which regulated the mines, and about a series of 18th century legal disputes.^{11,12} As part of a major reappraisal, he has returned to all the documentary sources and also had extended access to the copious records in the Duchy of Devonshire's Archives. This work produced much new material on many aspects of the mines and a very detailed history of the mines has emerged. As a result, therefore, readers familiar with earlier papers will find new interpretations and some contradictions in this monograph.

RECENT DEVELOPMENTS

In the 1960s, the Earby Mine Research Group began renovating and stabilising mining remains on the Out Moor and at Yarnbury. These include the bob-pit on the Bolton Gill engine shaft, which is part of the Hebden Moor Mines; the smelt mill chimney and flues; Glory Shaft whim circle; bouse teams at Beever Mine; and a nearby powder house. Although the latter is called Beever's powder house, it was actually part of Cockbur Mine, and the true powder house at Beever's was about 20 metres north of the shaft. The Yorkshire Dales National Park also co-operated with the Chatsworth Estate to establish a "Mineral Trail" round some of the mines at Yarnbury and Coalgrovebeck. The National Park has also done further consolidation work to the flues and chimney.

In recognition of their importance, the following features have been given statutory protection, either through Scheduling or Listing.¹³ The office, cottages and smithy are inhabited again, and their owners have restored them respectfully.

FUTURE WORK

For the first time, the development of the Grassington Mines is set within a tight chronology. This is a major advance, but the findings should be discussed and tested by others. Because the mines are largely inaccessible, work will be restricted to the surface, where there is scope for a new phase of problem-solving fieldwork aimed at isolating those features which still do not fit the model. In particular, the mines of the Old and New Pastures should be carefully mapped in an attempt to identify early features.

This monograph, like most others on the subject, treats the mines in isolation, but it is time to begin integrated studies of the area's population and other industries to assess their local and regional impact.

Table 1 Listed & Scheduled Sites at the Grassington mines

NAME	Scheduled Ancient Monument		Listed Building	
	No.	DATE	GRADE	DATE
Barratt Incline Portal			II	1988
Shallow shafts	536	1975		
Smelting mill/flue/chimney	1186	1978		
Powder Ho., Yarnbury			II	1982
Count Ho., Yarnbury			II	1982
Smithy, Yarnbury			II	1982
Yarnbury Cottage			II	1982
Yarnbury House			II	1982
Yarnbury Lodge			II	1982

HISTORY TO 1818

Since the Norman Conquest at least, Grassington has been a privately owned liberty. It was never Crown property, and probably saw very little mining before 1603. The Manor of Grassington was part of the Percy Fee from Norman times and was later purchased by the De Plumpton family. The latter sold half to the 2nd Earl of Cumberland and half to his brother, Ingram Clifford, in 1542. These moieties were united, through marriage, by the 3rd Earl. During the four centuries for which information on mining is available, only three families have owned the mineral rights in the Grassington liberty. Twice, the lack of a direct male heir caused the inheritance to pass, through a married daughter, to a grandson.

When lead was first mined at Grassington is unknown, but the absence of mining revenues from the Clifford estate accounts suggests there was no mining for some time before 1603. Between 1446 and 1458, a Grassington man, Will'mo Coksen, sold lead ore to Fountains Abbey.¹ The source of the ore is not given, however, and it may have been mined elsewhere. Nevertheless, we can infer the location of two early smelting sites, or bales, from place-name evidence. There is an area called "Bayle Hill" near the New Rake, at Yarnbury, and another, called "Bale Hill", near Gate Up Gill. The latter is in the Hebden Liberty but it was considered to be part of Grassington until the end of the 18th century.

Bales were simple, wind-blown furnaces, which were formed by a ring of stones, about three or four feet in diameter, around a shallow depression. They were built near to the edge of a hill, where they caught prevailing winds. Those from the west and south-west were favoured. The earliest date for their use is unknown but Joan Fuller argues that the plumbariae of the Domesday survey were bales.² By 1304 a small lead mine, near Burnley, was using a bellows-blown bale.³ In the latter half of the 16th century bales were superseded by ore-hearths, blown by water-wheel-powered bellows. Although bale smelting lasted for at least 300 years, it is likely that any early mining at Grassington was in the 15th or 16th centuries.⁴

