

# CASE HISTORY: ASPECTS OF THE LATE SEVENTEENTH CENTURY LEAD INDUSTRY IN WIRKSWORTH, DERBYSHIRE, REVEALED IN THE COURTS

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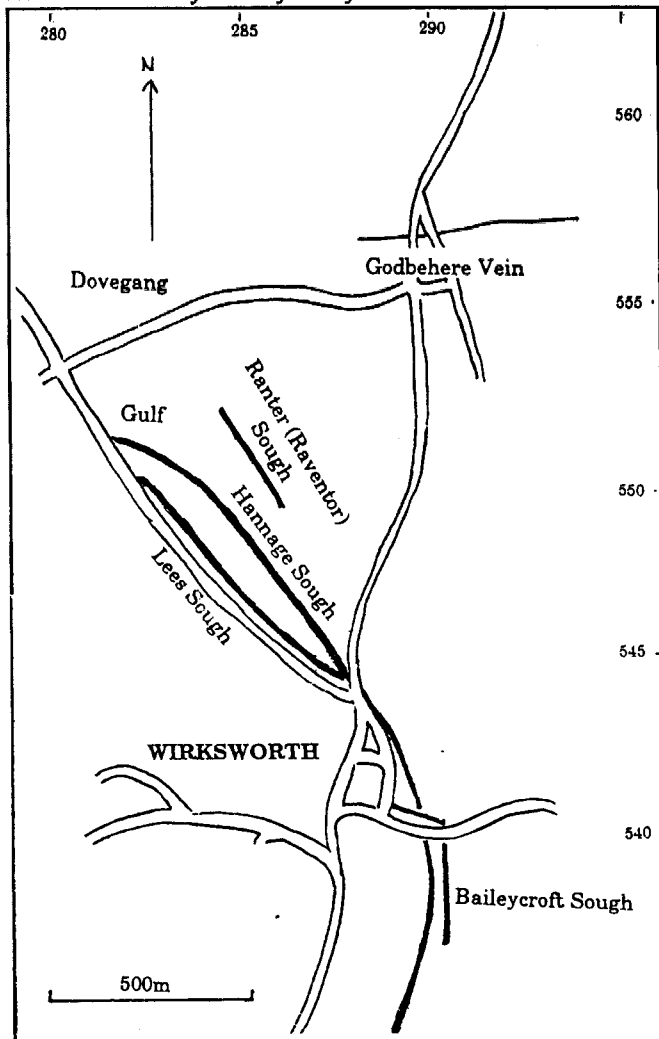
**Abstract:** Legal submissions throw light on certain aspects of the lead mining industry in the Wirksworth Wapentake during the latter half of the 17th century, including sough construction and the consequent rise in production, the export trade via Bawtry and Wilne Ferry, the competition to obtain the lease of the duties of lot and cope and the attempts by clergymen to assert their right to tithes of lead ore.

## THE BAILEYCROFT Sough

The lead industry in Wirksworth had suffered little disruption during the Civil War of 1642-1646, largely through the efforts of the Parliamentary commander, Sir John Gell who, as a major beneficiary from its operation, had every incentive to maintain the industry and its trade while he fought to prevent royalist incursions (Slack, 1997b). Construction of Sir Cornelius Vermuyden's Dovegang Sough, begun in 1631, had continued

intermittently throughout the war, and the industry in the area reached new heights of productivity in mid-century, following the sough's completion. This sough was followed by many which were undertaken in the second half of the century, resulting in the Low Peak becoming the highest producer in the country.

Fig. 1. The Godbehere vein and the 17th century Soughs which drained the mines of the Gulf and of Wirksworth town.



In the summer of 1673 the owners of a number of corn mills in Wirksworth brought an action against the proprietors of a sough which had recently been completed. This sough drained the waterlogged 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 (D258/7/21). 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 (D258/7/20/8). Mrs Primate's heirs pursued her complaints in the Court of Chancery on 19 November 1673 and in the Duchy Court on the 28<sup>th</sup> (D258/7/20/5). 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 agent's accounts of Baileycroft Sough have survived and have been used in a very detailed description of the sough's construction (Rieuwerts, 1980). 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.

