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# Kiwi Gold : Past & Present

## Alan Robinson

Introduction

During the Christmas of 1994/95, I was able to visit New Zealand for a tour of both islands.

Compared to our images of volcanoes, geysers or the fierce Maori warriors (and rugby players), New Zealand is not normally a country strongly associated with mining. However, without the discovery of gold in the mid-1800s, the colonisation of New Zealand, which was desperately faltering, might completely have failed. It was the inevitable "goldrush" which followed that boosted a flagging agricultural economy with a need for tools, machinery and transport, as well as food for the enormous influx of immigrants. As with North America and Australia, towns with populations of thousands sprang up in weeks or months. Today, some of these settlements still remain and with them an unusual array of mining artifacts.

The central region of the South Island consists almost entirely of metamorphic rocks, mainly schist. More than 130 million years ago, the sediments deposited here were transformed by an immense igneous intrusion associated with the boundary of two continental plates. The enormous temperature and pressure changes developed the schists and brought scattered metallic elements in the sediments together to form lodes or ore bodies. The most notable resulted in the goldfields of Central Otago. Erosion followed and flakes of gold were washed out of the quartz and concentrated in the river beds and terraces of old gravel deposits. In some areas, particularly Reefton, eroded gold has been re-deposited in cementitious clays, along with mica and quartz to eventually form pebbly conglomerates or quartzites.

On the North Island, the goldfields of the Coromandel Peninsula have been formed in adesite, the result of a large lava flow. As this igneous rock cooled, it left many cracks and cavities into which minerals could be carried by the magma or heated groundwater. The mineralisation of the North is much younger, a mere 17 million years, so very little erosion of the intruded quartz veins has taken place.

Early Gold Mining

As the description of the goldfield formation suggests, two different types of mining took place :-

a) Alluvial mining where the flakes or nuggets of gold were separated from the river gravels

b) Conventional mining of the quartz veins, followed by crushing the ore and processing with cyanide to extract the gold.

Gold was first discovered by Charles Ring at Coromandel on the North Island in 1852 but the rush was short lived once miners found that it was not alluvial gold. More gold was discovered around Thames in 1867 and other fields followed on the Peninsula over the next few years. The most important location was Martha Hill Mine at Waihi, which recovered over £24 million between 1892 and 1952. *The mine is now operating again and it is possible to visit the active site for a guided tour.* Thames even had a School of Mines from 1886 until 1954.

The first major goldfield on the South Island was discovered in July 1861, when Gabriel Read panned the eroded washout of Blue Spur Conglomerates from a gully near Lawrence (later surprisingly called Gabriel's Gully). In the frenzied stampede that followed, over 10,000 miners arrived in Lawrence to pan the Tuapeka River.

In 1862, two further discoveries of gold moved attention westwards to the Shotover and Arrow Rivers. In the first discovery on the Shotover, two sheep shearers found about 200 ounces of gold in 8 days and told everybody about it! Meanwhile, another small group of miners at nearby Arrowtown had quietly panned themselves 230 lbs of gold before news escaped to the outside world.

As with many goldrushes, the easily found gold using simple panning or sluice-box techniques was quickly exhausted and, after two years, the population of the goldfield began to dwindle. The individual prospectors who had failed to make a fortune either moved on or went back to more mundane employment. Longer term mining methods started with timbered tunnels and shafts into the loose gravel terraces or using high pressure water jets to remove the great thickness of overburden on the sides of the gorges. It seems ironic that, whilst this activity was taking place in an active river gorge, there was often no reliable water source to provide the volume and pressure

**Figure 1 - Main Gold Mining Areas of New Zealand**

of water needed. Long water races (sometimes up to 5 miles) and expensive steel piping meant that mining had to be undertaken by larger groups or syndicates, often financed from Australia. The search also moved towards looking for gold in the reefs of quartz veins further upstream.

The 1870s and 1880s saw the development of dredgers, which was a particularly intrepid endeavour for a fast moving river. The first boats were simple pontoons armed with a giant spoon, which would blindly dip down into the river bed. A steam powered bucket dredge was used on the Clutha River near the coast in 1881 and its success there led to another dredge being brought to the Shotover in 1888. This was set up by a Chinese merchant and proved very profitable for the next ten years, realising a return of over 25 times the original investment and allowing the construction of a further 3 dredgers on the claim.

"Dredge Fever" hit the region and, by 1904, there were over 150 on the rivers of Southland and Otago. As technology developed, electricity was used for power and suction and/or rotating cutters were introduced to work the rockier sections of the river beds. The downfall of many operations, however, was twofold: not enough gold and the extreme flooding in the already fast moving river.

The mining of the quartz veins at Bullendale first started in 1866 but the restrictions of fuel transportation meant that water power was the only means for running crushers and stamps on a limited basis. Until 1884, all mining was through adits as there was insufficient reliable power available for pumping. It was not until 1886, when a hydro-electric scheme was introduced, that larger stamps and compressed air drills could be introduced. This allowed further development of the mine with a few profitable years but, by 1897, the mine was losing money and it finally closed in 1905.

Two schemes to win riches from the Shotover river bed involved major engineering projects to divert the whole river. In 1906, the Oxenbridge family started blasting a tunnel to carry the water. After more than 3 years, a level 14ft wide and 750ft long had been driven through solid rock. Unfortunately, their efforts were not financially successful as Chinese prospectors had managed to win much of the gold there during droughts some 15 years before. *Even today it still carries the river and I can personally vouch for it providing an exhilarating finale to a whitewater rafting trip.* A similar attempt in the late 1920s involved cutting across a large loop of the river to create an oxbow. This consisted of a sluicing operation to cut a channel nearly 2,000ft across the glacial deposits, removing over 2,500 million tonnes of material. Once again it was a financial disaster, with only small quantities of gold being recovered.

A final attempt at "capturing" the river was made in 1932 with the construction of a steel flume, 16ft wide and 4ft high, through which the Shotover was to flow along one side of the river bed. Although more gold was found, this too proved to be another costly failure. *The remains of this and an old suction dredge can be visited on the white knuckle ride of a Jet-Boat (a more recent New Zealand innovation) as it races up the narrow gorge of Skippers Canyon.*

The township of Arrowtown remains today as a tourist attraction, with many of the original buildings from the late 1800s still intact. It has been developed along the lines of a "Blist Hill" type with a jail, post office and Bank of New Zealand. Since the buildings have not been moved, it does have a more authentic feel to the wide main street. *It also has a very good museum in the old bank building which includes a lot of archive information as well as an illustrated history of Arrowtown and the Chinese miners.* The Chinese settlement slightly upriver was settled from 1869 until the turn of the century. It was "re-discovered" in 1983. Prejudice against the Chinese normally forced them to form satellite villages and they were often prevented from establishing new claims. Instead, they concentrated on re-working tailings of abandoned claims or setting up trading stores and laundries.

