FIVE GENERATIONS OF DERBYSHIRE LEAD MINING AND SMELTING 1729-1858.

By G. G. HOPKINSON.

DURING the eighteenth and the first half of the nineteenth centuries, the Derbyshire lead industry was highly integrated, both technically and financially. Even at the beginning of the eighteenth century, the lead merchant, moving from his primary function of finding a market for pig lead, had come to dominate all the other sections of the industry. During this period, the lead merchant controlled all the lead smelting plants in the county and, in addition, the mills for rolling sheet lead and for manufacturing red lead. The lead merchant also provided a considerable amount of capital for the construction of the soughs which drained the limestone and for the sinking of the shafts and the driving of the headings in search of ore, all of which demanded a greater initial investment as the surface deposits became exhausted. In fact, the domination of the lead merchant in the mining sector of the industry steadily grew during the later eighteenth and early nineteenth centuries as it became more difficult to attract outside capital into what was an increasingly speculative investment with the exhaustion of the upper veins, which had a much more reliable content of ore than the lower.

In general, such was the wealth to be won from mining and smelting, especially during the first half of the eighteenth century, that few families had any lengthy connection with the industry, preferring to invest their profits in the much greater security of land, speedily forgetting the family origin in trade in the new-found dignity of Justice of the Peace, Sheriff or Deputy Lieutenant. One exception to this generalisation, however, was the Barker family and their successors in business, the Wyatts of Foolow, who together mined and

smelted lead in Derbyshire from 1729 to 1858. The account books and correspondence of the various members of these partnerships are of particular interest to the historian of lead mining in that they make it possible to ascertain the fortunes of different mines at different periods, to discover the markets supplied by the smelting plants and to keep a finger on the pulse of the industry throughout the county during these years.

The business was originally founded by William Barker, steward to the Duke of Devonshire. In the 1730's, it was carried on by his son, Alexander, in partnership with Thomas Barker of Darley Dale, steward to the Duke of Rutland. During this decade, the Barker interests in lead mining were concentrated in Monyash and Flagg, where the family held shares in Whalfe, Wham, Chapeldale and Hubbadale Mines in partnership with other local families such as the Buxtons, Thorpes and Schollers. Their share of the ore was smelted at the nearby Shacklow Mill on the Wye, well sited near extensive woodlands to provide the "white coal" used as fuel in this type of smelting mill. Accounts, now at Chatsworth, show that the Barkers smelted 505 fodders of pig lead at Shacklow between 1735 and 1740. The greater part of the lead smelted here was either sold on the spot or at Bawtry on the Idle, *en route* to Hull, to Chesterfield lead merchants such as Richard Milnes and Joseph Storrs or to Charlesworth and Edge in Hull, in the latter case either for cash or for sale on a commission basis in the United Provinces.[1]

In 1743, the business was taken over by William Barker's two sons, George and John. In addition to smelting ore at Shacklow, the two brothers leased other smelting mills at Rowsley and Beeley, although the latter works seems to have been comparatively little used. In 1748, Totley Cupola on the road from the lead mining areas in the High Peak to navigable water on the Don and well sited for coal supplies from the nearby Alton Seam was leased. With such extensive smelting facilities, the partnership required large supplies of ore. Consider-

[1] Reckonings for Sundry Mines 1736-46; Proprietors' Reckoning Book 1735-50; Reckonings, Whalfe etc. 1729-36. Sheffield City Library, Bagshawe Collection (hereafter S.C.L. Bagshawe), 430, 431B, 490.

