Lead miners’ heyday: the great days of mining in Wirksworth and the Low Peak of Derbyshire

by Ron Slack

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Foreword

For almost two thousand years, from the Roman occupation until the nineteenth century, there was an important lead industry in Wirksworth and its neighbourhood. The industry’s greatest period came in the late sixteenth century, after technical improvements and an expansion of the trade, and lasted until the late eighteenth century. This is an examination of the working of the industry and of developments during these two centuries.

From the sixteenth century onwards there is a large body of written material arising from the way in which the industry was organised. This book is largely based on such documentary evidence preserved in the Derbyshire Record Office and the Derbyshire County Library, in particular the archive accumulated over several centuries by the Gell family of Hopton, now in the DRO, and the microfilm copy of the Wolley manuscripts in the Local Studies Library at Matlock.

There is little to be seen of the mines at Wirksworth itself, apart from the covered shaft openings and the grassy hillocks of discarded waste minerals. The mine buildings are now heaps of limestones. Further away from the town, but still in the Wirksworth mining area, there is more to be seen on Carsington Pasture, between Carsington and Brassington. Here there is a coe with a chimney and fireplace, the remains of washing sites, a winch, a powder magazine and other survivals. For miners’ tools, winding gear and other mining paraphernalia the best source is the Peak District Mining Museum at Matlock Bath.

Acknowledgements

The 1632 plan of the Dovegang is derived from the original in the Public Record Office (DL44/1121). The 1725 sketch map of the Griffe Grange mines is reproduced by permission of the County and Diocesan Archivist from the original in the Gell papers in Derbyshire Record Office; reference D258/17/24/3. The map of the Wirksworth Wapentake is derived from one published in Lead Mining in the Peak District (4th ed., Landmark, 2000) and the map of the soughs, mines and mills in the Wirksworth area is based on maps in ‘History and Gazetteer of the lead mine soughs of Derbyshire’, by Dr. Rieuwerts (1987). The map of the lead trade routes is based on one in ‘The Derbyshire lead industry in the sixteenth century’, by Dr Kiernan (1989). The portrait of Sir John Gell is from the illustrated copy of Lyson’s “Magna Britannia” in the Derby Local Studies Library and is included by courtesy of Derby City Library. Photographs Nos. 13 and 14 are reproduced by permission of Doreen Buxton and Harry Parker respectively. I acknowledge the help I have received from the staffs of the Derbyshire Record Office, the Derbyshire County Library and Derby City Library. I am grateful to John Jones for map references to mines and for information of underground finds, and to Doug Nash, Jim Rieuwerts, Tony Holmes, Lynn Willies and Chris Newall for information and copies of material in their possession.
Mines, veins, soughs and smelters
Chapter 1: “The custome of the mine”

A long history

On one of the walls in Wirksworth church is a crude stone carving, found nearby at Bonsall and placed in the church in the 1870s. Probably executed in Anglo-Saxon times, it shows a man carrying a “kibble” or basket in one hand and a pick in the other. He is a lead miner. By contrast, the north choir aisle of the church is dominated by a far more ostentatious monument, a large ornate alabaster chest tomb, a memorial to Ralph Gell of Hopton, who died in 1563. The simple figure of the miner bears witness to the fact that for centuries the people of Wirksworth and their neighbours relied on lead mining. Ralph Gell’s imposing tomb is evidence that a few people became rich and powerful from the trade.

1. Ralph Gell’s tomb in Wirksworth church. Ralph married twice and on the lid of the tomb he is flanked by his two wives, while figures on the sides represent the children of each marriage. The Gells grew rich and powerful on the proceeds of the lead industry – next to Ralph’s tomb is the even more grandiose memorial to his son Anthony, rich lawyer, JP and founder of the Anthony Gell school.
While Derbyshire lead made Gell and others rich, for poor families it was both a living and an adventure, with the possibility of a better life from a lucky find. The industry was organised in a way which gave a measure of independence to many of them. Mining was hard and dangerous work - death, illness and injury came from poisonous lead dust, underground floods, falling rock, methane gas in shale workings and lack of oxygen in badly-ventilated galleries. From the later years of the seventeenth century gun powder introduced a further hazard. Nonetheless the thousands of shafts, hillocks and ruined buildings in the limestone landscape of the old lead mining areas, and the miles of galleries underground, make it plain that the veins of lead were intensively exploited. Without lead, to quote the governing Derby Committee during the Civil War of 1642-1646, “manie thousands will be undone … that great multitude, their wives, children and families, that live meerely by getting of lead oare and trading in that commodity”.

By the 1600s lead had become second in importance in the national economy only to wool. It was essential for the roofs of public buildings and the new houses being built in every part of the country by the nobility and gentry. All houses, including farmhouses and cottages by then, had glazed windows, with lead glazing bars. It was the only material for water storage and piping. Every army used it as ammunition. There was a thriving export trade as well as the home market and the Wirksworth area was the main source of the ore. The miners knew that the industry, as well as being vital to them, was important in the national economy and petitioned Charles I to recognise the fact by giving them two representatives in Parliament. They claimed “that the saide Towne is both a markett Towne, and very ancient, and hath for many hundred yeares beeene famous for the leade Mynes neere adjoyning thereunto: That many thousands of your Majesties Myners live in and neere unto the saide Towne, and that your Majestie is Lord, both of the saide Towne, and also of that whole hundred. That the Barmoote Corts are kept, and the mynerall controversies heard and determined in your Majestie hall in that Towne, and by your Majesties officer called a Barmaster”.

They went on to describe the great quantities of lead mined in the town and its neighbourhood, and the rich trade at home and abroad. Lead, they said, was a staple commodity, important enough to justify two MPs of their own to speak for them in Parliament. The petition was unsuccessful, and the miners had to continue to rely on the two Derbyshire MPs, the “knights of the shire”, to make their case, but their claims for the Wirksworth lead industry were accurate. By the middle of the seventeenth century Wirksworth was the most productive lead mining area in England. There were indeed thousands of men, women and children, involved in one way or another in the industry, and many tradesmen relied on the miners for their livelihood – blacksmiths, builders, carpenters, charcoal burners, ironmongers, woodcutters, chandlers, rope makers, carriers.

Wirksworth was the administrative centre of one of the “hundreds”, local government units, of Derbyshire. Uniquely, the Wirksworth Hundred was still known by the archaic term “Wapentake”. Lead ore was Crown property in most places and the mining area of Derbyshire under royal control was known as the King’s Field, with two separately administered divisions, the High and Low Peaks, each further divided into “liberties”, based on parishes. Wirksworth Wapentake was the Low Peak area of the King’s Field. At different times there were liberties based on Wirksworth, Middleton-by-Wirksworth, Cromford, Brassington, Matlock, Elton, Middleton-by-Youlgreave, Bonsall, Hopton and Carsington, and from 1638 until 1654 there was a separate liberty for the Dovegang, 200
7 acres on Cromford Moor which had become extremely productive after being drained by the first of the Derbyshire drainage schemes, or “soughs”.

Wirksworth Wapentake. The mining liberties were based on the villages

There had “always” been lead mining in Wirksworth. This is limestone country and the fissures characteristic of limestone contained rich deposits of minerals, and especially of galena – lead ore. The Romans mined there and left inscribed “pigs”, or ingots, of smelted lead as evidence. In the 800s AD Repton Abbey owned mines at Wirksworth and when the abbey was destroyed by Danish troops in 874 they were taken by the Danish king Ceolwulf. They remained in royal hands after the Norman conquest of England and paid royalties to the Crown for centuries afterwards. Lead mining and smelting was an established industry in 1086, when the mines at Wirksworth were recorded in Domesday Book. By 1540, just before the lead market was overwhelmed by a glut of lead plundered from the religious houses dissolved by Henry VIII, the mines at Colehills and Dale End were producing 490 loads, or about 122 tons of lead ore a year. The area from Wirksworth north to Cromford, Matlock and Bonsall was the highly productive heart of the Low Peak and in 1540 575 loads (144 tons) was mined in Dean Hollow, between Wirksworth and Cromford, a further 120 loads (30 tons) in other mines in Cromford, 97 loads (24 tons) in Middleton, 273 loads
(68 tons) in the Bonsall area and 163 loads (41 tons) in Matlock. To the West and North-West the mines in Carsington, Brassington, Aldwark and Wensley produced small amounts of ore which were vital to the villagers’ livelihoods.

The miners’ art

The ways in which the miners found their ore, and the tools and methods used to mine it, changed very little over the centuries. As late as 1880 a mining inspector could declare that “the working of the veins is carried on at the present day in a very crude manner, with but little improvement on the old Saxon mode of working the mines, some of the most antiquated customs and modes of working being still in use. Engineering skill and science have done little to improve the mode of working the lead mines of Derbyshire”. He was exaggerating, and there had been developments, but a seventeenth century miner would not have felt out of place in most of the nineteenth century mines.

Lead had traditionally been found by following veins from surface outcroppings, particularly in “rakes” – vertical fissures. By the seventeenth century, however, most surface lead had been mined and prospecting was achieved by less direct methods. Miners searched for surface signs which were similar to known lead-rich areas, they checked ploughed and other disturbed land for traces of ore, they checked for signs in plants and trees and poorly performing crops, since lead is poisonous to most living things. They used probes to check for signs of ore in soil a few feet under the surface and dug exploratory holes or trenches in promising places. This was usually done to choose the best places to sink shafts ahead of existing working and the rules defined when and where these activities could be carried out. Illegal probing was called “progging” and twice during the 1680s the Gell family of Hopton, who had continued and enlarged Ralph Gell’s lead interests, intervened to stop progging on Hopton Moor. In one case, in July 1680, four local men “acknowledge we have made several holes by progging which is not according to custom: & do promise not to offend in the like case again but will work according to the custome of the mine”.

The miners sank their shafts in “turns” of up to 90 feet, each turn being a few yards away from the bottom of the preceding one, along a gallery which may have been the working level reached by the earlier shaft. They climbed up and down their shafts using either footholes in the shaft walls or "stemples" - wooden steps built into the sides, an exhausting and dangerous way to start and finish a day’s work. These “climbing shafts” were usually within the miners’ “coe”, the limestone-walled cabin in which they stored tools, a change of clothes and food. Where the mine was on a hillside the vein could often be reached via an “adit” or tunnel driven into the slope. Daniel Defoe, the author of Robinson Crusoe, once met a miner on Brassington Moor who described just such an operation. Defoe was on his way from Wirksworth to Buxton in the 1720s when he spotted the miner climbing out of a shaft by means of “pieces of wood” in the shaft walls and questioned him about his work. The miner told Defoe that he was working at 60 fathoms (360 feet) and other members of his group at 71 and 86 fathoms. He envied these workmates because they “had a way out at the side of the hill”.

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Ore was brought to the surface up a “winding shaft” outside the coe. The miners’ equipment included picks, hammers and wedges to split the rock, “wiskets” or baskets to contain it, “corves” or sledges to drag it to the shaft bottom, and windlasses or “stows”, to lift it to the surface. In later years underground transport was improved by replacing corves by wagons, often running on wooden or metal rails - a 500-yard length of eighteenth century wooden railway was found recently in the Merry Tom mine, near Via Gellia. The miners avoided the need to excavate hard rock whenever they could and where it was unavoidable sometimes resorted to “firesetting”. A fire was built against the rock face after mining had finished for the day and allowed to burn through the night. Fragmentation of the heated rock was increased by throwing water on to it. The rule about firesetting only after the end of the day’s work was important because in the confined mines the smoke was deadly. Firesetting was a skilled technique and was used sparingly for that reason as well as because of the disruption caused by the smoke and the danger from splintering rock.

Tools of the trade recovered from Old Taylors Mine, next to Old Gells Mine. They were at the bottom of an 85 foot shaft cut in calcite, off the 300 foot level, and were neatly laid out as if ready for the next day’s work. Nearby was a metal candle holder fixed 8 feet high on a wall. (Photo and information – A.J. Holmes).
Technical change

After the mid-sixteenth century slump the industry recovered, new mines were opened on Middleton Moor, and production increased. Apart from the renewed demand after the monastic lead had been absorbed, the sixteenth century recovery was due to technical developments. While traditional extraction methods had persisted there were vital changes in the ways in which ore was prepared for smelting and in the smelting process itself. The traditional smelter was a “bole”, a large fire built on a hill and relying on wind power. It functioned best with large pieces of rich ore known as “bing” and could not deal with anything small enough to pass through a half-inch mesh riddle. The bole smelter therefore resulted in large amounts of ore accumulating on waste heaps. It required two days of strong wind and could only function when the conditions were favourable. In the late sixteenth century wind power was abandoned and the smelting blast was provided by a bellows driven first by foot, to an “ore hearth”, and later by water-power in a smelting mill. These smelters could deal with much finer particles of ore and new techniques were introduced to provide them.

3. Washing buddle on Bonsall Moor. A slurry of lead and other mineral particles was washed down the sloping trough. The lead particles sank to the bottom and the unwanted material above it was removed. (Photo – A.J. Holmes).
Before a miner could sell his ore he had to “dress” it. Dressing was the process of extracting the ore from the rock in which it was embedded and “washing” it - a further refining process. In the days of bole smelting the ore was roughly washed clean of waste minerals and dirt before being riddled for bing ore. The ore for the new smelters was smashed, or “crushed”, into pieces about the size of peas. This was done by hand, using a hammer called a “bucker” or, in larger mines, on a “crushing circle”, where a horse dragged a roller round a paved circle on which the ore was placed. Crushed ore was washed either by running water over it in a sloping trough called a “buddle” or by placing it in a sieve fine enough to prevent any ore particles passing through. The sieve was then plunged several times into a trough. In each case the object was to allow the heavier, lead-rich, particles to sink, enabling those containing lighter, unwanted minerals to be skimmed off the top and removed. These processes were then repeated at the smelter. By the seventeenth century new mines were being opened, shafts driven deeper, and old waste heaps were yielding new supplies for the smelters.

The customs

Everything about the old lead industry, from the mining of ore to its sale, stemmed from the ancient claim of the monarch to all mineral rights. The whole structure was designed to enable the Duchy of Lancaster, a royal possession, to collect the king’s royalties and, since these were farmed out, the miners paid them to the king’s farmer. By the seventeenth century the local holder of the mineral rights was also the Barmaster whom the miners mentioned in their petition for representation in Parliament. The Barmaster ran the industry, helped by deputies responsible for the liberties, and by the miners’ juries of the Barmote Court also mentioned in the petition. The lead industry is long gone, but its traditions are still maintained – the Barmaster and the jury still meet in the Barmote Hall in Wirksworth.

It was the royal possession of the mineral rights and the royal wish to encourage lead mining, that dictated the two characteristic features of the old industry. Any man who could demonstrate to the Barmaster that he had discovered a significant amount of ore was allowed to open a mine and retain the title to it as long as he continued to work it, and, secondly, mining took precedence over land ownership. No land owner or farmer could interfere with lead mining, though there were many attempts to limit its damage. In 1620 the Duchy of Lancaster’s tenants at Brassington complained that lead mining was poisoning their cattle. In 1663 the Brassington manor court forbade miners from taking water from the village well to wash ore, on pain of a fine of 1/-, and in 1670 imposed fines of 3/4d on miners who left shafts uncovered or raised heaps of soil and waste minerals against fences, allowing cattle to climb over them. But the customs raised the possibility of ordinary families making a living independently of farmers or other employers and in the regular conflict between miners and landowners in the Wirksworth area the miners usually managed to hang on to them, though they did lose some of their fights.
4. The Barmote Hall in Wirksworth, built in 1814. The earliest hall was built about 1500, and was a similar building to the Market Hall in Winster, built with “six butchers’ stalls and two butchers’ shops” underneath the courtroom. It was at the north-eastern corner of the Market Place and was demolished and replaced in 1773. This building was demolished in its turn and replaced by the present building in Chapel Street when the Market Place was extended.

The king’s farmers and chief Barmasters

The coveted and valuable “farm” of the Duchy of Lancaster’s right to the lead mine duties, coupled as it was with the office of chief Barmaster, endowed its owner with both a considerable income and authority over the running of the industry. It was always resold at a much higher price than that charged by the Duchy, which was £110 plus annual payments of £72 for the duties and £1-6-8d for the barmastership.

The mineral rights at the beginning of the century were held by a Robert Parker, who renewed his lease for thirty-one years in 1623, shortly before his death, when he was succeeded by Thomas Parker. The thirty-one years from the expiry of Parker’s lease in 1654 were leased to David Ramsey in 1631, and both leases were resold to members of the family of Sir John Coke of Melbourne, one of the chief Secretaries of State to Charles I. Sir John’s younger son, Thomas, bought the remaining years of Parker’s lease in 1637, and in
Figure 1. Barmasters and Stewards in Wirksworth Wapentake.

**King’s Farmers, Chief Barmasters**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>1592-1623</td>
<td>Robert Parker?</td>
</tr>
<tr>
<td>1623-1637</td>
<td>Robert Parker/Thomas Parker?Richard Carrier</td>
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<tr>
<td>1638-1644</td>
<td>John Gell I, John Milward (except Dovegang)</td>
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<td>1644-1654</td>
<td>John Gell II, John Milward</td>
</tr>
<tr>
<td>1654-1661</td>
<td>John Gell II, John Milward, Thomas Mitchel</td>
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<tr>
<td>1661</td>
<td>Earl of Northampton (including Dovegang)</td>
</tr>
<tr>
<td></td>
<td>Edward Vernon, Ralph Freeman</td>
</tr>
<tr>
<td>1691</td>
<td>Lord Clifford/Hugh Chudley/William Montague</td>
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<tr>
<td>1692-1698</td>
<td>Francis Gell (2/3 of Wirksworth Wapentake)</td>
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<tr>
<td>1701</td>
<td>Thomas Bagshaw</td>
</tr>
<tr>
<td>1708</td>
<td>John Hutchinson</td>
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<td>John Rowles</td>
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**Stewards**

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<td>Thomas Allsop 1661</td>
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<tr>
<td></td>
<td>George Hopkinson</td>
</tr>
<tr>
<td>1701</td>
<td>Thomas Bagshaw 1770</td>
</tr>
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<td></td>
<td>Godfrey Heathcote</td>
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**Deputy Barmasters**

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<th>Location</th>
<th>Name</th>
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<tr>
<td></td>
<td>Richard Cadman, Edward Bradshaw, Robert Flynte, Laurance Stokes, Anthony Steeple, Thomas Needham</td>
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<td>Edward Somers, William Tofte</td>
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<td>1639-1650</td>
<td>Brassington</td>
<td>Henry Trevis</td>
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<tr>
<td>1639-1655</td>
<td>Cromford</td>
<td>William Hardy</td>
</tr>
<tr>
<td>1639-1653</td>
<td>Middleton by Wirksworth</td>
<td>Thomas Spencer</td>
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<tr>
<td>1639-1653</td>
<td>Wirksworth</td>
<td>Ralph Poyser</td>
</tr>
<tr>
<td>1645-1650</td>
<td>Matlock</td>
<td>John Abell</td>
</tr>
<tr>
<td>1645-1650</td>
<td>Bonsall</td>
<td>William Needham</td>
</tr>
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<td>1645-1650</td>
<td>Elton</td>
<td>John Wilson</td>
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<td>Middleton by Wirksworth</td>
<td>Richard Marshall</td>
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<td>Brassington</td>
<td>William Blackwall</td>
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<td>1656-1659</td>
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<td>Francis Hardy</td>
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<td>1653-1661</td>
<td>Middleton by Wirksworth</td>
<td>John Sladen</td>
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<td>Wirksworth</td>
<td>John Sladen</td>
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<td>1666</td>
<td>Wensley</td>
<td>Henry Greatorex</td>
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<td>1701</td>
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<tr>
<td>1714</td>
<td>Wensley</td>
<td>John Abell</td>
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<td>1730</td>
<td>Brassington</td>
<td>Samuel Bacon</td>
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<td>1738</td>
<td>Matlock</td>
<td>George Tissington</td>
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<td>1740</td>
<td>Brassington</td>
<td>Stephen Bagshaw</td>
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<tr>
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<td>Brassington</td>
<td>Edward Ashton</td>
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<tr>
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<td>Elton</td>
<td>William Twigg</td>
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<td>1772</td>
<td>Matlock</td>
<td>Anthony Tissington</td>
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<tr>
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<td>John Abell, jun.</td>
</tr>
<tr>
<td>1777, 1791</td>
<td>Matlock</td>
<td>Joseph Simpson</td>
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<tr>
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<td>Wirksworth</td>
<td>Henry Sidebotham</td>
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<tr>
<td>1788</td>
<td>Cromford</td>
<td>Robert Lockall</td>
</tr>
<tr>
<td>1792-1804</td>
<td>Brassington</td>
<td>Thomas Slack</td>
</tr>
</tbody>
</table>
1643 David Ramsey sold his lease, due to run from 1654, to Sir John himself. Coke died intestate in 1644 and his estate was inherited by his elder son, also Sir John.

Thomas Coke sold ten years of the lease to John Gell of Hopton and John Milward of Snitterton in 1638, after he had separated off the mines of the Dovegang area from the rest of the Wapentake. The Dovegang, rich in lead but long plagued by flooding, was currently being drained by a sough and was potentially very valuable. Coke sold the Dovegang lease to the sough’s builder, Sir Cornelius Vermuyden, for £200. In 1644 Gell, by then Sir John after he had been created a baronet in 1642, transferred his estate, including his lead interests, to his son, another John, and in 1648 Coke sold the remaining six years of the lease to the younger Gell for £1000. The lease was valuable, as these complicated transactions suggest. The younger Gell, still in partnership with John Milward, had to fight off a legal challenge in 1652, where it was claimed that Thomas Coke had conveyed the lease in 1640 to a Timothy Littleton in trust for his, Coke’s, wife, a “neare kinswoman” of Littleton. Littleton claimed that Coke had conspired with the two Gells and Milward, using as cover the Civil War, his immunity from legal suits as an MP and an absence in France.

