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Moelferna Slate Quarry, Glyndyfrdwy, Merionethshire

J D Evans (formerly Mine Manager)

[transcript of written account held in SCMC library]

This slate quarry was one of a group of four or five slate quarries which were developed in the district, comprising Glynceiriog & Horseshoe Pass in Denbighshire & Glyndyfrdwy and Carrog in East Merioneth, produced good quality roofing slates for a long period - roughly about 100 years perhaps. I have a mining consultant's report on the quarry dated February 1876 but it appears that slates were being produced from the workings some time before that date. Like other slate quarries, this quarry felt the blast which actually brought it to an end in December 1960. Perhaps the scare of silicosis, very much publicised at that period, and also the reluctance of young people to accept mining as a means of livelihood, accounted for the fairly rapid decline of slate mining.

Competition from other forms of roofing materials was also another factor but the biggest factor was the lack of continuity in craftsmen. It took about five or six years to train a competent slate-maker or rock-man, so that if there was an appreciable gap in intake of apprentices it would have its effect in a few years as far as skilled manpower was concerned.

The slate vein in the district is known as the Silurian Strata, a blue-grey coloured slate which could be described as good medium and second quality. It is well known of course that the Cambrian Strata in West Merioneth and Caernarvonshire are the top quality slates. The slate bed in Moelferna was about 60-70 yards thick and, as the beds were some distance from the front surface, it developed into an underground quarry or mine.

The slate beds were worked by making openings - called chambers and supported by leaving pillars of slate bed unworked between the chambers. Generally speaking, the supporting pillars were about 15 yards in thickness and the chamber was opened at a width of 15 yards. As the chambers were worked forward, the pillars could be lessened by working another few yards from its side - this was done in order to extract as much slate as possible from a given chamber.

The rock was obtained by the skill of rock-men who also used black powder for the extraction of large slabs of slate. The slabs were conveyed by narrow gauge rail to the Sawing Sheds outside. After sawing the slate to workable sizes - say 30" long, 60-70" wide and of varying thickness up to 12" - the slate slabs (now called "blocks") were finally split and dressed by the slate-makers.

Part of the problem as the quarry progressed was the transport of the product from quarry to building site, etc. Initially a narrow gauge railroad was planned down the mountainside and a quay for stacking the slates was formed near the local railway station (Ruabon - Barmouth GWR). As is known, the height of Moelferna is over 2000ft and the quarry itself is somewhere about 1600ft, so the railway had to be carefully engineered to allow for the rapid fall in a length of about 3 miles -which is approximately the distance from the station to the quarry.

Finally I would mention that the quarry was well preserved and planned - the company who owned it was a very good one and it was only because of the manpower problem that the final decision to close had to be taken. At one time the quarry employed about 200 men drawn from the two neighbouring villages of Glyndyfrdwy and Carrog. This number had been declining steadily for many years and when the number was reduced to about 45 it was no longer an economic or viable concern.

Sizes of Moelferna slates (in inches)

24 x 14	24 x 12	22 x 12	22 x 11
20 x 12	20 x 10	20 x 9	18 x 12
18 x 10	18 x 9	18 x 4½	16 x 10
16 x 9	16 x 8	14 x 12	14 x 10
14 x 9	14 x 8	14 x 7	14 x 4½
13 x 10	13 x 7	12 x 10	12 x 9
12 x 8	12 x 6	12 x 4½	10 x 8
9 x 9	9 x 4½		

The Contest

Terry Davies

I discovered the poem below while leafing through some old magazines recently. It was constructed during the 1970s one night in the old clubhouse, following a social function during which the "ownership" of a young lady was discussed. It was such a great work of literature that it was promptly placed between the pages of a magazine and forgotten!

The young lady's name was originally Myrtle but, since this doesn't ring any bells any more, it has been updated to be more topical. Peter Peartree was the pseudonym for an ex-member who shall remain nameless to spare his embarrassment.

Now gather round folks and I'll tell you
A tale of deeds bold and true
And how a young lad named Dave Adams
Struggled but finally came through.

Now Adams was dead keen on "trogging"
And climbing down holes in the ground
But of late his attention had wandered
To following a young lady around.

Now the young lady's name was Annie
And she was a caver of note
Who had done Gaping Ghyll, just for the thrill
Without ladder or piton or rope.

Yes she was a tiger, she'd climbed down the Eiger
With crampons fixed to her nose
With her hands firmly placed in her pockets
Head first, using only her toes.

Now young Dave had a rival named Peartree
Who was an unprincipled rogue
He cursed, he told lies and he cheated
He sucked tea from a saucer, he smoked.

Well Annie could not make her mind up
About which of the chaps she should land
So the Club President suggested a contest
The winner to have Annie's hand.

Now there are mines for lead in South Shropshire
And the old shafts are dark, wet and deep
And the experts in such matters (who were all mad as hatters)
Were the Club named SC & MC.

The venue would be at Snailbeach

In a shaft particularly deep
The start line to be at the bottom
First at the top, fair Annie to keep.

Well Peartree arrived with his seconds
He sneered and he pulled his moustache
He put on yorks, a jockstrap and gaiters
And prepared to have a good thrash.

Now Adams drove up in a Range Rover
Wearing a bright pink hat
Sporting a large brass belt buckle
Plusfours, yellow gaiters and spats.

They both abseiled down to the bottom
And set their toes to the line
The referees took their places
Then the President shouted "Climb".

Well Peartree made a mad scramble
In order to get to the front
For understand it was essential
If he was to pull off his stunt.

For now was the time that Peartree
Revealed he was bad, through and through
For down each one of both gaiters
He had thrust a large tube of glue.

And the glue was a type that's quick acting
And as out of each tube it did flow
It left each foothold all sticky
Designed to make young Adams go slow.

So when Peartree neared the surface
In triumph behind he did glance
For Adams was way down behind him
He obviously hadn't a chance.

But a cad can't be allowed to triumph
Over a cleancut, sporting young lad
Else there would be no moral, to story
And no retribution to strike down a cad.

So the glance that Peartree threw behind him
On Adams belt buckle chanced to fall
It shone so bright, he were right dazzled
His foot slipped and he fell off the wall.

So he fell down the shaft and as cads will

He turned a bright shade of green
And instead of showing a stiff upper lip
He emitted a terrible scream.

And as he fell he passed Adams
Who thrust out a powerful arm
He caught hold of Peartree's jockstrap
Which caused him considerable harm.

It arrested Peartree's progress
Then as upwards Adams did surge
He dangled Peartree behind him
And arrived at top to loud cheers.

Thus Adams won the fair Annie
And the moral should be clear to you
Like Adams stick to fair haired young ladies
But don't put your trust in quick setting glue.

Nantymwyn Lead & Zinc Mine - a Modern Exploration

Roy Fellows

Introduction

The Nantymwyn Mine is geographically divided into two sites, lying above and below the village of Llandovery, Dyfed. The mine was worked mainly by adits driven into the mountain known as Pen Cerrig Mwyn and, on the face of it, being the largest metal mine in South Wales, should be a mine explorer's paradise. Unfortunately, however, at the end of its last working period, in 1932, all of the entrances were blown in. Spoil was later removed for road building and the surrounding area forested, with a forestry road cutting through the site. This, together with massive falls of ground, means that today only a small part of the underground workings are accessible.

The lower workings were served by the Deep Adit of the mine (known as the Deep Boat Level) and the collapsed entrance can be seen adjacent to a row of cottages known locally as Dray Cottages, an obvious corruption of the word "Dry". About 60 metres above the entrance there is a collapsed shaft but access may also be possible from a shaft by the roadside, opposite a house called Erw Hwch (NGR SN780440). As this shaft has been used for dumping rubbish in the past, I felt disinclined to go down it.

The upper workings are centred around the engine house at Angred Shaft and it used to be possible to drive up there in a car. The gate on the mine road at Nant y Bai, however, is now kept locked so the nearest vehicle access is at the top of Pannau Street, north of the village. Here, a gate gives access to a parking area on the spoil from Level Pannau, the lowest drive on Roderick Lode. This is the final level reached on a descent for which the modern explorer will need about 400ft of rope - more on this later.

Underground Remains

I have been able to discover 4 open adits in this area :-

- a) Just in the forest adjacent to Angred Shaft (NGR SN785445). It is about neck deep in water, 20 metres to a collapse, so this can be immediately discounted.
- b) Above the top spoil heap above Angred Shaft (NGR SN790445). It is a long crosscut, upper thigh deep in water, leading to an area of workings as shown in Figure 1.
- c) The level known to cavers as Level "Cadno" (NGR SN788441). This is just below the forestry road and is easily reached from the "Car Park" by following the path until a gate is reached. Then follow a wire fence on the right and, when you see spoil above, go up in a straight line. It is situated at the end of a cutting above a pile of stones.

A short distance inside (see Figure 2), you reach a shaft in the floor which can be crossed on two springy planks. The level continues to a collapse, passing

another shaft in the floor and a blocked rise. Back at the shaft with planks (see Figure 3), there is a choice of either a straight SRT pitch of about 80ft or a short 6ft pitch down some rotten ladder to a ledge. From the latter, you go round a dog leg incline to another ladder of about 12ft with many missing rungs. Here I have left in situ a hanger for a belay.

This pitch gives access to part of Lewis's Level and a large stope is reached to the north. Looking down, water can be seen about 80-90ft below and Lewis's Level can be seen to continue beyond. The level here must once have been timber floored but this has now all gone down, together with a lot of rock. This dissuaded me from an SRT descent, although there are some belay points left there by others. Heading south leads to the second pitch and, beyond this, a collapse can be seen and there is a length of "vintage" caving ladder with wooden rungs. As there was no proper belay point, I have left two hangers in situ. The pitch itself is about 120ft, possibly free-climbable but with two short vertical bits. Some old ladder here should be avoided.

This gives access to part of Maescarhyg Level and heading south leads to a stope in the floor. Flooded workings can be seen about 20ft below this, the water overflowing into an adjacent shaft which must connect with the level below. Beyond the stope, a loose collapse can be seen with what may be a level. Heading north, you reach a shaft which is almost the full width of the floor. I have built a bridge out of some old ladder uprights from the last pitch, so it can now be passed on the left. Beyond, are a few more yards of level ending in a collapse but with a few minor artefacts. There was a single in situ hanger here, set back along the passage for some reason. I have fitted another at the pitchhead and recommend the use of both.

Figure 1 Top Level

Figure 2 Cadno & Wet Levels

Figure 3 Section of Accessible Workings on Roderick Lode

Figure 4 Section of Roderick Lode from Old Plans

This pitch is about 30ft to a dog leg, where there was a dangerous mass of rotten ladder, old timber and rock which I have been able to clear. This was done by containing my rope in a tackle bag hanging from my harness, drawing rope out as I abseiled down and clearing the way as I went. The dog leg lead to another 30-40ft of vertical descent with some nearly sound ladder in it.

The next level reached is a short section of Angred Level and heading north leads to a collapse. Heading south leads to the final pitch. Although there was a length of scaffold pole wedged across the level as a belay, I have left two hangers in situ at the pitch head. This pitch is bad enough as it is without "foul rope" condition on the lip of the shaft. Beyond the shaft, the level can be seen to continue and I may return some day and put in a traverse line or build another bridge. As to the pitch itself, be advised that there is a near vertical section of about 40-50ft to a ledge, then about 30ft free hanging. On this section DO NOT look up (your helmet is stronger than your face and eyes).

Pannau Level is the next one reached and, heading south, you reach a small chamber before a collapse - this area is thigh deep in water. To the north is a well decorated passage with, believe it or not, secondary copper formations. This leads to the base of a stope where plankways and platforms can be seen above, possibly climbable with the proper tackle. It is not the same stope as seen from Lewis's Level above.

- d) One I have called for the purposes of this article "Wet Level" (NGR SN789441). The entrance is chin deep in water (be advised that I stand about 5ft 10ins) and at about the same elevation as Level Cadno about 100 metres further to the east. Walk east along the forestry road and look for a flat area below through the trees.

The first 30 metres are very wet (see Figure 2), with less than 1ft of air space in places, but after climbing over a fall it is down to about 2ft. The passage continues and eventually ends at a complete collapse with an air pipe sticking out. Before this is reached, however, there is a passage to the left. Unlike the

other workings described, these passages from now on are all low and narrow and the one now entered appears to have been driven without the use of explosives.

On the floor, many clog prints can be seen and some are small enough to be those of children. There are a few minor artefacts. The passage eventually reaches a long east-west crosscut, which soon reaches a small narrow stope to the east. This stope is very narrow, little more than 1ft wide, and at one point higher workings can be seen which a good climber could possibly reach. Heading west along the crosscut, a complete collapse is reached after about 100 metres. I started digging this on Boxing Day 1993 and a strong draught can now be felt. In my opinion this point is on Roderick Lode (see Figure 4), somewhere inbye of the fall in Level Cadno, it certainly appears so from my survey.