From Arrowtown, it is possible to travel upstream on foot and by 4-Wheel Drive to Macetown, where the veins were mined underground. Many shafts and adits can be found, along with numerous remains of surface buildings, stamp batteries, tips and other processing plant. The site is far too remote to attract scrap collectors, nor was it ever viable to transport redundant plant out again. The wagon route out for the processed ore was very flood prone and involved crossing the Arrow 44 times! Countless lives were lost in the Spring floods of 1863, at the peak of panning and sluicing the river.

<u>Gold Mining Today</u>

Today there are three large-scale mining operations in New Zealand - Macraes, Waihi and Reefton. Whilst there, we were able to visit the development at Macraes Gold Mine in Eastern Otago. It is the only hard rock venture in the South Island. Gold was deposited in the Macraes area as a result of super-heated fluids flowing up

**Figure 2 - Map of Shotover Valley**

through faults in the country rock of schist, approximately 120 million years ago. The gold is generally found within quartz veins and it is thought that there is a reserve of over 1 million ounces available.The modern mine first produced gold at the end of 1990 and, since 1992, has been producing over 100,000 ounces a year. The Macraes Mining Company now employs over 150 people and earns in the region of £35 million.

The mine is entirely opencast, so the actual mining is carried out by an earthmoving contractor. Mining operations are continued 24 hours a day, 6 days a week to maximise production and offset the effect of weather conditions during the winter. Excavation uses conventional quarrying techniques of benching in either 2.5 metre lifts for the ore or 5 metre lifts for waste material. All movement of material is carried out by 85 tonne or 150 tonne dump trucks. The main pit has been divided up into a 10 metre square grid, with a borehole being drilled at the corner of each square to obtain a core of the ore deposit. In this way, a map of the gold concentration (typically 2g/t) can be obtained prior to removal. Most of the rock breaking is done by ripping but blasting is required in some sections. All excavated material is then classified into one of three categories :-

a) High Grade - for immediate processing in the mill

b) Intermediate - for storage on site until gold prices increase

c) Waste - for disposal in tips with eventual use as grazing.

In practice, nearly 80% of the excavation is classified as waste immediately, whilst the mill will generate almost 15 tonnes of tailings for every ounce of gold produced.

To recover the gold, the ore is first crushed in a jaw crusher, then fed along conveyors into the SAG Mill and Ball Mill for grinding with steel ball bearings to form a smooth slurry. The blue grey ore which contains sulphide is first concentrated in a flotation process and then re-ground to liberate the gold particles trapped by the sulphide. This material is then pumped to a series of seven large tanks in which cyanide is added to the slurry to dissolve the gold. The gold solution is recovered by passing it over carbon made from coconut shells. When the gold is washed out of the carbon, it is electroplated onto steel wool and the resultant gold deposit is melted into ingots called dore to be sent for refining.

The tailings from the recovery plant are pumped into two storage dams built across a natural gully adjacent to the "pit". In the retained water, the finely ground rock settles out and the water is recovered. The cyanide used to extract the gold is allowed to degrade in sunlight or is denatured before the water is re-used. Environmental monitoring is an ongoing part of the project and deals not only with the water quality resulting from these processes but also air, noise, blast vibration and aquatic biology. All aspects of construction must include for the potential pollution that might result from earthquake damage.

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**Figure 3 - Plan of Processing Plant at Macraes Gold Mine**

# Cissbury Bellpits, Sussex

## David Coxill

In July 1980, I visited the Neolithic bellpits at Cissbury Hill, Sussex. This is an important historical monument as it is believed to represent the earliest known record of mining in Britain (Field, 1994). Burleigh (1975), using radiocarbon dating of an antler bone found in the collapsed galleries at Cissbury, gives dates of between 4,730-4,650 BP. BP means "before present", which is equivalent to a range of 2,745-2,635 BC. These dates indicate the significance of this site.

Situated by Worthing, near the southern coast of England, Cissbury Hill, or Rings, would probably not be that noticeable if it was not for the footpath sign indicating an ancient monument. This takes you up a steady gradient to the top of the hill, where a series of shallow depressions can be seen. Aerial photographs show a series of closely-packed depressions on the southern part of the hill, interrupted by the rampart of a later Iron Age hillfort (Field, 1994, p.24).

These are the remains of bellpits that were sunk by early man into the Cretaceous chalk to obtain supplies of flint. There are no underground entrances left to see at Cissbury today, just the collapsed remains of the shafts that produced a pitted, although not unattractive, appearance. Flint is a siliceous deposit that forms veins and nodules around the nucleus of fossils within the chalk. Early man sought this hard mineral because it breaks with a conchoidal fracture, that allowed him to chip pieces away against hard rocks to produce various shapes and instruments that could be used for wide ranging purposes including axe heads. Chert, another siliceous mineral, has a flat fracture that is not easily shaped into artifacts.

The site is important because it demonstrates that primitive man was prepared to go beyond scouring the chalk plains of southern England in order to obtain his supplies. Bellpits, although a primitive form of underground mining, represented an innovative approach in prehistoric times which should be regarded as an important step by mankind. The typical model of a bellpit is of a simple shallow shaft, sunk until the mineral horizon is reached, where the chalk containing nodules of flint would be worked out from the shaft in all directions. This was done without the use of supports until it was no longer safe to do so. The shaft was then abandoned, leaving a bell shape void. The early miners would then move a few metres and sink the next shaft, and so on until the local area was covered with these shallow shafts.

Archaeological investigations reveal that the bellpits at Cissbury were quite advanced for their type, despite their early date. Field (1994) notes that not all of the 7 metre diameter shafts are circular, some of them being almost square. Many shafts contained timber and have been recorded up to 12 metres in depth, which is quite deep. Willett (1875) records eight insets from a shaft, which were typically 1 metre wide (Field, 1994) and extended up to 8 metres (Lane Fox, 1876).