Chief Barmasters and “the 24”

At dinner in Wirksworth after meetings of the seventeenth century Barmote Court, the landlord of the inn had three tables for those attending the Court. There was the “24 table”, where the members of the 24-man jury sat, and where he charged 8d per head, “the Barmasters table”, at 10d a head, and a table where “gentlemens dinners” cost 1/- each. The gentlemen drank sack or claret with their dinner, the “men” were served with beer. The bill was paid by the king’s farmer and chief Barmaster. There were usually about a dozen gentlemen, some of whom were members of the jury, while others were there to present a case to the Court. Also among the gentlemen was the steward of the court, who was a lawyer and who conducted the sessions. The steward’s impartiality was important – at the end of the seventeenth century the mine owners of the Wirksworth Wapentake petitioned the Duchy of Lancaster to have the barmastership sequestered, as the current Barmaster had not appointed a steward “and therefore is often judge in his own case”. This was in spite of the lawyer to one of the owners, Sir Philip Gell, advising him in 1701 that “whatever he [the Barmaster] does as Steward in relation to his own interests … is as I take it, void in itself”. When the chief Barmaster for the Wapentake, always a man of wealth and rank, was a local gentleman such as Sir John Gell of Hopton, he often attended the Court himself. If the current chief Barmaster was an absentee member of the gentry or nobility he relied on his deputy Barmasters.

Deputy Barmasters

The deputy Barmasters whom the chief Barmaster appointed were experienced local men. Their duties required them to be able to read, write and keep account of granting and removing title to mines and of ore production and the duties levied on it. Some of them were yeoman farmer/miners, like John Sladen, a tenant of the Gells of Hopton when Sir John Gell and his son were chief Barmasters, and others local gentlemen such as Henry Trevis and William Blackwall of Brassington. The deputy Barmasters actually ran the system. It was they who initiated much of the business of the Court. It was they, in administering the
rules, who determined whether a miner should have a particular mine or whether another should lose one. On appointment each new deputy Barmaster was instructed “You shall well & truly execute the office of deputy barghmaster upon the leade mines within this wapentake & doe the lord of the said mines & their farmers profitt in all things that belongeth to you by vertue of your office according to the articles & customes of the said mines as farr forth as you can or lawfully may. And you shall deale justly & impartially in making arrests summoning jurors in all controversies betweene party & party. And therein & in every other thing you shall well honestly & impartially behave yourselfe in the said office according to the custome of the said lead mines during the time you shall continue in the same office soe help you God”.

Giving a mine

The Barmaster or his deputy granted title in a mine, the usual name for which was “grove” or “groove”, on receipt of proof that it was viable. The proof was a standard container, a “dish”, filled with about 65 pounds of ore from the mine in question. Every dish was calibrated by the Barmaster twice a year against a brass standard dish. The miner thus granted title to the mine was said to have “freed” it, either “for old” if it was a development in an existing mine, or “for new” in the case of a new discovery. He was given permission to work 2 “meers” of ground, known as “founder meers” (a meer = 29 yards in the Wirksworth Wapentake), with no restriction on width or depth. A third meer was the king’s, and other miners were each allowed to open a further meer (“taker meers”) along the vein. The miner marked each meer with his “possessions” or “stows” (a miniature version of the stows or windlass used to “wind” the ore from the shaft).

5. Two-roomed building at Orchard Mine. (Photo – A.J. Holmes).
Since the course of a vein of lead was unpredictable, there were many disputes caused by one group of miners following a vein into another mine. There were occasions when possession was disputed by physical means. Early in the eighteenth century, for instance, the owners of Ranter mine in Wirksworth took the partners in nearby Orchard mine to court for lighting a bonfire of hay and straw in their mine at 9 or 10 am. The smoke from the Orchard miners’ fire drove the Ranter men out - the offenders threatened “that if they or any other workmen … for the future came to work in the said vein, they will again make fires and serve them the same. On other occasions the partners in adjacent mines took steps to prevent disputes by appointing umpires – in 1739, for instance, the owners of the Gang mine agreed with those of the Provewell mine to appoint two local miners as arbiters, plus Anthony Tissington, deputy Barmaster, as final umpire “to settle disputes which may arise out of the close proximity of the mines”.

Collecting the dues

As ore was brought from a mine, it was measured by the dish and the Barmaster collected each 13th dish, a royalty or duty known as “lot”. This was the Barmaster’s “reckoning” and in the heyday of lead mining he was kept busy – during 1639, for instance, the Wirksworth liberty’s deputy Barmaster, Ralph Poyser, carried out five hundred and three reckonings. The Barmaster was responsible for the safekeeping of the lot ore – in 1652 the Cromford deputy Barmaster, William Hardy, presented a bill to the chief Barmaster, John Gell, for his expenses in building “a coe to lay the lott oare in”. Hardy’s coe had mortared and pointed stone walls, a paved floor and a turf roof. The total cost of materials and labour was £4-4-7d. A further duty of sixpence a load (9 dishes) was paid by the merchants who bought the ore from the miners. This second duty was called “cope”.

Title-holding and record keeping

The deputy Barmasters were responsible for settling disputes over ownership or of “arresting” or suspending operation of mines pending decisions of the Barmote Court. They could withdraw title whenever a mine was left unworked. They checked the mines regularly and used their knives to “nick” the stows at any neglected mine. After three nicks at weekly intervals title could be transferred to another miner. The mining rules required working shareholders in a mine to pull their weight. Any who did not were dispossessed, after a warning at the Barmote Court - on April 2nd 1630 the jury pronounced “Wee saie that Thomas Taylor Henry Lowe and John Worley shall come within tenn daies after they have warning given to them by the Barrmaster and shall keepe Thomas Redforde companie at theire groves in Home Rake or else to loose theire parte”.

The deputy Barmasters kept records of all changes of title and of the amounts of ore measured and the amounts of lot ore and cope collected at their regular “reckonings” at the mines. The lot and cope “accounts” involved quite complicated arithmetic. The information given included the period covered, the name of the miner or mine (occasionally both were given), the amount of ore mined, the number of dishes of lot ore received, the amount of ore sold to each buyer and the sum of money chargeable to each buyer for cope. Traditional methods were used at the reckonings – Barmasters carried knives “to worke upon a sticke
the number of dishes of oare as they were measured which is usuall to be done at a reckoning”. Many of their records have survived.

**Accidents**

In conjunction with the jury of twenty-four sitting at the Barmote Courts, the deputy Barmasters adjudicated in disputes and enforced compliance with the customs of the mines. Their duties extended to acting as the coroner in the case of fatal accidents, where a specially summoned jury of twelve or thirteen local miners decided the cause of death. In an eighteenth century example the Brassington barmaster, Edward Ashton, followed the rules after a death in Throstle Nest mine –

“Wirksworth Wapentake March 26th 1761.

We, whose names are under written, being this day summoned by Mr. Edward Ashton, Bar-Master for the Liberty of Brassington, to a groove called by the name of Throstle Nest on Brassington Pasture; to enquire into the the cause of the death of T.W. now lying before us; accordingly we have been down the shaft to the Foot thereof, and down one sump or turn to the foot thereof, and on a gate North-wardly about sixteen yards to the Forefield, where the deceased had been at work; and by the information of William Briddon who was working near him; it appears that a large stone fell upon him out of the roof, and it is our opinions the said stone was the cause of his death”.

In addition to helping the Barmasters to carry out their duties the twenty-four jurors brought practical experience to bear when the Barmote Court was adjudicating in disputes and trials. The main requirement of the jurymen was that they should be knowledgeable in mining matters and they included both working miners and, when it was thought necessary, local gentry. The jury at a “Great Court of Barmote for ye Lead mine held at Wirksworth” on 10 October 1655, which ratified and recorded the mining laws, included Robert Hayward and Robert Sage, lead merchants, Richard Buxton, squire of Bradbourne and Anthony Gell, a kinsman of John Gell, the current chief Barmaster.
Chapter 2: The industry, pre-war and pre-sough

Owners, partners and labourers

The term “miner” traditionally meant a working miner sharing the labour and financing of a small mine with his relatives or neighbours, and usually farming a few fields as well. In many of these small mines a whole family could share the labour, the men working underground and their wives and children winding the baskets of ore up the shaft and preparing it for sale. However, the increased production of the closing years of the sixteenth century was largely due to an increase in deep mining, and deeper shafts required more expenditure. “Miners” began to include entrepreneurs who had risked their capital in mining shares, while other miners could be men earning a living in a large mine as members of a team fulfilling a “bargain” or “cope” struck with the mine agent. These “copers” regarded themselves as still being independent, unlike the “hirelings” who worked as wage labourers. A working life began very early, in both the family groups working the small mines and in the bargain teams in the larger ones, where boys dragged the ore to the shaft bottoms for winding.

6. The remains of Smithycove mine, near the disused Tiremare Lane, above Sycamore Farm, near Hopton. In the foreground is a ruined coe, with the miners’ climbing shaft inside its walls. The tree in the centre of the picture grows inside the walls of a second coe.
7. A climbing shaft inside a collapsed coe at College Dream Mine, Stainesborough. The mines at Stainesborough are at least as old as 1639, when 86 loads (about 21 tons) of ore were won from six mines.

Free miners

Free mining - the traditional way - needed little capital and there were hundreds of small mines in the Wirksworth area. The evidence is still visible in the shafts and hillocks and in the heaps of limestones remaining from mine buildings. The barmasters’ records for the liberties in the Wirksworth Wapentake put names to these remains and to some of the men who worked there. The situation was to change later in the century, when successful mine drainage schemes enabled much deeper mining to be achieved, but the Wirksworth liberty figures for 1639 and the 1640s give a picture of many small mines, none producing much and most still worked in the traditional way by pairs or small partnerships of independent miners, owning shares in the mines they worked.

Ralph Poyser's accounts for the Wirksworth liberty in 1639 list eighty-six mine owners. Twenty-three of them had ore measured at their mines on only one occasion and a further thirty-four required Poyser’s service fewer than six times during the year. These fifty-seven men who produced ore for measuring less frequently than every other month were either miner/farmers, with fields and animals as well as their mines, or were supplementing income earned from working in other men’s mines. The fifty-six miners producing less than 5 loads must certainly have worked only part of 1639 at their own mines. However, a mine’s
output could vary over time, and it was usual to continue working during lean periods in
the hope of better luck to come.

Most of the rest produced enough ore during the year to make a living – George Hardy, for
instance, working in Upper and Nether Groves in the Barley Flat, had ore measured on
seven occasions and mined 13 loads 7 dishes. With ore selling at about 25/- a load this was
enough for a family to live on. There were twenty-two miners who produced between 5 and
20 loads (1-4 tons) during the year, figures suggesting that they could confine their mining
to their own groves, though the infrequency of their ore measurements suggests that they
too were miner/farmers.

The 1639 picture persisted through the 1640s. In 1645 Ralph Poyser made more than seven
hundred and thirty-four reckonings in Wirksworth liberty – some of the entries noted “at
several times measured”. There were eighty-one names, eight of them paired, implying that in at
least four of the seventy-seven mines listed there were only two partners. There were no high
production figures – only four of the mines had over 30 loads measured and only one of these
reached 50. There were, however, more mines producing enough ore to earn their owners a living
wage than there had been in 1639. Twelve men had between 20 and 29 loads measured and a
further twenty-six produced between 5 and 19 loads. Well over half of the men working these
small mines were therefore earning more than enough to live on. Typical were Thomas
Woodiwis, who had ore measured on twenty-six occasions and sold 25 loads, William Worslowe,
24 loads measured at twenty-four reckonings and Robert Wall, for whom Poyser measured 28
loads at twenty-five visits to his mine. They had small amounts measured at frequent intervals
and were clearly working full time in their own mines. The small amounts indicate small labour
forces – perhaps one or two underground, plus family help in winding and dressing the ore. As
in 1639 there were many who, from the small amount of ore they produced, or the few times they
presented ore for measuring, must have worked either on the land or in other men’s mines, as
well as their own.

Success for some

Alongside the small-time miners in 1639 were six whose output was much greater and who must
have been mine owners and employers of miners rather than working miners themselves. These
six mined 402 loads, or 36 percent of the year’s output of 1107 loads of ore. Ann Taylor, “in the
Dale”, had ore measured on nineteen occasions. These were mostly small amounts, but her
workers seem to have struck a rich vein in the second half of the year and the mine ended with
an annual production of 168 loads (42 tons). A second rich mine was owned by William Beighton,
who produced 157 loads at fourteen reckonings and a gentleman owner, John Stuffin, of Hopton,
had 77 loads measured on twenty-six occasions. Two men, John Swallow and John Mather,
seem, from the number of the occasions on which they had small amounts of ore measured, to
have been working miners going through a particularly good patch. Swallow, at “Cockinkilne”,
produced a total of 53 loads at twenty-eight reckonings and Mather, mining at Stainsborough,
near Hopton, had ore measured on thirty-six occasions, producing a total of 69 loads.

In 1645, while there were none of the high production figures of 1639, there were some
mine owners doing better than the majority. William Hopkinson, given the title “Mr” to
indicate his gentlemanly status, had ore measured twenty-six times at his Barley Flat mine
and produced 44 loads. Edward Hodgkinson, mining in the Steeple, produced 45 loads at thirty-five reckonings. These two men, plus Thomas Bradshall (56 loads), Henry Calton (41) and William Wall (34), were making a decent living from mining. Hopkinson came from a wealthy family whose large house in Wirksworth is still standing and has recently been renovated – “Hopkinson’s House”. None of these men, however, made a fortune from the industry, unlike some of the entrepreneurs who were to invest in the newly-drained mines later in the century, and it is significant that the names of the high producers in 1639 are missing from the 1645 list. Lead mining was an uncertain business. The predominant pattern in the Wirksworth liberty in the 1640s was the traditional one of a large number of small mines worked by a large number of independent small-time miners. This was the pattern in the other liberties at the same time and was only altered when drainage, deep mining and a large output, required capital and attracted investment.

8. Hopkinson’s House, in Greenhill, Wirksworth. It was built in 1631 by William Hopkinson, a rich lead merchant and mine share-holder. The Hopkinsons were influential in the industry and William’s brother, George, a lawyer, served as the Steward of the Barmote Court. William’s house had thirteen rooms and was one of the biggest in Wirksworth.
Women in the lead trade

Free mining was carried out by family groups, with wives and children usually winding and dressing the ore. Underground their work consisted of hauling ore to the base of the winding shaft. However, the barmasters’ accounts include women named as mine owners and ore buyers. In 1639, in addition to Ann Taylor, owner of the most productive mine in Wirksworth, there were Emmot Vickers and Mrs Mary Fearn. Mrs Fearn is given her title because she was the wife of John Fearn, gentleman – one of their daughters married John Stuffin, gent. By the same token Ann Taylor and Emmot Vickers were from the lower orders, though not, presumably, of the “poorer sort”. Emmot Vickers, whose gender is revealed in an ore account for Brassington, was both mine owner and ore buyer. She mined 27 loads 2 dishes at Wirksworth and bought ore from other miners there and at Brassington and Middleton. In 1645 she is listed as measuring ore “at Mr Stuffin’s grove in the Breech”. In addition to Emmot Vickers the ore buyers in 1639 included Mrs Elizabeth Wigley and Mrs Anne Hopkinson, mother of William.

Smelting

There were four smelters at Wirksworth, all powered by the river Ecclesbourne. The earliest, Wash Green, was built about 1589 by Henry Wigley. Wigley’s sons Thomas and Richard succeeded their father in the business until 1635 and among their successors were George Hopkinson and Robert Sage, followed by Hopkinson’s son Adam. By 1693 the mill was in the hands of Sir Philip Gell, who sold it to John Hutchinson in 1701. At the same time Hutchinson renewed the lease of the two mills which had been in the Gell family’s hands since the time of Sir Philip’s grandfather, Sir John. These were the Nether Mill, also known as Milnhouses or Lower Mill, and the Over or Upper Mill. Like Wash Green, Nether Mill dated from the late 16th century, when it was held by William Blackwall. The fourth smelter, Middle Mill, was in Sir Philip Gell’s hands in 1693 and was also later leased to Hutchinson.

Sir John Gell had been smelting earlier than 1633, when he was sued by a former employee (Kiernan, 1989). He bought Nether Mill in 1640 (D258/52/6b) and Upper Mill was in use before 1647 (Kiernan, 1989). Detailed accounts for the two mills’ operations survive for 1648 and some later years. In 1648 Nether Mill made a profit for John Gell junior of £18 for the first quarter (D258/61/50b) and £23 for the second (D258/28/20aa). At Upper Mill, where the tenant was Johannes Molanus, recently Major in his father’s regiment during the Civil War, the profit was £40 for the five months January to May (D258/28/20aa1). Molanus was a tough old soldier and had never been particularly fastidious in any of his activities. Gell found that the old man had not changed. On the 22nd May 1655 Gell petitioned the Commissioners of Excise that four excisemen “by force and armes the 28th day of March last did breake open the dore of your petitioner’s said Mill” and seize eight pieces of lead, knowing them to be Gell’s property (D258/10/9/68). They claimed “that one John Molanus was indebted unto them for the excise of some leade which he had formerly sould and sent away”. Gell protested that “neither accordinge to the lawes of the excise nor in equatie ought your petitioner’s personal goods to be seized on for a debt owinge by an other”.
The four mills were fuelled by “white coal”, which was in fact kiln-dried branch wood. Wood was preferred to charcoal for the main furnace, which smelted ore from the mines, as charcoal generated more heat than this furnace required. Drying the wood eliminated smoke, which would have made it difficult for the smelters to keep the necessary close observation of the process. Charcoal was used in a second furnace, which resmelted the slag from the first, and required greater heat. Draught for the furnaces came from two large bellows driven by the water wheels. Lead ore of all grades was first broken or ground again into finer particles and rewashed to produce very pure ore for the furnace.

The mills were built on high ground to the east of the town, exposed to the prevailing westerly winds. Most of the fumes they produced were therefore carried away from the town. The mill streams themselves were poisoned however and, while the mills had chimneys, they were not high enough to prevent surrounding grass and woodland being contaminated. There were many complaints, but the high efficiency and profitability of the smelting mills ensured that such complaints did not interfere with the industry.

Smelting mill workers

The mills employed four workmen or women at each hearth. Two were skilled smelters whose job was to manipulate the ore as it was smelted. One tended the furnace and kept the hearth loaded with ore and a fourth attended to labouring jobs, including breaking the ore and ladling the molten metal into the moulds for the “pigs” (ingots) in which form the lead was sold. There were 8 pigs to the fother (221/2 cwts). At Nether Mill in 1663 there were six men and two women, earning in total £20-13-4d a quarter. This averages £2-6-8d or 3/7d per week, though in fact the smelters would earn a higher wage than the other two. The workers’ names are given in the bills for manufacture and repair of tools, presented to the manager by a blacksmith, who named each person for whom he had carried out a job. The most skilled work in the mill was done using a shovel and a “crow” (bar), and the entry in the blacksmith’s bill reading “to Elizabeth Roper a Crowe” suggests that the women may have done some of it. The work was well-paid but highly dangerous – the poisonous effects of smelting were not confined to the landscape outside the mills and lead poisoning often caused ill health and early death among the workers.

In addition to the smelting mill workers, the industry employed “jaggers” carrying ore to the mills, or smelted lead from the mills, woodcutters making white-coal, blacksmiths, builders such as “Adam Ogden for mending ye chimney which was burnt ye first time” at Nether Mill in 1647, and many other trades.

Local investors

Lead mining, even when carried out on a small scale, was prosperous enough in the seventeenth century to persuade local men with spare money to risk it even on poor producers. Ownership and working patterns were complex. The man named as the owner of a mine in the barmaster’s accounts was rarely in sole possession. The Barmaster’s accounts in Wirksworth suggest that in most mines the named owner was probably in partnership with only one or a small group of partners, or “grovefellows”, who would often
be members of his own family. The labour, the profits, and also the costs and financial risk of the venture were shared. However, the ownership often extended beyond the working grovefellows, with shares held by other miners, by local farmers or tradesmen, by local gentry, by ore-buyers, smelters or by distant entrepreneurs. The mines in Brassington liberty, for instance, were always small ones and yet late-seventeenth century wills show that the richer farmers in the village put money into the mines. Robert Allsop, a prosperous yeoman farmer, left “all my mynes, meares of ground, groves and minerall possessions” to his wife in 1675. William Buckley, another yeoman farmer, though considerably less prosperous, left “grooves, mines, minerall possessions and partes thereof” in 1693, and the baker Jonathan Hill had “part or partes of grove or grooves or meeres of ground and mynerall possessions” in 1689.

