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STOTFIELD BURN AND BRANDON WALLS MINES, 1872-1882

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SYNOPSIS

This is a brief history of the attempts to work the Stotfield Burn and Brandon Walls veins during the second half of the 19th century by the Rookhope Valley Mining Company followed by the Northern Lead Mining Company Limited. Both attempts ended in failure, partly due to geological factors and partly due to the collapse of lead prices. The leases included the Thorny Brow Vein, but there is no evidence that either company worked this vein.

GEOLOGY OF THE REGION

The strata is near horizontal, dipping only slightly to the east-north-east. The rocks present a typical Yoredale succession of repeating cyclothems of limestone, shale and sandstones. The mines worked in veins flanked by strata from the Little Limestone down to the Scar Limestone.

Brandon Walls and Thorny Brow veins run to the north-east, as do most of the region's major productive veins, and both throw the strata very little. The Red Vein is a major quarter point vein, running to east-south-east and throwing about seven feet to the north-east at Stotfield Burn Mine.

The veins fall within the fluorite zone of mineralisation, the principal mineral being fluorspar, with minor quantities of quartz, and galena. The following is an analysis of run of the mine ore from Stotfield Burn Mine:

Sample from 15-fathom level forehead 1942[1]	CaF_2	78.89%
	SiO_2	7.47%
	PbS	5.54%

Red Vein carried from 5 to 8 ozs of silver per ton of lead, averaging about 6 ozs. Brandon Walls is reported to carry 6 ozs of silver per ton of lead.

HISTORY OF THE MINES BEFORE 1872

Most Weardale mines were leased by the Beaumonts from the Bishop of Durham, but the copyhold of Brandon Walls was apparently owned by Colonel Beaumont in the early 19th century, and he granted a lease to Messrs Alexander Whaley and Company in 1807. This was renewed in 1810 to raise ore at 40s 10d per bing and included Thorny Brow Vein.[2] By 1809 a shaft was sunk on Brandon Walls Vein on the east side of Rookhope Burn. Between 1859 and 1862 W.G. Ibson owned the mine.

The partnership of T.J.C. Plowden and Major E.B. Bere leased Stotfield Burn Mine for 21 years from May 8th 1866. They transferred the remainder of the lease on March 4th 1873 to J.H. Murchison, who acted on behalf of the Rookhope Valley Mining Company.

Plowden and Bere were probably responsible for opening up Stotfield Burn Mine, though the adit level may predate their enterprise. Murchison, when he addressed the first meeting of the Rookhope Valley Mining Company shareholders in July 1872, referred to the workings in the adit level, and the 15 and 25 fathom levels. At that time the Engine Shaft had already been sunk 31 fathoms. Two levels had already been driven 190 fathoms, leaving a further 60 fathoms before the boundary was reached.

THE ROOKHOPE VALLEY MINING COMPANY 1872-1879

The first shareholders' meeting of the company was held at the offices at Austin Friars in late July 1872, the company having been at work three months at that time. Mr W. Greame was the chairman and Captain Edmund Rogers was the manager. Mr Peter Watson, a stocks and share dealer of 1, St Michael's Alley, Cornhill, London, was a director, and Mr J.H. Murchison was apparently either secretary or accountant. Mr Peter Watson stated that "*the directors were the same as Tankerville and Roman Gravels*", which company was in the process of working and developing lead mines in Shropshire. Captain Waters was the manager in charge of the day to day working of the Shropshire mines. The Tankerville Mining Company had been established prior to 1870, and in about March of that year another company, called the West Tankerville Mining Company, was formed with the same directors. The descriptions applied to the prospects of the companies were so enthusiastic that they must be regarded with suspicion.

The Rookhope Valley Mining Company was divided into 15,000 shares, of which 7000 - 8000 were held by the directors. Cash assets amounted to £15,300, while liabilities were £600, including £400 which were the previous month's costs. At the meeting a shareholder asked what was "*the cause of the depreciation in the market value of the shares?*" The chairman answered that it was "*impossible to say*".