It was interesting to note that this crosscut had been driven from the direction of the fall, ie the west. The water runs west and the shotholes point east. If my theory is correct, to continue the dig straight ahead would eventually strike the solid rock of the hanging wall, so the way on would be either right or left. A possible route for future exploration.

There are two piles of backfill at the easterly end of this crosscut. This would indicate that at some time this passage had fallen out of use, the dumped material probably being from fossicking operations in the late 1920s. It is also probable that my Wet Level is in fact the level marked as "Old Level" on some of the old plans, being a drive on Old Vein.

Westcott Mine

Adrian Pearce

Geology

This mine extracted copper and barytes from the Longmyndian Sandstone. There are six veins crossing the area in a NW-SE direction, five of these contain pink and white barytes and one contains copper occurring as malachite, azurite and chalcocite. Quartz crystals and mineral pitch are also found in small quantities.

Mining Operations 1859-1870

The first recorded mining was for copper in 1859, when John Harrison & Company worked the mine by opencasting, levels and 4 shafts. There may have been mining before this date but no record has yet been found. John Harrison used to work the lead mine at Meadowtown until 1858 but, since this is only small, it presumably became worked out and he transferred his attentions to Westcott. In 1867, the mine was sold to the Westcott Mine Company, whose manager was John Kitto. The latter was also manager at Central Snailbeach Mine (see separate article) and he may have been responsible for erecting the pumping engine house and chimney at the main shaft.

The depth of the main shaft is not known but the water table is very near the surface here and pumping would have been necessary at relatively shallow depths. In 1870, Kitto was replaced by Jason Nancarrow (a Cornishman) who had been manager at Bog Mine between 1864-69. His managership does not seem to have lasted long since the mine appears to have closed in that same year. The only recorded output of copper for this period was :-

1866	60 tons	value not known
1867	98 tons	value £766
1868	21 tons	value £152.

Mining Operations 1890-1894

The mine was worked for barytes during this period by M Hulton-Harrop, who was the landowner. In 1890, there were 5 men working on the surface and 3 underground but by 1891 this had reduced to only 4 underground. Westcott Mine closed again in 1894 and Hulton-Harrop concentrated on his mines at Gatten and Rhadley. The only recorded output of barytes during this period was

1890	783 tons	value £574
1891	563 tons	value £281
1892	239 tons	value £120
1893	100 tons	value £50
1894	100 tons	value £50.

It seems that the returns for 1893-94 were guesses - he obviously didn't like filling in official forms!

Mining Operations 1910-1945

During this period, the Huglith Mine extracted barytes and it was the biggest such operation in Shropshire. A level was driven underground from the Huglith workings at a depth of 250ft and found barytes veins up to 20 inches wide under the old Westcott Mine. These were worked for a short time but were abandoned when better reserves were found to the north. It is believed that Westcott Birches was the original mine manager's house, although it was later occupied by the mine fitter.

Present Day Remains

The most obvious features are the remains of the engine house, boiler house and chimney by the main shaft. They lie in a private garden and have been preserved to some extent. The shaft itself is blocked with rubbish, although pump rods were seen in the shaft up until a few years ago. Two levels nearby (also in the garden) are collapsed.

A Share of Cornish Tin

George Hall

[based the Mining Journal, April 2nd 1864, p.244]

The importance of perseverance in mining enterprises was stressed at a commemoration dinner of the Redruth Mining Exchange, by Mr John C Lanyon, the Chairman. After the usual toasts, the Chairman stated that it had been 41 years since he was first tempted to take a share in South Dolcoath Mine. It was before his marriage and, after he had taken the share, he went to his future wife and told her what he had done. He had been worried that he could not afford to keep it but she said that, if he could afford to adventure in the mine, he could surely afford to keep it. As a result, he did not sell out and lost £400 in the mine which was subsequently closed.

The next mine he was connected with was Wheal Bassett, of which he held a 1/28th share for some years despite contrary advice from mining friends in Redruth. He had continued to hold shares in that mine ever since and it had paid him more than £10,000 in dividends. That money had enabled him to take shares in other mines until, at one period, he held shares in no less than 82 mines in Cornwall and Devon.

Lanyon reminded his audience that to hold that many shares, some of which were profitable and some not, was a serious matter for someone without a large capital. He had persevered, however, and Cornish mines had made him a profit of £40,000. If the mining exchange had been in existence 40 years previously, he believed that he could have made £40,000 more profit but there had been no facilities for buying and selling shares in those days. Although a man might have to pay calls up to £5,000, he would have had great difficulty in selling his share. At the present time, a dealer would be able to sell the shares within 48 hours. He encouraged his audience not to be daunted by occasional failure since, with perseverance and a good agent, ultimate success was achievable.

Lanyon was of course talking about cost-book shares, limited liability was still some years in the future. At the time he invested in Wheal Bassett, the channel of killas between Carn Brea and Four Lanes was generally looked on with disfavour. It is therefore interesting to note in the Mining Journal share list of April 2nd 1864 the following dividend mines in that zone :-

	<u>Capital called up per share</u>	<u>Dividends per share</u>
East Basset	£29.10.0	£119.0.0
South Wheal Frances	£18.18.9	£370.13.6
West Basset	£1.10.0	£25.3.0
Wheal Basset	£5.2.6	£597.0.0

This list does not include Wheal Buller which, once extremely rich, had paid about £955 on £5 but was then past its peak. The Great Flat Lode had yet to be discovered.

Central Snailbeach Lead Mine

Nigel Chapman

Introduction

The fame of the rich veins and profits being made from the Snailbeach Lead Mine inspired others to study the area for similar profitable mines. One of the obvious places to "fossick" was the continuation of the Snailbeach veins out of the mining sett being worked. It seems surprising that it took until 1860 for operations to commence to locate these veins. Probably previous prospecting has left little trace while the evidence of the Central Snailbeach activities are still clearly visible.

Over the summer of 1860, a number of local miners formed a private company and "Costeanned" on a sett to the west of the Snailbeach Mine. This was on the supposed continuation of the Snailbeach Main Vein and it was intended to locate and work this vein. During the course of these operations, several veins were found and explored for lead ore. It was noted at the time that none of the adjoining or nearby mines on the west side of the Stiperstones Hills had failed to produce lead ore.

Figure 5 Plan of Lead Veins at Central Snailbeach Mine

During May 1861, John Job wrote a letter to the Mining Journal concerning activities on the sett. Having admitted being interested in the adventure, he continued by

mentioning that the Snailbeach Main Lode probably traversed the whole sett from one end to the other. Several veins had been located underground with their horizontal and vertical planes converging towards each other. Work on the area had consisted of locating the best sites for several levels to be driven from the west towards Snailbeach, the Crows Nest Level (NGR SJ366017) being started about 400 yards to the south of Wagbeach Adit.

John Job, while believing in the ultimate productiveness of the veins, suggested the need to prove them at depth. It appeared that the existing enterprise of J Powell & Co were of limited means and unable to find the necessary capital. They thus hoped to set up a limited liability company to raise the finance for the venture. By now it becomes apparent that John Job's letter was a form of publicity to interest local industrialists in the proposed company.

Central Snailbeach Lead Mining Company

Events moved forward with the publication on July 20th 1861 of a prospectus for the Central Snailbeach Lead Mining Company, to consist of a capital of £10,000 divided into shares of £1 each. The adventurers held a tack-note of 295 acres and had obtained the services of Messrs Phillips & Darlington Mining Engineers to report on the mines. With this favourable report and lithographic plans of the sett showing the veins (real and supposed), the proposers looked for funds.

Mr Edward Davies, manager of the Bretchell Colliery near Shrewsbury, wrote following an underground visit about a "strong vein" with a northern underlie and heading west cut in Crows Nest Level "proving beyond all doubt that it was the Snailbeach Main Lode". This brought a letter from Captain James Richards of the West Tankerville Mine to refute the claim. Then in September John Evans and David Davies, two of the managers at Snailbeach, wrote to contradict Captain Richards' statements. They went on to point out "that the 'Strong Vein' in the Crows Nest Level of Central Snailbeach is none other than the main lode of this mine". This was a superb statement for the proposed company plus the publicity engendered by the argument.

The new company was incorporated on February 1st 1862 with Job Taylor of Dudley as Chairman and Edward Henry Lowe of Shrewsbury, George Joseph England of Dudley and John Job of Snailbeach as directors. The company held the lease of a valuable mineral estate under the Haggestow Hall Farm for 21 years from March 25th 1862. One of their first actions was to present 1,330 shares (fully paid up) to the previous company and to pay all the development costs to date of at least £300. An article of the company was that the management should be from the mine with Phillips and Darlington as consultants.

With over 3,100 shares subscribed for, the company set to work with the sinking of Taylor's Shaft during April. This was to intersect the Snailbeach Main Lode at its intersection with Davies Vein. It was expected to cut the Main Lode at a depth of 45 fathoms and was 9ft in diameter. The shaft was being sunk by 12 sinkers while a further 7 miners were driving the Crows Nest Level to intersect the shaft, to provide ventilation and eventually a water adit for the pumps.

With operations progressing favourably, the reports cease until a quarterly meeting held in the George Hotel at Shrewsbury on July 29th 1864. Walter Eddy and a Mr Hanmer had supplied reports on the progress of the mine which were most encouraging. They believed that the 214 yard level was on a continuation of the Snailbeach Main Lode and it was producing 1½ tons of lead ore per fathom. [I should point out the different measurements. On the South Staffs Coalfield all measurements were in yards, not fathoms. As some of the directors came from that area, they seem to have preferred yards.]

Following the quarterly meeting, an extraordinary meeting was held to consider raising the capital of the company to £40,000 to permit the shaft to be deepened and to obtain a larger area of land to work. The shareholders present were unanimous in their approval.

A prospectus for the increased capital was issued during August 1864 and with it were sent several photographs of the area and the mine. These show the preset beam engine house and the tall square chimney with a wooden headframe over the shaft. This would suggest the construction of the building during 1863-64. The buildings also suggest more colliery practice such as would have been current on the South Staffs Coalfield. The winder could have been supplied from the Dudley area, while the use of the square chimney is typical of the Black Country.

The company now consisted of the following directors :-

Job Taylor of Dudley (Chairman)
Edward Lowe of Shrewsbury
George Joseph England of Dudley
Rev Thompson Stoneham of Ketley
William Pearson of Stourbridge
Thomas Proctor of Moat Hall, Shrewsbury.

Of these people, Job Taylor was a partner in Bennett & Taylor, coalmasters of Oldbury, Worcestershire, and lived at Portway Hall, Oldbury. He was to be involved in the Mid Wales Lead Mining Company and at this time was Mayor of Dudley. William Pearson was a partner in J & W Pearson & Company, colliery owners and brick makers of Stourbridge, Staffordshire, making his fortune in these trades. He may also have been involved in an ironworks at Dudley.

A further meeting was held on December 24th 1864, when the confidence of the shareholders in the mine meant that over 50% of the shares were subscribed for.

1865

Operations continued on the shaft sinking with the aid of the steam winder, while the pump attached to the engine kept the water from flooding the shaft. Information regarding the mine during this year is unfortunately sketchy but work continued in order to find the Main Lode and produce the elusive profits so much demanded by the shareholders. One major news item for the year was the appointment of John Kitto, late of the Great Laxey Mines on the Isle of Man, to the management of the mine.

At a shareholders meeting in the following year, it was noted that the mine had a number of shareholders on the Isle of Man. It would appear that this was as a result of Kitto's influence encouraging investment in the mine. He reported to the shareholders that to date £11,000 had been expended on the machinery and excavations and he believed that the remaining £5,000 would be well and profitably spent on the mine. The workings of the Snailbeach Mine were only 150 fathoms from the Central Snailbeach shaft and these were said to be producing rich ore from the area. Again, the basic belief in both mines working the same vein system is indicated. More than any other factor, this basic belief kept the company working over the years.

1866

Captain Kitto was at the mine early in January 1866 to report on the No.1 Lode, which he found to have much improved. He went on to encourage the shareholders by mentioning the number of staunch supporters of the mine in the Isle of Man. The 12th ordinary meeting was held at the George Hotel in Shrewsbury early in February, with Job Taylor in the chair. He noted in his report that 16,000 shares had been allotted but it had been decided not to allot any more. To improve the standing of the company it was proposed to open an office at 12, Old Jewry Chambers, London with Thomas Thompson as their agent.

John Kitto reported that the 124 yard level in the No.1 Lode had been driven about 16 fathoms east and west and produced lead ore of poor value. Work on the No.2 Lode was still in the shale and required much further driving before lead could be expected. Operations had ceased while the shaft was sunk a further 15 fathoms. The shaftsmen had recently extended the pumps to the 124 yard level and were putting in a ladderway to the same depth. He hoped to be able to sink the shaft down to 154 yards depth in five months.