able amounts were obtained from Cowclose and Leadnams Mine in Elton, in which the two men were shareholders. This must have been one of the most productive mines at work in the county in the 'forties, as during this decade its output of ore was worth £23,000. In 1749, the two Barkers began to buy heavily from the mines on Eyam Edge, where they purchased the shares of ore belonging to Mr Tipping of Edensor and to Sir Archibald Grant of Moniusk, Aberdeenshire.[2] In addition, the partners bought the Duke of Rutland's tithe ore and the Duke of Devonshire's duty ore in Wetton. Finally, the fact that the cupola could smelt grades of ore impracticable in the smelting mill led to the Barkers buying ore, discarded by previous generations of miners, from the old hillocks at Placket in Winster and Oxclose in Matlock. Much of the lead smelted at these plants was either sold on the spot or at Bawtry to such local lead merchants as Dr Holland of Ford House, Higham; Joseph Storrs and Richard Milnes, both of Chesterfield; Joseph Whitfield, agent to the Quaker Lead Company at Ashover, and Richard Dalton, a Sheffield merchant buying lead on commission for John Mould and Walter Edge in Hull. Large quantities of pig lead were sold to Milnes and Wilkinson of Chesterfield and to Bernard Lucas of Hasland for manufacture into red lead at their mills on the East Moor above Chesterfield. The lead smelted at Totley was sent by road to Rotherham, the then head of navigation on the River Don, and from there down river to Thorne, where the greater part was bought by Milnes and Wilkinson.[3]

On the death of George Barker, the business was managed by his brother, Alexander. As well as working Shacklow Mill, Barker operated another of the old type of smelting mill at Calver on the Derwent. Much more important from the production angle was his possession of Totley Cupola, where he installed more furnaces in 1757, and his building, in conjunction with Milnes and Wilkinson, of Harewood Cupola on the East Moor in 1752 to replace two smelting mills at Longside and Loads.

[2] Sir Archibald Grant married Anne, daughter and heiress of Charles Potts of Eyam. B.M. Add. MS. 6694, fol. 99-103.

[3] Cash Account Book, J. and G. Barker 1743-51. S.C.L. Bagshawe, 484.

In 1758, Barker bought Lumbs Cupola above Matlock and Wash Green Cupola in Bonsall from another lead smelting partnership, Wall and Twigg. The former plant was resold to Joseph Whitfield and although there is no record of the sale of the latter there are but few references to it in the account books. Shacklow Mill was mainly supplied from Taddington and Monyash, and Calver Mill from the nearby Busks Mine. The consumption of ore at the two cupolas was high. In 1755, for example, they smelted ore worth £12,500. Harewood drew its supplies partly from Nether Sough, Long Furlong and Hogsland mines in Ashover and partly from Cowclose Mine, where the installation of a Newcomen engine had enabled output to be maintained at a high level. Barker also purchased the duty ore from Winster. Harewood smelted the duty ore from the Wapentake of Wirksworth, the right to collect which had been bought by the two Wilkinsons in 1750. Totley Cupola was supplied by purchasing the share of the ore from Odin Mine, Castleton, owned by Messrs Shallcross and Redcliffe, and by purchases of ore from Little Pasture, Miners' Engine and Consolidated Titles Mines on Eyam Edge.

Although Alexander Barker sold small amounts of lead to other merchants, almost the whole of his make of pig lead was handled by Milnes and Wilkinson who for example bought lead worth over £11,000 from him in 1754. A small quantity of this was sent to their red lead mills at Loads and Brampton Moor, but the greater amount smelted at Harewood and Totley was sent to Bawtry and Tinsley respectively to be forwarded down the Idle and the Don to Hull. There can be little doubt that Alexander Barker was, with his numerous holdings in lead mines and his control of four smelting plants, one of the most important business men in mid-eighteenth century Derbyshire. His cash turnover, for example, between 1752 and July 1755 was over £52,000 and from the latter date to 1758 some £49,000.[4]

A partnership between the Barker family engaged in mining and smelting and the two Wilkinsons, John and

[4] Alexander Barker, Cash and Bills 1752-9; Alexander Barker and Company, Journal 1752-9. S.C.L. Bagshawe, 485, 486.