Bellpits are inefficient by modern day standards, effectively sterilizing the mineral between two bellpits. Although there was only a small distance between each individual shaft in a mining field, on a collective basis the mineral sterilized will be significant. Yet at Cissbury the workings were found to often be interconnected, leaving only a small pillar of chalk to support the roof (Willett, 1875). Field (1994, p.25) notes that "... small windows were cut through these walls to provide reflected light". *[Editor - a more realistic reason would be to improve ventilation]*.

This poses the question as to how primitive the local Neolithic man was. He was the same species as ourselves, Homo sapiens sapiens, long having replaced Neanderthal man. Certainly this relative degree of sophistication suggests that he was versed in mining techniques. It is questionable whether I am correct in calling these mines bellpits since they are interconnected but, as there are over 270 shafts recorded at Cissbury (Field, 1994) over roughly 20,000 square metres, this classification will be used for want of a better one.

Working in these cramped conditions could not have been pleasant, particularly when the main tools for digging would be deer antlers, other bones and possibly flint tools.

Man was certainly capable of cutting stone in Neolithic times. In Britain, Stonehenge and the older Avebury stone circles were being erected approximately in this epoch. Across the seas in the Old Kingdom of Ancient Egypt, the only survivor of the Seven Wonders of the World, the great pyramids of Cheops and Chephren were being built about 4,500 years ago. They were built of granite blocks, capped with Eocene Limestone crammed with fossils called "Fusilinid foraminifera". The public image of early man deserves a reappraisal. He was innovative, intelligent, admittedly superstitious but no less able than we are today.

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# Gilfach Copper Mine

## Steve Powell

Gilfach Mine (NGR SH531477) is situated along the Cwm Pennant Valley and was one of a number of mines along the valley that were worked for both copper and slate. Gilfach was unexplored territory as far as the club was concerned and a quick scan through David Bick's book "Copper Mines of Snowdonia" showed that, although people had explored the known adits, nobody knew what lay beyond the point where the adits broke out into the stoping. The only plan available showed question marks at this point of the mine workings. Intrigued all the more by this, myself, Neal Rushton and Alan Moseley set out to see what possibilities it might hold.

On arriving at Cwm Pennant, we decided to scour the valley for the Cwm Llechfraith copper workings. This amounted to little more than a small incline road, dressing area and a very small section of flooded stope. The time seemed to be passing extremely quickly so we made our way to Gilfach.

Neal had been into the bottom adit some years before, so we decided to try the top adit. This was actually found to be not an adit but a stope worked out to surface. It looked a little difficult to rig with the ropes so we moved on to the middle adit.

This adit ends with a large hole in the floor which connects into the main stope. Directly on the left hand side of this was a solid floor with 2 small recesses, from which ore had been extracted. Straight ahead, over the hole in the floor, was either the continuation of the adit or possibly an ore shute from the upper adit. It was, however, blocked with large boulders and broken stemples. A passageway could be seen to the right hand side, with access via 2 rotten looking planks over the hole. A short time was spent putting anchors and bolts into the ore pockets, as the rock seemed stable at this point. This enabled us to rig up a traverse line over the hole. We discovered that the passage quickly turned at a right angle on itself onto a solid rock floor but it ended after only 3 metres in a large stope. The remains of a staircase could be seen here which would have connected to the lower workings but only the top section was left. Looking across the stope, we could see a passageway set on top of a large ledge. A lot of time was spent bolting the rock and setting up rigging, until the point where I was volunteered to try and traverse the stope. I eventually completed this task and dropped onto the ledge and a short vertical climb gave access to the passage. Unfortunately, it was blind after only 4 metres, with a couple of old bottles found at the end. Small consolation for so much hard work!

Undeterred, I placed some fresh anchors and hangers on the ledge and descended the stope. I passed through a wooden hatchway with an attached wooden ladder suspended in mid-air. A few metres below the platform, the same situation was found as above, ie a ledge on the side of the stope with a blind heading. A section of false flooring was still in position on the stope just below this ledge. I descended further but ran out of rope at 120ft from the starting point. At adit level, it was still not possible to see a connection to the bottom adit from here and I assumed it to be at least another 100ft below me. Many stemples were still in position and large amounts of rock were held on small platforms within the stope. Most of the timberwork had seen better days and had decayed quite badly, rendering it all very unstable.

There were no signs of mineral veins or any staining from ore deposits anywhere in the stope, including the stacked rock, apart from small traces of iron pyrites. Consolation, however, came in the finding of a large colony of bats, both at the top and middle levels of the stope. After ascending to adit level, we made our way out.

It was a few months later before we concluded our explorations at Gilfach. The next visit was planned over a weekend when we also visited Britannia Mine. Myself and Alan Moseley were this time accompanied by a larger party made up of Mike Worsfold, Eileen Bowen, Francis Turner and John Priest. The plan was to rig the top of the stope and try to find a connection to the lower workings.

I descended vertically for about 40ft before reaching a pile of very unstable boulders. From this position, I could see a broken wooden floor below with fallen rubble balanced on it. It was not possible to see whether a passageway existed at the end of the false floor. It would have been suicidal to try to go beneath the loose boulders so an attempt was made to re-route the rope. The idea was to descend through a small eyehole in the stope to move me away from the boulders but this was found to be inadequate and abandoned. While I was in the top of the stope, however, a couple of short passageways were found which could not be seen from the stope opening. Again, after climbing up into them, they were found to be very short blind headings. Back at the entrance to the stope, we tried throwing large rocks down onto the loose boulder pile. This failed to shift them so we made our way out and to the bottom adit.

**Figure 4 - Gilfach Mine**

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This was found to be extremely long, with many beautiful formations deposited by iron oxides leaching from the rock strata. This type of stalactite and stalagmite is very fragile and the slightest touch will destroy them. A small offset on the right hand side of the adit contained what looked like an explosives store, with a large wooden chest set into a pile of stacked rock.

The end of the adit connected into the base of the stope, before turning at right angles to the left. This passage was also very long and appeared to be barren. The formations along here were also superb, again great care is needed to ensure that they will still be there for other mine explorers.

The surface of Gilfach Mine shows little remains of its former activity, apart from sections of a leat, a couple of spoil tips and some curious stone-lined flooded pits at the base of the mine.

# John Lloyd, the Lilleshall Company, Steam Engines, Fans & Pumps

## Ivor Brown

In 1861, the Lilleshall Company saw a growing need for steam engines and opened their New Yard Works at Oakengates, Shropshire. This was partly to replace the Old Yard Works at Donnington Wood, which had originally specialised in canal boat construction.