The company was stated to have assets of £4,200.4s.7d over its liabilities and the shareholders seem to have been satisfied with progress. Sinking of the shaft continued over the next few months with periodic progress reports from John Kitto. He was always optimistic that riches were just around the corner, shafts should be sunk deeper or levels driven further with profits just out of sight. By the beginning of December, the shaft was down to the 82 fathom level and the driving of two crosscuts commenced. The shaftsmen were busy putting in a kibbleway and lengthening the pumping lift to clear the water. Once this was complete, the shaft sinking resumed while a team of miners drove a crosscut to find the South Lode.

1867

Captain Frank Evans of Holywell, Flintshire was asked to visit the mine and present a report for the general meeting towards the end of January. At the time, the shaft sinking had reached a depth of 164 yards and a level had been driven 5 fathoms to the south towards the No.1 Lode and the Main Lode. 1½ tons of lead ore per fathom was being raised from the level in a promising gangue with better results expected. Captain Evans suggested that continuing the level would intersect the Main Lode, proving its ore content and supplying profits. It was also decided to continue sinking the shaft to a depth of 200 yards and to drive off a level to test the lode at depth. For reasons of economy, this project was shelved.

By the general meeting held at the George Hotel in Shrewsbury on July 13th, the bank balance had fallen to £547.10s.9d. The company still held £24,000 worth of its shares and proposed selling them to the shareholders and the public to boost funds. During June, negotiations had taken place with the landowners to the south east of the Hogstow Farm estate and a takenote for the Hill Sett had been obtained. For the company to commence working the Hill Sett required the approval of the shareholders at an extraordinary general meeting. This was called directly after the general meeting on July 13th and heard reports from John Kitto and Curwen Salmon regarding the Hill Sett.

Four veins of lead were believed to cross the sett but more important was that the shale beds found under the Hogstow estate terminated against the range of hills. The miners had realised that lead ore was not going to be found in the shales and hoped that the Hill Sett would reverse the cash flow of the company. In the meantime, an outlay of £4,000 was required to develop the new area. Both reports suggested driving the south heading from the Engine Shaft at Central Snailbeach to cut the veins at a depth of around 100 yards. Operations were to commence on the surface to prove the outcrop of the veins and to find any hidden veins.

1868

At the general meeting, John Kitto reported that, in the 164 yard level to the west of the shaft, the lode was increasing in size, while the underlie had changed from north to the south. This underlie change brought the lode to an angle similar to the Snailbeach Main Lode and improved their chances of being in the correct lode. The shale had almost disappeared from the level, while the lode was now 4ft wide with spots of good lead ore. John Kitto was quick to point out the similarities to Snailbeach and the profits paid over the last 80 years from a lode found in similar circumstances.

The level being driven from the Central Snailbeach Engine Shaft was stated to be only 40 yards from the south boundary of the old sett and advancing at a rate of about 6 yards per month. All this expense was draining the bank account so, at the half yearly meeting on January 31st, appeals were made for shares to be bought. Of the original 8,000, only 2,422 had been taken and Edward Davies was asking shareholders to take up the rest. As an incentive, it was mentioned that the lode was now 5ft wide, worth about 1½ tons per fathom, and the value was improving.

The share issue was slowly taken up by the existing shareholders and the shortage of money brought operations almost to a stop, only the New Hill Level was continued. John Kitto protested loudly until operations were recommenced on the shaft sinking

below the 164 yard level and the level itself pushed forward. By the middle of April, the shaft had been sunk 12 yards below the 164 yard level, while the level was in a lode of 4ft width but of poor lead values.

These two activities continued for the next few months up to the half yearly meeting held in Shrewsbury on August 8th. Job Taylor revealed that the bank balance stood at £934.14s.6d. In John Kitto's progress report, the falling off of lead ore values below the 164 yard level was mentioned. Mr Kough the Secretary and Solicitor retired from the post. At a later directors' meeting, Mr Towle resigned and Henry Bloom Noble of Douglas, Isle of Man, was elected. Little appears in the reports but a boardroom battle seems to have taken place. Two camps probably existed as to the direction operations should have gone. At this stage, the directors were trying to keep the mine working and attempting to raise the necessary finance.

1869

Mining operations seem to have continued using the available bank balance until the next half yearly meeting in Shrewsbury on March 9th. Job Taylor from the chair proposed the winding up of the company but this failed on taking a vote. Mr Kough countered by proposing the creation of 10% mortgage debentures to raise £2,500. A proposal from Mr Derwent was to make the 8,000 shares created in July 1867 into preference shares. Various amendments watered down both these proposals until little was left. Finally it was proposed to consider the unissued 4,244 shares as preference entitled to twice the dividend of the 19,755 shares already issued. As an added incentive, these shares were to be entitled to be paid out of any wind up scheme ahead of other shares. The directors were empowered to have the shares legally created and offered to the shareholders. John Kitto produced an optimistic report for the occasion, noting the masterly state of the lode with spots of lead ore and expecting riches once the hanging wall of the vein was located.

Over the next couple of months, the directors had the new shares registered and called an extraordinary meeting to confirm the launch to the shareholders. This meeting took place on June 12th in the George Hotel in Shrewsbury. Job Taylor as Chairman confirmed to the gathered shareholders the proposal to issue the preference shares and to alter some of the Articles of the company. These measures failed to attract the necessary interest so the share issue was doomed to failure, leaving the company without sufficient funds to continue.

During 1869, Job Taylor was Mayor of Dudley, Chairman of Central Snailbeach and a director of the East Mid Wales Lead Mining Company working at Capel Banhaglog. Directing operations in mid Wales were none other than John and Sampson Kitto. One obviously led the other, they probably met at Central Snailbeach and a working arrangement for mid Wales developed from that.

Operations at the Hill Sett had drained the bank to the point of no return, meaning that liquidation was the only course left to the company. This was not to be the end, however, as a large number of the shareholders were keen to continue operations. The outcome was that the directors were empowered to liquidate in favour of a new company. Called the New Central Snailbeach Mining Company, it was registered on November 30th 1869. The directors proceeded to offer 8,000 shares to shareholders

in the old company but it took appeals and a discovery of lead ore before the shares were taken up.

1870

Early in the new year, John Kitto produced his usual optimistic report with details of the location of the Snailbeach Main Lode at Central Snailbeach. It was also claimed that the Ovenpipe Lode of the Tankerville Mine ran under the Hill Sett. As well as this, it was mentioned that instructions had been given to construct dressing floors, to be followed by regular returns of the lead ore produced. A 3ft wide vein was said to be producing 3 tons of lead ore per fathom.

At this period, operations seem to have ceased on the continued sinking at Central Snailbeach and the new shaft sinking at Mytton Dingle. At Central Snailbeach, the plant was extensively modernised, probably with a new beam winder to wind from the greater depths envisaged. The existing Lancashire boiler probably dates from this period, having been invented in 1866. As the original plant seems to date from 1863-64, externally fired egg boilers were probably used at first. Bad weather with severe frosts held up the work during winter for several months. Sinking at the mine continued to a depth of 200 yards to try the veins at a greater depth in the hope of finding ore.

At Mytton Dingle, the shaft was sunk using a horse gin until heavy feeders of water stopped work. A level was driven to cut the shaft at a depth of 14 yards and a portable traction engine was bought to wind and pump the shaft.

1871

At the general meeting held on March 31st at the London Tavern, Job Taylor as Chairman mentioned a credit of £2,639.12s.0d belonging to the company. He noted that the directors consisted of H M Wainwright, R Hilhouse, Henry Rotten and Job Taylor. The office of the company was now at 3, Birmingham Rd, Dudley with J S Wainwright as Secretary.

At Central Snailbeach, the sinking of a sump to a depth of 230 yards had been the major work, with some nice lumps of lead ore found. A level was being driven south towards the main lode with high expectations and a second sump was being sunk. The alterations to the surface plant were nearly complete with the masons and engineers expected to finish by the end of April. Mr H M Wainwright pointed out that the new plant would be one of the cheapest while at the same time, for its size, one of the most efficient in the county of Shropshire.

At Mytton Dingle, the shaft had been sunk to a depth of 44 yards and a level driven on the lode for 8 fathoms. Two large stones of lead ore were produced at the meeting to show the quality of the ore at the mine. A large part of the company's capital had been spent proving the lodes here, with great hopes of developing a profitable mine.

1872

Mining continued along similar lines into this year. Work at Central Snailbeach was now concentrated on driving the 164 yard level because the extensive workings of the previous company would enable a quicker intersection of the South Lode. Problems were being experienced with the sale of shares in the company. To finance mining, a further 3,000 shares entitled to a return of 10% dividend from the profits before any other shares were launched. Such a scheme was a sign of a company in trouble and few were prepared to risk their money.

By the general meeting on September 14th, over 1,000 shares still remained to be sold. Also, for the first time Job Taylor was missing and R Hilhouse took the chair. At this point, with the directors imploring the shareholders to sink more money into the concern, the reports end. It appears that somewhere towards the end of 1872 the company finally foundered, with little to show for years of work and several fortunes expended. In particular, Job Taylor had made a fortune out of coal mines at Oldbury, Staffs only to lose a large part of it in lead mining.

Present Day Remains

The most prominent remains are at the Central Snailbeach Mine (NGR SJ368015), in the form of a three storey Mytton Shale and brick built beam engine house. The engine beam was mounted on the south wall with a large flywheel slot (now a window) at ground level. At this point would once have been the winding spool with a "Rattle Chain" on it. Pumping was also done by this engine with a crank operating a flat rod to a quadrant on the shaft edge. Internally, the ground floor still retains two wooden beams the full length of the room that once supported the cylinder. To the east is placed the Lancashire boiler, minus many of its fittings but still in good condition. Probably once out in the open, it is now roofed over. Further south is the truncated square brick chimney still connected to the boiler. In the west face of the chimney is an arched opening pointing towards the site of the single shaft. Also, in the bank nearby a short stone arched tunnel can be found. This is believed to have drawn air from the shaft into the chimney, forming a primitive ventilation for the mine.

Bwlch-y-Plwm Lead Mine

Harold Morris & Ron Twigg

Introduction

About ¼ mile east of Llanfrothen church there are a number of shafts and levels of the Bwlch-y-Plym Mine (NGR SH628415). The main adit extends for a total of 600 yards and 200 yards in there is an internal shaft 75ft deep. After another 50 yards there is a further 35ft shaft. Above this adit there are another five levels.

Geology

The country rock consists of Ordovician sediments and there are 7 mineral lodes, from which lead has been extracted in great quantities. The Main Lode ranges east-west, underlying north about 45⁰ and varying in width from 3" to 6ft. The galena occurs in bunches amongst a brecciated gangue consisting of quartz and calcite. Pyrites occurs in the vein but there is no trace of zinc blende.

The North & South Lode ranges north-south, underlying east about 80⁰ and varying in width from 6" to 6ft. Galena, pyrites and zinc blende occur in a gangue consisting of shattered greenstone cemented with quartz and calcite.

History

Part of the area of this mine was once known as Gwaith Romans, or Roman Works, and an old smelting hearth was discovered here. Although it cannot be proved that the Romans worked lead here, it is possible that the site is of great antiquity.

In 1797 the mine was leased by a partnership of 9 persons from the landowner Owen Ormsby for a rent of £100 per annum. An old account book indicates that capital of £277.17.2½d was injected to get the mine started. Three teams of miners were being paid to sink shafts and open the mine for development. The following are typical entries from the account book for Richard Evans & Co -

Sep 27 1800	for sinking 21 yards of ground from the upper level to get air to the lower level at £2.2.0d per yard	£44.2.0d
Jan 3 1801	for sinking 18 yards of ground below the above mentioned sump to get air to the lower level at £2.15.0d per yard	£49.10.0d
Feb 7 1801	for raising 5 tons 2cwt of lead ore at £5.0.0d per ton discovered by sinking above sump	£25.10.0d

Entries in the Mining Journal for 1854 indicate that gold was found at the mine. It was in fact described as the Bwlch-y-Plym Gold Mine and it was claimed that gold showed visibly in the lode with an assay of upwards of 2oz per ton.

In July 1863, the Bwlch-y-Plym Lead Mining Co Ltd was formed to work the mine with a capital of £20,000 in 4,000 shares of £5. The initial shareholders were :-

Thomas Barnes	264	
Carlton Baynes	259	(Secretary)
David Clarke	68	
William Crippin	68	
Henry Dennis	56	
Walter Eddy	66	
Richard Morris Griffith	16	
Samuel Holland	539	(Chairman)
Thomas Saviour	307	
John Henry Williams	13	

Walter Eddy reported on the sinking of New Shaft which was intended to intersect Main Lode at a depth of 120ft below the old workings. Since the lode was underlying, the shaft was started east of the vein (see Figure 6) in order to intersect it at the required depth. A cross cut was to be driven towards the lode at a depth of 75ft and the lode opened up from this and the bottom level. A waterwheel and machinery for pumping/winding had been acquired and these would be operational in the near future. Mining was continuing in the old shallower workings and 20 tons of ore was being prepared for sale. A great deal of lead ore was obtained from these operations but lack of power meant that the workings were flooded out and eventually abandoned. The Roman Level was started in an attempt to drain the workings at depth but it had only been driven for a distance of 33ft before liquidators were appointed in May 1868. The company was finally wound up in February 1871.