**Expansion**

The figures for the 1640s show how much the industry had expanded since 1540. In the years 1640-1645 the total production of the Wirksworth liberty was over 5259 loads of “grove” or mined ore and a further 2515 loads of “caved” ore from the old waste heaps. Over 420 loads were collected as lot, making a total production of more than 8195 loads, or about 2049 tons, an annual average of 341 tons compared to the 122 tons mined at Colehills and Dale End 100 years earlier. In 1645 there were mines at Middle Peak, the Steeple, Yokecliffe, Barley Flatts and at Stainsborough, near Hopton, as well as Colehills and the Dale. Further increase in production was held up as shafts reached the water table and mines flooded.
Chapter 3: Trouble and strife

Lead mining was a troublesome business. There were disputes between miners and landowners, disputes over the miners’ very right to free mining, over possession of mines, over payment of duties. Most were settled by the Barmote Court, but the lawyers were always busy presenting cases at the Court of the Duchy of Lancaster, the Chancery in London, at the County Assizes, at Ecclesiastical Courts. The hostility of the gentry, landowners and employers to the independent miners was expressed by John Gell in a court case of 1617 – “Are not the laborers & myners for the most part given over to unthriftines and to be lavish and idle in expence, doe they not often bargaine and sell awai the proffitt of their labors before they have gotten it, to maintaine their idle expences to their greate losse, and might not otherwise manie of them growe riche, and most of them live well, and maintaine themselves honestlie”. Mining was not in fact an occupation for idle men, and most of the miners remained poor, but there was a strong community spirit in the mining field. As late as the nineteenth century, for instance, the miners were celebrating their own holiday, May 13th, by decorating their coes with garlands, eating a communal dinner to the sound of bands and singing their own songs. In 1821 they celebrated the coronation of George IV with a procession through Wirksworth, headed by the steward and Barmaster on horseback and a miner carrying the book of the mining laws and customs.

More seriously, at a time when the landed gentry were all-powerful, miners who helped to run their industry through the Barmote juries had acquired a taste for democracy. The petitioners who asked for their own MPs complained that “the said myners have not voyces either in chusing the knights of the shires, or the Burgesses of any Burrough for Parliament”. It was to be over two hundred years before they had a voice in choosing MPs and similar aspirations to increase their say in their own industry were also thwarted. A meeting of the Barmote Court at Wirksworth in 1655 drew up a list of fifty-three rules for the industry. Number one read “Wee say upon our oath that by the antient Custome of the myne within the Wapentake of Wirksworth That the marchants and miners at first chose themselves an officer called a Barmaister to be an indifferent person betwixt the Lord of the Field or farmer and the myners, and betwixt the miners and the marchants”. The farmer nevertheless continued to hold the Barmaster’s office, and the “antient Custome” of the miners to choose their own man was disregarded. However, the miners cherished their customs and defended them. When the law failed them they were ready to take the law into their own hands, and quarrels were liable to become physical. In the 1620s and 1630s the Wirksworth mining community was disrupted by two long-running fights.

Tithes

The first was over payment of tithes to the vicar of Wirksworth, Richard Carrier. There were few occasions when the miners got away without paying lot and cope. They recognised the rights of the “king’s farmer”, and the farmer himself usually ensured that the full complement of deputy Barmasters and jurymen was deployed to collect the dues. It was a different matter in the case of a third duty, tithes. Before the Reformation, tithes, or tenths, of produce such as hay, corn and lead ore were due either to clergymen or to one of a number of religious houses. After the dissolution of the religious houses by Henry VIII their
rights to tithe were sold, usually to local gentry, while the clergymen retained their claims. Throughout the seventeenth century the miners refused to acknowledge any obligation to pay tithes either to parsons or to the lay tithe holders and there were continual legal, and sometimes physical, disputes. The tithe holders were hampered in their efforts to collect their dues because they were not part of the administrative machinery of the industry. The barmasters’ responsibilities were to the holder of the lease of lot and cope and they were reluctant to collect any other dues. The mines were scattered over miles of moorland and barmasters felt no obligation to let the tithe men know when and where they would be measuring ore. Testimony given at court cases arising from disputes over tithes and other duties throws a light on the conditions in the ore-fields.

The Reverend Mr Carrier

During the 1620s and 1630s the Wirksworth miners’ chief antagonist was the vicar, Robert Carrier. This vicar’s activities illustrate how important to the miners was the identity of the man who had the right to collect the mining dues. Carrier’s tithes in fact seem to have been a burden on most of his parishioners. He claimed \( \frac{1}{2}d \) per lamb, up to four. Any villager with five lambs was obliged to have his third best animal valued and then to cast lots with the Vicar for it. The winner took the lamb and paid the loser half of the sum at which it had been valued. Where there were six lambs the Vicar took the third and paid 2d for it. His payments diminished to \( \frac{1}{2}d \) where there were nine lambs and any villager owning ten or more received nothing for his third lamb. There were similar schemes for wool, geese and pigs. There were charges for cows, calves, horses and swarms of bees. Hemp and flax were tithed and “for every hen one egge”. Finally the parishioners were charged 1d each to provide for Communion bread and wine and 3d each to pay for Carrier’s “smoake, for his garden and for his orchard”.

Carrier went to court in 1621 to establish his right to lead ore tithes and won his case. A further case in 1627 confirmed his claim. In 1623 his claims on the miners were extended when his father-in-law, Thomas Parker, inherited the thirty-one year lease of the lot and cope and barmastership in the Wapentake of Wirksworth from Robert Parker. Thomas Parker lived in Yorkshire and Carrier and his wife Jennet exercised Parker’s lease for him. The Carriers now had an advantage denied to most tithe holders. They or their deputies were always present when the ore was measured for collection of lot and were then in a position to insist on payment of tithe at the same time. In addition to lot, cope and tithe, Carrier enforced payment of a fourth duty which, like tithe, was only paid grudgingly and avoided if possible. This was “gifter ore”, a small payment to the Barmaster for his work in ore measuring, amounting to every 72nd dish. Carrier extracted these payments with vigour, showing a quite unchristian willingness to use violence as one of his methods of solving disputes. Helped by his wife, his servants, the deputy Barmasters and by a number of allies among the wealthier members of the mining fraternity, Carrier terrorised the miners.

Violence

Carrier’s methods were revealed in a number of court cases. On one occasion Jennet Carrier “drew forth a long knife, and said shee would take a short course with them, & being
desired to put up her knife shee said it was but a hanging matter if shee killed one of them”. The vicar was quoted as saying that “hee was Barmaster, Judge, Justice, & Lord of the Mine, & whosoever resisted hee would would set them in the stocks by the Neck, Middle, or Legg”. His deputies were accused of assaulting miners, including, on one occasion, one of the rare women miners. Carrier himself was accused of “sitting in the Barmote court and threatening both jurie and witnesses”. Ann Greatorex testified against him “for wrongfull taking of possessions and hiring of others to come with him” and Emma Vicars accused him of “cyting George Vicars for an offence supposed to be committed years before Carrier’s coming to the towne”. The miners often met violence with violence. In September 1624 two of Carrier’s deputy Barmasters, George Wright and Thomas Noton, attempted to collect a fine of 40/- which had been levied by the court on a miner called Thomas Godbehere. Godbehere was a leading man in the village, known as a resolute defender of the miners’ rights. His alleged offence was using a non-standard measuring dish with fraudulent intent. Whatever the truth of the accusation Godbehere responded with “greate violence” and Wright and Noton called in the twenty-four men of the jury. Confronted by this superior force “the said Thomas Godbehere became more quiett”.

Among Carrier’s allies were the brothers William and George Hopkinson. William Hopkinson’s prosperity from the lead trade has already been noted. His brother, who lived in Ible, was a barrister who was later to become steward of the Barmote court. The miners were terrified of this powerful alliance and of the rough ways of Carrier’s men – “people have been so terrifyd and opressd with him and his that they dare not drawe their breath against him, for the vulgar sorte doe beleev[e] that nothinge will be done against him but all will be with him as it hath beene and then he would torment them that either say or doe against him”.

Carrier was at loggerheads with one of the most influential local families in the lead trade, the Gells of Hopton. In John Gell he was up against a man who was equally willing to use violence. In 1621 Richard Wigley, an associate of Carrier’s who was a bailiff of the Manor Court at Wirksworth and who was later to be one of Carrier’s deputy Barmasters, arrested a servant of Gell’s and brought him to Gell’s own Manor Court at Hopton, where Gell was Lord of the Manor. On arrival at Hopton Wigley was set upon by Gell and a group of his servants and severely beaten. When he returned to Wirksworth he was met by more of Gell’s men who drew their swords and chased him to his house, where they hacked the door with their weapons and threatened to kill him. After another fracas, two years later, Gell was brought before the Wirksworth court and fined 3/4d for attacking William Hopkinson. Gell, who was a tithe holder in three parishes in the Peak District, and pursued his rights as vigorously as Carrier pursued his, was in the other camp in Wirksworth. As a mine owner he owed tithes to Carrier and was no doubt as reluctant to pay them as the Peak miners were reluctant to pay theirs. While Carrier had strong local support, Gell had the advantage of a brother, Thomas, who was a barrister, based in London and with the ear of influential members of the royal establishment. Carrier was eventually brought down, not because of his high handedness, or his cavalier way with the mining rules, but because he was an obstacle to a plan hatched at high level in London. This development was to see the temporary overthrow of traditional mining custom in one area of the Wapentake.
Star Chamber

The beginning of the end for Richard Carrier came in 1627 when, after complaints from miners, the Duchy Court ordered him and his deputies to measure ore on request and without insisting on the payment of gifter ore and tithes as a precondition. The miners were not allowed to sell their ore unless it had been measured and Carrier had been using this as a lever to enforce payment of the hated tithes and gifter ore. At the same time the Star Chamber, the notoriously arbitrary royal court in London, began an investigation into allegations that Carrier coerced and intimidated miners and mining juries, that he and his wife and deputies had made an unlawful assembly and that he had unlawfully exacted gifter ore. Carrier was allowed to continue collecting lot and cope, pending the outcome of the Star Chamber’s investigation, but the administration of the industry was put in the hands of John Fearn. Carrier was forbidden to attend Barmote Court meetings and, though he continued defiantly in his old ways, he was soon to be deposed. The Duchy Court made a provisional ruling in August 1631 which effectively ended his career. “For the riots & forceable taking of gifter ore”, Carrier, his wife and four others were committed to the Fleet Prison and heavily fined. He was replaced as vicar in 1633 and the Star Chamber’s judgement against him was delivered in 1634.

The Attorney General and the Wirksworth miners

Carrier’s accuser at the Star Chamber and in the Duchy Court was the Attorney General, Sir Robert Heath. Heath’s interest in the affairs of the Wirksworth mines was not in the misdeeds of the vicar/Barmaster, but in the possibility of profit for himself. The king, Charles I, was at loggerheads with Parliament, which claimed exclusive right to raise taxes and was largely successful in preventing Charles from doing so. He drew considerable revenue from the Duchy of Lancaster’s lead duties and from a tax of 48/- per fother (22½ cwts) of smelted lead. Heath, appointed Attorney General soon after the king’s accession in 1625, persuaded Charles that he could greatly increase his income from the lead mines by pre-empting the ore, that is instructing the miners to sell it to him at a fixed price. There was in fact no chance that this scheme could succeed, since the mining laws were clear that the king’s cope was paid in return for the miners’ right to sell to whomever they wished. Heath would have been aware of this and, in the words of one of his own disgruntled agents, he “neglected your majesty’s service of pre-emption, aiming only at his own profit”.

The miners, inevitably, put their case against the “pre-emption of all ore at a rate certain” to a Royal Commission in September 1627. They rested their case on the provisions of the mining laws which had been confirmed in an Act of Parliament of 1554. They maintained that although the king might buy their ore, he should pay “soe much as itt may be sould for unto another so as the Myners bargaines & debts be first paid ... and for that liberty the buyers pay cope to the Kinge”. They described the system of credit given by merchants to buyers and by buyers to the miners, a system which depended on trust and which was essential to enable the miners to work. They pointed out the variation in the quality of different ores and the consequent variation in price, and that as the mines became deeper it became more expensive to extract the ore.
There was great pressure from the authorities to make the miners change their minds and they were summoned on October 1st to hear “many speeches & pswasions”. They held firm however, and it was at this point that the spectre of the miners’ bogyman, Carrier, was raised to help Heath’s case. The Commission was told in November that the Wirksworth miners “were soe terrifyed by Mr Carrier” that they would be willing to accept “a reasonable rate as they might live by itt” in return for protection against Carrier. In the end the miners, alarmed by Heath’s activities, afraid that the king might be intending to change the mining laws, petitioned the Duchy Court in January 1628. The Duchy found in favour of the miners and ordered that the mining customs should continue in force. It also ordered that the Barmaster should not “intermeddle with the choosing” of the Barmote jurymen, a clear indication that Heath, with Carrier excluded from the administration of the industry, had been putting his own men in place.

The Dovegang Plot

Heath was not deterred for long. Once he had removed Richard Carrier he came to an agreement with him and his father-in-law Thomas Parker, who was still the legal Barmaster, that while Carrier should continue to collect lot and cope the Great Barmote Court should be held with a temporary steward and Barmaster in charge. This deal was later contemptuously described as a “composition with Richard Carrier the then Barmaster and a delinquent in the Star Chamber”. Heath’s target was possession of the mines of the Dovegang area, potentially the richest in the Wapentake, and he achieved his aim in 1629, when the king leased them to him for an annual payment of £1000. Heath had convinced Charles that he, the king, had the right to do this and that it would enable him to preempt the ore. In fact the king had no such right to lease the mines to anyone and Heath made no attempt at pre-emption. It was also alleged later that he never paid the £1000 rent.

Draining the Dovegang

The Dovegang vein ran for more than 600 yards, from near Black Rocks, between Cromford and Wirksworth, across Cromford Moor to Middleton. With its tributary veins it covered an area of about 200 acres. Intensively mined over many years the mines had been inaccessible since they had reached the water table in the early years of the century. There were by one account at least 300 mines and by another there were 28 owners at the time Heath obtained his lease. Among the owners were a group who had been attempting intermittently since 1615 to drain the mines. They had employed a succession of “engineers”, experts in drainage, to pump the mines dry. These experts used “rag and chain” pumps, in which an endless chain, with leather discs attached at one foot intervals, was turned by a windlass. The chain passed through a wooden pipe, usually a hollow tree trunk, planted at the bottom of a drowned shaft, drawing water through the pipe. The power was supplied either by teams of men or by horses. These efforts had had only temporary success.

The latest engineer, John Bartholomew, or “John the Devisor”, was a servant of the Earl of Dover, who joined the group in 1628 or 1629. A survey map prepared in 1632 to accompany the report of a commission set up by the Duchy of Lancaster) shows a line of shafts along the Dovegang vein. The line runs south-east toward the Wirksworth-Cromford road, parallel to the Wirksworth-Middleton road, and ends in a “gyn pitt”, with an “ingen howse”.
The “gyn pitt” or pump shaft was 240 feet deep and the “engine” was probably similar to one which Bartholomewe installed in 1633 at Tiersall mine, near Wensley. This was sunk in a shaft 174 feet deep and was operated by men and horses. It was designed to pump out water directed to it by the miners, who were to use “several sucking pumpes or hand pumpes” to lift water from below the level of Bartholomewe’s engine. Bartholomewe himself had other engines to attend to and at Tiersall appointed the most skillful man available to supervise its working. At the Dovegang he decided to try a different method. He had just started to drive a sough to drain the mines, shown on the 1632 map as “the sough end” at Dean Wall on the Cromford road, when Heath was granted his lease.

Heath used the Duchy Court to install the temporary Barmaster and steward of the Barmote Court, and to appoint an agent to take over the mines of the Dovegang. Heath’s men used threats, bribes and violence to remove the existing owners, while Bartholomewe vainly urged the miners to stay put, denying Heath’s right to the mines and assuring the miners that he himself would drain the Dovegang “and content them for their interest therein”. This was the traditional bargain between miners and drainers and was the procedure followed in every subsequent sough. Heath, promoted to Lord Chief Justice in October 1631, entered into a partnership with Sir Cornelius Vermuyden in the same month. Vermuyden was the man most likely to succeed where so many had failed in draining the flooded mines of the Dovegang. He had come from the Netherlands in 1621 to drain the East Anglian fens and his success there earned him a knighthood, granted in 1628. It is a measure of Vermuyden’s importance to Heath’s enterprise that the agreement between the partners gave Heath a third of the profits and Vermuyden two thirds. In July 1632 the king issued a order confirming Heath’s and Vermuyden’s rights to the Dovegang mines and instructing all previous owners to allow full possession, under pain of a £500 fine.

9. Hilltop Mine, overlooking Middleton-by-Wirksworth. The mine’s climbing shaft is inside the collapsed walls of the coe.
According to a contemporary, Sir John Gell II, Vermuyden’s was the first sough in Derbyshire. Gell, who died in 1689, wrote towards the end of his life that “formerly when the works were troubled with water they used leathern bags, pumps and other engines to lay the works dry. The first sough that ever I heard of was brought up by Sir Cor. Verm. at the Gange, which is within the memory of man, and I remember his coming into the country to undertake the sough”.

Heath took the royalist side in the Civil War which began in 1642 and he fled to France after the king’s surrender in 1646. He died in Calais in 1649. Vermuyden’s Dovegang sough was driven intermittently until 1651, employing large numbers of local miners and tradesmen – more than 1,000 in 1641, according to a miners’ petition of that year. In 1651 it drained a number of highly productive veins. Consequent investment in the newly rich mines altered the pattern of ownership in the Cromford liberty, whereby many formerly independent owners became employees of the shareholders in large mines.
A great petition

In 1641 the industry was helped by a reduction in a crippling tax on smelted lead. Elizabeth I had imposed a tax of 8/- per fother (22½ cwts) and the Stuart kings James I and Charles I, always short of money, had each added a further tax of £1, making a total of 48/-. The effect of the tax was to depress ore prices and the wages of mine workers. In 1629 lead ore was being sold for 18/- a load. A Brassington will of 1635 priced 36 loads of lead at 19/- each and some smelted lead at £4-13-4d a fother. All of these prices were low. By 1641 Parliament was successfully claiming sole right to levy taxes and the miners petitioned the House of Commons for the removal of the 48/- lead tax. The names on the petition, grouped under parishes, included miners, mine share holders, and their wives and children. Also included, though they were not named, were figures for waged mine workers and “cavers”, or those who reworked the old spoil heaps. The free miners regarded themselves as a superior class of men to the “hirelings” who worked for wages, as distinct from their own work as copers in other men’s mines at times when their own were unproductive. The cavers were the poorest people in the industry, who, in the words of the petition, “live upon ye mines”, presumably in shanty towns. There were, finally, 7720 un-named ancillary workers and suppliers, making a total in all categories of 20,000. There were 2513 names in the Wirksworth area and 4359 in the whole of the Wapentake.

The petition was promoted in London by Lionel Tynley of Holmesfield, a wealthy mine owner and lead merchant. He wrote to John Manners at Haddon Hall in March 1641, describing his progress. There had been a danger that the Committee considering his petition would be distracted by a second which had merged his arguments against the 48/- tax with a case against tithes, but he had this petition thrown out. Tynley urged Manners, who owned a private liberty, to persuade the miners to contribute 1/- each to defray his costs and said that any money his Barmasters collected should be passed to Thomas Gell, at Hopton Hall. Tynley wrote also to Gell’s brother John in his capacity as chief Barmaster of the Wirksworth Wapentake, asking him to set his Barmasters to collect for his fighting fund. The county MP, Sir John Coke the younger, in a letter written to his father at Melbourne in July 1641, was able to report the success of the petition - "... I wish myself heartily at Melbourne, and shall take leave to come down as soon as the new book of rates hath passed the House, For we have prevailed at the Committee to have the 48s impost upon a fother of lead reduced to 20s, which is a matter of great moment to the miners of the Peak, and I have not been wanting to them herein. But Mr Treasurer, being overruled herein at the Committee, threateneth as I hear to bring it again in question in the House, wherein I must do my country the best service that I can to oppose it ...".
Chapter 4: Civil War and the lead trade

The war fought by the armies of the king and Parliament between 1642 and 1646 brought destruction and hardship to Derbyshire, as it did to every part of the country. However, the Barmaster’s returns for the Wirksworth liberty, and fragmentary records for other liberties in the Wapentake, are evidence that the Low Peak lead trade was maintained throughout. This was in spite of the fact that Derbyshire, held by Parliamentary forces, was sandwiched between two royalist armies, constantly threatened from north and south and, in late 1643 and early 1644, partly over-run. That the line was held was largely due to Sir John Gell who, for most of the war, was in complete control of civil and military affairs in the county. He was also, as we have seen, the leading figure in the Wirksworth lead trade, an additional motive to repel royalist invaders who would certainly have dispossessed him if they had taken Derbyshire.

The king’s march

In August 1642 king Charles I marched south from York and raised his standard at Nottingham, the first step in his attempt to assert his authority over his rebellious Parliament. He moved from Nottingham on the 13th September and on the 15th entered Derby, where he raised a forced loan of £500 from the Corporation and seized all available small arms, promising their return once the rebellion had been put down. From Derby he moved unopposed to Shrewsbury by way of Uttoxeter, where he was joined by 1,000 Derbyshire miners. These men, among his earliest recruits, were drafted into the royal life-guards (Petitions, grants and declarations..., 1882). By the end of November the king, his court and his army had established their headquarters in Oxford and a second royal army commanded by the Earl of Newcastle was operating in Yorkshire. It was vital for the king’s success that he gain control of the midland counties which lay between the two armies, since with these counties in Parliamentary hands it would be difficult for them either to communicate or to join forces. Control of Derbyshire was also important because of the revenue raised from farming out the duties paid by its highly prosperous lead industry. Lead itself, of course, was a vital war material, used in the manufacture of gun metal and ammunition.