For the New Works, the company appointed John Lloyd as manager. John is said to have gained his experience with the successors to Boulton & Watt at Soho Foundry, Birmingham (James Watt's last son had died in 1848 but the company continued as James Watt & Company for many more years). The Lilleshall Company provided their new manager with a house called "Cappoquin" in Moss Rd, Wrockwardine Wood, where he lived for some years before moving to Priorslee Hall itself.

Within a year of its opening in 1861, the New Yard Works had produced a railway locomotive. A second one then won a gold medal at the 1867 Paris Exhibition. After this, many more were made and sold. In 1862, the Works produced a pair of beam engines which won a gold medal at the London Exhibition. With confidence growing, the Company then began to produce winding engines for mines alongside the locos and beam engines. Some of the many winding engines produced were for the Company's own mines and John Lloyd designed at least one himself, that for the Woodhouse Colliery. He also designed and built for this colliery the County's first steam powered mechanised ventilator or fan, now known as the Lloyd Fan.

Ventilators were not new to the Lilleshall Company, for they are known to have made at least two Lemielle's Ventilators of 24ft diameter for mines in other counties (Page Bank and Washington Collieries) but did not apparently use them themselves. John Lloyd seems to have got the idea for his type of fan in the early 1860s. At first he built a model, 18 inch in diameter and 6 inches wide, and carried out many tests. This produced a flow of air of 1,500 cubic feet per minute, with a w.g. of ¼ inch. He also made two other models: one of 27 inch diameter, which exhausted 2,500 cubic feet per minute, and a 60 inch diameter fan of 22 inch width which exhausted 26,196 cubic feet per minute with a w.g. of 2¾ inches. It is said that, during tests, "... several anemometers have been torn to pieces by the force of the current of air created".

By 1869, John had produced a full scale fan for use at the Company's Woodhouse Colliery. This fan was 16ft diameter, 5ft 10 inches wide and produced 59,400 cubic feet of air per minute at 62 revolutions per minute and seven eighths of an inch w.g. Some reports, however, say that in practice it produced only 10,000 cubic feet per minute in the underground workings. Later in 1869, Mr S McCarthy of the Company took one of the models to a meeting of the Northern Institute of Mining Engineers. He told his audience that the Company were satisfied with the results so far of the Woodhouse Fan but had not yet had sufficient experience to make comparisons with other types of fan. His paper was published in the Institute's Transactions for 1869/70.

John Lloyd took out a patent (No. 1715) on 3rd June 1869 for "... improvements in the construction of fans for ventilation" and his particular fan was described as an "... open running centrifugal ventilator". Its principal feature was that it was made up of a series of different length, curving, wrought iron blades, riveted at each end to a disc plate. One disc plate was solid and the front disc plate had a hole through which air was drawn into the fan. A centre-shaft held the two plates together and provided balance and the drive to rotate them. A special feature of this arrangement was that there were no support arms or obstructions to interfere with the flow of air into the fan, which was used as an extractor or exhaust fan.

In 1870, the steam engine used to drive the fan was described as a 14" diameter, 18" stroke, direct-acting horizontal engine (a plan and end view of the engine house is shown in McCarthy's paper). In 1871, the mining journals were carrying advertisements for the Lloyds' Patent Fan, which the company claimed was "... superior to any yet produced". Nothing further about the fan has been found however and, in 1891, Woodhouse Colliery is shown in a survey to have a Guibal Fan of 28ft diameter for ventilation. The same survey shows that two other Company mines had Guibal Fans (each 20ft diameter) so it appears that the Lloyd Fan did not match up to the competition. Furthermore, the Company made at least one Guibal Fan for sale, to Wollaton Colliery in Nottinghamshire in 1878. This was a massive 42ft diameter and 12ft wide. It is likely that the Company also made some or all of the Guibal Fans for its own pits.

In 1972, I photographed the substantial remains of Woodhouse Colliery but could not identify either the specific buildings of the fans or the Lloyd's Winding Engine, which had been described in 1870 as "... a vertical 32" cylinder, 5ft stroke with 11ft rolls" (drums!). The engine was winding with flat wire rope from a 250ft deep

**Figure 5 - Lloyd's Ventilating Fan**

**Plan**

**Elevation**

**Figure 6 - Lloyd's Ventilating Fan**

**Sectional Elevation**

shaft. In 1972, there was still operational equipment at the mine (although coaling had ceased in 1940) but in 1996 the pit area, now heavily wooded, was well fenced off.

Under John Lloyd's direction, the New Yard Works continued to make engines throughout the remainder of the 19th century. This included large mine pumping engines and one of these was for Shropshire Mines Drainage, a 50 : 50 partnership arrangement between the Lilleshall Company and the Haybridge Company. This Cornish-type pumping engine was erected on the old Pudley Hill Colliery site, about one mile from the Works, in 1890 and was used for draining the surrounding mines of both companies. It had a 66" diameter cylinder, 8ft stroke and pumped in 3 stages from a depth of 792ft. It is said to have stopped work before John retired in 1904 but the remains of the engine house were still on site in the 1970s.

John Lloyd was a highly respected engineer and, during his time, the Lilleshall Company was at the forefront in construction and production of a wide range of goods in iron, steel and clay. The Company continued to make steam engines for Britain and abroad until, in the 1930s, the last one had been produced due to the changing markets and the depression. The Company did, however, continue to supply other mining requirements, such as colliery headframes, until the 1960s. Shortly after, however, even the New Yard Works were closed.

Several Lilleshall steam engines have been preserved. One, a colliery winding engine, is the centrepiece of the recently proposed Pleasley Colliery Country Park in Nottinghamshire.

The accompanying drawings are from the Transactions of the North of England Institute of Mining & Mechanical Engineers, Volume 19, 1869-70.

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I would like to thank Alan Hill of Birmingham for his assistance in the preparation of this paper.