Figure 6 Section of Bwlch-y-Plym Mine

The mine was subsequently acquired by the Penrhyndeudraeth Lead Mining Company who continued driving the Roman Level (see Figure 7). In July 1873, David Homfray reported to shareholders that work was currently confined to driving the Roman Level night and day to intersect the Middle Lode. He estimated that it would take another three months to excavate the remaining 78ft.

A list of the miners working at the mine in August 1874 appears below :-

MEN

Griffith Edwards	Pen y Bwlch	John Edwards	Peny banc
William Edwards	Osmond Terrace	Daniel Evans	Plas Newydd
David Evans	Ty Eiddaw	Ellis Evans	Glan Llyn
William Evans	Pen Llyn	Robert Glyn	Pen y Bryn
Cadwalader Hughes	Pen y Bryn	Robert Hughes	Bryn Llydan
Edward Jones	Pen Llyn	Evan Jones	Bryn Rhys
Griffith Jones	Pen Clogwyn	Griffith Jones	Pen Llyn
John Jones	Cae Gorlan	John Jones	Pen Clogwyn
John Jones	Tan y Bryn	Richard Jones	Carreg
Richard Jones	Pen y Meini	Robert Jones	Glan Llyn
William Jones	Pen Clogwyn	William Jones	Tan y Banc
David Lloyd	Ty Eiddaw	John Morris	Bryn Saethon
David Orton	Ty Cerrig	Owen Owens	Pen y Bwlch
Benjamin Phillip Pant		Edward Price	Berthen Gron
David Roberts	Pen y Bwlch	Thomas Roberts	Pen y Groes
Evan Williams	Adwyddu	Griffith Williams	Adwyddu

BOYS

Ellis Glyn	Pen y Bryn	Robert Jones	Glan Llyn
William Jones	Pen Llyn	Humphrey Pugh	Berthen Gron

In August 1875, William Casson reported that the Roman Level had been driven for a distance of 1,140ft and, after intersecting Middle Lode, it was to be driven towards Main Lode. At that time, however, operations were stopped due to an unwillingness amongst the partners to fund further explorations. A shaft had been sunk to a depth of 40ft on the west of the property and a great deal of galena extracted. It was intended to increase this to a total depth of 90ft.

A report by a consulting engineer, W Jeffries, in November 1875 gives a comprehensive picture of the state of the mine :-

"The development of the mine has been for some time in abeyance, and operations have been confined to deeper sinking, on the run of the pipe of ore discovered by the deep crosscut on the Lower Vein, and to which reference was made in my report of the 30th October 1874 and again in the report dated 9th September of the present year. At the deepest point now attained the run or pipe of ore is not so rich as it was at the time when I last visited the mine, and as the further deepening without the aid of pumping and draining machinery is abounded with such heavy labour charges, I think it inadvisable meantime to sink further.

It is not desirable at present to spend capital for the purpose of making a direct outlet to surface by means of a shaft in order that machinery may be applied to prosecute the sink in depth, as it is better to wait until the level on the course of the vein is extended and other seams of ore discovered, the position of the shaft from surface may then be determined with a view to command the whole.

The success of the mine altogether depends on the discovery of new runs of ore in one or other of the veins or in each of them as the work of development progresses. The driving on the course of the Lower Vein may and should be immediately resumed. As the driving is advanced, doubtless other productive bars of ground will be laid open, these may then be worked with advantage and profit as the roof will be unbroken to surface for a height of upwards of 40 fathoms.

Runs of ore so discovered may be worked in the usual way by a regular system of stoping, and the ore produced will be altogether free from the heavy tax of manual labour necessarily attending the recovery of ores beneath water head. The great object of the undertaking is undoubtedly the opening up and development of Middle and Main Vein by the combination of the deep adit crosscut - numerous and extensive excavations prove conclusively that the veins have been productive at surface and in absence of proof to the contrary it is right to assume that they continue productive at depth.

The driving of the crosscut should be resumed forthwith by a full complement of miners, so that the object in view may be attained with the least possible delay. Operations will be very properly restricted to the driving of the crosscut and the combination of the driving on the Lower Vein with six good miners on each face - other labour with the exception of a single man to keep the working faces free from debris should be dispensed with so that for the present and until payable ore ground is discovered a full staff of men to be employed will consist of 12 miners and a labourer and agent.

Figure 7 Plan of Bwlch-y-Plwm Mine

The question of boring by machinery may and should be taken into consideration with a need to a trial of its merits in the crosscut, a trial may be made at comparatively trifling expense as the water wheel can be made available for compressing air, as for some time at least it will not be required for other purposes.

I have not made calculation of the cost of making a watercourse from and the diversion of the stream of water adjoining the property, in the absence of a special survey the calculation cannot be made. I have been over the ground and see no difficulty whatever attending the work. In early spring, if an increase in water is necessary a special survey can be made and the work speedily executed, meantime the water already available is sufficient for the requirements of the mine."

Between 1849-1875, a total of 355 tons of galena were obtained, from which 285 tons of metal were obtained by smelting. In 1874, 2,150 ounces of silver were refined from 112 tons of lead.

In January 1878, work was continuing on the Roman Level and the mine agent, M Whitford, recorded in his diary that there were 6 miners on bargain with one tramming on day work. In December of that year, Homfray reported that they had yet to reach the vein. According to a survey, they had now passed where the vein should be but there had been no indications other than a 10" string of quartz. The mine was still working in 1919 when there were 1,000 tons of mixed ore in stock.

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Rhadley & Sallies Mines

Alisdair Neill

Introduction

These surveys were carried out in June 1984 but I had been to both sites previously - Rhadley being one of the first mines I ever visited, at the age of one!

The two mines are situated in an area where lead has been mined since Roman times (proved by the discovery of pigs of lead with Roman inscriptions and dates) but lead mining died out before the First World War. Lead mining was gradually taken over by the mining of barytes (BaSO_4), a spar mineral which often accompanied the lead in large quantities. At that time, it was used for paint and paper making and in chemical manufacture but it is now used in large quantities as drilling mud in the oil industry. It is mined on a large scale at Silvermines, County Tipperary, Eire. Both Rhadley and Sallies were barytes producers, only a little galena (PbS) being found at Rhadley.

Rhadley Mine (NGR SO343958)

This lies on Black Rhadley Hill, part of the Stiperstones, a rocky ridge formed by the Stiperstones Quartzite (basal Ordovician in age). The barytes ore-shoot seems to have been in the overlying Mytton Flags formation (flaggy fine sandstones), in a vein which may have been a fault between the quartzite and the flags, the details of the geology being unclear. The Mytton Flags were the host rock for all the major lead-zinc orebodies in the area.

Figure 8 Surface Plan of Rhadley and Rock Mines

Trials for lead were apparently carried out at several periods in the 19th century, eg in 1874 a 'caunter' lode close to the north-east boundary was being investigated.

Several shallow pits and collapsed shafts can be traced on the line of this, on a steep slope close to the edge of a forestry plantation. At the foot of these workings can be seen a collapsed adit, with a tip containing some barytes but largely quartzite. All these workings are probably in quartzite, a rock unfavourable for any economic mineralisation. The adit is shown on an old plan to extend into the adjoining Rock Mine, another small barytes and lead mine. At Rock, the main shaft has been descended by the SCMC who found levels and stopes going off but couldn't get into them. The shaft is on top of a prominent spoil tip, beside the 'Rock', a tor-like quartzite crag. From here there are fine views across to the Berwyn and Aran mountains in North Wales.

The first success at Rhadley came in the 1880s when the barytes vein on the hillside was discovered. This trends east-west and dips 70° N. It carried an orebody about 60 yards long at surface containing up to 8ft width of solid barytes, with some calcite and scattered galena crystals. The deposit was discovered by Edward Wardman in 1883, who worked it on his own for 12 months before taking on local miners. The barytes and lead was carted to Minsterley station. Between 1887-1890 Wardman sold 2,670 tons of barytes worth 13/- per ton. In 1891 it was worked by the South Shropshire Barytes Co Ltd, who sold only 278 tons before the mine closed the same year.

Work was resumed in 1895 and, up to 1910, a further 4,022 tons of barytes had been raised. The barytes was produced from an opencut working on the outcrop, below which shallow shafts were apparently sunk. Between 3-6 miners were employed. The opencast has now largely been filled in.

Figure 9 Plan and Section of Rhadley Adit

Barytes veins cut in the adit are as follows :-

- a) 1-3" width of white barytes, partly stained by mineral pitch. Drive on vein is blocked after a short distance.
- b) 3-6" width of barytes.
- c) 3" barytes.
- d) ½" barytes.
- e) 1-3" barytes.
- f) unmineralised, heaves (e) 3" right.
- g) unmineralised, dies out towards end of drive.

At about the turn of the century, a cross-cut adit was driven from the north-west to cut the main vein 150ft below surface after driving 280 yards. It was probably hoped that this would cut further orebodies but only thin strings of barytes were discovered. The main vein was 2ft wide where cut and a rise was put up from the adit, proving the vein to widen to 12ft. An old section shows that the rise was vertical and it was connected by a short cross-cut to a shaft sunk from surface. After being left standing a few days, the rise workings caved in and had to be abandoned.

During the First World War, the mine was held by Shropshire Lead Mines Ltd (later Shropshire Mines Ltd), who held most of the mines in the Stiperstones area at that time. From about 1920 Rhadley, and also Rock (which was returned to Shropshire Mines Ltd in 1922), were worked by a London company called Rhadley Mines Ltd. This company employed up to 19 people (9 underground) but work ceased in 1924. It was probably this company that was responsible for sinking the 36ft winze in the adit cross-cut and then driving from the bottom towards the vein. According to Dines, this was not completed to the vein but the winze has not been descended to verify this.

Between 1932-1935, Mr E Murgatroyd of Keighley, who had been involved in barytes mining in Yorkshire during the war and later at White Grit, worked the mine. He is reputed to have driven an adit on the western slopes of the hill. Up to 5 were employed but no underground work was done after 1933. At the west end of the hill, 2 run-in adits and a shaft can be seen but these look much older than the 1930s. Some barytes can be found on the tips. [Editor -Murgatroyd's adit is further to the west at NGR SO337962. There is a very long tip and the ruins of what is probably a compressor house. The adit appears to head eastwards]

The main adit can be identified by a fair-sized tip by a track on the north side of the hill. It was driven at approximately 7ft x 7ft section, on a gradient of approximately 1 in 240 to allow free drainage. It cut several barytes strings up to 6 inches wide but too narrow to be worked. Short levels were driven on two of these. The rock was removed by a tramway which divided at the level mouth, the left branch going to the main tip and the right possibly to a simple dressing plant and loading bay. A building by the level portal was presumably a changing room, office, smithy and probably housed a small compressor.

The adit can be followed, partly by crawling, as far as the winze, beyond which it is walled up. The winze is approximately 7ft square, with an air main still in situ. It is dry but was not descended due to lack of tackle. In the level before this are the remains of a hemp rope and some signal wire. Also can be seen the initials in carbide soot

"DEB 1958", which one tends to find in so many mines in Wales and the border. [Editor - for the uninitiated, the initials are those of the ubiquitous David Bick]. The winze would be worth descending, needing a scaffold bar for a belay. Another open adit 250 yards to the north-east can be identified from its tip. This we found to have nil air space. A few minutes digging resulted in a few inches of room but it was decided to leave this and return later with tools.

Sallies Mine (NGR SO387992)

This mine lies to the east of the Stiperstones, the country rock being massive purple sandstones of the Bayston-Oakwood Group (Longmyndian, Pre-Cambrian). The beds dip steeply west, being inverted. These rocks have hosted large barytes orebodies at a number of mines with a little copper but no lead.

The most important barytes producer, Huglith Mine, was showing signs of exhaustion towards the end of the 1930s. The owners, Malehurst Barytes Co Ltd (a subsidiary of B Laporte Ltd who also worked the Bridford Mine in Devon) started prospecting at other sites in an attempt to find a replacement. The crude ore from Huglith and their other mines and trials was treated at a modern mill (acquired from Shropshire Mines Ltd) at Malehurst near Minsterley, which produced best quality bleached barytes. The prospecting located two virgin barytes veins at Sallies, 50 yards apart, trending E-W to ENE-WSW and dipping 50° - 70° .

By 1943, these had been proved by a cross-cut adit, from which levels were driven along each vein and rises put up to surface on each vein for ventilation. For most of the distance driven at adit level, the veins were found to consist of a solid leader of barytes up to 1ft wide, not wide enough to be worth mining. The east drive on the north vein, however, proved the vein to widen to workable widths. Stopping was commenced here and a winze was sunk below adit which proved the vein to improve further at depth. Between 1943-44, 1,388 tons of barytes were produced.