The company held leases on three veins, which their reports identify as No.1: Stotfield Burn and No.3: Brandon Walls. Therefore, No.2 must have been Thorny Brow. At the outset all effort was concentrated on Stotfield Burn Mine, but they also appeared to intend working Brandon Walls. In answer to a question, Rogers stated that it would take about six months to complete the water-wheel and three months to pump out the water. Subsequent events suggest that Brandon Walls was a secondary objective.

STOTFIELD BURN MINE

The Red Vein presented the company with a considerable problem, although the vein itself was wide and, being mainly fluorspar, easy to extract. However, the vein contained only small percentage of galena. Though there is some evidence that this was increased by selection of the richer parts in the mine, in general the lead ore was disseminated throughout much of the vein and, to extract it, a very large volume of feed stock had to be processed. This caused problems throughout the life of the company. The vein in the 25 fathom

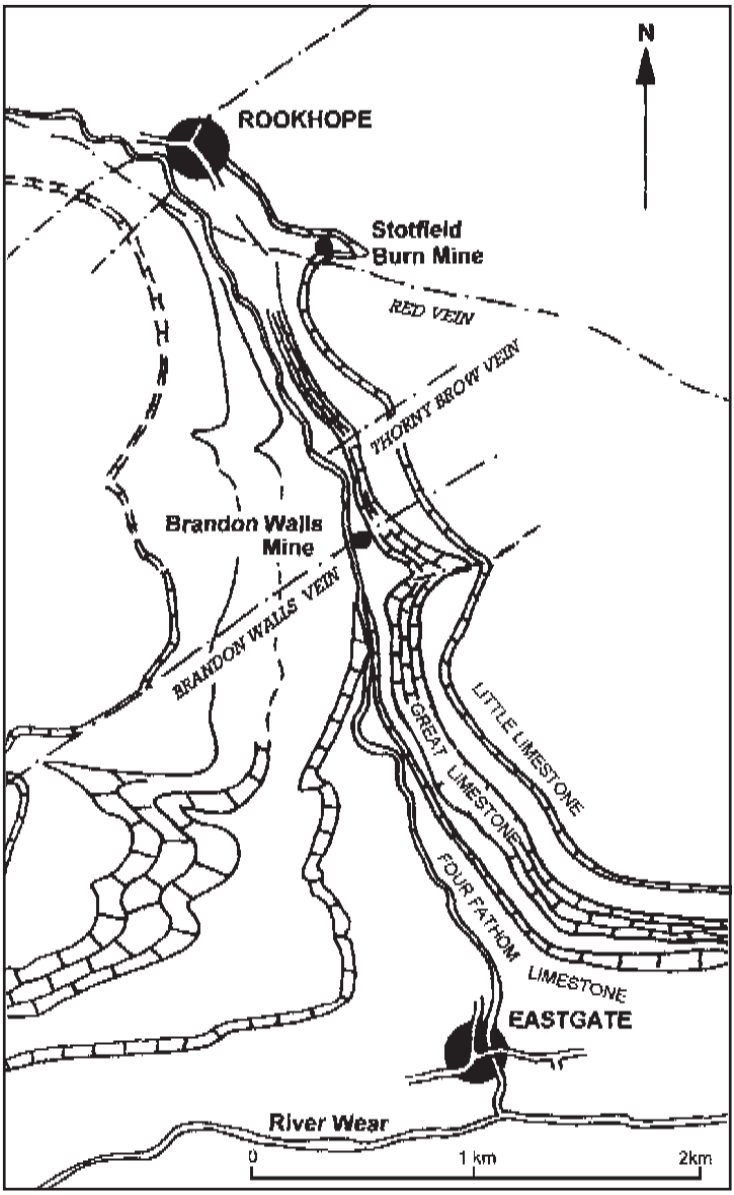

Fig.1

level was described as follows "*The portion of the lode carried is 6ft. wide, composed of soft fluorspar, coal shale, and a little mundic, interspersed with lead ore throughout, yielding of the latter 25 cwts per fathom*". This is about 6% PbS by weight, or 3% PbS by volume, agreeing well with the analysis made in 1942.