The king’s miners

During his two weeks in Nottingham and brief stay in Derby the king had had little success in recruiting townsmen. The miners who joined him at Uttoxeter had been recruited through the efforts of Sir Thomas Bushell, a mining engineer and speculator, who had persuaded some to forget their grievances against the king by promising exemption from the lead duties. The miners were not natural royalists and were indeed to give their support a few years later to the democratic movement known as the Levellers (Hill, 1961). In the Wirksworth area they had had the recent experience of the mines of the Dovegang being seized by the king’s attorney-general. Even greater offence had been caused throughout the county by the 48/- lead tax, which the king had been reluctant to remit, as Sir John Coke’s letter showed.
10. Sir John Gell, in his Civil War armour. The fortunes of the Gells reached their peak in Sir John, who was a smelter, mine owner and Chief Barmaster of the Wirksworth Wapentake, lessee of the Royal dues of lot and cope. Gell used his money to wage war for Parliament between 1642 and 1646, when he was Colonel of the Derbyshire Regiment and Governor of Derby.
The king tempted them by offering 5/- each for their expense in joining him, weekly pay of 
6/- and, after the war, relief from the lead duties of lot and cope (BM Add MSS 6677 f48). 
Bushell had the king’s declaration posted in village churches and offered the local 
Barmasters 12/- for every miner they persuaded to join the king and, while most of those 
whom he recruited soon changed their minds, 1,000 eventually took the king at his word 
and joined his forces. The miners had made clear what the attraction was when they had 
replied to the king’s declaration with a petition (BM Add MSS 6677 f47). In this they 
declared their willingness to continue paying lot and cope "being your Majesties ancient and 
undoubted right", but pleaded for the abolition of tithes - "the greatest grievance your 
petitioners have long undergone, is, the exacting and taking of Tythes, Tenths, and 
customary duties of lead-oare, which (your petitioners are informed, by learned Councell) is 
not due by Law". The king's answer to this request was, of course, to agree to do away with 
tithes.

Gell for Parliament

By November the king’s early advantage in Derbyshire had been lost. During his short stay 
the only troops operating there had been royalist ones and the king himself had 
encountered no opposition in his march from Derby to Uttoxeter. Most of the Derbyshire 
gentry were royalist or undecided and a number of royalist units raided with impunity. 
There was, however, one man who had made up his mind which side he was on. This was 
John Gell. While the king was in Derbyshire Gell was in Northampton, requesting and 
receiving a colonel's commission from the Parliamentary commander, the Earl of Essex, to 
raise a regiment of 1,200 men to hold Derbyshire. Gell feared the king’s claim to absolute 
rule. He was also a Presbyterian and hostile to the high-church version of the Anglican 
Church which the king had attempted to impose. His natural instincts were confirmed by 
the urgent need to safeguard his stake in the lead trade. Strongly motivated by a mixture of 
his own ambition and his political and religious loyalties, and driven by his natural energy 
and pugnacity, Gell was able to grasp control of the county and prevent all attempts to 
over-run it by the Earl of Newcastle's northern forces or by local royalists.

Gell went first to Hull, where the Governor of the town, Sir John Hotham, aware of the 
importance of establishing Parliamentary control in Derbyshire, assigned him a force of 200 
London volunteers as the nucleus of his new regiment. From Hull he marched to Derby and 
set about fortifying the town. By January 1643 a Parliamentary committee had been set up 
in Derby, largely composed of Gell's relatives and allies and at first wholly under his 
control. His authority was enhanced by his appointment as Governor of Derby in January 
1644 and, though a strong opposition to him was established by new committee 
appointments in 1644 and 1645, he maintained his grip until the king's surrender at 
Newark in April 1646. Gell's small force grew, soon including cavalry and dragoons as well 
as infantry, and was able, for the whole of the war, to take part in joint operations in 
neighbouring counties, as well as defend Derbyshire.
Gell's grip on the county through his command of the Parliamentary forces and his control of the committee responsible for raising war-time finance was further tightened by his pre-eminence in the county's main industry. He was by no means a popular man and in the High Peak his ownership of lead ore tithes in Bakewell, Tideswell and Hope parishes had involved him in prolonged legal and sometimes physical struggles with the miners there (Slack, 1996). The king's thousand miners were mainly from men who had cause to hate Gell and his tithe gatherers. However, the Gell family had for several generations been the largest operators in the lead industry of the Wirksworth area and Gell had great influence there. Even in the High Peak the royalist miners were a minority, since in general the miners' distrust of the king proved greater than their dislike of Gell's tithe gathering. Also on Parliament's side were the lead merchants. A list of Derbyshire gentry compiled in the early years of the Restoration included a list of thirteen "persons fitt to lend the Kinge Money". Ten of the thirteen were lead merchants "and never did the Kinge service". The richest of them during the war period was Thomas Gladwin of Coal Aston, who had been "servant, bailif and agent" to the royalist Sir Henry Hunloke of Wingerworth, but who became Gell's agent after Hunloke's estate was seized.

Derbyshire invaded

In the last months of 1643 the army of the Earl of Newcastle advanced into Derbyshire and threatened to over-run the county. He reinforced a garrison which he had set up at Bolsover Castle, which he owned, and set up new ones at Wingfield Manor, Chatsworth and Tissington. The tithes due to Gell and others in the High Peak parishes were collected by the Chatsworth garrison for their own use and the mines of the Ashover area were controlled by the royalists. Newcastle also created five regiments, commanded by Derbyshire royalists to whom he granted colonel's commissions. One of these colonels was John Milward of Snitterton Hall. Milward was Gell's partner as chief Barmaster of the Wirksworth lead mining liberties and, typically for this war, the two enemies continued their business partnership - a note in Gell's mining accounts records that he had received £30 from an ore-buyer "betwixt Mr Millard & myself about 8 Oct 1644". Gell had tried to enlist him for Parliament, but Milward now joined the royalist garrison at Chatsworth. Gell wrote many letters calling for help from his Parliamentary allies. One of them, written to the Earl of Essex on December 8 1643, acknowledged that miners in the royalist areas were deserting him - "the enimie increaseth his forces exceedingly, and our country myners flock into hym dayly, and though we cannot certainly know theyre strength, yet we are persuaded that theyre nomber for men is doubled since they came out of Yorkshire". The crisis ended when Newcastle was forced to withdraw in the new year by the arrival in northern England of a Scottish army allied to Parliament, and his troops formed part of the royalist army defeated at the battle of Marston Moor in July 1644.

War-time trading

In 1644, in a move to protect the family estates from the doubtful fortunes of war and politics, Gell transferred their ownership to his son, John, as his marriage settlement. At that time, in addition to his uncertain hold over the tithes of the High Peak mines and the
joint lease of the mining dues and barmastership of the Wirksworth Wapentake, Sir John owned shares in mines there and elsewhere and owned two smelting mills at Wirksworth.

The tenant of Upper Mill, Johannes Molanus, was an old mining colleague of Gell’s whom he had commissioned in his regiment as major, and who had a very busy war. Molanus had arrived in Wirksworth in the 1630s as a servant of Cornelius Vermuyden when Vermuyden came to drain the Dovegang mines. He had helped to seize those mines and had since prospered as a mine owner and smelter. Molanus managed to keep his smelting business going in the intervals of fighting, buying his ore from his colonel. Gell’s accounts show him paying Gell £340 for lot ore on July 26th 1645, shortly before he and his company were in action against Royalist troops in Staffordshire.

Gell’s regiment maintained its hold on the south, including the Low Peak ore field, for the whole of the war, and lead ore continued to be mined, smelted, bought and sold throughout the war in the eight liberties of the Wirksworth Wapentake. The detailed accounts from the deputy Barmaster for the Wirksworth liberty which have survived for the years 1640 to 1645 (Figure 2, below) (D258/60/11) are supplemented by fragmentary accounts for this and the other liberties for two further years (D258/58/18j,k). The Wirksworth liberty accounts contain weekly measurements at these mines throughout 1642 to 1645. Lead was mined only when there was a market for it, and the nearest lead market used by the Derbyshire merchants in the seventeenth century was at Bawtry (Kiernan, 1989). The lead was carried there, by pack-horse, before being taken on the rivers Idle and Trent to Hull, for export to the Continent or shipment to London. Journeys like these were carried out under armed escort during the war (D258/56/28). However, during the period in the latter part of 1643 and the early months of 1644, when Yorkshire and north Derbyshire were in enemy hands, the route to Bawtry became hazardous for the lead convoys from Wirksworth.

<table>
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Figure 2 - Production figures in loads and dishes for the Wirksworth liberty, 1640-1645.

(c60lbs=1 dish, 9 dishes=1 load; grove=mined ore; caved=rewashed ore from old spoil heaps; lot = a tax of every 13th dish, paid only on grove ore)
A marked drop in activity from 1643 is shown by the fall in production from the mines in the liberty, from 1,913 loads (428 tons) in 1642, which was an exceptionally good year, to 1,562 (390 tons) in 1643 and, dramatically, to 618 (154 tons) in 1644. The effect of the royalist activity can be seen even more clearly by comparing the monthly totals of ore mined in July 1643 and in July 1644, the month of the battle of Marston Moor. There were 108 loads in July 1643 and 20 a year later. At 8 loads of ore to the Derbyshire fother of 22 1/2 cwts of smelted lead (Slack, 1993), the July 1643 total of about 15 tons of lead for the market would have made up 150 packhorse loads of 2 cwts each (Hey, 1980). In July 1644 only 28 horses would have been required to carry the month's output to Bawtry. With the removal of the royalist presence in the north annual production in the Wirksworth liberty rose again to 1,301 loads (325 tons) in 1645.

Lead was a lucrative trade and the 273 loads collected by the Gells in payment of lot in the Wirksworth liberty between 1642 and 1645 were worth about £300 at current prices. The miners' ore, plus a further 1,683 loads of "caved" ore, won from old spoil heaps, was all sold, generating a further £130 in cope, payable to Gell. Sir John's lease of the duties and the barmastership of the Wapentake, shared with John Milward, cost him £300 per annum. If the income from lot and cope of £430 in four years from the Wirksworth liberty was matched by similar returns from the other seven liberties, the lease would have been very profitable for him. A reasonable estimate of his annual income from lot and cope, smelting, and returns on his shares in mines, would be about £1000, or £100,000 in twenty-first century terms.

Driving the Dovegang sough

The one area of the Wirksworth Wapentake which was not covered by Gell's lease, and the one which was later to become the most productive, was the Dovegang. By the time of the miners' petition against the 48/- duty the Dovegang sough was employing 1,000 men "when it is in work", and work seems to have continued intermittently throughout the war, financed mainly by loans made to Vermuyden by a fellow Dutchman, the merchant Marcellus Vanduren. The mines were not finally drained until 1651. It is characteristic of the confusion of loyalties during this war that Vermuyden was on the Parliamentary side and Vanduren was accused after the war of supplying the Earl of Newcastle with money and arms. Thomas Coke, meanwhile, who had sold the lease of the Dovegang duties to Vermuyden, was a declared royalist. Business was business, even if there was a war on.

Misappropriation

The Parliamentary authorities were concerned that all income from the property of their opponents which had fallen into Parliamentary hands, including lead, should be used for the war effort, and not for the private use of anyone who could get his hands on it. On the 3rd August 1644 the Derby committee received an order from the Earl of Manchester, commander of the Parliamentary forces in Derbyshire, Nottinghamshire, Lincolnshire and Leicestershire, forbidding any trading in lead within Derbyshire. His reason was that "there is greate quantities of lead belonging to malignants [royalists] & persons disaffected to the Parliament in the County of Derby & partes adjacent, which leade divers persons under hand buy and convert to their owne private benefitt, by which meanses the state is
exceedingly diminished & deceived". Any lead which had been mined was to be sent to Gainsborough, where any Parliamentary supporter could claim what was rightfully his, leaving the lead from mines owned by royalists to be seized by the state. This edict brought an immediate protest from Gell and the committee "with so many hartie expressions, which I may looke upon rather as a chardge than an information", and two days later Manchester wrote again, "troubled to find his order re lead has been construed as a burden to the county". The royalist presence in the north had been eliminated in July at Marston Moor and Manchester pointed out that there were now no obstacles to the transport of lead. He stressed that his order was solely intended to prevent any profit from lead getting into enemy hands. There was no intention to set up a monopoly in the lead trade - "there was no designe in me or in any under mee to my knowledge to bring the pre-emption of leade unto pertyculer hands" - and "I never intended that any person well affected to the proceedings of Parliament should have in the least measure been defrauded of his owne proper goods". He protested that he was personally disinterested - "I shal endevour so to order my actions as that I may approve myselfe to have no projects nor selfe aymes, but to study the advantadge of the kingdome".

Gell was himself under suspicion of appropriating the property of absent royalists, especially as his partner at Wirksworth, John Milward, was a royalist colonel, and their barmastership was leased from another royalist, Thomas Coke. He was collecting lot and cope from all the mines in the Wirksworth Wapentake, irrespective of the allegiance of their shareholders. His accusations against Manchester must have been in the spirit of attack being the best means of defence. In a letter dated the 7th August 1644 the committee acquitted Manchester of any personal involvement but "wee called the business a project which wee then did and styll doe conceive to bee invented & prosecuted by pryvate men, for their owne advantadge". Gell pointed out to Manchester that while there had been a rise in the price of lead caused by the opening of the trade routes following the Parliamentary victories, his order had caused a sudden drop in price, threatening the livelihoods of the miners. Any interruption in the lead trade was indeed very serious, not only for the miners and their families, but for many others in associated activities. Gell proposed a meeting to explain the mining industry's point of view. Manchester agreed to meet him and presumably took his point, since the industry began to expand again.

**Gell on trial**

Gell's conduct of the war in Derbyshire was investigated by a Parliamentary committee, starting in December 1645. Among the allegations brought against him was that he had continued to enjoy the Barmastership at Wirksworth which, since it was leased from a royalist, Coke, in partnership with a royalist officer, Milward, should have been forfeit to the Committee for Compounding, set up in September 1643 to seize royalist estates. There was a general charge that Gell had, throughout the war, carried on all his normal business transactions, including those in the lead industry, and had paid no tax on his income. An ore buyer testified that he had paid £201 to Gell for ore which he collected from the Barmaster and which he took to be lot ore since that was the only category of ore which Barmasters stored. Another had paid £150-£200 for lot ore and had paid cope to the Barmaster since midsummer 1645. Sir John was also accused of large-scale corruption, including the misappropriation of consignments of smelted lead belonging to the committee.
564 pigs of lead, marked "D" had been sent from Hull to London. They were worth £1,100 and this money had never appeared in the accounts. 100 fothers of lead, marked "Db" and also belonging to the committee, had been entrusted to a former royalist and never accounted for.

Gell's own Barmasters' accounts substantiate the charge that he had carried on the lead trade throughout the war, and there were witnesses to testify that he had arranged not to pay the tax which he and the committee collected from others. Gell could point to the transfer of his estate to his son in 1644, but his main defence was that, far from profiting from the lead trade or any other business, he had, on the contrary, spent his own money on the conduct of the war, in particular to pay his troops in the early days and at later times when official sources failed them. He had never received the salary due to him as colonel of the Derby regiment, or recompense for his personal expenditure, and in such a situation was not liable to pay tax. He strenuously denied that he had behaved in any way corruptly. Gell's house, Hopton Hall, had been plundered by local royalists while he had been in Northampton during the king's visit to Derbyshire in 1642, and his son had spent the war with the parents of the woman he married in 1644. Sir John spent several years after the war fighting the charges laid against him and petitioning Parliament for the repayment of his losses.

11. The memorial in Wirksworth Church to Sir John Gell, lead mining tycoon and Civil War commander. It was placed there in 1689, eighteen years after his death, under the terms of his son's will.
Chapter 5: Mine soughs

In 1646 the lead trade in the Wirksworth Wapentake emerged intact from the four years of armed struggle in and around Derbyshire. Sir John Gell's success in holding Derbyshire for Parliament, apart from the months at the end of 1643 and in early 1644 when the Earl of Newcastle's royalist forces over-ran parts of the north of the county, had also ensured that construction of Sir Cornelius Vermuyden's Dovegang sough, begun in 1631, had continued, with some interruptions, throughout the war. The industry in the area reached new heights of productivity in mid-century, following the sough's completion.

In 1650, with the fighting over, the king dead and the monarchy abolished, the new Commonwealth government established a commission to sell off the former royal possessions, including the Duchy of Lancaster's mineral rights. Commissioners in Derbyshire produced "a survey of the proffitts and duties of the Lott and Copp of the Mynes of Leade, And alsoe of the Barrmasters office within the Wapentake of Wirksworth in the Countie of Derbye lying dispersed in several Reakes and veines of Lead Oare in several places of the grounds within the said Wapentake called the Kings Fields And which were late pcell of the possessions of Charles Stuart late king of England in right of the Dutchy of Lancaster ..." The commissioners noted that the lot, cope and barmastership had been leased, and they valued the lot and cope of the eight liberties at £300 per annum. In 1652 they did a similar survey of the Dovegang, which by then had been drained by Vermuyden's sough, and estimated that the annual value of lot and cope was £350. That the Dovegang, which they described as having a circumference of one mile, was estimated to be more valuable than the mines in an area of about twenty-five square miles, clearly shows the effect of dewatering the mines there.

The post-war soughs

Until the seventeenth century mining had usually been abandoned when the work reached the water table. Efforts at draining lead mines by horse-powered pumps, or "engines" had little success. Soughs, driven into flooded veins to allow the water to run off, finally solved the problem. By lowering the water table and opening up large new deposits of lead ore, they transformed the industry. Without soughs most of the lead in the Wirksworth area would have been inaccessible. Vermuyden's was followed by a succession of soughs which by the end of the century had drained enough of the mines in the Wirksworth Wapentake to cause a dramatic rise in production in the whole area. The most important were the Cromford sough, which was over thirty years in driving, between 1662 and 1696, and was continued in the eighteenth century, and Hannage sough, begun in 1693 and also continued into the next century. Also among the important seventeenth century soughs were the Raventor, begun in 1655, Bates (1657-84), Lees (1664), and Baileycroft (1667-73). The Baileycroft sough drained mines in Wirksworth. Those in the area just to the north of Wirksworth called the Gulf were drained by the Raventor and Lees soughs. The Bates and Cromford soughs drained mines on Cromford Moor - Bates sough had reached the Dovegang by 1684. Hannage sough drained the area to the east of Yokecliffe Rake, on the south of Wirksworth.
Some of the accounts of expenditure on Raventor sough have survived. They show that the work was carried out by teams of miners under contract. On April 9th 1659, for instance, Lawrence Toplis “& his partners” were paid £2-10-0d for driving five yards at 10/- a yard. In addition each member of the partnership was paid for each shift worked. These latter figures reveal that the leaders of the partnership, Toplis and John Gregory, were paid 1/6d a shift while others received either 1/- or 10d. The most complete surviving records for a Wirksworth sough of the period are, however, those for the Baileycroft. In great detail these reveal how a sough was financed, managed and constructed.

The Baileycroft sough

In the summer of 1673 the owners of a number of corn mills in Wirksworth brought an action against the proprietors of the recently completed Baileycroft sough. This sough drained the water-logged mines of the Baileycroft area of the town, but the millers complained that it had also diverted water away from their mills. They demanded compensation. At about the same time Mrs Anne Primate, widow of a London merchant who had borne the lion’s share of the costs of the same sough, drafted a petition to the Duchy of Lancaster, the owner of the mineral rights, pleading that her late husband’s colleagues were reneging on an agreement they had made with her after his death. Mrs Primate’s heirs pursued her complaints in the Court of Chancery on 19 November 1673 and in the Duchy Court on the 28th. The courts had already been required to settle a dispute between the soughers and the owners of the mines drained by the sough, who refused to pay a previously agreed proportion of their ore to the sough partners.

The agreement

Vermuyden’s sough to drain the Dovegang mines had been constructed after the existing owners had been dispossessed by Vermuyden’s partner, the Attorney-General, Sir Robert Heath. This dubious expedient was not repeated. The later projects were accomplished by agreement between the soughers and the mine owners, whereby an agreed amount of “composition” ore won from the parts of mines drained by the sough, was paid to the soughers. The agreement between mine owners and soughers in the case of the Baileycroft sough, drawn up in 1672 at the completion of the project, engaged sixty-seven named mine owners to pay every fourth dish of ore to Sir John Gell, who had succeeded to the title on his father’s death in 1671, and eight others, who included a relative of Gell’s, John Lowe of Alderwasley. The agreement specified the course of the sough – “from the nether end of the Bowling Alley in Hannage at Wirksworth to the first taker meer of ground at Orchard Nooke Founder in the cross rake down the hill” – and named the mines to be dewatered – “Stoney Croft, Over Croft, Barley Flatts and Great Lease and other places adjacent”.

The sough partners’ agent, Edmund Ford, presented regular financial accounts to John Gell, and these payments for tools, materials, and workmen’s wages add up to a detailed picture of the sough’s progress. Letters to John Gell from the sough’s main financial backer, Anne Primate’s husband Josiah, and from their son-in-law, have also survived. They, together with the records of court proceedings and the accounts, illustrate what was involved in these expensive and risky investments. The disputes, physical and legal, which occurred in all aspects of lead mining, were common among soughing partners and
between them and the miners who were the sough’s beneficiaries. The usual tension between miners and others arising from the inconvenience caused by mining operations was exacerbated when a sough interfered with the natural drainage of the area. The Baileycroft project engendered most of the possible quarrels.

The financier

The sough was begun in 1667, after attempts had been made to dewater the mines by means of “engines”. The money for these efforts had been invested by Josiah Primate and, according to the submission by his heirs in 1673, had amounted to “neare £300”. Primate then joined Gell and the others in the soughing project and agreed to contribute the largest share of the costs, a quarter, in return for a quarter of the income when the sough was completed.