# Tankerville Mine

## Adrian Pearce

Introduction

The mine lies in a small valley on the west side of the Stiperstones, some 12 miles south-west of Shrewsbury (NGR SO355994). Unlike other large mines, there is no obvious spoil tip to identify it since most of this was removed during the Second World War to build runways for RAF Tern Hill. The engine house and chimney, however, are local landmarks and these are clearly visible from the road which runs from Snailbeach to Bog. Watsons Engine Shaft, at 1,690ft, is the deepest shaft in the orefield but it is now flooded for most of its depth. Like Snailbeach to the north, this mine possessed a very rich lead deposit and for a number of years was a source of great wealth for its shareholders. It is a shame that this was only found relatively late in the 19th century and, by the time the mine was properly equipped to exploit it fully, the price of lead fell. Like other mines in the county, it was unable to compete with cheap foreign imports of lead and had to close. The following account is a summary of currently available secondary sources as at January 1996 and will be developed as further information comes to hand.

Geology

The country rock here is the Mytton Flags and it is in this rock that most of the rich mineral deposits of the surrounding district occur. The main ore was galena (lead sulphide) and this contained an average lead metal content of 80% when smelted. The galena was also found to contain an average of 2 ounces of silver per ton but this was not particularly high compared to galena found at other mines and was thus not always extracted. Apart from lead, the other major ores extracted were barytes (barium sulphate) from the upper levels and sphalerite (zinc sulphide) from deeper levels. Calcite (calcium carbonate) was also found but this was originally dumped on the tips and only taken from here in later years when a market was found for pebbledashing.

The water table of the area was lowered when the Boat Level was driven past on its way to unwater Bog Mine and this took the natural drainage from higher strata. The Boat Level (or adit level as the miners called it) is 200 yards east of Old Engine Shaft, to which it is connected by a crosscut. The crosscut then proceeds west for 67 yards to join Watsons Engine Shaft and a further 100 yards south-east to end at New Shaft. At Watsons Engine Shaft, it is 226ft below surface. This level was the datum for the mine and all workings below were measured in fathoms below adit.

Galena is usually found as a vein, that is a narrow vertical fissure filled with ore. The width of a vein varied tremendously and sometimes disappeared completely (what the miners called pinching out). The fortunes of a mine were thus dependent on the vein width since a narrow vein would only produce a small amount of galena and involve costly operations to remove the waste rock either side. At Tankerville, the lead was found in another type of deposit, the pipe. This consisted of an irregular shaped mass which was normally horizontal but here was inclined steeply to the south-west. There were several pipes at Tankerville and the size of the main one was sometimes quite wide. This not only made it easy to mine but it also produced big profits. As at other mines, the local miners gave names to their deposits and they adopted the term “lode” which was normally used in Cornwall.

The Old Lode consisted of two pipes separated by a shale barrier which varied from 30-120ft in width. It outcropped (appeared at surface) slightly west of Lewis’ Shaft and east of Old Engine Shaft. The eastern pipe varied from 100-150ft in width from surface down to the 74 fathom level, beyond which it was never fully exploited. The western pipe was 80ft wide at surface but thinned out at the 52 fathom level. This was the first lode to be worked at the mine and it was extracted from Old Engine Shaft to a depth of 74 fathoms below adit. From the shaft, the 21, 42, 52, 62 and 74 fathom levels were driven east for up to 90yds and west for 60yds. Old Lode was also found and worked at the 192 fathom level from Watsons Shaft.

Main Lode does not outcrop and the highest point it has been found is just below the 21 fathom level. It lies a little to the south of Old Lode and was mainly worked from Watsons Shaft, being completely stoped out down to the 220 fathom level. There are only two stopes between this and the 232 fathom level and no stopes at all in the 244 fathom level, which is driven 10 yards east and west from the shaft bottom. The width of the lode varies from 40ft at the top to a maximum of 350ft and most levels from the shaft end at the margins, although some extended beyond it as trials. Main Lode was regarded in its day as the richest in the world but following it down caused great anxiety and fluctuations in the share price.

The grade increased all the way down to the 92 fathom level, where the western workings produced up to 30 tons of galena per cubic fathom. In the 62, 74 and 82 fathom levels it was between 7-20 tons per cubic fathom. From the 92 fathom level to the 130 fathom level it was enormously rich, reaching in places 40 tons 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 fathom level the lode was lost in a particularly large cavity. It came in again as rich as ever between the 140 fathom level and 152 fathom level and some winzes below the 152 fathom level went down in solid galena that was "as black as coal". From the 167 fathom level down, the lode became steadily poorer.

South Lode was parallel to Main Lode and was worked from Watsons Shaft at only a few places.

North Lode was a branch off Main Lode and was only worked at two places from Watsons Shaft. There was a 90ft long stope above the 192 fathom level and a 180ft long stope between the 206 and 220 fathom levels. It is the only lode containing a large amount of zinc and was the source of all that between 1881-1884. There are believed to be large reserves of zinc left unworked in the lower workings.

There were also several parallel minor lodes and Maddox's Crosscut (North) in the 120 fathom level, after passing through 40ft of mineralised ground, cut six of these. One may have been a much reduced Old Lode but little was done to explore these.

History

The mineral rights of the Tankerville area were in joint ownership and all leases were jointly granted by the Earl of Tankerville and the Lloyd family. There is no record of any early mining in the area and the surface of the mine site is shown on old maps as a farm up to the 19th century. The area was being drained by the Boat Level in 1797 but it is not known if any lead deposits had been discovered and were being worked at that time. The earliest known mining at Tankerville was by Walker, Cross & Company from the 1830s, when the mine operated under the name of Oven Pipe. The company's main activities were at Bog and Pennerley, however, and there was very little investment at this site, other than a crosscut called Oven Pipe Level which had been driven from the Boat Level to work a small pipe vein on Old Lode. Ore was removed from a small shaft by a horse gin and this was probably the one that was later enlarged as Old Engine Shaft. Lewis' Shaft may date from this time as an access shaft when the level was being driven.

Between 1860-63, Fred Jones & Company worked the mine and they had engaged Captain Arthur Waters as manager. In 1862, he referred to the workings in a letter to John Horton :

"... I found Oven Pipe Mine in the same position three years ago as the above named mines are today, but by a system of cross-cutting found a deposit of lead ore that, since its discovery, has yielded about £16,000 worth and that without sinking the Engine Pit an inch ... We are now sinking the shaft as a matter of course, having a rich lode to go down upon".

The deposit referred to must be Old Lode and Waters had presumably found both pipes on it from trial crosscuts. On the basis of lead being worth about £20 per ton at that time, about 800 tons must have been produced from 1860. During this time, Heighway Jones of the Bog & Pennerley Company was working several adjacent mines and he realised the potential of Oven Pipe Mine. In

1864, he sold his interest in Pennerley and Myttonsbeach Mines and bought Oven Pipe, where he then concentrated his activities. Waters was retained as manager and the new Oven Pipe Company acquired several other mines, ie Potters Pit and Burgam from 1866 and Batholes and Roundhill from 1868. Probably due to the acquisition of these extra mines, the name of the company was changed to West Tankerville Mining Company from 1869.