In 1944, a vertical shaft was commenced to prove the vein at depth. An electric winder and a Holman compressor were acquired from Huglith Mine and a converted tram tub was used for rock hoisting. Rock drills were used for all drilling, including stopping. Safety fuse was used in blasting, except in the shaft where electric firing was sometimes used. Stopping was by an overhand method. A major problem was the dust disease Silicosis and many men used face masks as protection against this.

Figure 10 Surface Plan of Sallies Mine

Employment figures given in the official returns are as follows :-

1945 26 (20 underground)

1947 36 (25 underground).

Although fair amounts of barytes were produced for the Malehurst Mill, supplemented by some from Gatten Mine, not enough could be obtained to replace that from Huglith Mine which had closed in 1945. The mines and mill were not profitable at this reduced level of output and all closed in November 1948.

Figure 11 Plan of Adit Level, Sallies Mine

Concrete foundations and the capped shaft can be seen on the site. The adit mouth has recently been blocked with a wooden gate [Editor - the adit now provides a domestic water supply and no entry is allowed] but a short timbered cross-cut used to lead to the North Vein, a tramway turntable being used at the junction. A flooded stope could be crossed to the left on the tramrails, the level continuing beyond until blocked by a collapsed rise. To the right, a short level joined the top of a flooded stope from a lower level. The cross-cut continued to the South Vein. To the right there was a blockage, again a collapsed rise, and to the left was a partial blockage. A cross-cut could be followed here to a north branch, traversing round a flooded winze. A squeeze over the fall led to the end of the level. In all of these levels the barytes veins were very obvious.

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Tankerville's Main Lodes - a Response

George Hall

In the 1993 Journal, Richard Fowler wrote an article entitled "Why are Tankerville's Main Lodes Where They Are?". George Hall has written the following response and the paragraphs in italics are Richard Fowler's further comments.

I have read, not once but many times, all the contemporary development reports on this mine from the 1860s to the 1880s. I have copies of the plans, and I once made a three-dimensional model of the Tankerville workings, on which, and on separate sheets, I plotted ore widths and values, and contemporary geological comments. This was most interesting and instructive but the model was unfortunately destroyed when on loan to some parties in London, and at the moment I hardly have spare space to make another, as it requires a cube with sides over 2ft long to do the job properly, without Potters Pit and Pennerley.

I find it very difficult to read an accurate strike for the Tankerville Main Lode off the abandonment plan, partly because of the short length of many levels and the natural sinuosity of lodes, but also because the upper levels west are either on a different vein from the deeper - not impossible - or the vein twists clockwise with increasing depth. However, I must make the overall strike of the Main Lode in the Tankerville workings about 50° T. While this is considerably more easterly than the 'north-south' Pennerley lodes, and even more so than Richard seems to have marked them in his general plan, it is more northerly than the line of surface workings and adits that so clearly mark the lode outcrop from Perkinsbeach to Tankerville, which is 75° . Nevertheless I am convinced that this lode is one of a number of veins which form part of the western extension of this Perkinsbeach - Tankerville lode group, and that its strike would, if prolonged eastward, be found to trend towards 75° T. This is, of course, more or less parallel to the Snailbeach, Pennerley east-west and Bog lodes, the dominant strike of the eastern mines of the orefield. I therefore think that the Tankerville Main Lode oreshoot is superficially conformable to the dip of the surrounding rocks, and that the lode itself cuts across the bedding.

The dip of the general lode structure should be 50-65^o towards 300^o as mentioned in the text. The lodes on diagram 1 have somehow been drawn to transposed figures that were taken from the stereographic and computer imagematic projections. The overall structure of the ore shoot appears to be dipping parallel to the lithological bedding.

I have long been puzzled to find factors that may have localised the Main Lode ore shoot. I think one might well at first assume that this oreshoot is simply controlled by a particularly favourable bed in the Flags, a more exaggerated example of the Snailbeach situation, where the main runs of ore dip west conformably with the westward dip of the strata. This I take to be a physical rather than a chemical effect. However it is not borne out by the old reports.

I still believe that the ore precipitation occurred due to fluid mixing. However, the physical effect of one favourable bed is very true. This is due to this particular bed having a higher porosity and permeability, hence it allows the mineral laden fluids to move through it in preference to the lower porosity and permeability beds over and underlying it.

These seem to me to make it clear that the Main Lode about Watson's Shaft is joined, both on the north and south, by a number of lesser lodes, some of which were moderately productive, that diverge from it eastward at angles of around 10° or 20° . However, the Main Lode oreshoot, which is only about 20 yards long at its richest part, is not situated at any of these intersections, but west of them. Nor is it against the shales (as is the best ore in the Roman Lode of Roman Gravels), but some fathoms short, and indeed it is only a couple of the deepest levels that reach the western shale. The only possible localising feature that I have found in the old reports is that (at least in the deeper levels) the beds east of Watson's Shaft dip east, and those west of it dip west, or in other words as Arthur Waters remarked, the shaft, which went right down the centre of the oreshoot, is on the crest of an anticline.

In reference to an "anticline" being present, I can only find non-conclusive evidence to substantiate it. Firstly, if there is an anticline present then there must be at least two scales of folding. Also there should be two cleavages present, one for each fold event. This would be evident on the surface. What is a more realistic explanation is that there is a fold present, stratigraphically it would be an anticline but it is part of a synsedimentary and/or immediately post sediment deposition small scale local deformation structure. The easterly dipping "bedding", however, is also parallel to a persuasive joint set due to a spoking effect around the main syncline, in other words remaining perpendicular to the bedding. This could have been mistaken as bedding and so a fold structure. These cannot be proven either way.

I don't think there is anything in the 19th century reports, or on the mine plans, to correspond with the faults shown on Richard's surface plan. In them there is nowhere mention of a lode or fault intersecting the Main Lode at right angles, although at the east end of the 180 an unexpected lode was found, striking 105° , unusual in this mine, with shale beyond it.

This lode striking at 105° would tie up to the fault present on the surface.

This extraordinary oreshoot, regarded in its day as the richest in the world was, as everyone knows, very short in its rich section and I would much like to know whether it was pure chance that guided Arthur Waters to it, or whether he had some reason not known to us to crosscut just where he did. Following it down caused great anxiety and fluctuations in the share price. The grade increased all the way down to the 92 and was enormously rich from there to the 130, reaching in places 40 tons of galena per cubic fathom. It had been accompanied by a series of cavities throughout, some of which were spectacularly lined with crystalline minerals, but below the 130 the oreshoot was lost in a particularly large cavity. It came in again as rich as ever

between the 140 and 152, and some winzes below the 152 went down in solid galena that was "as black as coal".

The 167, however, never came up to such values and, below that level, the lode became steadily poorer. Anyone who has seen the mine plans will know that the bottom levels are much longer than those above. The reported reason for this is that mineralisation extended over a much greater length of lode (although I am sceptical of the thoroughness of exploration in the upper levels) but grades were much lower, and the abandonment of the mine was the inevitable result of a lode worth at best 2 tons per fathom, with dressed galena selling at £6.50 per ton. However, it is worth noting that Arthur Waters said that there was as much lead in total between each level at the bottom of the mine as there had been higher, but spread as it was over a much greater length it would not pay to stope under ruling conditions.

The Main Lode was accompanied by several more or less parallel lodes. Maddox's crosscut (north) in the 120, after passing through 40ft of mineralised ground, cut six, of which one was probably the Old Lode. Little was done to explore these but some production in the last years of the mine's life came from the North Lode, worked between the 192 and 244 levels. This lode was rapidly approaching the Main in the bottom of the mine and Peter Watson and Arthur Waters were most anxious to reach the junction, where they hoped the Main Lode would recover its value, as they thought the Main Lode had been so rich at about the 92 where lodes had branched away in the vertical plane. However, they were unable to raise the necessary finance in the bleak 1880s and the lodes were still 9ft apart at the deepest point seen, the 244. The North Lode, apparently alone in Tankerville Mine, carries a good deal of zinc, and was the source of the blende sold between 1881-1884.

Looking at the district in general, it can be seen that the mines on the eastern outcrop of the Mytton Flags are on the whole much deeper than those on the western outcrop, and moreover there is some evidence that mineralisation continued underfoot at the bottom of Snailbeach, Tankerville and Bog, although not of payable grade at the first two at the time these mines closed. Moreover, barytes is much more abundant in the eastern mines. I therefore suspect that there is a vertical zoning of mineralisation, with barytes more common in the higher parts, and let us say a galena zone about 2,000ft deep. The zoning slopes down to the east so that the western parts at least of Grit and Gravels, at 600ft below surface, may be the bottom of the lead zone, which might yet be some way below Tankerville. Within this overall zoning, individual orebodies will be of finite dimensions, some being quite small, a characteristic of lode deposits everywhere.

Depth is greater in the east due to the syncline. I reckon barytes abundance is due to the chemical properties of the host. It will always precipitate in a rock with high porosity and permeability characteristics due to its allowance to transmit mobile fluids. There is a much lower percentage of high porosity and permeability lithologies in the western areas of the orefield.

In general in lodes in a thick series of Palaeozoic sediments there is, as in mid-Wales, an overall tendency for orebodies to be lenticular in shape. This ideal outline is modified, of course, by pronounced changes in stratigraphy, as in Shropshire, the most obvious cases being Roman Gravels and Tankerville Mines. In the case of

Roman Gravels, the oreshoot is everywhere against a shale roof and sulphide values die away in the body of the Flags. So what controls Tankerville? In the bottom levels there is about 150 yards of ore of moderate grade in an apparently undisturbed lode between two shales, but in the upper levels it looks as though the rich upper part has been squeezed up through the crest of an anticlinal structure, and for some reason at present unknown had not spread out. I'm not entirely happy with this but I can't do any better!

The lode is precipitated from hot fluids rising up after enrichment. The high porosity and permeability unit pinches out, which is why it appears squeezed. This is due to the sedimentary deposition. In the Arenig, with the sea to the west, the sediments are overlapped onto the Stiperstones shoreline. This will give a thicker unit to the west than the east. When this had been folded, the pinch out will be at the top. This can occur on a local or unit scale.

Almost all of the orebodies of which we are aware, both in Shropshire and mid-Wales, had an original outcrop either on some exposure of bare rock or in a stream bed, and the workings have gradually been extended from that point over centuries by revivals of prospecting activity, or the application of more powerful pumping machinery. The Tankerville Main Lode is one of those rarely discovered orebodies which had no natural outcrop, the uppermost part being several hundred feet below surface, and it was found by apparently random cross-cutting from a nearby oreshoot. Are such 'blind' orebodies extremely or even particularly rare? I see no reason to think so. Indeed, whatever shape or size orebodies may be, if they are of finite dimensions, there must be many others not yet seen, unless, as seems to be the case with the barytes deposits east of the Stiperstones, they are related to the present land surface. I don't think this has ever been claimed of the lead mines and I have long felt that there is an enormous potential for new orebodies to be found at moderate depths between the existing deep Shropshire lead mines.

Olympic Dam in Australia is a huge blind ore body.

It is worth remembering that the Tankerville Old Lode, the original 'Ovenpipe', is parallel in all dimensions with the Main Lode and was apparently of very similar form, though in the Old Lode the high values were in the upper levels and had faded by the 92. It is interesting that these two form almost a mirror image, and tempting to suppose that they were formed by the same pulse of mineralisation, which found its way through some zone of fracturing or porosity from the latter to the former, but I have no decided view on this. However, I see both as examples of orebodies which, while they are in horizontal plane confined by some geological feature or features, end, the one above, the other below, for no particular geological reason but simply where the intensity of mineralisation died away.

There are many factors but I still believe that the localised lithological variations played a large role in the eventual areas of precipitation.

One thing that has always interested me is what happens to the 'north-south' (30⁰) striking Pennerley lodes to the north? They are evidently too far east to have been seen in Tankerville Mine but do they cut through or even reach the Perkinsbeach - Tankerville Lode group and enter Burgam Mine? Has evidence of this been seen in

the Club's examination of Burgam? I hope plans are being made of the accessible workings, and that the strikes and dips of the fractures, both mineralised and otherwise, will as far as practical be entered thereon, together with the strata themselves.

I surveyed Burgam Mine, both upper and lower levels, and these are published in Account 21. These plans reveal the main joint sets, bedding, size and extent of mineralisation and their trends. With regard to the Pennerley lodes appearing in Burgam, no mineralisation or prominent fracture pattern is present to their orientations. However, almost near the end of the upper level there is a prominent vertical joint set dipping towards 108° or striking 28° east. This would tie in with the Pennerley set orientation but is not mineralised.

I should very much like to see a proper survey made of the Boat Level which would make so many geological puzzles clearer and add so much to our understanding of the conditions governing ore deposition in Shropshire. I'm beginning to think I'll never get through there in this life but I wish I could!