Until the 17th 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. The problem was solved by the introduction of Soughs, driven into flooded veins to allow the water to run off. The first, Vermuyden's Sough, driven between 1631 and 1651, succeeded in draining the rich mines of the Dovegang area (Fig. 1) and enabling large amounts of ore to be mined there. It was followed by a succession

of soughs which by the end of the century had drained enough of the mines in the Wirksworth Wapentake, or Low Peak, 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 (Rieuwerts, 1998), and was continued in the eighteenth century, and Hannage Sough, begun in 1693 and also continued into the next century. Also among the important 17th 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, Lees and Hannage Soughs. The Bates and Cromford Soughs drained mines on Cromford Moor - Bates Sough had reached the Dovegang by 1684 (Rieuwerts, 1987).

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. For example, 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 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" (D258/23/7/1).

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" – this was a very large sum and is more likely to have been the correct figure than the £3000 given in Anne Primate's draft petition. 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.

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. On 27 May 1668 he wrote to Gell hoping that "our sough" was making progress (D258/35/50). It was at that time being driven rapidly through shale and had reached a sufficient depth to require artificial ventilation. He 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 – "see thous 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 enspecksion 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.

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 (D258/35/50/1-61). From April to July 1670, for instance, the total cost incurred in driving the sough was £38-4-0d (D258/35/20/1-7). 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 rodts", which may have been intended for use in setting charges. The cost of the powder was 6d. If powder was still priced in 1671 at the same price as four pounds of it had been appraised in a Wirksworth shopkeeper's will in 1617 (Slack, 1991), 6d would buy half a pound. This was not enough to make a significant contribution in the Baileycroft and the soughers clearly finished the project by the same methods used earlier. The cost of powder cannot have been the over-riding reason – a few years later the miners in the Dovegang used over a ton of gunpowder between 1676 and 1681. This was bought at 10d a pound, a total expenditure of £93-10-0d (RGO 33).

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. The letter of May 1668 refers to a visit by the Gell family and mentions Gell's father, Sir John. The elder Gell was a neighbour of Primate's in London, and 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 counters to play with" and expressed pleasure that another son's eyes were "purfet well". A year later 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 (D258/35/50). 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 (D258/35/50). 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 "bufte 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 (D258/10/53/2). 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 (D258/8/1/1-22). 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 benefit". 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 wrought the workes much after my father's coming away".

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 - Lowe 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 (D258/33/2/6 & /18/44/2). 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, 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 malicious 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 Councill [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 (D258/7/20/8). 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 survivorshippe" after her husband's death, and asked the Chancellor of the Duchy to issue subpoenas to Sir John Gell and his "confederates" to appear before the Duchy Court to answer her charges.

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 (D258/7/21). 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. Gell noted later "This sough took away the water from the corn mills in Wirksworth, for which the owner 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" (BM Add MSS 6676 ff182d)

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 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 helpes 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.

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" (D258/7/20/5). 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" (D258/7/20/7), 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 (D258/7/20/7). 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 17th century soughs in giving access to hitherto inaccessible veins.

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 (D258/34/20/2), circulated the miners in November 1675 to check on their willingness to subscribe to the articles (D258/35/20/8-10). 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. It became redundant when the Hannage Sough was driven under the Gulf area to the north of Wirksworth between 1693 and 1700 (Rieuwert, 1987).

## ORE PRODUCTION

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 in 1659/60 to 1432 in 1660/61. Table 1 (below), shows that that level of production was still being reached at the end of the century. The

**Table 1. Wirksworth Liberty ore production 1692-98 in loads and dishes.**

	Grove	Offal	Caved	Lots	Totals
1692 (June-Dec)	810-5	231-3	203-8	68-5	1314-3
1693	1313-7	349-4	342-3	106-6	2112-2
1694	1112-1	285-6	380-6	90-4	1868-8
1695	922-1	216-3	273-8	77-2	1489-5
1696	1966-7	390-6	418-3	161-1	2936-8
1697	4444-7	805-8	670-8	367-3	6288-8
1698 (Jan-Mar)	519-0	130-1	92-8	43-8	785-8
<b>Totals</b>	<b>11089-1</b>	<b>2409-4</b>	<b>2382-8</b>	<b>914-2</b>	<b>16796-6</b>