On 27 May 1668 Primate wrote to Gell. He referred to a visit by the Gell family and mentioned Gell’s father, Sir John. Sir John Gell was a neighbour of Primate’s in London and the families had been associated since at least 1651. It was probably he who had persuaded Primate to risk his money on the sough. Primate also referred to Gell’s children – he sent his youngest son “a boxe of counter s to play with” and expressed pleasure that another son’s eyes were “purfet well”. Primate and, later, his heirs, relied on Gell to keep them informed of the sough’s progress and to ensure that his investment was recouped. In this letter he hoped that “our sough” was making progress.

It was at that time being driven rapidly through shale and had reached a sufficient depth to require artificial ventilation. Primate had heard nothing from the agent Edmund Ford and urged Gell to remind Ford of the need for action. By May in the following year the soughers had reached limestone, where driving was considerably slower than in the shale, and where the “bargains” under which the sough’s face workers were paid had become more expensive. On 25 May 1669 Primate noted that the sough had not advanced more than ten yards since the previous summer and understood that failure to reach an agreement with a local landowner over sinking a ventilation shaft was preventing the soughers from working – “soe thoues that worke now can doe littell good they can have noe wind without a shaft”. He urged Gell “to make an end with Mr Booth if you have not done it already”. Gell had in fact already settled with John Booth for the rent of his property, the “Tannyard”, and Edmund Ford’s accounts include payments for stone and timber used in building a coe there. There are half yearly payments of 5/- paid in rent to Booth from Michaelmas 1668. Primate left it to Gell to “give a lettell enspeckson in to the worke” and expressed confidence in the men “that worke up the sough”. He suggested that “now we are com soe fare” a word from Gell would do much to expedite matters. The shaft was sunk in early 1670.

The “engines” which Primate had been using before their lack of success prompted the soughing venture, continued to be used during the driving of the sough, and the accounts include payments for repairs and parts. They were presumably being used to bring water up to the level of the sough. After initially selling a share in his pumps to Ford, Primate later sold them to a partner in the sough, Edward Millward, who sold them on again in 1672.
Income and expenditure

By 1669 Baileycroft sough had reached the veins it was designed to drain, and the agent’s accounts include income from lead ore to set against the costs. From April to July 1670, for instance, the total cost incurred in driving the sough was £38-4-0d. Set against this was income of £13-16-0d raised by selling 10 loads 2 dishes of ore at £1-7-0d per load. The account has the calculation of fourth, sixth, eighth and twelfth parts of the net cost of £24-8-0d.

The sough was completed in 1672, after a last difficult drive in hard rock. The soughers, who had until then succeeded by using manual methods, plus, when the going became hard, fire-setting, experimented with gunpowder. There is one entry for gunpowder in an account covering the period 24 December 1671 to 15 July 1672 and a payment had been made earlier in the year to a blacksmith for “3 heads and socketts for boreinge rodds”, which may have been intended for use in setting charges. The cost of the powder was 6d. Gunpowder cost 10d per pound at the time (RGO 33) and slightly more than half a pound of it would not have been enough to make a significant contribution in the Baileycroft. The soughers clearly finished the project by the same methods as used earlier.

Partners at loggerheads

The relationship between the soughers at work in Derbyshire and their main supplier of finance soon became uneasy, and Primate relied on Gell to protect his interests. He clearly regarded him as a friend. By 1699 however he was being accused of not paying his contribution to the cost of the sough. He assured Gell that if the agent, Ford, would check his accounts; he would see that the accusations were untrue. He suspected that someone was misinforming Ford – “I doe beleafe that Mr Ford and I hath sum that would doe us ill offices”. Ford had written to say that Primate owed £70 and Primate assured Gell that he had already paid £60 and would settle with Ford.

An undated rough calculation by Gell noted that Primate’s quarter of a total expenditure of £96-4-0d was £24-1-0d and that he had only paid £6-0-6d. In 1672 Gell, by then Sir John, after his father’s death in November 1671, sent Ford a list of Primate’s sough payments to 27 March 1670. These amounted to £101-9-0d, £8-4-5d more than was shown by Ford’s own accounts. According to this list Primate was financing some personal expenditure by the partners, for among the entries for blacksmiths and others were payments for two “buffe coates” for Gell himself, a sword and two satin caps for Ford and a looking glass for his wife. Ford was to return the list to Gell and there was to be a meeting to settle the accounts on 8 February 1672. In a later set of notes on Ford’s accounts Gell queried whether £40 which Ford was demanding of Mrs Primate did or did not include her share of £26-10-0d which had been paid in the sough drivers’ bargains. By the time these disagreements over Primate’s contributions to the costs of the sough ended in court, the Primate family’s trust in Gell had become severely strained.

After Josiah Primate’s death while the sough was being constructed, a series of letters from his son-in-law to Sir John Gell during 1672 and 1673 show a continuing dispute between the Primates and the soughers in Derbyshire and one between the partners and the miners.
The son-in-law, Edward Christian, wrote on behalf of Primate's widow, who had inherited her husband's interest in the sough, and on his own behalf as owner of one of the Wirksworth mines. In October 1672 Christian noted that while the sough would keep the mines dry and enable the miners to carry on working, they were, nevertheless, objecting to paying a quarter of their ore to the soughmasters. The Primates reluctantly fell in with Gell's opinion that a quarter was in fact too high a price for the miners to pay, and that the partners should settle for a sixth. Mrs Primate was "very sorry, after so great expense and so long patience wee should meete with so little encouragement from them when they are like to receive benefitt". However, if no compromise between a quarter and a sixth could be reached, Christian was authorised to give her agreement "upon the reasons you have laid downe & the great confidence shee has in your prudence & integrity".

This confidence began to diminish when the family was threatened with further loss of income from their investment. By December Christian had been informed that if his mother-in-law did not settle payments left outstanding by her husband her part of the composition ore and Christian's own share of the ore from his mine would be "arrested", i.e. placed in the Barmaster's hands pending a Court hearing to settle the dispute. On 28 January 1673 Christian expressed his bewilderment at these developments. He had visited Wirksworth after Josiah Primate's death and had asked for a statement of Primate's debts. The only response had been from "one man about a mile from Workesworthe that demanded some moneys due upon a Bill". He repeated his request for particulars several times in his correspondence with Gell, without success. He thought that the debt could not be large "for I do not understand they wrough the workes much after my father's coming away".

Violence and litigation

Christian secured injunctions to prevent the seizure of his ore and complained to Gell in February 1773 that they were ignored and his ore seized "by violence" by "Capt" Lowe and others – John Lowe of Alderwasley had been a Captain on the royalist side in the Civil War. John Sladen, who was superintending the collection and division of the composition ore from the mines drained by the sough, had been ordered to seize Mrs Primate's share and hand it over to the Barmaster. Sladen had been a deputy Barmaster during a long period when Gell had been chief Barmaster of the Wirksworth Wapentake. He lost his job when John Gell lost the lease in 1661 and Sir John Gell, pulling strings from London, had helped him to a new one. More recently he had been working in the sough. Christian asked Gell to intervene with Sladen and prevent his mother-in-law's ore being seized. Efforts were made in the Barmote Court to have Christian's shares in his mine taken from him. He declared to Gell "unlesse they take mee for a Dutchman, they knowe I have a possession & how I came of it, and that they canot impeach it".

In June 1673, with the soughing agreement between Gell and his partners and the miners concluded, Christian notified Gell that Mrs Primate would be taking legal action to claim her ore. Christian had assumed that John Sladen had been acting for all the partners and dividing the ore according to each partner's share. Sladen had indeed been doing this "but I perceive others shift for themselves & leave my Mother to hir malitious enemies, which I hope shee will finde friends to protect hir against". Legal action in the Duchy Court was the
Primates' only remedy and Christian thought it necessary for all the partners' interests that each one's share should be legally established. In a letter dated 14 June Christian assured Gell that the legal action was necessary “and these troubles will give you the advantage of having your interest in the sough settled, which otherwise Counsell [legal advisors] conceive in hazard”.

Mrs Primate's submission to the Duchy of Lancaster described the background to the construction of the Baileycroft sough, the terms of the agreement between the miners and the soughers and the way in which she had been deprived of her entitlement under the agreement. Baileycroft, Stoney Croft, Barley Flatts, Over Croft and Great Lease mines were by then profitable, and Mrs Primate claimed that ore to the value of £5000 had been mined from the veins drained by the sough. She claimed her share of the money raised from the sale of the soughers’ composition ore. She accused her colleagues of conspiring against her and “takeing advantage of survivorship” after her husband’s death, and asked the Chancellor of the Duchy to issues subpoenas to Sir John Gell and his “confederates” to appear before the Duchy Court to answer her charges.

The millers’ tale

A third legal dispute was provoked by an unforeseen effect of Baileycroft sough. The soughers were already paying half-yearly rents of £5 and £1 respectively for driving the sough through two closes when in June 1673 they were sued by the Wirksworth corn millers for taking their water away. Christian advised that mining should not be held up while the case was heard. He took part in advising the soughers’ lawyers and on 24 June 1673 noted that “the tryall is carryed downe by ye Miller”. Christian’s opinion was that he would not be able to prove that there had been an underground water course which had been diverted by the sough. He was wrong and the millers won their case, in spite of an argument put to the Duchy Court in May 1674 that the “custom of the mine” was at stake. The Court rejected this and found for the millers, noting nevertheless that their judgement should not “in any sort bee interpreted to the prejudice or discountenancing of the Custome of the Mynes on making of Soughs or otherwise which the Court will be ready on all occasions to countenance & protect according to Justice”. Gell noted later “This sough took away the water from the corn mills in Wirksworth, for which the owners of the mills sued those that brought up the sough, & obtained a verdict agt the soughers, whereupon we compounded with them and allowed them £12, as I remember”.

Death of the intermediary

John Sladen, who seems to have been used by both parties, was sent to London by Lowe and others to give evidence on their behalf and Christian let Gell know on 19 June 1673 that on his return to Derbyshire Sladen would bring a copy of Mrs Primate's submission with him. He asked Gell to make his appearance at the Court and once more asked him to use his influence to persuade his partners to behave better – “now that you do discover what they would be att, I hope you will give order that Sladen may take up all ye oare & give every one their part, & not suffer any ptner to bee interested one more than another but for his just proportion”. Sladen in fact did not deliver Mrs Primate’s document as he fell ill in London. Christian described the drastic remedies inflicted on him – “hee has beene
sweated, blooded & glisters applied with all good helps to a sick man”. Christian was angry at the partners’ treatment of Sladen and proposed to prosecute them “that ye world may see how unworthily hee has been used”. Sladen died in September, by which time Gell had still not made his appearance at Court and Mrs Primate had still not received her share of the composition ore. In the last letter in the series, dated 6 November 1673, Christian reported that his mother-in-law had died, that he was about to start a new action and that Gell would be served with a subpoena.

Claims

In their submissions to Chancery on 19 November and in the Court of the Duchy of Lancaster on the 28th, Primate’s heirs claimed that the sough agent had seized the articles of agreement and the account books and that Anne Primate’s partners had refused to pay her the share of composition ore due to her, claiming that “the profits raised should go towards the payment of her late husband’s debts”. The Primates pointed out that there was nothing in the articles to support this action and claimed Mrs Primate’s share of the composition payments for her heirs. They demanded that all sough documents should be produced, including any “received from ye widow & relict of John Sleydene late of Wirksworth”.

The Primates’ submission referred to Baileycroft sough as being “perfected long since”. However the sough agent’s accounts do not support their allegation that ore to the value of £5000 had been mined by 1673. His continuous accounts run from 27 March 1670 to 15 July 1672 and include 35 loads of lead ore. The accounts include payments made to the Barmaster for measuring and one of them makes explicit the connection between the measuring of ore and the ore received by the soughers. The 35 loads were clearly composition ore, which was in fact one sixth of the total, “a 4th being thought too hard for ye miner”, implying a total production during 1670-72 of 210 loads.

Sir John Gell used Sladen’s accounts for the period from 15 July 1672 until 24 May 1673 to calculate each partner’s share of the composition ore paid by the miners. Sladen’s figures for composition ore imply that the total amount of ore taken from the mines drained by the sough was about 1200 loads, which at the current price of £1-7-0d per load would raise £1620. The Primates were exaggerating, but Sladen’s 1672/3 figure of 1200 loads mined in less than a year from the mines of the Baileycroft was high and a sufficient indication of the efficiency of the seventeenth century soughs in giving access to hitherto inaccessible veins.

Baileycroft’s aftermath

After the successful case brought against the soughers by the Wirksworth corn millers the sough was dammed. It had, however proved its value to the miners, and the soughers, after calculating their costs, circulated the miners in November 1675 to check on their willingness to subscribe to the articles. One of the partners, Edward Millward, together with Edmund Ford and others, spoke to over two hundred and fifty of them and only a few disagreed with reopening the sough. After the settlement described by Gell the sough was reopened.
Hannage Sough

Baileycroft sough became redundant when the Hannage sough was driven under the Gulf area to the north of Wirksworth between 1693 and 1700. Hannage sough, like most of the others, provided plenty of work for lawyers. The soughers were in dispute with miners who refused to pay composition, one group claiming that they were working an old vein which had not been dewatered by the sough. The sough was blocked for a number of years in an effort to force payment of composition ore. Hannage sough, also like Baileycroft and others, interfered with the natural drainage of the area – according to Thomas Bagshaw in 1702 “the town of Wirksworth hath borne the losse of their water from the town to the impairing of their health being utterly deprived by the sough of as fine springs in the town as the Kingdome had”. Bagshaw also pointed out that the people of Wirksworth had suffered twice, being deprived of their water supply by the sough and having their mines drowned again when it was blocked.

12. Two-storey building at Ratchwood Mine. Ratchwood expanded its production rapidly after it was drained by the Hannage sough in 1732 (photo AJ Holmes)
Cromford Sough

Throughout the seventeenth, eighteenth and nineteenth centuries soughs continued to be the main means of draining the deep mines of the Wirksworth area. The longest and most successful to be started in the seventeenth century was the Cromford Sough, known originally as the Longe Sough. This was over a hundred years in the driving. It was begun in 1673, three years before the signing of the articles of agreement by Sir John Gell and others, and it was the strong, continuous flow from its tail that was to persuade Richard Arkwright to set up his cotton mill in Cromford almost a hundred years later, in 1771. The sough was originally intended to drain the mines of Ashcroft Vein on Cromford Moor and, driven in an undulating course to keep in soft shale, reached Dun Rake, a quarter of a mile to the south of Cromford, in 1680.

A short distance beyond Dun Rake the soughers left the shale and turned south-west, through limestone. In this section, as far as Tinley Vein, the much more difficult rock prompted the use of gunpowder – “for carrying on the Sough so vast a way thro’ Rocks of limestone which could not be worked but by boring holes and blasting with Gunpowder”. In addition to the problem of blasting a way through hard rock the soughers were plagued by poor ventilation – “great obstructions were occasioned by the want of wind in the Sough, which caused damps and killed the miners, and to carry on the Sough they were forced very often to sink Pitts or Shafts … at the expense of £100 to £200 a shaft”. After an expenditure of £20,000, Tinley Vein was reached by 1696.

The work was abandoned for ten years, before the sough was driven further south to the Godbehere Vein, which was reached in 1709. This section of the work was carried out in shale and the miners were menaced by firedamp. The ventilation problem in this section was tackled by a “double drift” system, with passages cut between the two drifts, a technique known as “thurling”. A basket of burning coal was suspended in the mouth of a shaft, creating an up draught. The current of air was drawn up the sough, through the thurl currently in use and back to the shaft. As the sough progressed the thurls were filled in to prevent short circuits in the ventilation current. After intersecting the Godbehere Vein the sough was driven westward along the Gang Vein, reaching Milcombottom, to the north of Wirksworth, by 1756.

Branches were driven south, the most important being the Ranter branch, which reached the Ranter or Raventor mine about 1773. The Gell family had retained a share in the mine, and the effect of the sough can be seen in the accounts prepared for Phillip Gell, the current holder of the family estate. Raventor, where 193 loads had been mined in 1693, produced 12,539 loads (3,145 tons) between March 1773 and May 1776. The ore was sold for £20,771 and, while the mine’s expenses were high, Gell’s sixteenth share of the profit yielded him £601-14-9d.

While the flow from the sough’s tail provided Richard Arkwright with the power for his mill, it also had an effect at the other end similar to the one caused by Baileycroft a century earlier. In 1780 Samuel Buxton, a Wirksworth miller, took the soughers to court, claiming that the sough had damaged his business by reducing the flow of water to his mill.

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Meerbrook Sough

Drainage of the mines in the whole of the Wirksworth area was eventually accomplished by the Meerbrook Sough, begun at the level of the river Derwent in 1772, at a time when lead mining ventures had become only intermittently profitable. The entrance to this sough is 10 feet wide and 8 feet high and has a keystone inscribed “FH 1772”. FH was Francis Hurt of Alderwasley, smelter, lead mine shareholder, iron-master and the main shareholder in the sough. It still discharges 12-20 million gallons a day, and by the 1830s had so reduced the flow from the Cromford Sough that Richard Arkwright’s successor sued the sough’s owners for taking away the water he needed to power his cotton mill.
Chapter 6: After the soughs – ownership, production and trade

Figure 3

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<th>Grove</th>
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|       | Crmfd   | 6297-7| 1379-7| 528-5| 8203-1|
| (Oct-Dec) | Midltn | 88-2  | 24-6  | 5-6  | 118-5 |

|       | Brsn    | (incomplete) | 904-7 |
|       | Crmfd   | (incomplete) | 1240-5|
|       | Midltn  | 573-8        | 38-3  | 780-1 |
|       | Wkswth  | 580-6        | 455-0 | 39-1  | 1074-7|

|       | Brsn    | 727-7        | 226-8 | 45-0 | 999-6 |
|       | Midltn  | 407-4        | 161-3 | 30-0 | 598-7 |
| (9 mntns) | Wkswth | 1432-7       | 471-0 | 112-4| 2016-2|

Production figures for the Brassington (Brsn), Cromford (Crmfd), Middleton (Midltn) and Wirksworth (Wkswth) liberties, in loads and dishes

Big new mines

The traditional way, where the men working a mine owned shares in it, was disrupted wherever a mine became very productive. In 1653, for instance the picture in Brassington, Middleton and Wirksworth liberties was quite different from the one in Cromford, the difference being that Cromford liberty contained the mines recently drained by the Dovegang sough. In each of the Brassington, Middleton and Wirksworth liberties the Barmasters’ records named about forty proprietors, only half of the number mining at Wirksworth in the 1640s, suggesting that the large new mines in Cromford drew their workforces from the formerly independent miners in all the liberties of the area. While in each liberty apart from Cromford there were a small number of mines which produced a disproportionately large amount of lead ore for the Barmaster to measure, the disproportion was small enough to demonstrate that the mines in these liberties remained small ones, worked by independent miners.

In Cromford however, with the Dovegang drained by 1651, the large amounts of ore made suddenly accessible attracted men with the capital to invest in extracting it. An unprecedented 6897 loads (1724 tons) of lead ore was mined in the Cromford liberty in 1653, compared with 702 in Brassington, 349 in Wirksworth and 278 in Middleton. Over 55
percent of the Cromford ore came from the mines owned by Lionel Tynley. Tynley died in November. He and his successor mined 3,816 loads (954 tons) while, in his capacity as merchant, Tynley bought 707 loads (177 tons) of groove and caved ore in the liberty between January 1653 and the time of his death. Two other mines produced over 19 percent and 11 percent respectively and, with over 5 percent from another entrepreneur who combined mine owning and ore buying, 90 percent of Cromford’s ore came from four sources. The rest consisted of small amounts produced by 45 independent miners.

There are no records of the numbers of men employed in the large mines but, since the tools and methods of ore getting in 1653 were the same in large and small mines, the enormous amount of ore extracted in such a short in Cromford indicates large workforces. The ore in the large mines may have been in larger deposits and have been more easily extracted than in the small ones, but in the days of high production there were obviously more men employed in the few large mines of the Cromford liberty than there were in all of the rest. They would have worked in teams of copers, supplemented when necessary by wage labourers paid by the shift. The pattern established in Cromford liberty in 1653 became typical throughout the most productive areas in the Wirksworth Wapentake and elsewhere in Derbyshire.

The small mines survive

In spite of the dominance of the large mines there were still many which were too small to attract rich predators, and many of the men in the Barmaster’s accounts regularly had small amounts of ore measured. In spite of the dominance of the large mines there were still many which were too small to attract rich predators, and many of the men in the Barmaster’s accounts regularly had small amounts of ore measured. They included, for example, two of the Cromford liberty miners, William Copeland and William Ward. In 1653 Copeland had amounts varying between 3 and 9 dishes of ore measured on 16 occasions. These occurred in every month except October. His total for the year was 10 loads 5 dishes (2 tons 11 cwt). Ward had no ore measured in January, March, October and November. During the other eight months of 1653 he presented ore for measurement on 13 occasions, a total of 32 loads 2 dishes (8 tons). The measurements are too frequent for these miners to have spent any time working for such as Lionel Tynley. The Barmaster’s accounts for this year do not give the ore prices. They are, however, unlikely to differ much from those for 1655, which varied between 22/6d and 27/- per load. At these prices Copeland’s income from his mining would be between £12-4-6d and £15-1-0d. Ward would have made between £36-11-6d and £44-5-5d. These figures are not net income for the two men. Apart from mine expenses, each would have had a partner or partners. Copeland’s income of around 5/- a week was just a living wage for a miner with family labour. Ward, earning three times as much, presumably needed more labour for his higher output.