Dressing Floors on the Kingside Lode, Copa Hill, Cwmystwyth Mine

Colin Armfield

Introduction

During the summer of 1989, a survey was made of the building remains on the area of Copa Hill covered by the Kingside Lode workings of Cwmystwyth Mine (NGR SN805748). Copa Hill lies to the east and above the more familiar 19th century remains of dressing floors which are on the side of the road to the east of the village of Cwmystwyth. The largest stream to the east of the workings is Nant yr Onnen and this passes many important workings, adits and buildings which are mostly well dated to the period of recorded history of the mine (1600 onwards). On the eastward side of the stream, the enormous valleys cut by hushing can be seen descending from the Comet opencast area. To the north of the hushes can be seen the massive tips which form the dressing floors on the Kingside Lode.

The historical evidence for mining at Cwmystwyth begins with the opencast workings at the top of Copper Lode on Copa Hill, to the south of Kingside Lode. This area has provided dates of approximately 1500BC. The modern recorded history begins about 1500AD with the Mines Royal and the Company of Mine Adventurers. Very good early descriptions are provided by William Waller and Sir Humphrey Mackworth, dating from about 1708. At this time, reference is made to the mine being worked a long time ago by the "Old Man" and to the mine being of Roman origin, although this was the blanket dating for any old mine working.

The remains of many buildings exist on the area of Copa Hill, which is occupied by the workings of the Kingside Lode. This is a large lead-zinc lode which was worked throughout the area of the mine. On Copa Hill, the lode outcrops near the summit and it has been extensively worked by adits and opencasts down to where it crosses Nant yr Onnen stream. The buildings consist of dry stone walls constructed of random stones, usually derived from the mine workings. There are a few buildings, however, which are constructed from large flat stones laid horizontally to produce a more robust and stable wall. These flat stones are also obtained in the vicinity. There is no direct evidence on first examination to give a definite date to any of these buildings.

The buildings are mainly associated with adits and probably represent dressing areas. The larger buildings usually have a raised shelf or seat at the closed end, with the other end being open. There is no evidence for roofing on these buildings. The smaller buildings often show only three sides built into the hill and probably represent ore bins. The written history describes shafts in this area but none are evident now that would date from the 17th century.

In this area of the mine, there are large numbers of dressing stones which fall into two types :-

- 1) small stones about 6Kg in weight, usually with one depression on each side
- 2) large stones of greater than 50Kg with several depressions on each side. Some of the latter stones have been incorporated into the buildings.

Description of the Buildings

- A. Single building constructed of rough undressed stone. Dressing stones incorporated into the structure. Rocks incorporating shotholes associated with the site.
- B-C. Double structure constructed of rough undressed stone. Building C is partly lined with flat slabs of stone placed vertically in the walls.
- D. 8ft x 15ft building open to the north with shelf at rear 4ft wide. Built of rough undressed stone which appears to have been obtained from the local dumps. There appears to be a path leading up to and north from the area of A-B-C to this area over the dumps.
- E. From the mouth of the adit north and up to the rear of a building open to the north. This building is constructed from large rough undressed stone. In the local area is much stone with shotholes present. Above and to the east there is a flat area of grass. A path appears to lead 110⁰ to a depression in the tip, possibly a shaft.
- F. 35 yards to the north on a path across the dumps is a 5ft x 5ft stone building constructed of large slabs of stone up to 30" square. Possibly ore bin.
- G. 16 yards away is a well constructed building 7ft x 15ft open to the south with a shelf in the northern closed end. The walls are of selected large stone slabs approximately 2ft x 2ft laid horizontally. Just to the north behind the north wall is an adit entrance which enters native rock with no tips above. Water issues from the mouth of the adit which has run in. There is a large flat area to the north (25 yards square). 300⁰ and slightly lower, 30 yards from the last adit there is another adit mouth. There are large dumps above this area and the tip ends 25 yards to the north. North of the well constructed building is the lowest area of opencast workings. To the west is a sampling shaft lined with softwood. Also in this area are signs of other sampling pits.
- H. At this point another well constructed building is built of stone slabs. This building is open to the south with a stone shelf in the northern end. The opencast workings bear 65⁰. At the top of this part of the opencast is a flat area with small tips of small broken stones.
- I. In the base of the continuation of the opencast is another building 7ft x 12ft and open to the west. This is built of rough flat stones laid horizontally and lined with vertically placed slabs of stone. There are slight indications of a shelf at the rear. The building is placed into the opencast with room to pass to the rear into the workings or an adit. To the north of this building is open land. At the top of the opencast are grass covered tips of fine broken stone. These tips lead to the open rake or adit working which forms the upper workings on the Kingside Lode. 100 yards to the south of this area is a large opencast or

hushing cut overgrown with turf. There is much evidence for hushing in this area and also possible later trials.

The upper workings on the Kingside Lode present the appearance of being much older than the lower workings. The tips in this area are of small stones about 2"-3" across. The tips are overgrown with turf and there is no apparent rock showing shotholes. Possibly the old men worked the upper area for gossan and high grade ore, the only beneficiation necessary may have been hand breaking and picking. There are again trial pits in this area which may be as late as 1930. There are also "Costeaning Pits" which may be contemporary with Waller's working or even much earlier. Further investigation is needed in this area.

- J. Below the largest of the high tips are the totally collapsed remains of a building. A pair of hushes lead down to the next lower area of working which is a complex of buildings. The tips in this area are of very even sized stones 1"-3". An adit runs into the hill bearing 30⁰. To the south there are 75 yards of tips and then grass and the line of the boundary hush. This is at the same level as the hushing dam for the Comet Lode.
- K. Below the big fine tip there is a ruinous building with only two sides remaining, built of rough random stones. 25 yards to the north is the end of the escarpment. In this area there is less evidence of shotholes in the rock. The dumps are of an even fine size of stone about 1"-3". There are small dressing stones of about 10 pounds weight in the area. Just below is a flat area.
- L. Another building approximately 6ft x 18ft, open to the west and built of rough random stones. There are several dressing stones in this area, one of which bears three depressions in a line. There is a sampling pit to the west. Down and south to a lower working area. On this floor level there are two depressions in the tips which may represent one or more adits.
- M. The first building in this area faces east and is 7ft x 10ft, built of rough random stones. There is a shelf in the closed western end.
- N. Another building 6ft x 6ft, which has only two sides remaining, stands in front of M.
- O. Round to the front of the tip is another 6ft x 6ft building, again built of rough random stones.
- P. To the south, following an obvious pathway, is a building 6ft x 12ft, built of rough random stones with a shelf in the wall at ground level.
- R-S. To the south there are two 6ft x 6ft buildings constructed from large thin stone slabs. The southern of this pair of buildings uses large dressing stones of about 2cwt, placed vertically to form the walls. At Bonsall's Adit west of Nant yr Onnen, just below Herbert's Stope, is an area of working associated directly with the early recorded history of the mine. One of Waller's maps and descriptions describe this area as "Cwmystwyth Old Works".

Bonsall's Adit penetrates the hillside in an area associated with hushing. Water still runs from the adit mouth, which is drystone lined with neat large flat stones placed horizontally. The tips in front of the adit mouth which run down to the stream overlay a hush which runs down the southern side of all the tips. On the hillside to the south are possible small trial trenches about 6ft x 2ft, showing as depressions in the grass. The evidence of the tip material would appear to show more than one period of working. There is newer clean material on top of older tips.

- T. To the north is a three sided building built of large flat stone blocks which are present locally.
- U. The next building is one wall built into the hillside constructed of very large local stones. There is a slight concave curve to the wall and it is sloped back. This could possibly represent an ore-stone bin. Adjacent and to the north is the wall of the building identified as Waller's stamp mill.
- V. This building is extremely well constructed from large local flat stones well fitted together in the best type of drystone working. Some of the stones incorporated into this building show shotholes. This building is formed of two 7ft square halves separated by a low dividing wall. There are various holes in the walls of this building which must have held fixing timbers. The building is erected directly onto the bare rock, the lower western part of which appears to have been used as a tailrace for a water powered machine. Built into the rear eastern wall of this building is a large dressing stone. Above and to the north, level with Herbert's Stope, is a drystone wall which may have formed a leat to bring water to building V.
- X-W. On the higher floor above Herbert's Stope there are two buildings together. Both are 10ft x 10ft buildings constructed of small flat stones laid horizontally and built into the bedrock. 15 yards to the north is the entry to an adit. In the tip just below these buildings, a large dressing stone was found buried.

Listed Mine Sites in Shropshire

Adrian Pearce

The following Shropshire mining remains are currently listed by the Department of the Environment as Grade II buildings of special architectural or historic interest. It is hoped that others will be added in the near future.

Central Snailbeach Mine

Engine House & Chimney [1308] SJ36780152

East Grit Mine

Engine House [1323] SO32719801

Ladywell Mine

Engine House [13701] SO32789922

Old Grit Mine

Engine House [18863] SO328984

Pontesford Colliery

Engine House [13365] SJ410065

Snailbeach Mine

Blacksmith's Shop [17319] SJ37430216
Candle House [17379] SJ37590210
Chapel Shaft Chimney [17327] SJ38130203
Lordshill Chimney [17325] SJ37440197
Compressor House & Chimney [17321] SJ37460213
Crusher House [17322] SJ37500215
Lordshill Shaft Pumping Engine House [17323] SJ37430205
Lead Smelting Flues [17453] SJ37330304
Lead Smelting Works [17452] SJ37350305
Locomotive Shed [17318] SJ37440219
Magazine [17326] SJ37690217
Ore House [17317] SJ37510224
Georges Shaft Winding Engine House [17320] SJ37420215
Lordshill Shaft Winding Engine House [17324] SJ37460206

Tankerville Mine

Watsons Shaft Chimney [18882] SO355995
Watsons Shaft Engine House [18883] SO355995
Old Shaft Chimney [18884] SO355996
Old Shaft Engine House [17472] SO355996

White Grit Mine

Engine House [17473] SO31939797

Clearance & Examination of Stone Building on Copa Hill

Colin Armfield

Introduction

The building investigated is in the first set of workings above Herbert's Stope on the Kingside Lode on Copa Hill. Along the southern end of the tips, a hush runs down the hillside. This is in places filled with tip material and it has drystone bridges over it. Running down to the tramways, and further to the road, is a shallow hush which has evidently been used as a track for access to the upper workings. A large tip runs down to, and partly overlays, Bonsall's Adit and the area of Waller's stamp mill. On top of the tip there are three buildings and the southernmost single one is the subject of the main investigation.

The northern pair of buildings are of substantial drystone construction, approximately 6ft x 18ft. These buildings are of three sided construction with the open ends facing north. Both buildings use medium to large sized random shaped stones simply piled to form massive walls. The eastern building is walled inside with large thin stone slabs placed vertically. In the open northern end of this building is a square depression lined on each side with a single stone slab forming a possible open hearth. The western building has a raised stone shelf to the rear, approximately 3ft wide and covering the full width of the floor.

There are several dumps of rock in the immediate area which partly overlay these buildings. The dumps consist of large (6"-12") sterile stones. Behind and to the east of these dumps is the entry to an adit. A pair of drystone walls runs under the tips from higher workings. Investigation of this area has failed to find the adit due to the amount of material filling the mouth. There is a softwood lined shaft penetrating into the tip to the south of the single building. This is probably a sampling shaft and may be associated with the sampling work undertaken during the 1920-1940 period. Similar shafts are evident all over the workings.

When examined, the building was in a derelict condition and the floor was covered with a large amount of stones and turf. The first action was to remove these stones which were partially filling the building. Most of these stones appear to have originated from the tip to the east which partly overlays this building. The layer exposed was turf, on top of peat which varied in thickness from 2"-4". The northern closed end had a slightly raised area about 3ft wide and running the full width of the building. This was covered with a layer of peat about 4" thick. This covering was removed to expose a flat area consisting of two large stone slabs resting on a base of other stones.

The main body of the floor was then cleared of turf which revealed in one place a dressing stone resting in the peat layer. Also found under the turf layer, but on top of or in the peat, were a number of stones. One of these stones shows a section through a drilled shothole about 5" deep. Examination of the tips in this area has shown that there is much evidence for blasting of the rock. As the peat layer was removed, some plant material was found. Against the western wall and just in front of the stone slabs there was a small area of compressed and partly preserved turf. Also found were

some very small pieces of rotten wood about 3/8" diameter, which could have been either branch or thick root.

The floor of this building is a layer of clay and fine shale packed very hard approximately 2" thick. This layer is placed on top of a levelled area on the dump material and not on bedrock. Upon examination of the larger stone slabs forming the top of the shelf, it was felt that one of the lower stones upon which they rested may be a dressing stone. Upon lifting the top layer, a very large dressing stone was found. Three worked areas are present on the top surface and more were evident on the underside, although the stone was not further disturbed. The estimated weight of this stone is 2cwt and the appearance is of a river stone, with fully rounded corners and sides. The stone was not broken and did not give the appearance of being worn out. In the position in which the stone now lies, it would have been very difficult to use it as a mortar, being only about 1ft off the floor.

Summary

This building is erected on top of a tip which consists of rock obtained by blasting. Since the large dressing stone has been used as part of the fabric of the structure, it would seem that at the time of building this type of stone was not in use. The stone shelf is of a comfortable height to use as a seat for hand dressing or other work. The smaller types of dressing stone of approximately 15lbs in weight are much in evidence in the area of these tips. It may have been possible to sit on the shelf with a small stone on the legs for use in dressing ore.