In October 1872 four men were employed "*shooting off the side*", in order to fill the former workings and so make the stopes above available. They also continued to sink the Engine Shaft. By January 1873 they were 12 fathoms 4 feet below the 25 fathom level, and by April they had cased and divided the shaft down to the 42 fathom level. At the 42 fathom level, the lode was five feet wide, composed of fluorspar, with lead ore interspersed throughout and yielding 30 cwt per fathom.

By September 13th 1873, it was reported that the "*36 inch cylinder rotary engine, with all its connections from West Fedu, has been delivered on the mine, and a good number of hands are building the engine-house foundations for the same, and we hope to commence building the engine-house the early part of next week*". By April 1874 the new engine was nearly complete and the boiler-house chimney was 40 feet high. At the same time they were also securing the top of the old gin-shaft, which was probably the Low Shaft.

Activity in the mine was well developed by the end of 1874, as indicated by the following report made by D. Brown on September 28th: "*No. 1 stope, in the back of the 15, close to the boundary, by two men, at £1 15s., will yield 15 cwts per fathom. The four men that belong to No.2 stope are now engaged picking the stuff already broken, and depositing the bouse or ore stuff into shoots to send to the surface. No.3 stope in the back of the 15, by four men, at £2 15s, will yield 1 ton of lead ore per fathom. The new winze from the 25 is down 4 fms 2 ft 6 ins in good ore; each end of the winze is left open, so that the lode may be seen as I described in my last - 3 tons per fathom. The 42 fathom level end is being pushed on by nine men; there is one of these can attend the winding-engine, they have to tram, fill, land, and wind their stull to surface at £6 15s per fathom. The rise from the 42 we holed into bottom of the winze, sunk from the 25, three days after my last report was sent you, which has well ventilated the 42. The six men that were in the rise are now stoping in the back of the 42 from the rise west over; this is not well opened out yet for setting, but already 9 ft. wide.*" Clearly they were both developing and extracting at that time. Similar reports indicate that there was no problem of extracting ore. A report of January 8th 1878 mentioned that "*No 1 stope over the 15 fm level is standing, the place being filled with broken orestuff, worth 15 cwt of ore per fathom*", suggesting that production was still outstripping the dressing facilities.

This problem of dressing enough ore to make the venture profitable was never overcome. The directors were very aware of it and, in 1872, Peter Watson told the shareholders' meeting that it was not a question of getting ore out of the mine, but of enlarging the dressing floors.

The dressing floors at the mine prior to the Rookhope Valley Mining Company involvement must have been very poor for Captain Rogers estimated that it would cost £1,000 to enlarge them. Management of the dressing floors apparently lacked a sense of urgency, however, considering that work at the

mine began in June 1872. On September 7th 1872, Rogers reported that excavations were being made to enlarge the floors, but added that he could not have the slime buddles made "*for want of a carpenter*". By October he was able to report the completion of building the ore yard, and was preparing for the new jiggers. Two new 'plunger jiggers' were at work by the end of November and, as would be expected considering the nature of the ore, were reported to be making a good separation. Frost and snow meant that there was little outdoor work done in January, as the dressing floors were frozen up. At that time the carpenter was making the frame for a new crusher.

Towards the end of 1873 the dressing floors were still causing problems. In September, J. Manley and F. Williams reported that, "*The dressing-floors being in a very dilapidated condition, we have under consideration the entire re-modelling of the same until the new machinery is erected, after which stoping and dressing operations will be carried out vigorously*". Manley's November report mentions sending out samples for 20 tons of lead ore. It seems that this was a new venture, as no ore had been sold previously. He also stated that when the six new 'machine jiggers' were erected, regular returns would be made.