As Old Engine Shaft was sunk below adit level, the new workings had to be pumped dry and the depth was probably beyond the capability of the old horse gin. As a result, Waters erected a small ex-colliery engine 30 yards from the shaft which raised the ore, operated the pump rods and powered the roller crushers. It was a 16" beam engine of 16 horsepower and 3ft 6" stroke. Old Engine Shaft was deepened to the 74 fathom level, being vertical to 70ft below adit (214ft from surface) and then running at an angle of 15°. The reason for the change in angle was to allow the shaft to follow the direction of Old Lode. This meant that ore extracted during the sinking paid for the costs but it caused problems later with winding and pumping. Levels were driven into Old Lode down to the 74 fathom level and the ore stoped out.

Waters continued to drive exploratory levels from the shaft and one of these, driven south from the 42 fathom level, discovered the top of Main Lode. Other exploratory levels were driven and these proved that the lode extended downwards at 40° and continued to be very rich. Crosscuts from Old Engine Shaft allowed the Main Lode to be removed above the 74 fathom level but it was decided not to deepen the shaft since it would move further and further away from Main Lode. At this stage, there was still no indication as to how far the Main Lode would continue but hopes were obviously high.

A description in the Mining Journal early in 1870 describes how the mine was working at that time. Old Engine Shaft was used for both raising the material and for the pumps, and access to the levels was by way of ladders in the pumping portion of the shaft. There were about 50 miners employed at the mine, split into three eight hour shifts working round the clock. The steam engine raised ore from 6am to 2pm, drove the ore crushers from 2pm to 5pm and pumped the mine from 5pm to 6am. Pumping was done by four lifting sets of pumps from the 74 fathom level, the lowest having a 7" diameter and the others slightly larger. There was also a 'forcing set' from the Boat Level to the surface, used to supply water for the dressing floors when surface water was scarce..

The lead ore was raised in a kibble attached to a single linked chain and slid up deal planks in the inclined portion of the shaft. The ore was worked downwards in stopes of 6ft from one level to the next, with the higher level being boarded up for a tramway. The ores from the lower level were raised to the upper level by windlasses and taken by tramway to be loaded into the kibble at the shaft.

On the surface, the ore was crushed in roller crushers powered by the steam engine. It was then placed on a rotary screen and the larger pieces were gathered together by brushes on a rotating horizontal wheel, to be sent back through the crushers until small enough for the next phase of the operation. This took place in four jigging machines, sieves worked up and down in water by hand labour, that separated the heavier lead from the spar and stone waste. It was then washed in flat buddles, put through jiggers with finer sieves and finally into rotary buddles. The lead was then ready to be sent to the smelter at Pontesford by horse and cart. On the return journey, the carts brought back coal for the boilers from the Pontesbury Coalfield.

From the bottom of Old Engine Shaft, a crosscut ran along the 74 fathom level to Main Lode and an internal shaft was begun down the angle of the lode. By the beginning of 1870, this had reached the 92 fathom level. Since these workings would need to be pumped, there must have been a system of flat rods along the 74 fathom crosscut to operate pumps in the new underground shaft. Water was presumably pumped up to the crosscut and directed to the sump of the Old Engine Shaft. Although it was easy to work ore in the lode, it had to be wound up the internal shaft in kibbles, taken by wheelbarrow along the crosscut and then wound up Old Engine Shaft using the small winding engine. This was a very inefficient system and it was found that the maximum amount that could be removed was about 50 tons per month. This did not satisfy Waters who believed that it was possible to extract 300 tons per month if a new shaft was sunk from surface directly onto the workings.

Heighway Jones could not afford this scheme himself so, in 1870, a joint stock company called the Tankerville Mining Company was formed with £72,000 capital. The company bought out Heighway Jones' interest in the mine in February 1870 and the names on the official lease were Messrs Murchison, Geach, Watson, Grundy and Mitchell. The share issue was so popular that it was oversubscribed, with 12,000 £6 shares being offered at £20 within a few days. The price soon increased to £30 as early profits rose sharply, a dividend of £3,000 being paid within four months. In May 1870, the mine was renamed Tankerville in honour of the Earl of Tankerville. At that time, Waters claimed that "the mine is unquestionably one of the greatest, if not the greatest, lead producing lodes in Shropshire".

During 1870, the underground shaft was extended from the 52 to the 102 fathom level and a high pressure Fowler engine was installed underground at the 74 fathom level for winding purposes as sinking continued. It had 190 fathoms of wrought iron chimney installed via Old Engine Shaft to remove the fumes from the boiler. In 1871 a start was made on sinking the new shaft from surface and a further three engines of 6, 25 and 60 horsepower were installed at surface. At least one of these was probably for ore crushing, etc but the larger one probably replaced the old engine for winding and pumping in Old Engine Shaft. This engine may have been housed in the small engine house adjacent to the top of Watsons Engine Shaft. This has the marks of a large winding drum on its internal surface and slots in the north wall. A photograph of around that period shows the winding cable running from this engine house to Old Engine Shaft. The old engine house was probably relegated to operating the dressing machinery only.

At the end of 1871, Waters reported that the "mine throughout continues to maintain its high character for productiveness and had never in its history shown such indications of permanency". A local press report said "the rich and profitable mine of Tankerville is second in importance only to Snailbeach, two miles to the north-east".

According to the Mining Journal, " the extraordinary richness of the Tankerville Lead Mine is so well known that it is needless to dilate on it here".

The new shaft was called Watsons Engine Shaft after Peter Watson, one of the new partners who was also a director of Devon Great Consols Mine. By 1872, some ore was being crushed and stored underground in anticipation of the opening up of the new shaft. A letter to the Mining Journal in 1872 gives some indication of the costs of sinking the shaft. A gang of 12 men was employed with each man earning £1 per week. In a month, the cost of drill steels, powder, fuse, candles, etc was £12, making a total charge of £60 per month for the gang. If the gang was paid on contract at £20 per fathom sunk, they would need to sink 3 fathoms per month to cover costs. In a 12ft x 9ft shaft, this would remove 9 cubic fathoms of ore at 20 tons per fathom, giving a yield of 180 tons per month. Lead ore was selling at £13 per ton at that time.