Richard, engaged in marketing lead was a natural one. This partnership, probably first entered into in 1759, was carried on by Richard Wilkinson's sons, John and Isaac, until 1807 when the latter withdrew, probably as a result of a serious accident sustained about this time which compelled him to spend the remainder of his life at various spas.

The mining interests of Barker and Wilkinson during the second half of the eighteenth century were much more extensive than those of other lead merchants in the first half of that century. The most productive of the mines in which the firm had interests in the 'sixties were Breachside Sough in Hassop, where 14,140 loads of ore were raised from 1763 to 1769 with a total profit of £6,334; Cowclose Mine in Elton where 8,088 loads were mined in 1763-4; Placket in Winster, which produced 7,739 loads from 1763 to 1768 and a profit of £7,750; Gorsey Dale Mine in the same liberty, where 3,369 loads were extracted from 1763 to 1768, with a profit of £828; Calver Mill Sough, where £2,025 was invested before it made a profit of £958 on 2,732 loads raised in 1765-6; Winster Pitts, where 1,627 loads were raised from 1767 to 1769 with a profit of £305; and Waterhole on the ridge above Rowland, where 1,342 loads were mined from 1766 to 1769 with a profit of £319. At the end of the decade, 28 years of driving a sough at a cost of £9,000 were rewarded with the discovery of an extremely rich pipe of ore at Hubbadale in Taddington Liberty; 12,556 loads of ore were mined at Nether Hubbadale and 2,037 loads by the sough owners, who together made a profit of £14,633 from 1767 to 1769.

At the same time, however, many mines which had been highly productive at an earlier period were either exhausted or were being worked so deep in the limestone that they had become waterlogged. No ore was produced at Crowshawe Rake in Taddington, Wills Founder in Winster, Maury Mine in Priestcliffe, Wilds Old Grove in Eyam and Chapeldale in Flagg. Whalfe was sold in 1763 as it was "heavily loaded with water and not likely to be of any use unless completely drained"; Blakeden in Wardlow was so waterlogged that the mine was declared

valueless and Writheing Lake in Hucklow was said to be in 1765 "so overloaded with water it will never be of any service".

During the 'seventies, Waterhole and Breachside Sough continued to be highly productive. At the former, 12,995 loads were produced during the decade and at the latter 15,201 loads from 1772 to 1780. In addition, Watergrove Mine, alongside the Hernstone Lane Head Turnpike, had an output of 18,674 loads between 1771 and 1777 and Shining Stone Sough in Youlgreave produced 4,304 loads from 1771 to 1779. Production at many of the older mines, however, fell off badly. Cowclose raised only 1,765 loads during the period; output at Placket declined to 2,210 loads from 1772 to 1777 and Nether Hubbadale was regarded as "of little value". Moreover, it had become impossible to work a number of mines that were badly affected by water. By 1771, heavy pumping costs had made Drake and Limekilns Mines in Winster uneconomical to work; Saltersway, near Winster, was under water in the following year; the "fire-engine" at Calver Mill Sough was sold in 1774 as the mine was believed to be of no value "unless a new sough be put in to drain it"; and despite heavy expenditure at Oxclose Sough the mine had to be abandoned without ore being discovered when the vein began to dip below the water-level in the limestone.[5]

There is, unfortunately, little information on output at the mines operated by the partnership during the next decade. Some indication of their position and prospects is however given in a valuation made in 1782. Breachside and Watergrove were still productive. Many mines remained waterlogged and measures were in progress to drain some of them. At Yatestoop in Winster it was proposed to install a Newcomen engine 95 fathoms below ground to drain a large body of ore. Shining Stone Sough, Broad Meadow, Guy Vein and Honey Spot were dependent upon Hill Carr Sough being driven from the Derwent under Stanton Moor into Haddon, Harthill and Youlgreave Liberties to clear them of water, whilst

[5] Proprietors' Reckoning Book 1760-81; Letters dated 31 July 1772, 21 December 1772, 26 December 1776, 7 May 1778, John Barker's Letter Book 1765-1811. S.C.L. Bagshawe, 431, 494.