**TABLE 2 INCOME AND EXPENDITURE AT THE
GRASSINGTON LEAD MINES**

YEAR	INCOME			EXPENDITURE			PROFIT			LOSS		
	£	s	d	£	s	d	£	s	d	£	s	d
1612	196	7	9	109	11	0	86	16	9			
1613	184	16	7	115	7	11	69	8	8			
1614	212	3	7	157	10	1½	54	13	5½			
1615	189	15	4	189	8	9	0	6	7			
1616	328	14	5	347	0	10				18	6	5
1617	296	8	7	315	12	4				19	3	9
1618	<u>134</u>	<u>16</u>	<u>7</u>	<u>168</u>	<u>19</u>	<u>0½</u>				<u>34</u>	<u>2</u>	<u>5½</u>
	1543	2	10	1403	10	0	211	5	5½	71	12	7½

THE EARL OF CUMBERLAND'S MINES

The Third Earl's profligate gambling and involvement in unsuccessful privateering ventures led to the estates being heavily mortgaged and, in 1604, most of the land in Grassington was sold to sitting tenants, with sporting and mineral rights reserved. The deeds of sale apportioned the Out Moor to each new freeholder on the basis of the land they owned in the then-enclosed lands of the village.⁵ Having made considerable land sales, the 4th Earl began a major programme to raise money from the remaining estates. This included lead mining at Grassington, coal mining in Airedale, and iron mining in the Forest of Knaresborough.

Whitaker wrote that "*he could find no evidence of mining prior to the Reign of James Ist when, from circumstances (one in particular which I do not hold myself at liberty to disclose), I believe them to have been first undertaken, and principally, by miners from Derbyshire*".⁶ This agrees with the start of mining by the Earl of Cumberland who built the Low Smelt Mill at Brow Well, near the River Wharfe, in 1605. The mines made a profit of £13.33 in 1604, but the returns for the years 1605 to 1611 are missing. In 1615, the account noted that the high cost of working was because of the "*extraordinary works in making search for it*". Judging from the high cost in the two following years, the trial continued. The estate accounts (table 2) include items of income and expenditure which suggest that the Cumberlands worked the mines directly until 1618. After this, the Receiver-General stopped accounting for lead sales and costs, which led Richard Spence to conclude that the Earl put his mines on lease around then.⁷

Spence's conclusion is supported by the comments of Roger Kenyon, the Surveyor of the King's lead mine at Thieveley, near Burnley, who visited Grassington in 1630. Kenyon was told that the Earl "*findeth all wood to timber the groves, and for turns, corves etc; and prepares and keeps in repair the smelting houses, bellows and dams (the smelt mill bellows were driven by a water-wheel), and finds chopwood or wood for smelting and kilns and fire to dry the same with*" and, in return, took a duty of one-

TABLE 3 CASH RECEIVED FROM THE GRASSINGTON LEAD MINES

YEAR	£	s	d	COMMENTS	£	s	d
1630	232	4	11				
1631	166	15	6	Plus lead worth	42	9	0
1632	166	15	5	Plus lead worth	70	17	6
1633	312	13	1	Less lead worth	84	2	6
1634	178	7	0				
1635	138	12	5				
1636	Incomplete						
1637	Incomplete						
1638	219	15	4				
1639	158	9	8	First eleven months only			

third in smelted lead. These were the Earl's basic obligations to the miners under the Customary laws (see below). Despite the mine's being rich, the Earl made little profit after accounting for the cost of timber etc.⁸

In 1620 the mines made a profit of £75.07, but from 1621 to 1629 the returns are lumped together and averaged about £54 per year. During the 1630s, when lead sold at about £8 per ton, the cash receipts (table 3) suggest that the mines produced around 75 tons per year. A second smelt mill, the High mill, was built at Coalgrovebeck on the edge of the Out Moor in 1637, but it only had a very short life because output fell during the Civil War and remained low during the Interregnum.

CUSTOMARY MINING LAW AT GRASSINGTON

The Grassington mines had a system of Customary Mining Law similar to that used elsewhere, especially in Derbyshire. A knowledge of this topic is crucial to our understanding of the Grassington mines during the 17th and 18th centuries.