In February 1873, Waters commented that "the weather is very severe, but by sending the hot water from the condenser through our various dressing appliances, we get on very well preparing the ore for market". Despite the weather, the new shaft was progressing well, so it can be presumed that the connection had already been made by then. The new shaft was vertical to the 52 fathom level (226ft below surface) and it then followed the angle of Main Lode downwards at 38°. A 32" engine of 25 horsepower was installed for winding in Watsons Engine Shaft and the big chimney probably dates from this time, serving this engine first and later being used for the Cornish pumping engine. An interesting statistic from that year's Annual General Meeting stated that 27,000 cubic feet of masonry, weighing 1,600 tons, had been used to construct the engine houses. It was also mentioned that Lewis' Shaft and Old Engine Shaft had been re-timbered, with new ladders and pitwork installed in the latter. The underground Fowler engine had become redundant and was removed.

The new 32" engine was also intended for pumping and work was underway to fit new pitwork in the shaft. A crosscut to the Boat Level was made half way down the vertical section of the shaft

for the pumped water to flow away. In April 1873, the carpenters were preparing a new balance bob, main rods, etc for pumping in the shaft and it was intended to send down the new pitwork in the near future. By May 1873, all the bobs were ready, the plunger lifts were waiting on the ground and the main pumping rods were to hand. It can therefore be presumed that the new pumps were working by the end of 1873. The vertical motion of the pump rods had to be converted into angular motion at 500ft below surface, where the shaft changed direction to follow the vein. This was achieved with great difficulty and there was considerable wear and tear on the pitwork. Various designs of rods with links, guides, wheels, etc were tried. A great deal of money had been invested in equipment and Waters claimed that Tankerville was only in its infancy and the best days were yet to come.

The angle of the shaft not only caused problems with the pump rods but even more so with the kibbles. The monthly bill for replacing timber kibble guides in the shaft was said to be about £200. The kibbles used, according to the Mining Journal, took 17cwt and even the bulk of Peter Watson himself. Waters replaced the chains on the winding engines with wire ropes, which weighed a lot less and thus saved fuel. In May 1873, after introducing wire rope on Watsons Engine Shaft, Waters said "we do not consume more than half the quantity of coal required to wind with a chain".

By 1874, the shaft had reached 190 fathoms below adit and John Smitham was appointed as mine agent to assist Waters. The latter said that the mine was "at last in full swing, despite a drop in lead output due mainly to the amount of work connected with sinking the new shaft. The mine is well-managed and well-equipped and has splendid machinery and general plant for winding, pumping, crushing and dressing". Lack of surface water for ore dressing was still a problem, Waters arranged for water to be pumped up from the Boat Level and yet the following year he was complaining about the heavy rains which stopped surface working! He continued to issue encouraging reports to the shareholders, saying "there is a great future in the mine and he had never seen finer rocks of solid ore".

It was found, however, that the Main Lode was thinning out with depth and there was increased water in the lower workings. This increased costs and, possibly as a result, in 1875 the company acquired limited liability as Tankerville Mining Co Ltd. The existing pumping engine could not cope with the water and

work was started on a new engine house on the other side of the shaft in September 1875. Despite delays due to bad weather, Waters reported in November 1875 that "the new engine house is up to the spring beams, the latter, together with the girder, being in their place. The engine is on the mine and the boiler, with fittings attached, in the house". By the following January the beam of the new pumping engine was lifted into its place.

Alterations were required to the underground pitwork for the new pumping engine and, in summer 1876, Waters reported that "we are getting on well with the engine, the changing of the pit-work, etc, and shall be ready to commence pumping for good with them by the time appointed". The 40" Cornish pumping engine from Harveys Foundry at Hayle was ready for work and connected to the pumps in the first week of August, allowing Waters to announce that it was working splendidly and all the difficulties with respect to drainage were over. By December 1876, he stated that "the new pumping engine drains the entire mine, old and new workings throughout". Waters indicated that only one new boiler was required for the engine, presumably the Galloway boiler which was eventually sold by auction. The other one, a Cornish boiler, may have been for the 32" engine, which was restricted to winding only after the new engine was started up.

In September 1876, the usual shortage of surface water caused Waters to comment that "we have been much put to for want of water for several weeks past but a favourable change has taken place and the dressing can now go without delay". The pump on Old Engine Shaft was presumably still working to bring water up to surface from the Boat Level at times of shortage.

At Watsons Engine Shaft, a machine kibble was installed down to the 180 fathom level. This may have been a skip, a method which was used in Cornish inclined shafts to increase the speed of loading. At the top of the shaft, ore was transferred to one of the six adjacent ore bins, all of

which had a grating to prevent large lumps passing through. Of the lumps left on top, pure ore was removed for sale, waste rock thrown away and mixtures of the two would be broken up by sledge hammer to a size that would pass through the grating. From here the ore would go roller crushers and pass through the same dressing processes as previously described. It was originally intended to extend the Snailbeach District Railway in the 1870s to Bog Mine and this would have bypassed Tankerville. In the event, it only reached Crowsnest to the north and all ore still had to be transported by horse and cart to the smelter at Pontesbury.

Waters was still encouraging the shareholders with comments like in 1876 "no finer specimen of a Shropshire lead vein can be found anywhere in the district" and in 1877 "they were mining a champion lode well charged with ore - the 192 fathom level". In that year the mine doctor, William Eddowes, retired and the agents and miners raised £3.18.0d towards his testimonial. There were two dressing floors at the mine and, in November 1877, Waters reported that he hoped to have new machinery installed on the lower dressing floors by the end of the month. This included new machine jiggers, classifiers and round buddles which indicates that he had mechanised the dressing process for greater efficiency. Even so, the surface operations were reliant on the weather and in December 1878, "the frost was so great that for some days the ore weighed into the wagons could not be discharged for some time".

By the end of 1877, the first hint of caution crept in to Waters' reports when he said "the present state of our mine in no way alters my opinion as to the chances of its opening out again to a profitable state in the future". In 1878 Waters rallied by saying that the mine was "sending off ore as fast as the carriers can take it". The problem was that the Main Lode was thinning out at depth and it was costing more to obtain ore of a gradually decreasing quality. These increased costs corresponded with a fall in the price of lead and in 1878 the company made a loss for the first time. The company's shares were already fully paid up and it was not possible to raise any more capital. Waters recommended to the shareholders that the mine only sell as much ore as necessary to meet costs and concentrate on opening up ore-bearing ground for when the price rose again. The shareholders would not agree, however, and as a result, the old company was liquidated.