Limekilns and Cowclose were awaiting drainage by an extension of Yatestoop Sough.[6]

The completion of some of these projects led to an expansion in production at the mines with which the partnership was associated in the 'nineties. Blythe Sough in Alport produced ore worth £32,688 during the decade, on which a profit of £18,807 was made; Shining Stone Sough raised ore sold for £46,000, of which £15,962 was profit; Breachside Sough ore was sold for £17,531, with a profit of £1,387.[7] Output at Watergrove continued to run at a high level during the decade, ore worth £14,075 being mined. A loss of £4,500 was however sustained during this period, mainly accounted for by the heavy pumping costs incurred by the large quantities of water encountered in the mine. Three new water-driven engines were installed during these years and when they proved incapable of keeping the mine clear an atmospheric engine, built by Booth of Sheffield, was installed in 1795.[8] The high price of lead enabled some of the more high cost mines, such as Haycliffe, Old and New Bradshaws and Ladywash, to be worked during the decade; at these and other mines, ore worth £31,000 was raised although £1,400 was lost in the process. Production at Portoway in Winster continued high as ore worth £14,075 was mined, although the profit of only £368 was comparatively low.

The output figures for the mines, with which Barker and Wilkinson were associated during the last seven years of the partnership, show the decline which appears to have been common throughout the industry at this time. Production at the mines on Eyam Edge dropped to £5,000; at Winster to £10,000 and at Breachside, Shining Stone and Blythe Soughs to £20,000. Profits too declined seriously. The three soughs only made some £5,260 profit during these years and the four mines in Winster the trifling sum of £841.

With their extensive holdings in lead mines, Barker and Wilkinson, of necessity, needed large smelting

[6] Valuation of John Barker's shares in lead mines 1782. S.C.L. Bagshawe, 634.
[7] Proprietors' Reckoning Book 1790-1802. S.C.L. Bagshawe, 482.
[8] Watergrove Reckoning Book 1783-97. S.C.L. Bagshawe, 422.

facilities. In the 'sixties this partnership was working, in addition to the two cupolas at Harewood and Totley, four of the older type of smelting mills at Shacklow on the Wye, Stoke and Calver on the Derwent and Barbrook on the East Moor. Technically this type of smelting plant was obsolescent; Stoke was closed down in 1769, Calver and Barbrook in the following year and Shacklow in 1775.[9] These smelting mills were replaced by two additional cupolas, one at Stanage between the Matlock and Rowsley turnpikes out of Chesterfield, and the other in Middleton Dale. Stanage was mainly supplied with ore from Gregory, Westedge and Cockwell Mines in Ashover during the last decade of the century. Harewood Cupola drew its ore chiefly from mines in Calver, Sheldon and Alport; Totley Cupola from Odin and the mines along Eyam Edge.[10] When the output of lead ore mined in the Peak declined early in the new century, Totley Cupola was shut down in 1802. With a further decline in the output of ore in Ashover, Stanage Cupola was closed down in 1806, so that when Isaac Wilkinson withdrew from the partnership only Harewood and Middleton Dale Cupolas were at work.

It is unfortunate that the account books of Barker and Wilkinson give little information about the market for the lead smelted at these various works. One thing is however plain. Derbyshire lead was no longer handled on any scale by the Hull merchant houses. In the 'seventies, it is obvious from the bills with which the Wilkinsons paid Alexander Barker that they were exporting lead direct to Rotterdam and Amsterdam.[11] At the end of the eighteenth century, almost all the lead smelted at Totley Cupola was purchased by Brown, Wheat and Company of St. Mary Hill, London.[12] Considerable amounts of lead were sent from the other cupolas to the red lead mills controlled by the partnership at Holymoorside and Brampton Moor. Information also about the profits made by the concern is minute, as the only record

[9] Barker and Wilkinson, Lead sold and smelted. S.C.L. Bagshawe, 490.
[10] Cupola Accounts 1794-1806. S.C.L. Bagshawe, 479.
[11] Alexander Barker's Accounts with the Cavendish Family. S.C.L. Bagshawe, 500.
[12] Waste Book, Barker and Wilkinson 1800-7. S.C.L. Bagshawe, 483.

is for the two years 1806 and 1807, when the partners divided £11,000 between them.