Captain D. Brown, the manager, reported in March 1873 that they were still working on the dressing floors, a new engine was nearly complete and the new jiggers were working, but in May 1874 he reported that they were "*still having problem dressing sufficient ore to clear area ... not raising ore*". However, he reported that the new jiggers were working well. In September two more jiggers were working and provision made for two more. The crusher was moved and connected to the 'big engine'. They also installed a round buddle, driven by a nine foot waterwheel using water from the dressing floors. A propeller buddle was also installed. The dressing floor was obviously incapable of keeping up with the mine and, in December 1874, Brown reported that "*the large pile on the dressing floor is growing larger still*".

It seems that they were short of water in the summer, and this may be the key to their problems of capacity at that time. Then Brown designed a scheme which would allow water to be stored in the mine during the night and pumped out during the day, "*which would be a great boon to us in such dry seasons as this last has been*". Production returns for 1876 were 236.8 tons of lead ore, yielding 153.9 tons of lead and 1075 ozs silver. For 1877 they were 190.2 tons of lead ore, which yielded 142 tons of lead and 994 ozs silver.

The sad tale of lack of dressing capacity continued and, as late as January 1878, a dissatisfied shareholder complained that it had been stated that the mine would dress 50 tons per month increasing to 80 tons, but this had not been achieved. If the 1876-7 figures are typical, it would seem that they could only produce about 14 tons of lead concentrates per month, though

they probably had to dress in excess of 140 tons of ore to produce this quantity, depending on how much concentration could be achieved underground by selection. The response to the shareholder's complaint was that everything had been done to put the dressing floors into the best position at least cost. A new dresser had been engaged, having been recommended by the London Lead Company, and it was hoped that next month the returns could be increased – as usual an optimistic reply that could have little relevance to reality. It was probably at about this time that the money ran out, and a new company was formed to take over the enterprise in 1880.

BRANDON WALLS MINE

The mine was an old mine with extensive workings accessed by a shaft near the Rookhope Burn. Soon after its formation, the new company removed an old wheelpit and started to build a new water course, wheelpit, and waterwheel to pump the mine. The wheel pit had been completed by the end of 1872 and a wheel was being built. By April 1873 the pumps were working and the water level was down to the 25 fathom level. Progress was slow, however, because of "*the great length the level is driven which is full of water*". The total depth of the shaft was 60 fathoms and it took until September 1873 to clear the mine of water. A new winding machine was purchased to attach to the waterwheel. In February 1884, Captain Arthur Waters recommended to the shareholders' meeting that the company should "*confine operations to Rookhope proper for some time to come, and go to Brandon Walls when you can see your way clear for doing so*". It seems that Captain Waters suggestion was implemented and Brandon Walls abandoned, in theory for the time being, but in reality for ever.

FAILURE

The Rookhope Valley Mining Company was fighting a losing battle. When it started operations in 1872, the price of pig lead was about £20 per ton, but this value had dropped progressively to reach £15 per ton in 1880. By March 1874, they had expended £8,000, i.e. half of their original cash assets, at a time when they were said to have a balance of assets over liabilities of only £5,000. What the cash balance was is not known. Clearly, if the losses could not be stopped, the company could only continue operations for a short time. In 1876 activities were limited and the company had to be reconstituted. What was implied by this is not known, but no doubt more capital was required to continue operations. Mr W. Blenkiron became involved in the decisions affecting day to day operations at this time, and D. Brown must have followed his instructions. For example, on March 22nd Blenkiron reported that he "*instructed Mr Brown that ordinary day work inside the mine was to be reduced to 3s per day*", and on May 9th he reported that "*I told Brown no time must be lost on dressing-floors*".