When, or where, the oral traditions which regulated mining originated is unknown but they are generally felt to date from the mid or late Anglo-Saxon period. Most of that period's unwritten customary law was slowly superseded by the Common Law and was codified by the legal advisers of Edward I. Probably because of its specialised nature, mining law remained independent and that used in the King's Field, of Derbyshire (the High and Low Peaks, where the King held jurisdiction) was recorded at an inquisition, or *Quo Warranto*, held at Ashbourne, in 1288.⁹ At about the same time, miners in other King's Fields, such as Alston Moor, parts of Swaledale, Teesdale and possibly Greenhow, had royal protection for their ancient customs.¹⁰

The laws and customs were not restricted to royal property, however, and they were used in some private, customary liberties. In all cases, the purpose of the law was to save the Mineral Owner the cost of the administrative burden of organising the exploitation of his property. He permitted customary law to develop to provide a means of ruling the various relationships between the himself, merchants and miners. Disputes were settled at a mining court, called the Barmoot, by reference to a body of customary law. The court's principal officer was the Barmaster, who administered the laws, and (at Grassington) it was chaired by the Earl's Steward. The Barmaster was usually appointed by the Mineral Lord. Unlike a modern court, where the jury should have no knowledge of the affair being tried, the Barmoot relied on a jury of miners to arrive at a verdict.

The origin of Grassington's customary mining law has been a subject of speculation. The orthodox model for the origin of mining at Grassington, proposed by Whitaker, follows a traditionally diffusionist approach, with skilled miners migrating to a new or under-developed area. The model was enhanced when writers on Grassington's mining laws noted their similarity to those of Derbyshire and suggested that the laws were also introduced by miners from that county.¹¹ This view ignores some significant differences, however, and has led to the Grassington laws being classified as an interesting, but inferior, version of the former.¹² For example, whatever the practice, other lead mining law is entirely masculine in its drafting but that for Grassington has

two items which include the term “*man nor woman*”. They clearly do not preclude women from becoming shareholders in, or owners of, mines and that continued to be the case in the 18th century.

The author’s study of *Yorkshire Lead Mining - before 1700* demonstrated that from at least Monastic times the county had a pool of skilled lead miners in Arkengarthdale, Swaledale and the liberties of Bewerley, Appletreewick and Stonebeck Down.¹³ It also proposed that customary mining law was once more widespread in Yorkshire than hitherto thought. This was confirmed by the discovery of a copy of the laws used at Marrick, in Swaledale, in the 15th and 16th centuries.¹⁴

There seems little reason, therefore, for the Barmoot Court which met at Grassington in May 1642 to establish covenants for regulating the mines, to rely on advice from Derbyshire. Moreover, George 3rd Earl of Cumberland, and Philip Wharton, later the 3rd Lord Wharton, who owned the mineral rights to large tracts of lead mining ground in Swaledale, were great friends and Wharton also married the 3rd Earl’s sister, Frances Clifford.¹⁵ The Earl could, therefore, have sought experienced miners from either the Greenhow mines or from Wharton’s mines in Swaledale.

The Barmoot held at Grassington in May 1642 agreed 20 laws, but it was not the first court because the verdict confirms the fines imposed by an earlier one.¹⁶ Examination of the laws shows that they are almost entirely concerned with the responsibilities of the miners and the mineral lord towards each other (see Appendix A). They confirm their respective rights and responsibilities as described by Kenyon in 1630 and practically ignore the means of gaining title to ground. This was to be regretted later.

Just why the laws were codified at the 1642 Barmoot remains a mystery but when Hopkinson’s Derbyshire mining laws were written in 1644 he made specific mention of the troubled times caused by the Civil War. The Earl of Cumberland supported the King and his castle at Skipton was besieged by Parliamentary forces for three years until the garrison surrendered on the 21st December, 1645. It is, therefore, perhaps not too surprising that the miners should seek to have their customs confirmed at this time.

The Clifford’s male line ended in 1653, with the death of the 5th Earl, and the Manor of Grassington descended to his daughter, Elizabeth, wife of Richard Boyle, 2nd Earl of Corke and Earl of Burlington.

THE EARL OF BURLINGTON’S MINES

The mines were not a high priority to the Burlingtons and, by 1659, only 45 tons were smelted. The lack of data for this period also makes it difficult to assess the development of mining during the rest of the century. It is clear, however, that the laws underwent an evolutionary process, much of which has gone unrecognised. Around 1680, changes were made which included the adoption of the more usual system for allocating ground, whereby the first finder of a vein got two meers, with the next meer reserved to the Mineral Lord.¹⁷ The meer was also increased from 21 to 30 yards, which was the length used in Swaledale. The mines of Greenhow, Langstrothdale and