Isaac Wilkinson withdrew from the partnership at what was for him a very fortunate time. During the three years after the Treaty of Amiens, probably as a result of war-time inflation, the price of lead had been steady at £35 a fodder, more than double what it had been in 1794. Between March and September, presumably as a result of Napoleon's overrunning of Germany and his victory over Russia, with all that these events meant to the efficient working of the Continental System, the price of lead dropped to £26 a fodder and even at that price it was almost impossible for the Derbyshire smelter to find a customer in London. In the following February, the price declined still further to £23. 10s. a fodder delivered in London and sold at six months' credit. In May, the price slid further down to £20 a fodder. During the following months, the metal fluctuated violently in price, largely as a result of Hull merchants speculating in lead in the hope of an early peace. In September 1808, lead rose to £38 a fodder, fell during the same month to £33, shot up to £38. 10s. in October and was at its peak at forty guineas in November. As usual, after such speculation, especially with the disappointment of the hopes of an early peace and the opening of foreign markets, the price cracked and by the middle of December the market was "at a stand or worse".[13] By the next April, the price of lead had fallen to £30 a fodder delivered in London and in fact only one firm, Walker, Maltby and Company, was in the market for Derbyshire lead. Worse was to come. In August 1809, lead fell to £29 a fodder and even at that price little was sold. In the March of the following year Thomas Preston, one of the chief buyers of Derbyshire lead in London, went bankrupt, an event which only further served to throw more gloom on the Derbyshire lead industry. Even the freeing of the Continent from French rule failed to revive the demand for the metal, a natural enough fact when the lack of purchasing power in countries suffering from

[13] Letter dated 13 December 1808, John Barker's Letter Book 1765-1811. S.C.L. Bagshawe, 423.

war is considered, and the period immediately before and after Waterloo was marked by a weakness both in the demand for and in the price of the metal.

With the withdrawal of Isaac Wilkinson from the partnership, John Barker II lacked adequate capital to finance the business. Consequently another member of the Barker family, Caleb, was brought in as a partner. Even so, this new partnership was compelled to borrow from Wilkinson and from the Chesterfield bank of Jebb, Slater and Malkin. To add to their difficulties, many of the mines worked by the concern were either on the point of exhaustion or heavily waterlogged. Mining on Eyam Edge was practically dead. Attempts to discover new veins of ore were completely unsuccessful and involved the various groups working Miners' Engine, Little Pasture and Consolidated Titles in a loss of well over £1,000. The vein at Watergrove mine had dipped steeply into the limestone with the result that the water problem had become so acute that in 1806 the manager, William Wyatt, had recommended the installation of another engine. This suggestion, after the withdrawal of Wilkinson from the partnership, was obviously impracticable and only a small amount of ore was raised here after 1807.[14] Heavy losses were also sustained at the various mines in Winster. Shining Stone Sough, despite an ore production worth £9,412 between 1807 and 1816 lost its partners some £283. Breachside Sough closed down at this time. Because of the decay of lead mining in Ashover, smelting ceased at Stanage Cupola in 1808 and Harewood had to be supplied from as far away as Sheldon Moor, Castleton and Hazlebadge. Heavy transport costs made this procedure uneconomic and smelting at Harewood ceased in 1810. From this date, smelting was concentrated at Middleton Dale Cupola, nearer to the mining centres in the Peak and within easy striking distance of the Cromford Canal by a comparatively level road. The reduction in smelting facilities necessarily led to a great decrease in output which in 1816 was only a fifth of what it had been in 1806. During these years a great change had taken place in the firm's customers. In

[14] Watergrove Reckoning Book 1797-1825. S.C.L. Bagshawe, 423.