The figures demonstrate that even small operators could make a living from mining. There were two other miners whose names occurred more than twelve times in the Cromford reckonings for 1653, four who appeared between seven and twelve times, and ten between three and six. Those whose names appear only once or twice may have been partners of others on the lists, or have spent more time farming than mining, or have worked for wages at a large mine as well as retaining their own small titles.
Mines could be short-lived. One small partnership, William Glazebrooke “and his grovefellowes”, made a lucky strike in Francis Hardy’s garden in 1664. They spent a total of £5-9-2d on developing their Garden Grove in November and December, and had 4 loads 4 ½ dishes measured by the Barmaster on 21 January 1665. During the year they mined 105 loads which they sold at prices which ranged between £1-2-6d and £1-12-6d a load, making a total of £148-0-11d. Their expenses came to £86-13-6d, making them a profit for the year of £61-7-5d, of which £17-2-1d was paid “for the use of the scoole in Worsworth”. The record ends on 4 December 1665, by which time the yield had dropped and their expenses had risen.

Complicated ownership

The complex pattern of mine ownership is illustrated by a set of accounts kept for Mrs John Gell at the robustly named Grey Mare Arse mine in 1657. Mrs Gell seems to have pursued her own lead interests separately from her husband, who was the chief Barmaster and holder of the lease of lot and cope at the time. The mine, a small one, employed six men and one woman to mine and dress 10 loads (2 ½ tons) of ore between May 9th and August 22nd. The woman, Mary Horneby, was paid 1/- and may have been a surface worker, winding the ore or perhaps dressing it. The men were paid by the shift at rates ranging from 6d to 1/4d, the top rate dropping by 2d between May and July, when a completely new labour force was installed. At least two of the men were or had been mine owners – they had appeared as such in the Wirksworth Barmaster’s lot and cope accounts two years earlier. The appearance of one of the others in the accounts for the driving of the Raventor sough in 1659, by then being paid 1/6d a shift, suggests that he at least might have been a professional labourer. Mrs Gell herself had an eighth share of Grey Mare Arse mine, an indication that ownership of even small mines was often widely shared. Her share brought her a net income for the three months of 8/01/2d.

Gell investment

That there was widespread shareholding in even small mines is shown by a list of the Gell family’s holdings drawn up after the death of the second Sir John Gell in 1689. The list groups the Gell holdings under liberties. In the Hopton and Carsington liberties, nearest to the family home at Hopton Hall, most of the mines were on the high plateau of Carsington Pasture, and were during most periods small, requiring little capital, and were unproductive. This was an area in which the main owners were the miners themselves, and yet these small mines attracted Gell money. Mrs John Gell’s son, Sir Phillip, and his brother Francis had one twelfth of the Foxhole, Guits Founder and Sitifolds mines and one sixth of the Whiterake and Doustonhills. The barmaster’s accounts seven years earlier had shown two mines in Whiterake producing amounts which would have given the Gells very little return on their investment. Between May and July 1682 the miner William Taylor presented 4 loads of grove ore and 10 dishes of “offall” (caved) ore, while Thomas Torot’s output was 14 dishes and 5 dishes respectively. This surviving fragment of the liberty’s accounts does not include the other mines in the 1689 list, but the totals for the Whiterake mines are characteristic, and Foxhole, Guits Founder, Sitifolds and Doustonhills are unlikely to have been more productive.
The Gells invested much more in those mines in the Cromford, Wirksworth and Middleton liberties which, from the second half of the seventeenth century, became more productive and lucrative as they were progressively drained by soughs, including those of the Raventor (Ranter) and Northcliffe veins. It had long been known that these were rich deposits. An attempt had been made to pump Raventor by horse-power before 1635, and the first sough to reach it, Old Raventor, drained it in the late-1650s. Northcliffe was reached by the Lees or Northcliffe sough ten years later. In 1689 Sir Phillip Gell’s agent reported to him that “In Raventor veine of all the meares that belongeth to the soughers tithe there joyntly you have a 16th & 64th parts. Of 4 more there northwardly you have joynly that were Sir John’s interest a 12th part. Mr Francis Gell hath of his owne of ye said meres a 12th part, Madam Elizabeth & Madam Temperance hath of the said 4th meare each of them a 12th part. Madam of the 13th, 14th, 15th and 16th takers at Raventor I gave to Sir John a 24th part and to Mr Francis for himselfe a 24th part”. Raventor was a good investment for the family for many years. The mine produced 156 loads in 1693.

Capital

The agreements between the groups undertaking sough construction (“soughers”) and the owners of the mines which the soughs were designed to drain, reveal how extensive was mine shareholding, spreading far beyond local magnates such as the Gells. The Baileycroft sough agreement of 1672 named 67 share holders in the mines to be drained. They included gentlemen, tradesmen, lead merchants, farmers, innkeepers, clergymen and 9 miners. A similar spread of ownership was revealed by the agreement for the Longe (or Cromford) sough in 1676. Sir John Gell and a Doctor of Divinity from London and a Bachelor of Divinity from Magdalen College, Cambridge, were among the 61 owners of the mines in the Tinley vein, the Dunrake, the Rose Rake and the Ashcrosse Rake “which are so far wrought under water that further workmanship cannot be made without unwatering the same”.

Gell owned shares in mines in all four areas to be drained by the Longe sough. The others signing the agreement were all living in Derbyshire or had some connection with the county. Cornelius Vermuyden “of Grays Inn” was the son of Sir Cornelius, who had driven the first sough in the area, in 1631, the Rev. Thomas Hitchinson “of London, Doctor of Divinity” was probably a member of the Carsington family with lead mining and smelting interests and Roland Manlove “of St Magdalen’s Colledge, in the University of Cambridge, Bachelor in Divinity” has the same surname as the man who had published a rhyming statement of the Wirksworth lead mining customs in 1653. Of the other 9 absentee gentry, most were probably local land owners, like William Savile of Hilltoppe, near Beeley, whose family owned one of the manors at Brassington. There was one lead merchant among the absentee, Roger Coates of Chesterfield, and one other clergyman, John Oldfield of Alfreton. The remaining 48 share holders were from Cromford (12), Brassington (1), Wirksworth (9), Hopton (1), Carsington (2), Bonsall (5), South Wingfield (1), and Matlock (17). The local yeomen/minor gentry were heavily represented. The Brassington signatory was William Blackwall, gent, inn keeper and barmaster of the Brassington liberty. John Hitchinson (Hutchinson) of Carsington and later of Stainsborough Hall near Hopton was a lead merchant and smelter. The second Carsington signatory was Edward Hitchinson. Among the Matlock and Cromford signatories were 4 members of the Wigley family, active in the industry as owners and smelters since the beginning of the century. The names of
Hopkinson and Ferne (Bonsall), Tompson, Bunting, Ridgway, Blackwall and Glasbrook (Cromford), and Coates, Godbehere and Woodiwiss (Cromford) were all of families whose members had prospered and raised their social status by their mining and/or smelting activities.

Ore buyers

The Barmasters’ responsibility for collecting cope (6d per load) obliged them to keep records of the names of the ore buyers, the men who were paying it. Most of the ore was bought by a few smelters and merchants, though there were a large number of smaller buyers. In Cromford liberty in 1653 the ore was sold to a total of 31 buyers, of whom 18 bought more than 100 loads (25 tons) and whose purchases varied between 7 and 1644 loads (2 and 411 tons). The largest buyers were men from the minor gentry — Robert Day, tenant of Nether (smelting) Mill at Wirksworth (1644 loads), the lead merchant Robert Sage of Wirksworth (1100 or 277 tons), Anthony Wood (1030 or 257 tons), Henry Coates (864 or 216 tons) and the miner owner and lead merchant Lionel Tynley (699 or 175 tons). Sage was a cousin of the Hopkinsons and at the time of his death in 1661 lived in part of the Hopkinsons’ house in Wirksworth. In addition to Tynley, the main producer of lead ore in the Cromford liberty in 1653, Sage, Coates, Anthony Wood, Captain Sleigh, William Flint and Major Molanus were also mine owners. Samuel Sleigh of Chesterfield was a Roundhead officer who had done well out of the Civil War. Sage, Day and Coates bought from the miners in other liberties, as well as Cromford, and other Cromford buyers who bought in other liberties were Martin Tompson (a total of 1041 loads or 260 tons) and Major Molanus, tenant of Upper Mill (979 or 245 tons). Tompson was also a smelter and mine owner. The buyers paid cope on both grove and caved ore. The total of the two at Cromford in 1653 was 8529 loads 6 dishes (2132 tons), yielding £213-4-10d at 6d per load.

John Hutchinson was the leading smelter in the Wirksworth area during the second half of the seventeenth century – by 1666 he was the tenant of both the Gell smelting mills in Wirksworth and added Sir Philip Gell’s Middle Mill at the end of the century. He was a major ore buyer in all the liberties of the Wirksworth Wapentake from the 1660s and was the main buyer in the Wirksworth liberty by the 1690s – in 1693 he bought almost seven hundred loads (175 tons) from the Wirksworth mines. He also owned shares in some of the most productive mines in the area and was a partner in soughs, including Baileycroft.

Miners and buyers

One Barmaster, William Blackwall at Brassington, linked buyers with sellers in his accounts revealing that in general ore buyers bought from a large number of miners, necessarily so, since most of the miners had only small amounts to sell, and that most miners sold to a number of different buyers. The main buyer, William Flint, bought from 30 of the 44 miners named in the accounts, during a number of months ranging from 1 to 11. The figures for the second largest buyer, “Mr” Bindley, were 17 miners and from 1 to 4 purchasing months, and for the third largest, Molanus, 10 miners and from 1 to 5 purchasing months. The largest producer of ore, William Taylor, sold to Flint during 10 months, to Molanus during 5 and to Bindley during 1. The second largest producer, Roger Billing, sold to all 5 buyers. The monthly figures in the accounts are the totals of a number
of reckonings, and show that Taylor, Billing and others sold to different buyers in the same month. Clearly, there was a free market at the mines, with the miners bargaining for the best price, and the buyers playing one miner against another.

The price was determined not only by the quality of the lead ore on offer but also by the current price at which the smelters could sell their product, and the costs of production and transport. The rewards of mining, therefore, were dependent on the national and Continental lead markets, since the price of ore was the only component of the merchants' costs over which they had control. The maximum of 27/- a load paid to John Gell for lot ore in 1655 had risen to 31/- by 1660.

The trade

It was a busy industry. From April to December 1657, for instance, John Hutchinson produced 139 fothers at Nether Mill and George Tomson 153 at Upper Mill, a total of 292 (over 328 tons). The selling price at the time was £11-14-0d a fother, making the value of the two mills' output during nine months of 1657 the enormous sum of £3416-8-0d, or over £4500 a year.

In 1667 John Hutchinson, in spite of his large portfolio of mine shares, which should have ensured him a steady supply of ore for his smelter, seems to have been short of lead to supply his customers. He borrowed two large consignments from John Mundy of Markeaton. Mundy was a powerful member of the county gentry. He had served as a Captain in Sir John Gell's regiment during the Civil War and had been a member of the Derby Committee from 1644. He was a JP in 1648 and High Sheriff in 1659. He was prominent in the lead trade, operating via Bawtry and Hull, and also bought and sold mines. Hutchinson's subsequent failure to pay his debt to Mundy led to a court case which throws light on the activities of some of the leading players in the industry.

In February 1667, according to the case which Mundy presented to the court, Mundy lent Hutchinson twenty-one fothers of "merchantable lead", "which was truly delivered to him". Hutchinson agreed to deliver twenty-two fothers, each fother containing 22½ cwt (1143kg), by 2 August. Hutchinson borrowed a further twenty fothers on 27 March 1668 on similar terms, promising to supply Mundy with twenty-one by 15 September. By October Hutchinson had managed to return only ten of the forty-three fothers he owed Mundy and the two came to a verbal agreement that Hutchinson should pay off the debt in monthly instalments of three fothers, paid at one of his smelters. As security Hutchinson pledged his shares in a number of mines on Cromford Moor and in Wirksworth, and his interest in Cromford Moor sough.

Hutchinson had the backing of the mining establishment in Wirksworth and one of the local mining officials, William Crees, was his co-defendant in the action which Mundy brought early in 1669 to recover his debts. Mundy claimed that Hutchinson and Crees, "an agent employed by the Cheife Barmaster", together with the Steward of the Barmote Court and a number of deputy Barmasters, "who are used to returne juries there", and other officials, had "set up divers secret estates of the said mynes & meares of ground & shares thereof". Crees and Hutchinson had told Mundy at different times that Crees had the title to some of
the mines, that Hutchinson had sold some of them and that some had been seized by the barmaster. Mundy estimated the value of the thirty-nine fothers which he claimed Hutchinson still owed him to be £500.

The evidence given by Hutchinson, Crees and others establishes a number of features of the lead trade at the time. Failure to pay lot and cope could result in the seizure of the offender’s mines – “Hutchinson beeing at Michaelmas last indebted to the Earle of Northampton, his Majesty’s farmer of lot & cope, in the sume of £360 & it beeing taken to bee the custome that the Defendant’s grooves & parts of grooves will by the articles & custome of the mynes in such cases bee for lot oare & for cope lyable for the payment & satisfaction of such debts...”

Hutchinson failed either to pay the November and December instalments of his debt to Mundy or to surrender his mining shares. These shares, as listed by Mundy, are a good example of the way in which mine ownership was fragmented. Hutchinson owned different fractions ranging from 1/6 to 1/24 of seven different parts of the Godbehere mine, 1/8 of the “Hedge meere in the close adjoyning to Cromford moore”, 1/16 of three other meers in the same close, and 1/6 of the “great Crosse rake”. Hutchinson denied owning these shares but admitted to owning 1/96 of Godbeheres Founder.
Verbal agreements were regarded as binding - Mundy claimed that “by the custome of the mynes in the Soke & Wapentake of Wirkesworth titles or estates in lead mynes or parts or shares of lead mynes may bee transferred as well by paroll without writing as by writing” and Hutchinson and Cees agreed with him. However Hutchinson denied reaching any agreement, verbal or written.

The lead was carried to Bawtry and stored and traded there on Mundy’s behalf. Hutchinson claimed that he was twice unable to collect lead on warrants issued to him by Mundy. On the first occasion the book-keeper at Bawtry had already sold Mundy’s lead and on the second “by reason of the Dutch warres & very much lead lying on the shore the Defendant could not get the 20 fothers weighed off to him at the time of the delivery of the warrant to the booke keep[er] there who in such cases delivered the lead upon warrants brought thither”.

Weighing seems to have been an approximate business. Mundy’s agent referred in one statement to an error in the Bawtry books of “40 pigs of lead”, explaining that fifty-five fothers had been entered but only fifty "sent away". At eight pigs or ingots of smelted lead to the fother, forty pigs was an alternative way of saying five fothers. He also testified that Hutchinson received twenty fothers of lead in three consignments, one of ten fothers and two of five, all weighed out on the same day. Each consignment was overweight and Hutchinson paid £16-6-6d for an overweight of 27cwt-3qtrs-7lb (1412kg), a figure which differs from the total of the three overweights cited. Richard Yates, the book-keeper, died in December 1668 and his “wharfinger bookes” were in the hands of Mundy’s agent at the time of the lawsuit. He testified that they were “incertaine and imperfect”, with entries for lead which could not be traced.

Over thirty years later Hutchinson, by then sufficiently prosperous to have attained the status of “gentleman”, was the plaintiff in another case which amplifies the picture of the lead trade. Hutchinson testified that he supplied the defendant, Leonard Fosbrooke, gent, with forty fothers of lead. There were two consignments. One consisted of thirty-five fothers marked with Fosbrooke’s “lead mark” and a further forty pigs were supplied at the request of John Greatorex, whom Fosbrooke employed as his “common buyer and carrier of lead”. The forty pigs were marked “O”. Some time later Hutchinson sent forty pigs of lead, marked “JH” to Wilne Ferry, near Shardlow, on the Trent. Unlike Mundy, Hutchinson was trading by the longer but easier southern route to Hull through Derby to Wilne Ferry. There was apparently a lead market there as the consignment was either to be sold on the spot or to be transported. Hutchinson’s complaint was that, although he had already supplied Fosbrooke’s order in full, Fosbrooke seized ten pigs from this consignment as well. Hutchinson seems to have suggested that the authorities at Wilne Ferry were at fault in allowing Fosbrooke to take the lead, as the court was advised that the action should be brought against Fosbrooke alone, and not “the rest of the persons interested in the ferry”.

John Hutchinson’s consignments were part of a very busy export trade. Lead was one of the three English export staples, the others being cloth and tin. An annual average of over 10,000 tons was being shipped abroad at the turn of the century, reaching as far as Turkey – lead was “generally sould in Turkey for ready money”.

58
Ore Production at the end of the seventeenth century

By the time that the Baileycroft mines had been drained by the Baileycroft sough, the Wirksworth liberty had already benefited from the Raventor sough, begun in 1655, and the Lees sough, both to the north. The arrival of the Raventor sough had caused a rise in the liberty’s production from 580 loads of mined ore (145 tons) in 1658/59 (figure 2), which was 180 tons less than the 1645 figure, to 1432 (358 tons) in nine months of 1660/61, figures which demonstrate both the decline in production when the mines reached water, and the recovery when the water was drained. The figures in figure 4 show that that level of production was still being reached at the end of the century. The sudden rise in 1696 and 1697 coincided with the arrival of the Hannage sough at the Well Grove vein in 1696.

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Wirksworth Liberty production figures 1692-98 in loads and dishes

(offal = low-grade ore; lot paid only on grove ore – offal and caved ore were exempt).

The Matlock mines

In addition to the predictable rise in production in newly-drained fields such as Wirksworth and the Dovegang, fragmentary figures for other areas in the Wapentake which were either dry or were not to be soughed until the eighteenth century, also demonstrate continuing high activity.

In the 1670s both sides in a dispute over the payment of tithes to the Rector of Matlock claimed high output from the mines of the Matlock liberty. Gentlewoman’s Grove was variously credited with twenty, thirty or forty loads (5 – 10 tons) a fortnight and two or three hundred loads (50 – 75 tons) in four years. Bownes Grove “sometimes” produced sixteen loads (4 tons) a fortnight and more than two hundred loads (50 tons) were said to have been mined at several groves over two years. Gentlewoman’s Grove and others together produced several thousand loads, three hundred and sixty (90 tons) in one three-week period. The Rector claimed that the six named defendants had mined ore worth £1000 in three years. He also said that he had collected each twentieth dish from Nestus mine, raising £120 in one year, implying that Nestus had produced over two hundred loads (50 tons) that year. Both sides had an interest in high production claims. The Rector’s tithe claim was tied to the mines’ output and the miners aimed to demonstrate that tithe was
never paid even when large amounts of ore were mined. The figures they gave were probably exaggerated and some are admitted approximations, but it seems nevertheless that the Matlock mines were busy in the late seventeenth century.

The Griffe and Carsington Pasture mines

Between 1659 and 1691 the Gell family’s small private liberty of Griffe Grange produced an average of 252 loads (63 tons) during the years for which there are complete figures (D258/20/7-8)). This average conceals some years in which the output was considerably higher. There were 330 loads (82 tons) during six months of 1681 and 724 (181 tons) between April and December 1682. Carsington liberty, which seems to have been the Carsington Pasture part of the Brassington Liberty, produced over 140 loads (35 tons) in two months of 1682, implying an annual figure of 854 (213 tons) (D258/18/25). This compares with about 900 (225 tons) for Brassington in the 1650s.

Gunpowder in the Dovegang

Powder continued to be used only rarely throughout the seventeenth and eighteenth centuries. It was much more expensive than traditional methods and, while it required less skill than firesetting and was clearly more effective than picks and wedges in hard rock, the miners in fact worked wherever they could in soft rock, removing the ore and as far as possible nothing else. However, in addition to its use during the driving of the Cromford sough, gunpowder was used in ore-getting in the Dovegang, where the miners used over a ton between 1676 and 1681. This was bought at 10d a pound, a total expenditure of £93-10-0d (RGO 33). The surviving accounts cover the period April 1676 to October 1683. Powder was bought in London and the accounts show purchases of 255lb in 1676 and 562lb, 417lb, 564lb and 402lb respectively for the next four years. 30lb was bought in January 1681, 12lb in March and the gun powder purchases end with 2lb bought in December 1681. These figures suggest that powder was used during a period of mining in hard rock and abandoned when traditional methods became possible again.

The Dovegang accounts show that these mines, the first ones in the Wirksworth Wapentake to be drained by a sough, and the first to make extensive use of gunpowder, were still highly productive over twenty years after the Parliamentary Commission’s report of 1652 (RGO 33). 5,197 loads (1299 tons) were measured in the nine months April-December 1676 and, while there was a fall to 1,883 loads (471 tons) for the whole of 1677 and to 1,480 (370 tons) in 1678, production rose again in 1679, when 1,685 loads (421 tons) were measured during the four months January to April. However, sales figures for the years 1680 to 1683, for which there are no production figures, imply a considerable reduction in the amounts of ore measured. At the current average price for ore, £1-5-0d per load, 744 loads (186 tons) were sold in 1680/81, and 505 (126 tons) and 429 (107 tons) respectively in the two following years.
Chapter 7: Rights and wrongs

Lot and cope

In 1662 the Attorney General of the Duchy of Lancaster presented a case in the Duchy Court on behalf of the Earl of Northampton, current holder of the mineral rights and office of Barmaster in the Wapentake of Wirksworth. Northampton complained that his rights were being denied him by his predecessors John Gell and Gell’s partners John Milward and William Michell. He claimed that after taking up his lease of the mining dues and the barmastership on 26 March 1661 he had followed the usual procedure and convened a meeting of the Barmote court in Wirksworth and appointed a steward, George Hopkinson. Hopkinson had appointed deputy Barmasters and instructed the miners in the Wapentake to pay their dues to these deputies. Gell and his partners, he alleged, had obstructed the new deputy Barmasters in their attempts to carry out their duties “& since the 26th day of March 1661 have intruded & entered into his majesty’s lead mines within the said Wapentake of Wirksworth within several places and taken away the greatest lot & cope & profits of the said lead mines to a great value”.