THE NORTHERN LEAD MINING COMPANY, 1880-1882

This company was formed in January 1880 with the objective of taking over the Rookhope Valley Mining Company's mines. People formerly involved

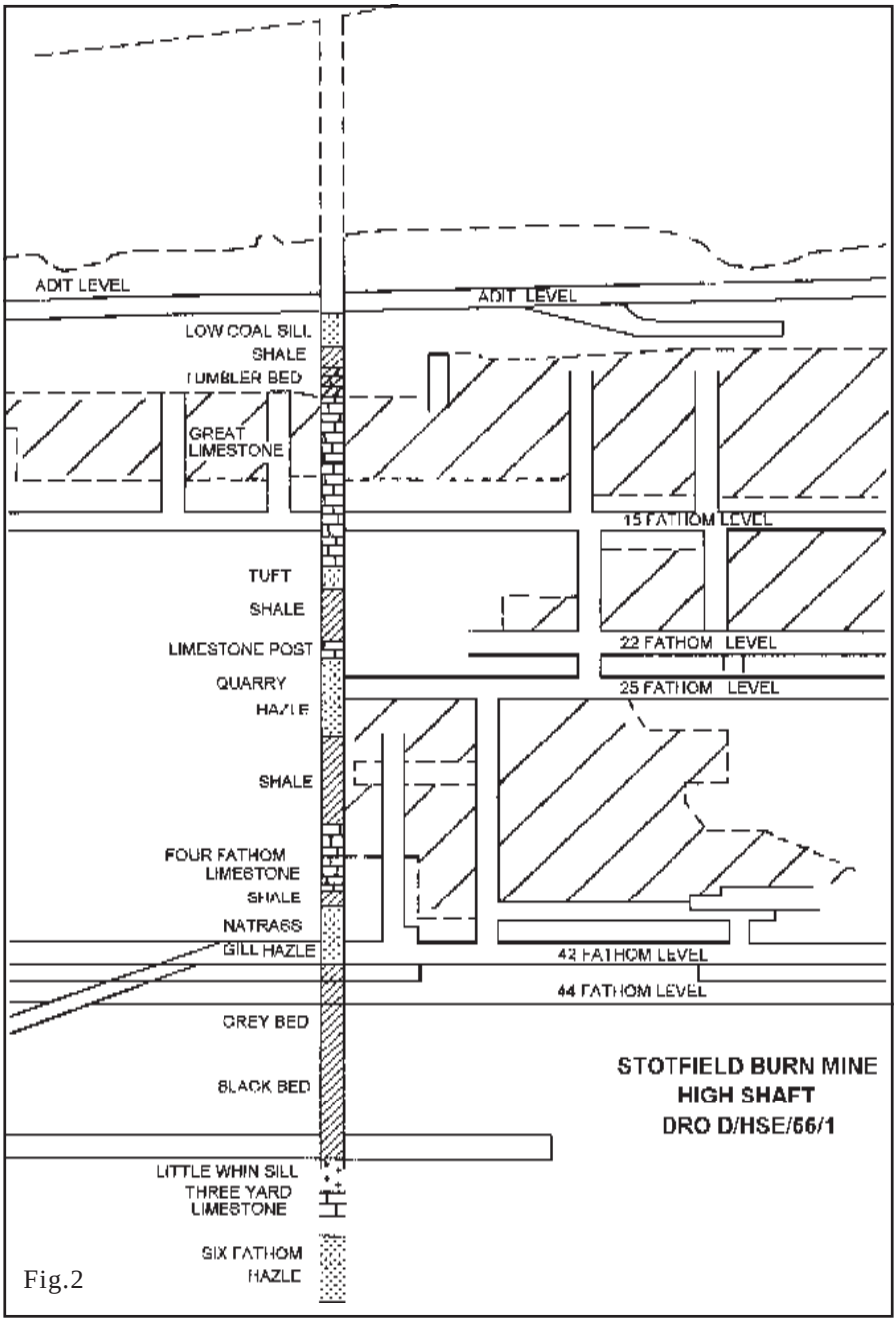
ADIT LEVEL
ADIT LEVEL
LOW COAL SILL
SHALE
TUMBLER BED
GREAT LIMESTONE
15 FATHOM LEVEL
TUFT
SHALE
LIMESTONE POST
22 FATHOM LEVEL
QUARRY
HAZLE
25 FATHOM LEVEL
SHALE
FOUR FATHOM LIMESTONE
SHALE
NATRASS
GILL HAZLE
42 FATHOM LEVEL
44 FATHOM LEVEL
GREY BED
BLACK BED
STOTFIELD BURN MINE
HIGH SHAFT
DRO D/HSE/66/1
LITTLE WHIN SILL
THREE YARD LIMESTONE
SIX FATHOM HAZLE

Fig.2

with the mines were active in the new company. For instance, John Blenkiron, who was the manager in the latter years of the Rookhope Valley Mining Company, held the same position in the new company. Mr Murchison appears to have retained the position of company secretary, and the offices were still at 8 Austin Friars, London E.C.