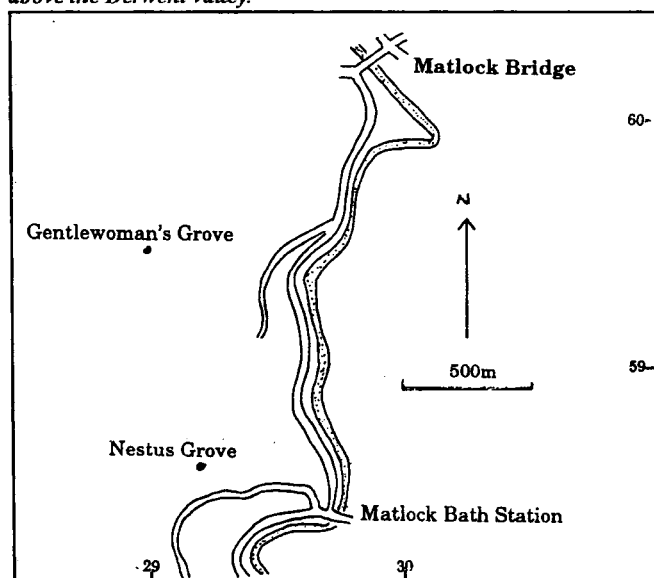
(Grove = mined ore; offal = low-grade ore; caved = re-washed ore from old spoil heaps; lots = duty of every thirteenth dish paid only on grove ore - offal and caved ore were exempt. There were 9 dishes per load, and approximately four loads to the ton.)

sudden rise in 1696 and 1697 coincided with the arrival of the Hannage Sough at the Well Grove vein in 1696 (Rieuwert, 1987).

Surviving accounts for the mines of the Dovegang for the period 1676 to 1683, show that these mines, the first ones in the Wirksworth Wapentake to be drained by a Sough, were still highly productive at the beginning of the period (RGO 33). 5,197 loads were measured in the nine months April-December 1676 and, while there was a fall to 1,883 loads for the whole of 1677 and to 1,480 in 1678, production rose again in 1679, when 1,685 loads 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 were sold in 1680/81, and 505 and 429 respectively in the two following years.

In addition to the predictable rise in production in newly-drained fields such as Wirksworth and the Dovegang, fragmentary figures

**Fig. 2. Gentlewoman's and Nestus mines, on the Western hillside above the Derwent valley.**



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.

Both sides in a dispute over the payment of tithes to the Rector of Matlock, described below, claimed high output from the mines of the Matlock Liberty. Gentlewoman's Grove was variously credited with twenty, thirty or forty loads a fortnight and two or three hundred loads in four years. Bownes Grove "sometimes" produced sixteen loads a fortnight and more than two hundred loads 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 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 that year. Both sides had an interest in high production claims. The Rector Sought to maximise his tithe claim 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 17th century.

Between 1659 and 1691 the Gell family's small private liberty of Griffie Grange produced an average of two hundred and fifty-two loads 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 three hundred and thirty loads during six months of 1681 and seven hundred and twenty-four between April and December 1682. Carsington Liberty, which seems to have been the Carsington Pasture part of the Brassington Liberty, produced over one hundred and forty-two loads in two months of 1682, implying an annual figure of eight hundred and fifty-four (D258/18/25). This compares with about nine hundred for Brassington in the 1650s.

## THE TRADE

John Hutchinson of Carsington and later of Stainesborough Hall near Hopton was the leading smelter in the Wirksworth area during the second half of the 17th century – by 1666 he was the tenant of both the Gell smelting mills in Wirksworth (D258/35/49/22) and added Sir Philip Gell's Middle Mill at the end of the century (D258/20/20/8). He was a major ore buyer in all the liberties of the Wirksworth Wapentake from the 1660s (D258/7/20/4) and was the main buyer in the Wirksworth liberty by the 1690s – in 1693 he bought almost seven hundred loads from the Wirksworth mines (D258/18/25). He also owned shares in some of the most productive mines in the area and was a partner in soughs, including Baileycroft. In 1667, however, he seems to have been short of lead to supply his customers, as 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 (Brighton, 1981). 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 (BM Add MSS 6678 ff66-71).

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  $22\frac{1}{2}$  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. As security Hutchinson pledged his shares in a number of mines on Cromford Moor and in Wirksworth, and his interest in Cromford Moor Sough.