1808 the bulk of the lead sold was marketed in London through John Ellil and Yeats, Brown and Scott. In 1816 the greater quantity smelted was sold to Rodmell and Beckett in Hull; the remainder was disposed of locally to Cox and Poyser in Derby and to Rawson, Barker and Company in Sheffield, a change obviously the consequence of the Barkers' inability to stock lead in the capital and await its sale because of their weak financial position.

In 1816, a quarter share of the business was bought by Benjamin Wyatt of Foolow for £500.[15] The new partner was a man with wide experience in both mining and smelting in Derbyshire. This partnership, too, encountered severe economic difficulties until 1829, when Wyatt bought his partner out for £1,300. By 1817, lead had dropped to £20 a fodder. During the next four years, it rose to £23 a fodder, but there was little demand for Derbyshire lead at this price. The boom years of 1824-5 naturally led to a rise in its price but the onset of the next slump caused lead to fall to £19 a fodder delivered in London and even then Derbyshire lead merchants found it difficult to dispose of their stocks in 1826. The slump forced Welsh producers to throw their stocks on to the market, with the result that lead prices fell to £18 a fodder in 1827 and to £16 in the following year. Worse was still to come, as pig and sheet lead were being offered in the Midlands at £13 a fodder in the winter of 1829 — well might Thomas Cox, the leading lead manufacturer in the county, write "The Times are bad for farmers, worse for lead merchants".[16]

Despite these difficulties, Benjamin Wyatt was able to build up the business from the low position it occupied in 1816, when its total income from the sale of lead was a mere £3,588. By 1818, sales had risen to over £10,000, a figure which the concern was to average during the 'twenties. Profits, however, remained obstinately low and were rarely more than a hundred or two pounds a year, a sad comparison with those made early in the century. The main reason for this was the fact that the mines,

[15] S.C.L. Bagshawe, 587/97.

[16] Letter dated 2 November 1829, General Correspondence of the Wyatts. S.C.L. Bagshawe, 654.

with which the two men were associated, sustained heavy losses during this period.

Mine.	Ore Production.	Loss.	Profit.
Blythe Sough, Alport	£5,529	£1,291	
Chapeldale	804	490	
Little Pasture, Eyam		2,595	
New Rake, Sheldon		2,446	
Odin, Castleton	10,135	2,569	
Portoway, Winster	5,648		£325
Shining Stone Sough	3,712	1,351	
Stanton Mines	2,661	1,253	
Wheels Rake, Haddon		750	
Yatestoop, Winster	3,697		505

The market for the pig lead, smelted at Middleton Dale Cupola, from the partners' share of ore at these mines, was almost completely local, the best customers continuing to be Cox and Poyser and Rawson, Barker and Company.

Benjamin Wyatt, as sole partner in the business, was to meet, until the time of his death in 1836, even more severe difficulties than he had encountered when associated with John Barker II. In 1830, lead fell to £12. 10s. a fodder. It was impossible to mine and smelt lead in Derbyshire at this price at a profit, with the result that output in the county fell to only 1,000 tons of pig lead in that year. There was unprecedented poverty among the mining population in the Peak. Many men emigrated from the Wirksworth area to the Staffordshire coal mines. Those who remained were only kept from starvation by charity. Petitions to Parliament and to the Board of Trade effected nothing, as much of the imported lead was ultimately re-exported as sheets or pipes.[17] The situation remained bad until the middle of 1833, with pig lead selling at £13 a fodder, the export trade dead and the demand in London flat. A steady recovery in general trade after the trough of the trade cycle had been passed in 1832 caused the price of the metal to rise to £14 a fodder in August 1833, to £17. 15s. in the following September and to £20 in February 1836. Naturally, these

[17] J. Taylor, *Additional Memorial presented to the Board of Trade* 1830; *H. of C. Journals*, LXXXIII, 385, LXXXVI, 256; *Sheffield Independent*, 8 January, 5 February 1831; *Derby Mercury*, 6 April 1831.

difficulties were reflected in Wyatt's sales of lead which, in the six years prior to his death, declined to an annual average of £6,200.