The 1662 case illustrates the strong competition among the gentry to share in the prosperity of the lead industry by acquiring the mineral rights, and the complexity of the disputes thrown up by the system of leasing and selling on the lease, which was often done well in advance of the expiry of the current one. These high level disputes mattered to the miners. Lot and cope were high taxes and the identity of the man responsible for running the local industry and of his tax collectors was important. As was noted in a case before the Duchy court early in Queen Anne’s reign, “if any disturbance be by setting upp different titles her Majesty’s revenue will be in danger of being lost and the myners take advantage thereof and pay no dutyes to either party”.

End of a reign

John Gell’s attempt to hold on to the mineral rights was thwarted by two events. In 1650 Sir John Coke the younger died without making a will. His heir was his brother Thomas who, as we have seen, had bought Thomas Parker’s lease of the mineral rights and office of chief Barmaster in 1637 and sold them on to the partnership of the elder John Gell and John Milward in 1638. This lease was due to end in 1654 but Thomas Coke’s inheritance from his brother included David Ramsey’s 1654-1685 lease, bought by the elder Sir John Coke in 1643. According to Gell, when the new lease began Thomas Coke intended him to continue to hold the rights, which by then had been in the family for sixteen years. Thomas, however, was in trouble. He had been on the royalist side during the Civil War, had been fined £500 for this in 1648 and was further fined £2,200 on succeeding to his brother’s estate. By 1650 he was known to the authorities as a royalist conspirator against the new government, and in 1651 was imprisoned in the Tower of London (Brighton, 1981). At this point Lady Elizabeth Coke, widow of the younger Sir John, was granted the administration of the estates of both her husband and her late father-in-law. It was Lady Elizabeth who was now to decide how to dispose of the mining rights in David Ramsey’s lease.
In the event Lady Elizabeth sold the first seven years of Ramsey’s lease to Gell, Milward, and a third partner, Thomas Michel, in 1654 and in 1655 sold the remainder, from 1661, to Richard Woolaston for £950 plus certain property. Woolaston resold it to the Earl of Northampton for £1,500. Thomas Coke had excluded the valuable Dovegang area from his bargain with the elder John Gell in 1638, but in 1654 Lady Elizabeth Coke sold the rights in the Dovegang to Woolaston and reunited them with those in the rest of the Wapentake by her sale of the rest of Ramsey’s lease in the following year. When John Gell blocked the new deputy Barmasters from collecting lot and cope in 1661, he claimed that he and his partners had made a verbal bargain with Thomas Coke in 1654. Coke had died in 1656, however, and was not available to back up Gell’s story. The Gells’ control of the Wirksworth lead industry had survived their association with a prominent royalist for the whole of the Civil War and beyond. Thomas Coke’s eventual disgrace and displacement by his sister-in-law ended it.

The mineral rights in Wirksworth continued to be fought over for the rest of the century and beyond (BM Add MSS 6681 ff231-266). There were many more legal battles, involving the monarchs and their courtiers, one of whom was the Lord Clifford of Chudleigh, son of one of the members of the group of Charles II’s ministers known by their initials as the Cabal. The presence in the Gell archives of the Barmaster’s accounts for the Carsington liberty for 1682 (D258/42/21) is evidence that the Gell family had renewed their investment. From the next decade there survives a three year lease from Clifford (BM Add MSS 6677 ff31-33). The lease, which ran from 1692 and was renewed for a further three years in 1695, was bought by Francis Gell, son of the younger John Gell and brother of the current baronet, Sir Phillip. It consisted of the dues in two thirds of the area.

Miners’ rights

While losing his claim to the rights in the Wapentake John Gell did gain one important concession from the Duchy court in 1662. This was recognition of his ownership of the mineral rights in Griffe Grange and exemption from paying duty to the Duchy on the lead mined there. Griffe Grange, near Gell’s estate at Hopton, had been held by the Gells since it had first been leased by John Gell’s great-grandfather Ralph from Dale Abbey and then bought by him in 1546, after the Abbey had been dissolved by Henry VIII. John Gell’s ownership of all rights in the mines of the Griffe were confirmed in the decree which confirmed Northampton’s claim to the mining dues in the rest of the Wapentake. The Gells ran the Griffe mines in traditional fashion, but miners’ rights were invariably more precarious in the private liberties than in those of the Duchy of Lancaster, and the Griffe miners sometimes found themselves paying higher lot charges than their neighbours on Carsington pasture.

The Gells’ success in excluding the Duchy of Lancaster from Griffe Grange was unique in Wirksworth Wapentake at the time. The gentry were in general hostile to the free miners’ privileges and there had been attempts in other places either to exclude the miners altogether or, like the Gells, to wrest control of the industry from the Duchy. In 1623 Robert Parker, lessee of the mineral rights in the Wapentake, had obtained an injunction in the Duchy Court instructing John Fitzherbert, lord of the manor of Tissington, to allow lead mining there. The court ruled that the mining rights in Tissington belonged to the Duchy
and not the manor. Unsuccessful attempts by other manorial lords to take control of the mineral rights had led to violent resistance by the miners in the 1650s and Henry Buxton of Bradbourne had no success when he claimed at the Duchy Court in 1662 that the rights in Bradbourne ought also to be separated from the rights in the Wirksworth Wapentake. However, the Duchy court took the opposite decision when the owners of the manors of Ible and Newton Grange brought similar cases in 1686. Ible’s lords of the manor were the Hopkinsons. As we have seen, they were allies of Richard Carrier in his conflicts with the miners in the 1620s and George Hopkinson had been appointed steward of the Dovegang as a reward for his support of Sir Robert Heath’s activities there in the 1630s. He and his son William had driven miners out of Ible on several occasions, and William was a witness against free mining in Newton Grange in 1686. Newton Grange had been a productive part of the Brassington liberty – the Barmaster had measured 89 loads of ore there in July 1639, for instance. However in the 1680s the lord of the manor took direct action against the exercise of traditional mining rights, in addition to the submissions he was making in court. John Derbyshire, defending free mining in Newton Grange, was imprisoned and his family harassed until he was forced into an undertaking never to mine there again. Griffe Grange, Newton Grange and Ible remained the only manors in the Wapentake which were not under the jurisdiction of the Duchy of Lancaster, and run under the “ancient custome of the mine”.

Tithe wars

The prolonged legal and physical struggles over tithes during the early years of the century (Slack, 1996) continued in the second half. In the 1670s the Rector of Matlock, John Chappell, conducted two long cases in an unsuccessful attempt to get his right to tithe confirmed (BM Add MSS 6676 f162-170). Chappell was inducted in 1671, and immediately moved to secure his tithe income, which he testified was the main income of the rectory. A case in the Exchequer in 1672 failed on the technicality that it had not defined titheable ore as being the ore which was liable to payment of lot. Chappell brought a second case in 1676, this time in the Court of the Duchy of Lancaster.

Chappell claimed that tithes had been paid to his predecessors, who had paid the miners 1d a dish for dressing the ore but that the miners had refused to pay him, in spite of the fact that over £1000 worth of ore had been mined in the previous three years. The tenth dish had been paid as part of the Barmaster’s reckoning, making the lot dish the fourteenth. Tithe was paid in all the parishes of the High and Low Peak except Bradbourne, and was the principal revenue of small churches. Chappell cited cases fought and won by Sir Francis Leake, Sir John Gell and Richard Carrier, vicar of Wirksworth, to establish their rights to tithe.

This picture of a smoothly running system of tithe gathering in the years before 1671 was belied by Chappell’s own witnesses who, while supporting his right to tithe, acknowledged that it was usually evaded – “the myners usually did conceale the parson’s duty”, “myners concealed their oare which when hee discovered hee troubled them with citations & gott satisfaction”. Evidence was given that one of the miners’ witnesses in 1672 had been given a bribe of £5 to lie to the court. A Brassington miner testified that the miners in his own and other named parishes paid tithe. This man must have known that the proprietor of the
Brassington tithes had fought a five-year battle before his right was legally established in 1672.

Chappell’s description of the tithe-gathering in Matlock was demolished by the miners. Any lead ore given to the Rectors was either a gift or was given to the persistent clergymen “for their quiet and not as duty”, to avoid legal action. The miners rehearsed some old arguments against tithes – “That the myners oftentimes spend greate sumes in the lead mynes before they gett any oare. And never knew the pretended penny a dish paid by any Rector to the myners for dressing the oare. That the payment of the said duty will bee disadvantage to his Majesty for that itt will discourage myners to gett & seeke for lead oare and will not make them any profit, oare not beeing to bee gott but at very greate charge in tymber soughing or drayning the water att greate labour & industry”.

It was stated that “myners used to give the parson something for reading prayers in a morninge; but the myners not cominge would give him noe more lead oare” and there were descriptions of the rebuffs suffered by tithe gatherers. One witness reported that he had been present when the Rector’s man arrived at a measuring and asked for a dish of tithe ore – “Younge answered for what; The other replied for praying for you at 6 in the morning; Younge said lett others give what they would wee should have noe oare of his”. Another witness, while a pupil of a former Rector, had been sent off with a bag to Side mine to collect ore at a measuring, and was turned away empty-handed. On another occasion, when a tithe gatherer appeared a miner “thrust him out of the coe & threw a dish of oare after him but Parsons man left it whereon Parson cyted him & hee appeared twice”. One seventy-six years old ore buyer testified that he had never known tithe paid in the whole of his long career, and “hath seene a fellowe goe with a bag to begge oare for the Rector of Matlocke, & sawe none given”. Only to avoid prosecution did the miners grudgingly hand over any ore to the Rector – “Parker sayes they would rather give any thinge of good will than goe to suite”.

Among the witnesses were several women. Although both the lead industry and seventeenth society generally were dominated by men, the women, as we have seen, were active in mining, smelting and the trade, and their frequent appearances in court cases demonstrated their knowledge of the industry and their willingness to speak their minds.

The parsons’ bill

The failure of Chappell’s lawsuits and subsequent failure to collect tithes prompted the vicars of Ashover, Matlock, Darley, Bonsall and Carsington to present a private bill to Parliament in 1701 in an effort to get their rights recognised. This, entitled “An Act for preventing multiplicity of vexacious suits, and for settling and ascertaining the tythes of lead oar in the said County”, was opposed by the mine owners. The vicars and their opponents both organised petitions to Parliament and to the nobility in Derbyshire (BM Add MSS 6682 ff225-228,239-244), and produced printed arguments to circulate among the influential merchants in London. The miners reiterated that while great amounts of ore had been mined in the five parishes, no tithe had ever been paid. They noted the failure of a case brought in Ashover in 1658, and of the 1672 and 1676 attempts at Matlock, and pointed out that the only successful tithe cases had been in other parishes. If this bill was adopted by Parliament tithes would be payable in every parish in Derbyshire with dire
consequences for the miners and for the royal revenue. It was pointed out that the Barmasters “are officers under the Crowne and are paid their sallaries by the farmers of the lott and cope” and that if the bill were passed they would become “subject to the country Parsons whose charity, God knows, to the Myners will bee as cold as the season is here, and its full as sharpe as any tyme in winter”.

This propaganda by the miners in the five parishes was backed up by similar arguments from other parts of the county. The clergymen referred to “the plaintiffs in these suits having multitudes of enemies” and there were ninety-nine signatories to one miners’ petition. Many of these made their mark in lieu of signature, indicating that working miners, as well as gentlemen owners, took part in the campaign. It was organised by the leading men in the industry, including in particular Thomas Bagshaw, of Ridge Hall, Chapel-en-le-Frith, currently living in Bakewell. Bagshaw, a lawyer, had great influence, managing to hold the office of steward in both the High Peak hundred and Wirksworth Wapentake at the same time as being a lessee of the lot and cope in the Wapentake. This combination of duties was eventually to produce a petition asking the Duchy to relieve him of the barmastership which, it was alleged, made it impossible for him to conduct the barmote courts fairly. While the tithe case lasted, however, Bagshaw organised the miners’ defence. Emissaries travelled the county, collecting signatures, and lodged in London, to lobby the Parliamentary Committee considering the bill.

Putting the parsons’ case

The clergy, in a printed broadsheet entitled “The country parson’s address to the merchants of London” stressed the charitable use of tithes in maintaining small churches and, in the case of the Brassington tithes, their value to charities which relieved poverty and promoted education. They denied that tithes damaged the industry, claimed support from certain mine owners and, in what was presumably a reference to Griff Grange, Newton and Ible, claimed that in some “peculiar Granges, or exempt places (where nothing is paid either to the King, or Parson)”, miners were often forced to hand over more than tithe and lot. In one petition to Parliament the clergymen noted that the opposition had spent over £12,000 in the previous eighty years in law suits and, implicitly acknowledging that tithes did damage the industry, stressed that the lead ore tithe was “peculiar to the county of Derby” and posed no threat to mining interests anywhere else.

The bill was promoted in London by the Rector of Carsington, Nathaniel Boothouse, who had local support from Sir Philip Gell. Boothouse’s letters to Gell, one of the mine owners whose support is claimed in the “address”, show a familiarity between the two men. However, Gell’s support was not based solely on personal friendship or altruism. He was himself a tithe holder. The Gell family had long held a third of the tithes of lead ore in Bakewell, Tideswell and Hope and one of the printed handbills circulated in support of the tithe bill noted that over £1500 had been spent maintaining their claim, a sum not available to poor clergymen. Sir Philip’s mining interests did not conflict with the clergymen’s tithe collecting since, apart from shares of mines on Carsington Pasture, most of his mining income came from other parishes and from Griff Grange. Boothouse kept Gell abreast of the progress of the bill. The members of the Commons committee examining the bill represented the mining areas of the country, including Devon and Cornwall.
Boothouse relied on Gell’s influence to persuade helpful witnesses to make the long journey to London. “Old Edward Hutchinson”, for instance, could help because only he and Gell’s late father, Sir John Gell II, who had told Boothouse about it, knew of two cases in which tithes had been paid by local mine owners. Sir Philip was asked to encourage Hutchinson to “sett forward hitherwards from Nottingham (or, as the Coach Master tells me, from Darby) on this day sennight to be here on Saturday se nnight, or he may take my mare if he dares ride her, or he may have any horse he likes & we will pay the charges, or howsoever he must needs sett out on Monday after Easter”. Boothouse complained that the opposition was using “sacrilege, perjury and lying” and promised to discomfort “TB” by demonstrating his “wickedness & hypocrisy as naked as my nail”. TB was presumably Thomas Bagshaw, and Gell must have read this with mixed feelings as he was in debt to Bagshaw, who was his lawyer, and was in regular communication with him. Boothouse described the miners’ petition and the printed handbill, “both drawn by TB”, as “all one continuous falshood”, and “saw TBs cloven foot” in another petition.

The verdict obtained by the holder of the Brassington tithes in 1672 had been ineffective, and further injunctions had been taken out against the miners in 1683. A letter to the tithe holder from his tenant in Brassington in December 1683 makes it clear that the leading figures in the industry were organising the resistance to the tithe collectors – “Mr Travis ... is the occasion of this suite by driving them into this rebellion”. Travis, or Trevis, was the son of a former deputy Barmaster, and was a mine shareholder. Boothouse called on the charities supported by these Brassington tithes to throw in their weight behind the bill. They included Christ’s Hospital, poor students at Oxford University and charities for the relief of poverty in Lincolnshire and Chippenham, “all who are great sufferers yearly by loss of the Tyth oar in Brassington”. He lamented that these corporate bodies were slow to act. However “just now, as I was writing this, comes to me the beadle of Christ’s Hospital with a letter from the Clerk & Treasurer there to tell me that the Governoures will meet on Monday morning 10 o’clock & desire me to meet ‘em with a copy of our bill, which I intend to do”.

In spite of the intense lobbying, however, the committee was dominated by the mining interest, so much so that its chairman advised Boothouse to withdraw the bill. Boothouse persisted, but the clergy were in fact faced with opposition from the whole industry, not simply the miners – Boothouse asked Gell “to afford us a line or two for Mr Wigfall or other merchants of that kind; it may tend to disabuse ‘em, for they are really engaged against us”. He confessed that though the chairman had said that he was satisfied of the justice of the clergy’s case “Mr Boscowan & his Cornudos [Cornishmen] & ye Devonshires, & Mr Humphrey Mackworth & his mine adventurers & Sir Rowland Gryll & Lord knows who, have all of ‘em found such strong parties against us that it is impossible to gett our bill passed”. By 26 April 1701 Boothouse was sending word that Edward Hutchinson need not after all travel to London.

Tithe disputes continued throughout the eighteenth century. The struggle between the miners and the church was finally settled by an agreement reached with the vicars of Wirksworth, Bonsall and Cromford in 1780. At a meeting with the rich owners of the larger mines, the vicars agreed to accept tithe payments of one twenty-fifth. This was then put to the working miners who, however, would settle for nothing greater than a fortieth. This was accepted by the vicars and this cause of conflict was at last ended.
Chapter 8: Development and decline

Mine drainage

The soughs of the seventeenth and eighteenth centuries largely solved the water problem in the mines in the Wirksworth, Middleton and Cromford liberties. There was no need for the steam powered pumps used in Winster and other High Peak liberties and rag and chain pumps continued to be used to supplement the soughs. In the only other liberty in the Wapentake where there was mine flooding, Matlock, pumps driven by water wheels were introduced. For example, in one such attempt a group of mine owners in Matlock and Matlock Bath joined in 1766 in an agreement to rechannel the Derwent at Matlock in order to erect an “engine” on the diversion. The engine would pump water from the Dimple Mine and carry it back to the Derwent. A wheel driven pump, capable of raising 1,000 gallons of water per minute, was installed at the Side mine at Matlock in 1824.

13. Via Gellia cupola smelter, about 1822. It was at the junction with Clatterway, and later became a cotton mill (from Views of Derbyshire, by J. Rawlinson, 1822)
Smelting by cupola

The improvement in smelting efficiency achieved by the ore-hearth furnace was carried forward during the eighteenth century by the gradual introduction of a new type of furnace – the cupola. The ore-hearth had a number of disadvantages. Its characteristic over-heating and dissemination of polluting fumes made it necessary to close the smelter down at the end of each day’s work. The hearth burned out quickly and regular weekly repairs or rebuilding were necessary – between 24th June and 29th September 1657, for instance, thirteen new hearths were required at the Upper Mill in Wirksworth. Water-powered blast furnaces were restricted to riverside sites and “white coal” fuel required a good supply of timber. By the eighteenth century timber supplies were running out and, where coke or coal was used because of timber shortages, impurities, particularly sulphur, were introduced into the lead. It was, finally, less efficient than the cupola.

The cupola worked on the reverberatory principle. The fuel was burned in a combustion chamber at the side of the furnace, separate from the “charge” of ore, thus avoiding any contamination. This removed the disadvantage in using coal, which was far more plentiful than timber. The ore was loaded from a hopper into a concave furnace with a low, arched roof and a tall chimney or a flue at the opposite end from the combustion chamber. Horizontal flues were introduced to trap pollutants before they could be discharged into the air through the chimney. The flames and heated gases from the fuel were drawn across the charge by the draught from the chimney and beaten down by reverberation from the low roof. Slag on the surface of the molten lead was raked off and the lead itself poured into an iron pot at the side, before being ladled into moulds.

Several factors contributed to the cupola’s greater efficiency than the blast furnace. Unlike the blast furnace it could be operated continuously. Since the air flow over the ore was less powerful than that from the bellows of the blast furnace fewer lead particles were blown away. Further lead was saved by the fact that since the fuel and the charge were separate none of the lead was lost among the ash. Since no water power was needed the cupola had a fourth theoretical advantage of being freed from the riverside location of the blast furnace, and able to be placed in the most convenient site for supply of ore and coal. However the higher temperatures needed to melt the slag recovered from the primary melt required a water powered blast furnace and, since slag mills tended to be placed next to the cupolas, most cupolas remained in riverside sites.

From around the middle of the eighteenth century these more efficient and less polluting smelters began to replace blast furnaces. The Gells’ three mills in Wirksworth, Upper, Middle and Nether, were still in operation in 1715, leased to John Hutchinson until the following year. Gell was in dispute with his tenant over rents. Hutchinson was currently paying a total of £180 a year for the three mills and Gell estimated that he smelted 900 fothers of lead for which he charged £720, leaving him £540 to pay for repairs, supplies and wages and leave a very good profit. This was on the basis of single shift working and Gell noted that Hutchinson had operated double shifts for some years and even three on occasion. All three of these busy mills had either ceased smelting or were doing little business by the middle of the century. Middle Mill was leased in 1751, the rent for the first two years of the lease being a peppercorn and for succeeding years £10. It was later
converted to a dyeing works. By the end of the century Nether Mill was leased to Richard Arkwright, who had permission to dismantle it and reuse the stone.

The Wash Green mill at Wirksworth was converted to the new principle in about 1749. Francis Hurt built a cupola at Alderwasley, and others were installed at Bonsall, Cromford, Lea, Lumsdale and Via Gellia.