There are contradictory references in the evidence to the nature of the commodity being traded. While lead ore was measured at the mine to enable the barmaster to collect lot, and was sold to the smelters in measured loads, smelted lead was sold by weight, and the references throughout the document to "fothers" and other units of weight imply that Mundy and Hutchinson were dealing in smelted lead. It is therefore confusing to read that Mundy bought and sold lead ore, and that he and Hutchinson were dealing in "merchantable lead", a term which usually meant dressed ore ready for purchase. To add to the confusion Mundy's agent referred in one statement to "the delivery of two parcels of lead oare" and in another 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. In spite of the use of the term "ore" the two men were dealing in smelted lead, and the agreement specifies that Hutchinson should make his repayments at one of his smelters.

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  $\frac{1}{6}$  to  $\frac{1}{24}$  of seven different parts of the Godbehere mine (Fig. 1),  $\frac{1}{8}$  of the "Hedge meere in the close adjoining to Cromford moore",  $\frac{1}{16}$  of three other meares in the same close, and  $\frac{1}{6}$  of the "great Crosse rake". Hutchinson denied owning these shares but admitted to owning  $\frac{1}{96}$  of Godbeheres Founder.

Verbal agreements were regarded as binding - Mundy claimed that "by the custome of the mynes in the Soke & Wapentake of Wirksworth 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 Crees 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 there who in such cases delivered the lead upon warrants brought thither". Weighing seems to have been an approximate business. According to Mundy's agent, 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.

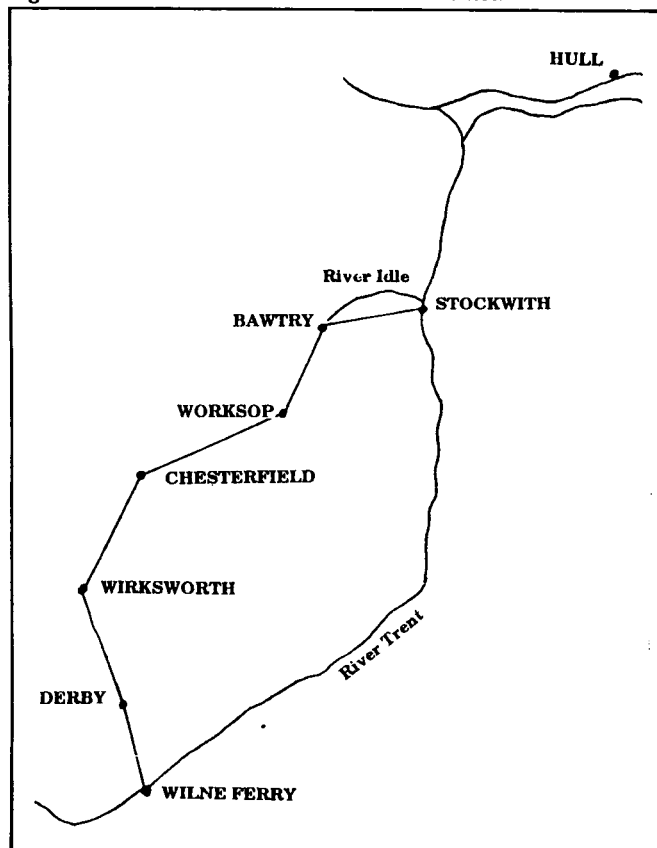
Over thirty years later Hutchinson, by then sufficiently prosperous to have attained the status of "gentleman", was the plaintiff in another case which amplifies the picture of the lead trade (BM Add MSS 6681 f286). Hutchinson testified that he supplied the defendant, Leonard Fosbrooke, gent, with forty 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".

## THE MINING DUES

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 (BM Add MSS 6686 ff136-142). 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 26<sup>th</sup> 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".

Fig. 3 Overland and water-borne lead trade routes.



The coveted and valuable "farm" of the Duchy of Lancaster's right to the duties of lot and cope, 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 lot and cope and £1-6-8d for the barmastership. 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 duties to either party" (BM Add MSS 6681 f238).

The primary leases to Robert Parker (succeeded by his son Thomas) from 1623 to 1654, and to David Ramsey from 1654 to 1685 (BM Add MSS 6686 ff132d-135), had been sold 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 (Fisher, 1952), and in 1643 David Ramsey sold his lease, due to run from 1654, to Sir John himself (BM Add MSS 6686 ff136-142). Coke died intestate in 1644 and his estate was inherited by his elder son, also Sir John (Brighton, 1981).