William Wyatt on succeeding to his father's business had to face initially similar problems. In June 1838, the price of lead dropped to £18 a fodder. With the decline in trading activity after the peak of the trade cycle had been passed in 1839, prices fell still further and by the end of the year, Cox was writing gloomily, "Never at any time since our Works were erected was the demand for manufactured goods as it has been for several months last past", and asserting that the smallest of their three works was more than sufficient to meet the demand for lead.[18] To some, the tariff reduction made by Peel in his 1842 Budget on imported lead seemed to spell complete ruin to the industry in Derbyshire. Fortunately, this fear proved ill-founded and, except for the years 1847 and 1848 when general trading conditions throughout the country were badly affected by a banking crisis and by political troubles on the Continent, the lead industry was fairly prosperous in the county during the 'forties. This prosperity continued during the 'fifties until the banking and commercial crisis of 1857 led to another fall in the price of the metal, largely attributable to Welsh smelters throwing lead on the market at £22 a ton. Nevertheless, the price of lead in this year was much higher than it had been in earlier periods of depression and output at 6,061 tons in Derbyshire was a relatively high figure for this period.

William Wyatt continued to be associated with the various mines in which his father had been a partner. None of these raised any considerable volume of ore during this period. All, indeed, sustained serious financial losses.[19] The general rise in the price of lead in the 'forties and 'fifties, however, encouraged Wyatt to become a partner in various companies engaged either in reopening old mines or in sinking new and deeper shafts in search of unworked deposits of ore. Some of these operations proved, from the standpoint of the amount of ore mined,

[18] Letter dated 3 December 1839, General Correspondence of the Wyatts. S.C.L. Bagshawe, 654.

[19] Reckonings for various mines 1827-55. S.C.L. Bagshawe, 538.

very successful but almost all proved, from the standpoint of the dividends paid to their shareholders, to be failures.

Much the most successful of the concerns with which Wyatt was associated was the Eyam Mining Company, set up in Sheffield in 1847 to purchase Morewood Sough and to work the Glebe Mine. After an investment of £3,200, the Company struck a rich vein of ore, from 1855 to the time of Wyatt's death sold ore and pig worth £41,617, and distributed £17,400 in dividends to its fortunate shareholders.[20]

Almost as important were the mining developments with which Wyatt was associated at Alport. In 1841, Hill Carr Sough was cleaned out to drain the water from the numerous veins intersecting it; a hydraulic engine was installed in the Guy Vein shaft and iron pipes were placed in position from the River Lathkill through Alport to provide the necessary head of water for another hydraulic engine to lift water from workings 21 fathoms below the Hill Carr Sough. These measures enabled 1,487 tons of ore to be mined in 1842-3. In 1844, the Stanton branch of the sough was cleared and another hydraulic engine installed to drain the water from a long run of good ore ground. During that and the next year, 1,812 tons of ore were extracted. In 1847, however, output fell as the veins decreased in ore content; water to work the hydraulic engines was short as a result of an inability to ensure an adequate supply from the river; and simultaneously water increased in the mines to a flow of from 2,000 to 6,000 gallons a minute, a quantity believed to be "the largest upon record in the whole history of mining operations". Equally important was the fact that the market for lead broke during the depression of that year, causing its price to drop seriously. The political troubles on the Continent diverted large amounts of Spanish lead on to the English market. The price of ore fell below £9 a ton, the minimum at which the Alport mines could be profitably worked, with the consequence that their output fell to 664 tons in 1849.[21]

[20] Eyam Mining Company, Unaccessioned MSS. S.C.L. Bagshawe.
[21] Alport Mine Reports 1841-9. S.C.L. Bagshawe, 587/1.