Decline

While soughs and pumps allowed access to greater supplies of ore, while gunpowder allowed the miners to get their ore more quickly, and while improved dressing and smelting methods greatly increased the amount of saleable lead, there was a gradual decline in the industry through the eighteenth century. There were still periods of prosperity, there were still discoveries of rich deposits and the miners continued to divide their time between their small land-holdings and their little mines. Investment continued throughout the century and into the nineteenth. The returns shrank, however, for the gentlemen share holders and the local miners alike and, while the old industry took a long time to die, its best times were long gone by the end of the 1700s.

The Gells and the diminishing lead trade

The lead industry had always alternated good times with bad. One of the bad times came in Wirksworth at the turn of the seventeenth century, at a time when most of the veins dewatered by the soughs had been mined and before the Cromford Sough was restarted. The price of lead fell in the last quarter of the century and the Wirksworth gentry petitioned the county magistrates to restore a “house of correction”. It was needed, they said, because the town was “greatly oppressed with Poor by reason of the Mines now being in decay”. The petitioners were building workhouses and establishing a factory to find work for the unemployed miners.

The fortunes of the Gell family followed the ups and downs of lead. Even with their large holdings in mines, their smelters and their involvement in soughing adventures, the family was unable to recapture the financial clout enjoyed by Sir John Gell before the Civil War. Sir John’s losses during the War and his failure in many attempts to persuade Parliament to pay for them – he had been awarded only £3,000 - meant that the next two generations of the family were always short of capital. The loss of the mineral rights in 1661 accentuated their difficulties, and Sir John’s son and grandson both used family connections to raise money. In 1664 his daughter-in-law borrowed £1500 from Robert Eyre of Highlow, father of her daughter’s husband William, and surrendered the family’s Raventor, Bayleycroft and Lyddow Flats mines in Wirksworth and the mines on Cromford Moor and in the Dun Rake, for the duration of the loan, to two men who were standing as sureties for it. As soon as her son Philip inherited the estate and baronetcy in 1689 he was seeking ways to raise enough money to pay off debts left by his father, who in 1678 and 1687 had put parts of the estate in trust to William Eyre and other relatives, the rents to be used to pay off debts. After protracted negotiations over possible loans of £2000 or £1000, carried on by his agent in London, Sir Phillip wrote in 1692 that “I think it better to take but one thousand at present, for if it be called for again one is easier to pay than two”.

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His brother Francis, in financial straits and beholden to Sir Philip, claimed in 1693 to have a friend “that will furnish you with £7000 att 5 percent on the mortgage of my father's estate”. Francis, who was a London merchant, had accepted an annuity of £100 with an eventual payment of £2000 in return for his share of the trust property and the rest of the landed estate (he kept his share of the mines and soughs). Sir Philip and Francis Gell and their collaborators had to use the courts to enforce payment of composition ore from the owners of Ratchwood, Venture and Northcliffe mines drained by the Hannage and other soughs in which they had invested. There were obscure disputes – in 1701 Sir Philip claimed title to certain mines on the grounds that the possession stows placed by rival miners who were searching for a vein were “watch stows” which could properly be removed and replaced by his own once the vein was discovered. He was advised by his lawyer, after consultation with an eminent barrister, that he had no chance of winning his case, since his opponents had been honestly searching for a vein which they knew existed and no court would find for the man who “stands above ground or hears ‘em say they have found a vein & claps down his stows before they can get out of the hole”.

Francis Gell’s lease of the lot and cope in one third of the Wapentake from 1692-1698 brought him an income of about £1400 from a total of 914 loads of lot ore from the Wirksworth liberty. This liberty’s figures are the only ones surviving and his total income from lot and cope would have been larger. However, by the 1690s the lead trade was in an unprofitable period, one which proved to be the start of a long decline, and neither his income from lot and cope nor his other investment in mines and in sough building were enough to save Francis Gell from bankruptcy.

Desperate for money, Francis sold his annuity, defaulted on the payment and was bailed out by Thomas Bagshaw in 1697. He was declared bankrupt in 1699 and again in 1706. In 1708 Sir Philip, having finally paid off his own debts, redeemed the property from Bagshaw for £2000 and took out a two year mortgage on Griffe Grange with him for the same amount. At the end of the two years Gell defaulted on the mortgage, which was renegotiated in 1712. He redeemed it only in 1718, a year before his death. A further indication that the Gells’ mining interests had become inadequate to maintain their estate is seen in extensive property sales carried out by Sir Philip Gell in the early 18th century.

Export duty

The trade was still hampered by the export duty. Even reduced from its highest point of 48/- a fother to the more manageable 20/- which had been achieved in 1641 it was still a burden and the lead interest argued for its complete removal. Sir Philip Gell rehearsed the arguments early in Queen Anne’s reign. Lead was one of the three staple products of the English trade, the others being cloth and tin. All duties had been removed from the cloth trade, because of its value to the whole national economy. The duty on tin had been replaced by alternatives for the royal revenue and Gell argued that lead should be given the same treatment.

As a young man, before the death of an elder brother made him heir to the baronetcy, Philip Gell had been a cloth merchant. After two years trading in London he had lived from 1773 to 1775 in Smyrna, the modern Izmir, in Turkey, and for a few months in Tripoli, as a
prisoner of corsairs who had captured him on his way home. He knew that there was a valuable trade with Turkey in all three of the English staples. Wool of all grades was bought cheaply in Turkey, shipped to England to be woven and then returned to Turkey, where it was bartered for other commodities. Lead and tin were sold for cash. Gell argued that the encouragement already given to this trade by lifting the duty on cloth and tin should be increased by lifting the lead duty. Gell had the export figures for lead for the six years 1699 to 1704. The total was 66,580 fother, a fother defined as 20 hundredweight, and the highest annual figure, in 1701, was 12,853. It was “modestly computed” that the industry employed 10,000 men, women and children in Derbyshire alone and that lifting the duty would bring an increase in their wages and in the price of ore, with a concomitant rise in the revenue from lot. The duty raised £12,000 in some years, a very small proportion of the whole national revenue, but if Parliament judged that the revenue lost by removing the lead duty would have to be found elsewhere, Gell had some suggestions. An import duty on Irish wool would make English wool more competitive and make sheep farmers more willing to pay their taxes. A tax on ships provisioned with Irish beef would encourage the English beef trade. An import tax on Scottish beef would also help English cattle farmers and persuade them to pay their land taxes. The East India trade should be taxed. Gell knew, having “measured their cloth for seavere ll yeares”, that East Indiamen refused to transport any more cloth than had been pre-sold. Instead the trade consisted of exporting bullion and importing ”trifles”. In particular he suggested that an import tax on “chinaware” could replace the lead duty.

Peaks and troughs

There are few production statistics for the eighteenth century, but the lead industry remained a worthwhile investment until about 1780. A letter from one gentleman to another who was looking for ways of increasing his income enough to stand for public office, advised in 1723 that farming was not profitable enough to interest a gentleman but that “you cannot deale in a more solid and stable commodity than that of lead”. He thought that owning mines and ore buying were both “very precarious, unless one was to be allwayes on the spot, & knew very well who one had to deale with”. He advised buying lead from the mill and exporting it via Hull, and calculated that a profit of 3½ percent was possible on each consignment. Four consignments a year would mean an annual profit of 14 percent, and five or six consignments were feasible.

There were peaks of activity after 1710 and in 1730, in the 1750s and 1760s, and in the late 1780s. However, an indication of the increasing difficulties of the industry is the formation in 1771 of the Society for the Encouragement of Mining in the Wapentake of Wirksworth. The forty-one members included twenty-one from outside the county, as well as members of the Gell, Hurt, Nightingale and other local gentry and trading families. It was an attempt to encourage investment in a faltering trade. The late burst of prosperity at the old Raventor mine caused by the arrival there of a branch of the Cromford Sough was short-lived. Production figures for the mine show a peak of 4661 loads mined in 1773. This dropped to 3840 in the following year and to 2036 by 1777. In 1783 only 394 loads were mined and Philip Gell’s income from his sixteenth share was £12-2-0d for the year.
The Griffe Grange mines

The Gell family had retained their ownership of the mines in Griffe Grange, and Philip Gell, in another attempt to exclude the free miners, brought an action in the Duchy court in 1780 to claim that Hopton Wood and Hopton Moor were parts of his private liberty. He was faced with a succession of witnesses to the fact that the Brassington Barmaster had jurisdiction “as far as the fence on the top of the Griff”. Among the mines in contention were the Eblows (Ebb Leas) mines marked on the 1725 sketch map (map 5). The surviving records of the family’s activities in the Griffe during the eighteenth century illustrate both the investment which continued to be made in mining and the fall in returns from it.

Most of the Griffe mines were of the same type as those in the neighbouring area of Carsington Pasture – shallow and poor producers. Like the Carsington mines, most were dry, though a soughing agreement was made in 1735 by John Gell with twelve gentlemen investors, who included Gell’s agent, George Tomlinson, and seven other local men plus three from Cheshire and one from Nottingham. The agreement stressed that the Griffe was not part of the King’s Field and that any activity was by permission of John Gell and under his terms. Any ore was to be measured in a dish prescribed by Gell who, either in person or represented by his agent, was to be present at measuring. Gell was to have a lot payment of one ninth, more, as the parsons had alleged in 1701, than either the Duchy lot or tithe, plus a cope of 6d per load. He was to provide wood to the value of 40/- annually for coes and stemples and had unlimited right to inspect the workings during daytime and repossess them if they were left unworked for three weeks or more. The sough was to go from a swallow, or natural cavity, called Markdale (OS 252 562), and dewater Horse Close vein, Meadow vein, Mathers vein, Simpsons vein, Wigleys or Fynesdale Rake and other veins. The sough has not been found but possible evidence that it was in fact driven with some success is a reference in a mining agreement of 1771 to a number of mines and veins which included the Old Sough Vein. These mines lay “in or South of Markdale in the said Griff”. Since one of the veins to be drained by the 1735 sough, Fynesdale Rake, is shown in a sketch of 1725 running into the area of the Griff Grange Valley, it is clear that the sough was driven south from the valley, into the Griffe Grange ore field. The 1771 agreement concerns mines “in the said Griff so far as the Horse Road to the East which leads down to the Griff House from Hopton Moor”. This road is presumably the one marked on the 1725 sketch.

A water problem is also suggested in a letter in June 1775 to Philip Gell from the family’s solicitor which refers to sinking shafts “while the springs are so low that we may have everything ready against the Engine arrives”. Output from the Griffe was usually low in the late 18th century. In 1783 a total of 87 loads 7 dishes of ore were mined in the Griffe, bringing an income from lot and cope of £12-10-1d for the year. These figures for the Griffe suggest a similar sudden drop in output as had occurred at Raventor, since accounts during the 1770s had shown large lot and cope payments for the biggest mine in Griffe Grange, Golconda.
Golconda

In 1769 Philip Gell reached an agreement with his two unmarried sisters and ten others to work Golconda and another mine in the Griffe. Gell took two of twenty-four shares and was to receive a lot payment of every ninth dish of ore mined. For the years 1771 to 1775 Philip Gell received a total of £814-10-5d in lot and cope payments from Golconda. The highest payment, £362-11-5d, came in 1773, and the fact that by 1775 the annual receipts had dropped to £40-8-7d suggest that a large deposit had been worked out. The same accounts suggest that the large amounts of ore mined there had not recouped the money spent in developing the mine, since they include “By cash paid for loss at Golconda Mine, beginning 22nd May 1773, and ending 30th June 1776 - £33-15-8d”. Another note reckons the total profit from Philip Gell’s two shares between 1769 and 1776 at £127-10s, offset by losses of £65-6-2d, leaving a total profit for the seven years of £62-6-2d. The income from lead received by Philip Gell in the last quarter of the 18th century was a small part of the total income of the estate, which was about £3000 per annum.

14. Outside the coe at Golconda mine, about 1907.
Free mining under fire

Landowners were increasingly using the courts to challenge the miners’ ancient rights. A letter of 1746 refers to the “decay” of lead mining because of the ruin of the mining laws and customs, and the miners and mine owners petitioned the Duchy. They declared that “the myners have time immemorial had peculiar Laws & Customs for the working & governing of the said Lead Mines, & without a due observance of which Laws, the Mines cannot be worked, but must be ruined & destroyed, to the utter impoverishing of many 1000 families, & the great detriment of the Kingdome. That by the Minerall Customs if the Miners be oppressed, their properties invaded, or their Laws infringed, their dernier [last] resort for redress & protection is to your Lordship in the Duchy Court. That of late years the Customs of the Mines are infringed, the Miners & their rights are forced to appear in Courts & try their rights before incompotent judges ignorant of their Laws & Customes, to their utter ruin”. A note to a copy of the petition listed some of the miners' grievances. The duties were being farmed out to men who did not understand the mining customs, mines were being “arrested” without justification, wood for mine timbering was being removed and tax was being levied on candles and windows.

The miners’ grievances were keenly felt, sufficiently so to bring them on to the streets in 1756, when a large crowd rioted in Wirksworth, attacking and damaging some of the mills. The magistrates called out the yeomanry and a unit of dragoons dispersed the miners, killing several and capturing others.

Falling profits

Lot and cope were becoming much less profitable and the lessees sought to increase their income. Low-grade ore, known as “smitham” or “offal”, had been exempt from payment of lot, but the rise in the amount of it presented for sale, and the suspicion that miners were producing it by crushing otherwise lot-grade ore, prompted the Duke of Devonshire to fight a prolonged case with the proprietors of the Portway Mine in Winster to have smitham made liable for lot in the High Peak. He won his case in 1756, and the lessee of the lead duties in the Wirksworth Wapentake, John Rowles, began a similar case in 1766.

At the same time, in a move which illustrated the declining profit to be made from the industry, Rowles attempted to strengthen his case for payment of lot on smitham by agreeing to reduce it for all grades of ore, from every thirteenth dish to every twenty-fifth, acknowledging that the traditional tax had now become too heavy a burden on an increasingly expensive trade. In a printed broadsheet written and signed by the Barmaster, Anthony Tissington, in 1773, it was argued against Rowles that smitham was the product of poor men’s mines and that those mines rich enough to be owned by gentlemen produced mostly the high-grade ore known as “bing” or “peasy” ore. Where half or more of a mine’s output was bing, the proposed new duty of every twenty-fifth dish on all grades would be the same or less than the duty of every thirteenth dish paid only on bing or peasy. The opposite would be the case in poor mines, where most of the output was smitham, with the result that such mines would be uneconomic to develop. If lot was levied on the predominantly smitham ore from such a mine, at the current price of 3/- a dish the miner would be paying £4-1-0d on fifty loads of smitham and one of bing ore, “a sum probably
three times as great as all he had for his labour after payment of all necessary charges”. Tissington alleged that those mine owners who supported Rowles’s proposal did so for the cynical reason that in making poor mines uneconomic the imposition of lot on smitham would force the miners to work for them. “How cruel! That those very people who have rose from labourers to maintainers [owners] by means of this custom should themselves become the betrayers of that custom and rivet slavery on their descendants”.

In a revealing description of the nature of the trade Tissington claimed that levying lot on smitham would also be unwise, since rich mines usually became poor ones. He argued that failure to work mines when their output dropped, a recurrent state in all mines, would soon destroy the industry. “There are very few rich Mines now, that will be so ten years hence; fewer that will be so at twenty. The Gentlemen Maintainers desert them because they are poor; the labouring Miner cannot work them, because of the new Duty of Lot on Smitham; new Discoveries are by this new Duty prevented”. He forecast mass emigration by impoverished miners.

Supporters of Rowles’s compromise assumed that the new levy, like the old, would never be exacted for smitham – “Supposing that he could establish his claim upon smitham (which I hope he never will) it would not be in his interest to take it”. This assumption proved correct. A Barmasters record for the 1790s shows lot of every twenty-fifth dish levied on ore and none on “belland” or smitham. By this time a shortage of mined ore, improved budding techniques and the ability of cupola smelters to process the smallest particles of ore, had prompted an increase in the reworking of old spoil heaps. In a case lasting from 1795 until 1797 a group of Wensley miners were taken to court for carting old mine hillocks from Wensley down to Darley Bridge for budding near the River Derwent. They were accused of polluting the river by their activities.

Tissington painted a picture of life in the Wirksworth mines in the middle of the eighteenth century – “The labouring miners generally work one shift a day at the mines of gentlemen for bread for their families, and in an evening go for a few hours to one of these poor mines for themselves, for which they do not often get one shilling per week, but from the hope of some discovery they toil on”. While lot was not levied on smitham, the general running down of the industry did indeed provoke emigration from the Derbyshire lead mines.

Daniel Defoe and the miners

Daniel Defoe’s conversation with the miner he met on Brassington Moor, and with a miner’s wife whom he had met earlier, produced a vivid picture of the working life and reward of the small miner at the time. At Wirksworth he had noted that “there is no very great trade to this town but what relates to the lead works, and to the subterranean wretches, who they call Peakrills, who work in the mines, and who live all round this town every way”. “Peakrill” was a dismissive and somewhat contemptuous term used by educated outsiders for the “lower orders” of the Peak District. Defoe described the miners as “a rude boorish kind of people” but also as a “bold, daring, and even desperate kind of fellows in their search into the bowels of the earth; for no people in the world can outdo them”. He noted the strange mining customs, the rule of Barmasters and juries, and the quarrelsome nature of the miners.
Defoe then set off over Brassington Moor and came upon a woman and her children living in a cave usually thought to be the cave at Harborough Rocks, which has evidence of prolonged occupation. She was a miner’s wife and told Defoe that her husband earned about 5d a day. She herself, when she could leave the children, could earn another 3d by washing ore. Defoe’s comments on this woman and her cave home belie the low opinion of the “subterranean wretches” generally held by people of his class. Inside the cave “everything was neat and clean” and the family “seemed to live very pleasantly, the children looked plump and fat, ruddy and wholesome; the woman was tall, well shaped, clean, and (for the place) a very well looking, comely woman”. The description of his work given by the miner whom he met after leaving the woman, which had to be translated for him from the Derbyshire dialect, so moved Defoe that he thanked God “that we were not appointed to get our bread thus, one hundred and fifty yards under ground, or in a hole as deep in the earth as the cross upon St Paul’s cupulo is high out of it”. Defoe gave the miner 2/- for a piece of ore, more than he could earn in three day’s work, and when he met him later in an alehouse in Brassington, gave him more money to take home to his family.

**Damaging duties**

Every attempt to persuade the government to abolish the export duty failed. Far from removing or even lowering it, the authorities continued to regard the lead trade as a suitable source of revenue. In 1784 the duty was raised, and it was reported in the following year that the effect of the increase in duty was to reduce the export trade from Hull and Newcastle by 25 percent and lower the price of lead at Hull from £17 to £16.5.0d a ton. It was argued that lower export prices meant lower prices throughout the industry, including the home trade. The export trade was at a disadvantage with German, Italian and Spanish lead and there were rich veins in New England which would attract English miners put out of work at home. Even Scottish mines could undersell English and Welsh ones since they had retained the exemption from duty which they had had before the Union of 1707. It was not until after the Napoleonic Wars, with the English lead trade under increasing competition, that the government yielded to the pressure from the industry. The duty was abolished in 1816.

The decline of the industry after the late-eighteenth century was due to worked-out veins, increased production costs and the discovery of much cheaper foreign sources. The industry was protected from this foreign ore by import duty in the late 18th and early 19th centuries. A progressive reduction in the duty after the 1820s and its abolition in 1845 brought a steep rise in the volume of lead imported into England and accelerated the local industry’s decline.

**The end**

There were still bursts of high production, and indeed the output of certain mines during the eighteenth and nineteenth centuries exceeded anything achieved in the seventeenth century. At Brassington, for instance, a liberty which had always been a low producer, rich finds at the Victoria and Old Brassington mines boosted the annual production to more than 1,000 loads (250 tons) of ore between 1847 and 1864, with over 2,000 loads (500 tons) being raised in 1861 and 1862. This late flowering at Brassington proved to be very brief.
By 1878 total production in the liberty had dropped below 100 loads, and in 1888 just 2 loads 6 dishes were mined there.

In 1863 it was stated that Ranter, Ratchwood, Bage, Sough, Good Luck and North Town End mines had been the most productive in Wirksworth. Statistics for the period a few years later, however, show that in 1872 Ranter produced 4 tons of ore and Ratchwood 3.9 while Sough, Good Luck and North Town End submitted no figures. The only productive mine at the end of the century was Bage, which produced a total of 2245 tons between 1872 and 1887, an annual average of 140.3 tons. The figure for 1887, however, was down to 75 tons and by 1894 Bage was employing only four men underground and three on the surface. By 1891 the number of men employed in the Derbyshire lead mines had fallen to 285, most of whom worked at the Millclose Mine at Darley Bridge. Most of the former lead miners who had remained in the area, and their descendants, found work in the new quarries, opened to supply the roadstone and chemical industries – there were 3488 quarrymen in Derbyshire in 1891. By 1908 the only man working at Bage was one surface worker and in 1905 the total output of the Wirksworth liberty was 47 loads 7 dishes (12 tons). Apart from Bage, the last significant amounts of ore in the Wapentake had been mined at Millclose which was in Wensley liberty until 1879, when the workings entered the property of the Thornhill family of Stanton. Millclose, the biggest lead mine in the country, took the Derbyshire lead industry into the twentieth century. It flourished when every other mine had become of interest only to historians, and ensured that the long story of lead mining ended on a high note.

15. The ruins of Bage mine, about 1933.
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