There was no evidence in situ for the walls having been very high. The amount of stone inside the building and around the base of the walls would not have been enough to raise the body of the walls to more than about 3ft from the surface. There is no indication to show that any kind of roof was present on the building.

Discussion

Some of the buildings have incorporated large dressing stones into their walls. The stones do not seem to be worn out and, as there is much broken stone of similar size on the hillside, it may be a deliberate use when these stones had been superseded by stamp mills. Most of the buildings in this area are constructed from rough undressed stone which is found all over the dumps. The stone is mainly the result of mining waste although there are some areas of natural fracture due to weathering of exposed outcrops. A few buildings are, however, constructed from selected large flat stones laid horizontally. There is no apparent system to the type or location of construction. Many of the remains of the buildings show signs of association with stone derived by blasting. Some of the buildings are constructed on top of tips which contain rocks with shotholes present. There is very little firm evidence of shotholes in rocks used for construction of the buildings left in situ, although there is much blasted rock near the buildings. Evidence for the use of gunpowder begins in this country with a description by Roger Bacon in 1242AD, although this was written in connection with military usage. Bacon suggests that by 1266 the existence of gunpowder was common knowledge, being used in "divers places". However, it is unlikely that blasting was used for mining this early as the cost would have been prohibitive.

Many of the buildings appear to post date the use of mechanical ore breaking (ie after 1680) and most probably date from the time of the Mine Adventurers or Thomas Bonsall. The latter conducted most of the work in this area of the mine but some of the workings could be very much earlier. The examination of the site and discussion have raised proposals for further research. Much remains to be done at this site to establish a chronology for the workings and the use of dressing stones.

Since we now know that Cwmystwyth was worked at a date of 1500BC, it seems difficult to believe that 3,000 years passed until the Elizabethan miners "discovered" the mine in the 16th century. Where are the Roman remains?

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Coal Mining in the Shrewsbury District

Stuart Tomlins

During research for the forthcoming book on Shropshire mines, I came across a pre-war newspaper report on Hanwood Colliery. The current owners have kindly agreed to allow us to reproduce it in full.

COAL MINING IN SHREWSBURY DISTRICT AN IMPORTANT SHROPSHIRE INDUSTRY "ADVERTISER" REPRESENTATIVE'S VISIT TO HANWOOD COLLIERY

Mention of the eastern part of the county of Salop generally calls to mind picturesque hills and valleys and delightful rural scenery. It is less widely known as a coal producing area, nevertheless a good deal of coal is every year brought to the surface in the Hanwood district. A century or more ago, before the general introduction of railways, the transport of coal from a colliery to distant consumers was a very serious problem, and so it follows that workable seams of coal at no great depth from the surface were of great convenience to the community in the neighbourhood where the seams were found.

To the people of the Shrewsbury district in former times, the Coal Measures which rise to the surface on the westerly slopes of Lyth Hill, and follow the line of the hills round by way of Pontesbury and Westbury, proved a great boon, providing them with a plentiful supply of good coal. In the days of our grandfathers there were coal mines flourishing at Pontesbury, Westbury, Crewe Green, Arscott, Moat Hall and Hanwood, and on the other side of the hill one may still see the old workings at Longden Common, Stapleton and Longnor, which latter used to be worked by the late Mr Edward Corbett, of Longnor Hall, father of the present Major E R T Corbett.

Gradually, however, the smaller pits became exhausted, as it was not possible in those days to work any great distance from the bottom of the shaft, a new pit therefore had to be sunk, and to greater depths, though here Nature provided compensations, for, generally speaking, the quality of coal found at depth is better than that found near the surface. In the early years of this century the mines round Pontesbury and Westbury closed down one by one until, in 1920, there were only three left working in what is geologically known as the Shrewsbury Coalfield.

A NEW COMPANY

These three were the Arscott, Hanwood and Moat Hall Collieries. In 1921 the present company, which is known as the Hanwood & Moat Hall Collieries (Salop) Ltd, was formed, being made up of a number of local people with Mr A Nicholas Fielden as managing director. This company took over the colliery businesses previously carried on by Messrs Atherton and the late Mr W T Shorthouse, and when the Arscott Collieries were closed on the expiration of their lease, the men from these pits were absorbed in the larger undertaking. Today the company and its associated company, Hanwood Brickworks Ltd, provide employment for some 250 men and youths drawn from Hanwood, Westbury, Pontesbury, Hookagate and Annscroft. These districts have long looked to the collieries to provide a large number of their men with a

livelihood, and nowadays they rely yet more on this industry to provide them with employment.

OPENINGS NOW

There are at the moment a number of openings for boys of 14 or 15 at the colliery, and there is no reason why a boy of intelligence starting there should not rise to a well-paid position in a few years, though of course a great deal must depend on the boy himself.

At various times there have been 7 shafts sunk at Moat Hall, varying in depth from 25 yards to 150 yards. Both the present Hanwood and Moat Hall pits, however, were sunk some 50 years ago to the Half Yard Seam, about 150 yards down. This produces a very high grade of coal, which has a calorific value of approximately 15,000 BTUs, and which is a quick lighting and free burning coal. Always the products of these pits has been in great demand in Central Wales right out as far as the coast, and all over the countryside between here and the coast Hanwood coal is very widely known. Today, coal from this colliery is sent down to South Wales as well as Central Wales, and the local demand is growing steadily.

UNDERGROUND

From the bottom of the pitshaft, the workings stretch out for about a mile, and slope downwards in the northerly direction at a gradient of about 1 in 10. As the pit is free from gas, the use of naked lights is allowed underground and this freedom proves of great advantage, as a disease of the eye due to working in the insufficient light which the safety lamp too often affords and from which, miners in gassy pits often suffer, is practically unknown in open lamp pits.

All the coal is brought to the surface at the Hanwood shaft, where the tubs are weighed before being sent on to the screening plant. Under the guidance of Mr A N Fielden, the present company at its formation made many improvements at the collieries, bringing them up to date in practically every respect. The underground workings from the two shafts now join and Hanwood and Cruck Meole are worked in complete conjunction.

THE CHANGES

In the old days, a number of steam engines provided the power for the work of the colliery but the first and most important step which the new company took was to introduce electricity for pumping and underground haulage, while the company's power station also supplies electricity to the associated company.

In the power station, which is at Cruck Meole, there are two Williams-Robinson centre valve electric sets, the two generators being rated at 200kW each, and there are instruments to show what power is being used in various parts of the workings. The introduction of the underground electric haulage constituted a great improvement, particularly in view of the steep slope of the workings, while it has enabled the company to reduce the number of pit ponies to a minimum.

TRAINED PONIES

There are in fact only three ponies now in use at the colliery, and it has been found possible, with no great difficulty, to train these ponies to enter the cage without fear, so that they are brought out of the pit at the close of each working day - a privilege enjoyed by very few pit ponies in this country.

The use of coal cutting machines has been tried at the colliery but, owing to physical difficulties, the machine did not show any marked superiority over the man. Electricity also serves to light the pit bottom, as well as the surface works, while the screening plant and the ventilating fan are also electrically driven. The ventilation is on the general principle, the impure air being sucked out of the pit so that pure air naturally takes its place. The ventilation is so controlled underground as to ensure a steady current of air over the coal face.

To the uninitiated, the screening process is particularly interesting. The plant is at Cruck Meole, where all the coal is screened. The coal is tipped onto the screen in exactly the same state as when it comes up the pit shaft, and is carried along the plant to be automatically divided into four grades - large coal, nuts, steam peas and a fourth grade that is little more than coal dust. Each grade finds its way down its particular chute into the appropriate truck.

It is interesting to note that the company themselves use the fourth and inferior grade of coal to feed the furnaces of their steam boilers, which are also to be found at Cruck Meole. They are enabled to use this cheap fuel, for one is informed that it can be sold at a remarkably cheap rate if taken in large quantities, because they have a special grate fitted with an induced draught apparatus. Under the grate are four tubes through which steam draughts are passed.

The company do their own repairs and near to the pit head there are the workshops, containing the necessary machines and tools, where these repairs are carried out. Altogether one gathered that the Hanwood and Moat Hall Collieries constitute a self-contained and up to date business run on economical and methodical lines.

FREEDOM FROM ACCIDENTS

Enquiring into the history of accidents at the collieries, one found a record of freedom from accidents which it would be difficult to equal, for Hanwood and Moat Hall have each had only one fatal accident in recent years, with a few minor casualties.

AN ENDOWED BED

Writing of accidents of one kind and another, one is reminded that at the Royal Salop Infirmary there is a cot endowed by the employees of the Hanwood and Moat Hall Collieries and the Hanwood Brickworks Ltd, and it is good to know these men, while retaining their own health, yet remember others who have lost theirs.

Between the management and the men an excellent feeling exists and while the men, of course, joined in the general strikes, there have been no disputes between the men and management at the collieries. In fact a good healthy spirit characterises the undertaking.

THOSE IN CHARGE

Mr Nicholas Fielden, the managing director of the company, is widely known and esteemed by all who know him. He has an encyclopaedic knowledge of the coal industry, of which he had experience in Yorkshire before coming to Hanwood. Mr Fielden has been mainly responsible for the development and improvement of the undertaking.

The collieries are under the able management of Mr C H Bolton, who prior to coming to Shropshire, has many years experience in the deeper pits of Lancashire and has a thorough knowledge of his work.

Mr W Mansell is the under manager and is a valued official of the company. He as served all his working life in the company's mines and has an intimate knowledge of them.

The Engineer is Mr W Clarke, a capable and knowledgeable official. He hails from the Forest of Dean.

The output of the mines is very considerable and is handled by the Shropshire Coal Company Ltd, with offices at 7 Shoplatch, Shrewsbury, here interested persons will find the officials always willing to arrange for them to visit the collieries upon due notice being given.

THE BRICKWORKS

The works of the Hanwood Brickworks Ltd adjoin the Cruck Meole Colliery, from which, as has been stated, this undertaking gets electric power, though there is a special 150HP electric motor to drive the brickyard plant. There one finds a huge Staffordshire Kiln which holds 180,000 bricks. It is oval in shape and the inside is a series of chambers built round a central block. In these chambers the bricks are built up. The fire slowly burns underneath each chamber, taking about a fortnight to complete the circuit of all the chambers. Thus the fire is taken to the bricks, rather than the bricks being taken to the fire.

The heating process is very gradual, while the chambers under which they are very slowly passing is, of course, subjected to intense heat, the chamber in front of it is getting hot, while the chamber ahead of this is also getting warm.

In the old days attempts were made to make bricks from the pit shale, and for a time bricks were made from this material. They were not suitable for the needs of the district, however, and their manufacture was discontinued some years ago. All bricks now are made only from good red clay and the excellent quality common brick produced finds an extensive sale in this district. The red clay is passed over a screen and mixed with water, after which it is moulded and subjected to high pressure, the

whole process being carried out on one ingenious machine. The "green" bricks thus formed are then transferred to the kiln.

At the brickworks, as at the colliery, everything is very methodically arranged, and a visit to the premises is full of interest.

Well at Lilleshall Hall, Newport, Shropshire

David Coxill & Adrian Pearce

At the request of the National Sports Centre, members of Shropshire Caving & Mining Club explored and surveyed a well and associated features on 16th October 1994. The features probably date from the 1830s when the hall was built as a hunting lodge for the Duke of Sutherland. Members present were David Adams, Cara Allison, Colin & Liz Armfield, David Coxill, Mike Moore, Adrian & Julie Pearce, Alan Robinson (who descended the well) and Nick Southwick.

The well has been sunk through the Enville Beds, consisting of alternating beds of fine grained red sandstone and sandy calcareous marl. Since the marl beds are structurally unstable, the first 40 metres has been lined with bricks. Below the RSJ frame, the bricks have not been mortared and this was probably to enable water to seep through from the strata behind and thus help to fill the well. Several sections of the unmortared lining are getting into a very unstable condition and beginning to bulge out. At a depth of just under 40 metres, the well continues in solid sandstone without a lining. There is an infill of rubble and other rubbish at the bottom so it was not possible to determine the original depth. This rubbish is emitting a bad smell and the oxygen meter gave a low reading at the bottom.

The standing water was only present for a depth of 0.5 metres above the rubble infill but this would presumably rise with the water table over winter. There is no evidence of any original inlet of water at this depth other than seepage from the surrounding strata and there does not seem to be a great flow from this source above the current water level. Seepage may be much greater below the current water level but the volume of water available in the well is greatly restricted by the presence of rubble infill at the bottom.