Two mines to be reopened were the Magpie Mine on Sheldon Moor and Watergrove Mine, near the junction of Ashford and Taddington Liberties. At the former, some 845 tons of ore were mined in 1843-4. The pumping engine, a forty-inch cylinder engine with a stroke of nine feet, built by Joseph Thompson of Chesterfield in 1825, however, only proved capable of draining the workings in fine weather and disputes between the partners over the advisability of installing a seventy-inch pumping engine or of driving a sough to the River Wye, led to the closure of the mine in 1846.[22] Watergrove Mine was reopened with Wyatt as agent in 1837, after its owners, George and William Greaves of Sheffield, had decided to put the old levels in a thorough state of repair and to lift the water up to these, with the determination that " no expense (shall be) spared to give it an effectual trial".[23] A steam engine, purchased from Fairburn of Manchester, was installed but it proved necessary to put in more powerful pumps five years later and to excavate a new branch sough from Morewood Sough to an old engine shaft at Cliff Stile to clear the veins. These steps enabled some 9,000 loads of ore to be mined during the 'forties, but the loss incurred of £3,567 during these years led to the mine being shut down in 1850.[24]

Much less successful were attempts to reopen various mines on Longstone Edge and in Flagg, as in both cases it was discovered that almost all the ore had been extracted by previous generations of miners.[25] Equally unsuccessful from the standpoint of production but financially much more disastrous was an attempt to deepen a shaft, 196 ft. deep, sunk at High Rake by John Tucker and Francis Hurt in 1757 on the Hucklow Edge Old Vein. In March 1842, a steam engine was bought from Graham's Milton Ironworks in South Yorkshire to keep the workings clear of water. In 1846, the shaft was 604 ft. deep but was,

[22] Magpie Mines, Miscellaneous Correspondence and Printed Reports. S.C.L. Bagshawe, 587/20.

[23] Letter dated 27 July 1835, General Correspondence of the Wyatts. S.C.L. Bagshawe, 654.

[24] Watergrove Reckoning Book 1842-50 and Minute Book 1836-51. S.C.L. Bagshawe, 426, 518.

[25] Chapeldale Reckoning Book 1827-46; Report on Longstone Mines 1846 and Chapeldale Miscellaneous Correspondence. S.C.L. Bagshawe, 398, 587/4, 587/82.

to the disappointment of the partners, still in the toadstone. Four years later, despite further sinking, the toadstone had not been bottomed and such veins as had been found were of comparatively small value. By 1852, after investing £19,387, when the shaft was down to 120 fathoms, the partners concluded that there was little prospect of making mining pay and its equipment was therefore put up for sale.[26]

Although on the average, William Wyatt sold more lead than his father had done in the early 'thirties, sales during his ownership of the business showed a steady decline. In the late 'thirties, he sold annually, on an average, lead worth £14,350; in the 'forties, his sales averaged £11,000 a year and in the next decade, until his death in 1858, he sold lead worth £10,000 a year. His best customer continued to be Cox and Company of Derby who, for example, purchased lead valued at £46,300 from 1851 to 1856. The opening of the North Midland Railway in 1840 and of the Manchester, Buxton, Matlock and Midland Junction in 1849, however, enabled Wyatt both to open up new markets and to penetrate into old ones lost to the concern since the early days of the century. Lead was sold in London on a considerable scale to Champion, Fishwick and Company and to Walker, Parker and Company; in Manchester to William Occlehurst and in Birmingham to Stock and Company.[27]

[26] High Rake Reckoning Book 1835-52 and Minutes 1841-52. S.C.L. Bagshawe, 408, 587/17.
[27] Ledger 1807-57. S.C.L. Bagshawe, 562.