John Gell's case in 1662 rested on the first of the leases to the Coke family, expiring in 1654. Sixteen years earlier, in 1638, Thomas Coke had resold the lease to Gell's father and John Millward of Snitterton. While doing so he had separated the mines of the Dovegang area, currently being drained by Vermuyden's Sough, from the rest of the Wapentake, and sold it to Vermuyden for £200. In 1644 Gell, by then Sir John, transferred his estate, including his lead interests, to his son. The family's lead interests included mine ownership and two smelting mills, as well as the barmastership and right to lot and cope. In 1648 Thomas Coke sold the remaining six years of the lease to Gell for £1000 (BM Add MSS 6686 ff132d-13). With a new lease, beginning in 1654, held by Thomas Coke's brother, Gell must have assumed that his tenure was secure.

Gell's long-term hold on the mineral rights was thwarted by two events. In 1650 Sir John Coke the younger died and, according to evidence given on Northampton's behalf, he also, like his father, died without making a will. His heir was his brother Thomas. 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 (Brighton, 1981). By 1650 he was known to the authorities as a royalist conspirator against the new government. At this point, according to Northampton's evidence, 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. Gell described this development as a device to enable Thomas Coke to avoid the sequestration of his estate, while retaining possession of it.

The first seven years of Ramsey's lease were sold to Gell in 1654. The argument in 1662 was between Northampton's claim that this sale had been made by Lady Elizabeth, and Gell's assertion that it was the result of a verbal agreement between Michell and Thomas Coke. Michell, according to Gell, paid Coke 20/- and agreed to a future payment of £2,500. Gell and Millward agreed to join Michell in the deal. Gell, as John Mundy was to do several years later, claimed that verbal agreements were common – "that by the custom of the mines in the said wapentake mineral estates do frequently pass by word of mouth". Unfortunately for Gell the only one who could have corroborated his account, Thomas Coke, had died in 1656, and the documents produced by Northampton told a different story.

Lady Elizabeth had sold the remainder of Ramsey's lease, from 1661, to Richard Woolaston for £950 plus certain property and Woolaston had resold it to the Earl of Northampton for £1,500. Gell versus the Earl of Northampton may have gained in intensity from the fact that, twenty years earlier, Northampton's father, the second Earl, had been killed in battle against Sir John Gell's troops. Gell had caused outrage by refusing to surrender the dead Earl's body to his son, and had carted it naked from the scene of battle at Hopton Moor in Staffordshire, through Uttoxeter, to Derby (Slack, 1997a). In court in 1662 Sir John's son lost his battle – "It not appearing to the court by any of the proofs now read that the said Thomas Cooke had any estate in the premises nor that his majesty's interest in the mines & profits could pass by parole agreement in case any such were made betwixt the said Thomas and William Michell".

Thomas Coke had excluded the Dovegang area from his bargain with the elder John Gell in 1638 because he had recognised the increased value of the mines there once they had been drained by Vermuyden's Sough. 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. John Gell gained one important concession from the court in 1662. This was recognition of his right to the mineral rights in Griffie Grange and exemption from paying duty to the Duchy on the lead mined there. Griffie 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 Griffie was confirmed in the decree which confirmed Northampton's claim to the mining dues in the rest of the Wapentake. That Gell's rights in Griffie Grange had to be proved can be seen in the fact that Henry Buxton of Bradbourne, whose family owned one of the two manors of Brassington, unsuccessfully claimed that the lords of the manor owned the lead rights there and that the rights in Bradbourne ought also to be separated from the rights in the Wirksworth Wapentake (BM Add MSS 6681 ff234).

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, was granted to 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. The value to historians of the Gell connection to the lead industry is that they preserved their records and that these records have survived. There are therefore barmaster's accounts for the end of the century as well as for the twenty-three years that the Gells were in office in the middle. While Francis Gell was a London merchant, the industry was administered from Hopton and the accounts were kept there. His lease was renewed and there are accounts for the Wirksworth liberty from 1692 to 1698 (D258/42/21).

## TITHES

The prolonged legal and physical struggles over tithes during the early years of the century (Slack, 1996) continued in the second half. The often successful attempts of miners to avoid paying tithe to either clerical or lay tithe-holders in spite of court orders against them, prompted a Parliamentary Bill as an effort to settle the issue. 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, who were able to cite a recent long case in which the Rector of Matlock had failed to get his right to tithe confirmed (BM Add MSS 6676 ff162-170). The Rector, John 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 and the miners paid 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 the 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 (Slack, 1991).

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 sougning 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 comeing 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 hee 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".