It appears that the well originally had an ancillary water inlet from surface. In the walls of the well top chamber there are three vertical recesses with remains of wooden supports. At the top of each of these is a lead pipe of 10cm diameter and an iron pipe of 2 cms diameter. All pipes have been cut off flush with the back of the recess. It is probable that the lead pipes were water inlets to the well from surface drainage, possibly connected to drainpipes on the old hall. Thus the well could have been used as a cistern with surface rainwater to supplement lateral seepage from surrounding strata. It is also probable that there was a pump installed in the well which delivered water to surface through the smaller diameter pipes, probably feeding fountains directly or via cisterns at a higher level.

Both inlet and outlet pipes were removed at some time before the First World, possibly if fountains were no longer used or (more likely) if the larger cistern nearby replaced the well for storage. There is no obvious sign that water stills flows in via the large inlet pipes and it is likely that they were disconnected at the far end from the drainpipes and replaced by pipes feeding the other cistern.

Figure 12 Plan of Well

Figure 13 Section of Well

In 1914, the hall was sold by the Duke of Sutherland to a Mr Ford, who held it until sold to the Sports Council in the 1950s. Before the Second World War, the grounds were open to the public and the well was used as a wishing well with coloured lights below the surface grille. Water from a reservoir on the nearby Heath Hill was piped into the well to keep it topped up, since it apparently had negligible water flow from seepage. It is likely that the RSJ frame dates from this period and it probably supported a platform for maintenance access (and to remove the coins thrown in!).

The well top chamber is a puzzling feature and it is not known why the shaft to surface is offset from the well itself. The most likely explanation is that the chamber was built to hide unsightly machinery or workers from guests wandering around the garden. Both the chamber and access passage have been constructed on the "cut & cover" principle so there has obviously been some landscaping after the well was first sunk to cover the structure over with soil. The shaft to surface probably helped to ventilate the chamber, as well as providing a mysterious garden feature for the owner and guests.

The access passage and well top chamber all have cobbled flooring, suggesting heavy usage. The passage also slopes gently down from surface and it has been suggested that there may have originally been a horse or donkey used to wind up the well. The steps might be a later addition and the original way out might have been via a ramp. Half way along the passage, there is a grille part way up the wall with an earthenware pipe inlet just behind. This presumably acted as a surface drain and a sloping passage would also help to direct water into the well. There is evidence of old doors at the bottom of the steps and the entrance to the well top chamber, presumably originally kept locked for safety purposes.

Near the entrance, a section of the passage has been lined with modern bricks and fitted with a doorway at each end. A light switch indicates that people spent some time in this section. It is said that the passage was used as an air raid shelter during the Second World War and this would have been the part used, the doors at each end acting as blast protection. A piece of wire is stretched across the top of the archway into the well top chamber and this probably held up a blackout curtain from this period, preventing light from showing in the shaft to surface.

Pant y Wrach Copper Mine

Harold Morris

The Deep Adit of this mine lies to the north east of Portmadoc at NGR SH61744044 and, at the time of printing, it was on Forestry Commission land so underground access is not allowed. Limited parking is available at NGR SH61684020, a few metres along the minor road from its junction with the A487. Note that the trip is for experienced persons only and it would be very difficult to evacuate a casualty from the lower levels.

The Deep Adit heads south east for 43 metres and then heads south south west. After a further distance of 32 metres, it is blocked by a heavy run of ground. It is, however, possible to reach the adit at its point of intersection with the East-West Lode by descending through the stopes of this lode. The distance from the fall to the point of intersection with the lode is about 180 metres. References to left and right should be taken as follows. If in a stope, directions are given facing the foot wall. If in a level or stope and following the route, directions are referred to the left or right hands.

Ascend over mine debris, through small trees and bushes to reach the top of the first tip, below a steep rock face. Here a stream of water is seen to issue from the debris at the foot of a short gully. This is the buried portal of the Shallow Adit. Climb the gully and take the easiest line above through steep heather, keeping slightly left. The lower of the large open stopes is reached in a few metres. Ascend again, keeping left but following the fence bounding the stopes. A point is soon reached where there are two open stopes at about the same level, being due to a lode junction. A low wall should be followed to the left, where in a few metres an adit will be seen.

The adit is about 5 metres long and breaks into the hanging wall of a small stope, open to day. There is an awkward descent of 4 metres, belaying to a tree outside the level. A partly blocked level about 2 metres to the left, in the foot wall, gives access after 5 metres to a large open stope. Bolts and hangers have been fixed at this point to provide aid and protection for crossing the stope, using a crumbly pillar. Note that this is a very exposed move.

Follow the ledge on the foot wall to the left, past a blind crosscut and into a level. After a short distance, the level turns sharp left and then sharp right after a further few metres. A small flooded winze can be passed without difficulty and a stope is shortly reached, having large rocks perched on the edge of an abrupt drop. There is a descent here of 6 metres, belaying to rocks at the head of the pitch. The stope can be followed left to other large rocks and an abrupt deepening of the stope, requiring a descent of 18 metres with bolts and hangers in situ. The landing is on a rubble cone with a scramble down of 5 metres to a level. Since this rubble is unstable, care is needed in negotiating a flooded winze on the right.

This level is the Shallow Adit and it can be followed through shallow water to the bottom of a large stope where daylight can be seen above (this is immediately below the dangerous traverse previously described). The level continues along the stope to the right and requires a short scramble over rubble that has fallen from above. The level is eventually blocked by collapse of the stull timbering and on the left is a small

hole in the timbered floor of the stope. This has a 4" compressed air pipe visible and bolts and hangers are in situ. Great care is required not to disturb the timbers and stones piled around the hole and old timbers have been used in an attempt to further protect the hole from rock falling from above.

The hole has a very unsavoury appearance and leads to a drop of 18 metres into a short stope drive. Further bolts have been placed here and it is a convenient place to break the descent. The stope is followed down for a further 8 metres using a handline, to a wooden planked floor with an access hole in it. The planks seem sound enough and the final descent from here is about 8 metres. From the bottom of the pitch, the clean level floor of the lode can be followed for a few metres to a point where the Deep Adit comes in from the right. The adit is in good condition but leads in a short distance to ever deepening water as a result of the grading of the adit.

A number of side branches will have been passed during the descent but these are short and uninteresting, apart from one with a flooded winze and remains of a jackroller. A rise has been driven in the lode at its lowest point and close to the bottom of the final pitch. It is, however, and had no development.

Explorations at Rorrington Mine

Steve Powell

Rorrington Mine (NGR SO305998) was originally worked for lead from the 1850s and then for barytes this century until the 1930s. The last known exploration was about 20 years ago so permission was obtained from Rorrington Estates to establish what surface and underground features remained.

In October 1993, Paul Thorne from Kent brought his winch up and it was tested on the Air Shaft down to the Deep Adit. It was found that the shaft was blocked with rubbish at a depth of 17 metres, attempts had obviously been made to infill the shaft in the past. The only way on was to start work in the Deep Adit itself, in which a huge volume of water appeared to be backed up. This was started in December 1993 when a large party of keen workers began to clear a channel from the stream up to the adit. Silt and rocks were then dug out of the portal, at which point the water dramatically gushed out and lowered the level in Deep Adit.

A smaller party then proceeded up the adit until they came to the first obstacle, where silt had slipped down an offset shaft into the adit. This was frenziedly attacked until another large volume of water was released, bringing the airspace down from 10cm to 60cm. There was some discussion as to whether there might be bad air in the adit if it had been flooded for so long and if it should be left for a couple of weeks for air to flow. In the event, Steve Powell and John Davies decided to push on, taking the oxygen meter with them in case of bad air. After negotiating neck deep water, they came eventually to the main blockage. Steve then entered a flat out crawl for a few feet before being able to stand upright on a cone of rubble. This was at the base of the Air Shaft and the infill had fallen away for a height of 15 metres, leaving the rest jammed above. The way on was completely blocked at this point but could easily be dug, so exploration was abandoned for the day. Since there were bats hibernating in the adit, it was decided to leave further exploration until the summer.

Figure 14 Plan of Rorrington Mine dated 1917

In August 1994, a digging party returned to the bottom of the Air Shaft, shored it up and dug out the gravel blocking the way on. This dropped the water level on the far

side and allowed members to carry on up the adit. On reaching the first junction, however, an old notice was seen warning of the possibility of bad air. The side passage was explored for a few feet until the oxygen meter warned of bad air and a safety lamp flame went out. At this point, the party made a quick exit.

Not to be beaten, members returned in September 1994 with aqua lungs and oxygen bottles. The exploration party consisted of Mike Worsfold, Steve Powell and a close friend Colin who would act as the back up man. It was decided to use the diving rule of thirds, which gave 20 minutes going in, 20 minutes to come out and 20 minutes as a reserve. Colin also had some reserve bottles in case the other two did not return on time. All three proceeded up the adit but at that point the oxygen meter decided to stop working. This meant that they didn't have any warning of bad air but they decided to go as far as the previous trip, since air was sufficient to this point at least. Colin would set up base here and the other two would use oxygen from then onwards. They started out after synchronising watches and leaving Colin with the bad air signs for company.

After some distance they reached the first section of stoping, being able to see the dips in the strata and barytes pillars left in for support. They found they were able to breathe at this point without the aqua lungs, so they explored the stope and took photos. The way on was again blocked but, after clearing a few rocks, it was possible to squeeze through into the passage behind. Beyond this was a second set of stopes and another passage but, since the first 20 minutes had expired, they were not explored. The two put their bottles on again and returned to Colin, then exited.

Another combined Club effort will be required to reach the far workings. Thanks go to Mike Worsfold for providing the diving bottles and to Nick Southwick for being the motivator for the project.

South Shropshire Project 1993-94

The following is a summary of the activities undertaken by many Club members.

Boat Level

29/9/94 Digging at entrance.
9/10/94 More digging around entrance and exploration to far blockage.

Burgam Mine

13/6/93 Underground surveys of Nos. 1, 2 and 6 Levels.
15/6/93 Underground surveys of Nos. 3 and 7 Levels and Shaft C.
4/7/93 Surface survey of upper area.
8/93 Underground survey of No. 8 Level.
27/2/94 Fitted grille on upper shaft and covered small shaft.
6/3/94 Surface survey of bottom area.
27/3/94 More concreting on shaft grille.
8/5/94 Finished concreting shaft grille.

Cothercott Mine

22/1/94 Surface reconnaissance.

Gatten Mine

6/2/94 Surface reconnaissance.

Grit Mine

6/94 Descent of Rider Shaft and open stopehead nearby.
16/6/94 Descent of Flat Rod Shaft.

Huglith Mine

25/4/93 Reconnaissance surface survey.
6/2/94 Toured surface with two old miners and identified remains.
6/3/94 Measured surface buildings.

Ladywell Mine

6/93 Descent of Air Shaft.

Leigh Level

27/3/94 Explored part way up with breathing apparatus.

Potters Pit

5/93 Descent of stopes to water.

Rhadley Mine

14/8/93 Underground survey of adit on south east of hill.

Roman Gravels Mine

18/6/93 Minecam lowered down Spring Vein Shaft to water.
8/5/94 Surface reconnaissance.
17/5/94 Descent of Sawpit Shaft. Exploration of Day Level.

Rorrington Mine

23/10/93 Winch descent of Air Shaft. Exploration in Deep Adit.
5/12/93 Surface survey. Digging/exploration in Deep Adit.
9/1/94 Measured mine buildings. Exploration of Levels 1-7 and Shaft C.
14/8/94 Dug through fall in Deep Adit and got partly into stope workings.
4/9/94 Used breathing apparatus to explore Deep Adit further.

Sallies Mine

24/4/93 Surface survey.

Snailbeach Mine

3/10/93 Classifier, jigs and Black Tom engine shed measured.
7/11/93 Excavated floor of Black Tom engine shed.
19/12/93 Cleared vegetation from magazine.
28/12/93 Cleared vegetation from Crusher House and Office.
8/1/94 Cleared vegetation from Crusher House, Office and Loco Shed.
16/1/94 Cleared vegetation from Crusher House, Office and Loco Shed.
5/2/94 Cleared vegetation from Black Tom area and Lordshill Shaft area.
5/3/94 Took 5 old miners into Perkins Level. Cleared vegetation from Lordshill Shaft area.
26/3/94 Cleared vegetation from Lordshill Shaft area.
7/5/94 Moved artefacts from loco shed to blacksmith's shop and burned scrub.
3/9/94 Cleared vegetation from incline down from Lordshill Shaft area. Evaluated how to restore processing shed by Perkins Level.
8/10/94 Finished clearing vegetation from around Lordshill Shaft area and started on reservoir next to Blacksmiths Shop. Uncovered jiggers from tips and stored in Blacksmiths Shop.
5/11/94 Started roofing Black Tom engine shed and built bonfire.
13/11/94 Continued roofing and wall cladding of Black Tom Engine Shed.
27/11/94 Finished roofing and wall cladding on Black Tom Engine Shed.

Tankerville Mine

7/93 Descent of New Shaft.

Westcott Mine

5/9/93 Surface survey. Underground survey of Nos. 1 and 2 Levels.

Wilderley Mine

22/1/94 Surface reconnaissance.

Wrenthall Mine

22/1/94 Surface reconnaissance.

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