The description of the mines published in the *Mining Journal* was, to say the least, misleading. For example, the mines were said to contain "*three lodes that have been worked to great advantage and profit in the adjoining mine for centuries, and have yielded largely in the property now acquired by the Northern Company, though the ground yet opened is not very extensive; but there are already at Stotfield Burn part of the property 2000 fathoms of ore ground in a state to be operated on at once, which will be worked on tribute, and are estimated to yield at least 30 tons of lead ore per month to start with*". The need for a "*moderate outlay of capital*" was mentioned, but the difficulty of processing the ore was never referred to. The previous company's failure was attributed to the low price of lead, "*£7 per ton being about what they realised latterly, whereas now about £12 to £13 can be got for similar ore*". In fact, the price of lead had only risen by about £1 per ton in the year concerned, and had never been as low as £7 per ton. They also claimed to have got the duty on the ore reduced from one ninth or one eleventh paid by the previous company down to one eighteenth for two years, and thereafter probably not exceeding one fifteenth. Such a reduction would be an incentive, but was unlikely to materially alter the overall profitability. As usual, the notice concluded "*A considerable number of the shares have been already applied for*". This may have been true, but quite possibly the shares disposed of would be in the hands of the directors.

The company was to have 10,000 shares at £1 each, "*to purchase the mines machinery and leases belonging to the late Rookhope Company, and to work the mine vigorously. Immediate returns will be made --- good profits are likely to be realised in a short time.*" Considering that the previous company had only £15,000 capital, much of which seems to have been lost in operating costs, this may have been a bad deal, but the actual value placed on the plant and equipment is not available. The new company may have been a scheme for the directors of the Rookhope Valley Mining Company to recover some of their capital, as they are thought to have held the majority of shares of the old company.

The company started to work Stotfield Burn Mine in August 1880 and began dressing ore by September 1880. By November, Thomas Tonkin reported that they were working in the 15 and 35 fathom level stopes and extending the 42 level east section. They were also driving east and west in the bottom of the Coal Sill.

They opened Brandon Walls mine and, by January 1882, they were securing the 37 and 50 fathom levels as fast as possible as the lode, where seen,

"*presents a favourable appearance and yields some good stones of ore*". In May, Tonkin reported that the tributers were getting out very good ore, the yield being 30 cwt to the fathom. The vein was said to be "*of a concentrated form, and the productive portion is chiefly confined to a solid rib on the footwall of the lode.*"

In a report published on June 3rd 1882, Tonkin was still enthusiastic, mentioning that Brandon Walls continued to yield 30 cwt per fathom and that the 15 fathom level (in Stotfield Burn) is "*processing lead ore in remunerative quantities*". This was the last report published, optimistic to the end.

THE WEARDALE LEAD COMPANY, 1883

The company was formed in June 1883 to take over the Beaumont Company's Weardale leases. It also acquired the lease of Brandon Walls and probably of Stotfield Burn. It continued some exploration work at Brandon Walls until about December 1885, when the directors discontinued exploration "*for the present, having so many other places which promise quicker results*". The company did not work Stotfield Burn Mine until 1914 and then it was for fluorspar, after having extracted about 405 tons of this mineral from the dumps between 1905 and 1913. Much of their fluorspar was got from parts of the vein that had been previously worked for lead. The mine was finally abandoned in 1966.

J. Blenkiron, who had been a manager or agent for both the previous companies, was one of the managing agents for the Weardale Lead Company.[3]

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