The failure of Chappell's lawsuit and the subsequent failure to collect tithes prompted the incumbents in Ashover, Matlock, Darley, Bonsall and Carsington to present a private bill to Parliament in an effort to get their rights recognised. Both sides 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 (BM Add MSS 6677 f52). They noted the failure of a case brought in Ashover in 1658 (Band, 1996), and of the 1672 and 1676 attempts, and pointed out that the 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. This propaganda by the miners in the five parishes was backed up by similar arguments from other parts of the county (D1289 B/L 160). The clergymen referred to "the plaintiffs in these suits having multitudes of enemies" (BM Add MSS 6681 f359) and there were ninety-nine signatories to one miners' petition (BM Add MSS 6682 f239). 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 Thomas Bagshaw, Steward of the High Peak Hundred. Emissaries travelled the county, collecting signatures, and lodged in London, to lobby the Parliamentary Committee considering the bill (BM Add MSS 6682 f240).

The clergy, in a printed broadsheet entitled "The country parson's address to the merchants of London" (BM Ad MSS 6677 f51) 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, claimed that in some "peculiar Granges, or exempt places (where nothing is paid either to the King, or Parson)", miners often gave the owners more than tithe and lot. In one petition to Parliament (BM Add MSS 6681 ff372-373) 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 (BM Add MSS 6681 f359). 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 (BM Add MSS 6677 f66d). 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 sennight, 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. 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 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 Munday 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 Cornudo’s [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 should not after all travel to London.

## SUMMARY

Legal submissions concerning the Bailey Croft Sough, plus the unusually large amount of documentation in the agent’s accounts and the Gell correspondence, present a clear picture of the methods and problems in financing the very expensive work of driving a 17th century sough. These sources also reveal Soughing techniques. The soughs succeeded in lowering the water table in the Wirksworth area, and many previously inaccessible veins were drained. The surviving fragmentary records confirm a consequent rise in output.

The submissions and witness statements in the Mundy versus Hutchinson case of 1669, and of the Hutchinson versus Fosbrooke case in 1704, provide evidence of the customs and practices of the lead industry, including the export trade via Bawtry, Wilne Ferry and Hull.

The high value of the customary duties from a prosperous industry produced keen competition for the right to levy them. Among the entrepreneurs leasing the barmastership and lot and cope were men from the Government establishment, and local clergy went to extreme lengths to establish their legal right to tithe.

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## REFERENCES

### MSS sources

Derbyshire Record Office. Chandos-Pole-Gell collection (D258)  
Local Studies Library, Matlock. Wolley MSS (BM Add MSS) (microfilm)  
Cambridge University Library. Royal Greenwich Observatory (RGO 33)

### Printed sources

- Band, S.R. 1996 An Ashover lead mining tithe dispute of the 17<sup>th</sup> century. *Mining History. Bulletin PDMHS*, 13:1, pp52-57.
- Brighton, T. 1981 *Royalists and Roundheads in Derbyshire*. Bakewell & District Historical Society.
- Fisher, F.N. 1952 Sir Cornelius Vermuyden and the Dovegang lead mine. *Derbyshire Archaeological Journal*, 72, pp74-118.
- Kiernan, D. 1989 *The Derbyshire Lead Industry in the sixteenth century*. Derbyshire Record Society.
- Rieuwerts, J.H. 1980 The earliest lead mine soughs in Derbyshire. *Bulletin PDMHS*, 7: 5, pp241-314.
- Rieuwerts, J.H. 1987 *History and gazetteer of the lead mine soughs of Derbyshire*. Sheffield: The Author.
- Rieuwerts, J.H. 1998 Early gunpowder work in Longe Sough or Cromford Sough, 1662-63 and 1676-1680. *Mining History. Bulletin PDMHS*, 13:6, pp.1-5.
- Slack, R. 1991 *Lands and lead miners: a history of Brassington, in Derbyshire*. Chesterfield. The Author.
- Slack, R. 1996 John Gell and the miners: legal struggles over tithes of lead ore in early 17th century Derbyshire. *Mining History: Bulletin PDMHS*, 13:1, pp48-51.
- Slack, R. 1997a *Man at war: John Gell in his troubled time*. Chesterfield. The Author.
- Slack, R. 1997b Sir John Gell and the Derbyshire lead industry during the Civil War, 1642-1646. *Mining History. Bulletin PDMHS*, 13:3, pp 68-71.

R. Slack.