New Engine Shaft was commenced in 1879 but it only went down to adit level, from where it connected with Watsons Engine Shaft. The purpose of this shaft is not known but it may have been an attempt to search for new ore deposits or a means of pumping water up to the adjacent reservoir. There is a concrete engine bed next to the shaft but nothing is known about this.

The mine was acquired in 1880 by a new company called Tankerville Great Consols, the Cornish sounding name being the idea of Peter Watson, the leading light of the new company. He had bought Bog and

Pennerley Mines in 1879 and attempted to raise £100,000 capital to work all three mines plus Potters Pit. The venture was described in the Mining Journal as "probably the largest lead property in the kingdom" but it only raised a little money and this was used to get ore out of Pennerley Mine and to try to drain Bog Mine. Tankerville Mine was all but ignored and, within two years, the company was in financial trouble. In 1882, a crisis meeting of shareholders was held and at the meeting Waters promised :

"We shall not rest until we have Tankerville into such a position as will recoup you all your outlay. As long as we are connected with the mine, no stone shall be left unturned, no brain power that we possess shall be left unexpended to produce a result that shall be satisfactory not only to our shareholders but to ourselves".

Luckily, some more capital was raised and Watsons Engine Shaft was sunk to the 244 fathom level. This was the final depth of the shaft and it has been estimated that it cost a total of £30,000 to sink, although the ore won more than compensated for this. By this time, compressed air boring machines were being used and this is believed to be their first use in Shropshire mines. Despite this, however, the price of lead continued to fall.

It appeared that North Lode was rapidly approaching the Main Lode in the bottom of the mine and Peter Watson and Arthur Waters were most anxious to reach the junction. They believed that this would be where the Main Lode would recover its value, as it had been so rich at about the 92 fathom level where lodes had branched away in the vertical plane. They were unable to raise the necessary finance to continue, however, and the lodes were still 9ft apart at the deepest point seen, the 244 fathom level. The lode was only producing a maximum of 2 tons per cubic fathom and, with dressed galena selling at only £6.50 per ton, the mine could not cover costs. It is worth noting, however, 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. Since the mine was unable to make a profit, pumping was stopped on 2nd May 1884 and the company was liquidated 13 days later.

The mine workings flooded up to adit and, although there were subsequent attempts to work the mine, these were only small. In 1889-90 the mine was worked by the Earl of Tankerville himself with 4 men on the tips. In April 1891 the mine was leased by Shropshire United Mining Co Ltd, who paid the Earl of Tankerville £193. 7s. 6d for unidentified machinery. They worked the upper levels of Old Lode and the mine tips for lead and barytes but had abandoned the site by 30th September 1893. In 1895 a license was granted to S M Ridge to search for minerals but little work was actually done. In 1898 the Mining Journal reported that the 32" winding engine had been removed from the mine.

The remaining mine equipment was finally auctioned off in 1902, together with that of Pennerley Mine. The lots for Tankerville Mine were :-

- Valuable Cornish beam pumping engine, 40" cylinder, 9ft stroke in and 7ft out, in good condition, by Harvey, Hayle Foundry, Cornwall.

- Single purchase rope winch.

- Coil of 1½" rope.

- About 162ft of 9" cast iron pump trees in shaft above water, with plunger pole, and about 1,450ft of 8", 7" and 6" cast iron pump trees under water; also about 162ft of pitchpine pump rods above water, the remaining pitchpine and iron pump rods under water.

- About 120ft of cast iron 9" steam flange piping from engine to boilers.

- Galloway boiler, with two tubes 30ft 6" x 6ft 6" by Easton & Tattersall, Leeds

- Cornish boiler, with one tube, 3ft x 6ft 6", with steam and safety valves.

- Quantity of 3" steam and feed piping and several 3" bends.

- Two wrought iron kibbles and sheet iron pit tub.

- Quantity of 2" wrought iron piping.

- Wrought iron scale hook and sundries.

- Free stone engine bed, with strong wrought iron holding-down bolts and nuts.

A number of items are missing from the list, eg the engines from Old Engine Shaft and the crushers, rails, dressing machinery, etc. It is likely therefore that they had been previously been sold or removed for use elsewhere on the combined sett, perhaps at Pennerley.

In 1921-23 the mine was leased to Shropshire Lead Mines Ltd who worked the dumps for barytes and calcite, the latter being used for pebbledashing. In 1922 the official records showed five persons working underground but these may have been working at one of the other mines on the sett. It was probably during this period that there was a branch aerial ropeway from the one that took barytes from Bog Mine to Minsterley. This took spar, etc from Tankerville up past Burgam Mine to a transfer station. In 1929 the Boat Level was blocked just past the junction with the mine, probably by infill of a shaft. The crosscut to Old Engine Shaft has also now collapsed but water can still flow through.

Surface Remains

Old Engine Shaft is located in the middle of a farmyard next to Tankerville Lodge and is completely filled. Nearby are the remains of the small engine house and associated chimney that contained the original pumping and winding engine. Watsons Engine Shaft is blocked a short distance down and, in 1995, the shaft walls at the top were reinforced with concrete rings and a cap fitted. At the rear is the large engine house for the 40" Cornish pumping engine and an octagonal chimney. Adjacent to the engine house are a set of ore bins. The foundations of other buildings around the shaft have been covered with rubble.

The balance bob, which counteracted the weight of the pump rods, was mounted at surface in the stone tunnel immediately opposite the engine house. The only other buildings of note are the count house (now used as a dwelling), cottages (now used as workshops) and the magazine.

On the uphill side of the road, underneath the workshop, was Lewis' Shaft, now filled. What appears to be an open arched level behind the pottery is actually a potato store. A short open level on the hillside opposite to the pottery has a tight inclined drop of unknown depth. There was also a shaft and level to the left of the cottage, both of which have been filled.

New Shaft is open with trees growing out of the top. A concrete engine base is adjacent, possibly for a winding engine. It was descended in 1993 to a blockage at 200ft. The path to it leads across the dam of the mine reservoir.

On the hillside to the north-east, above Burgam Mine, there is the concrete base of one of the aerial ropeway piers. Further up are the foundations of the transfer station.

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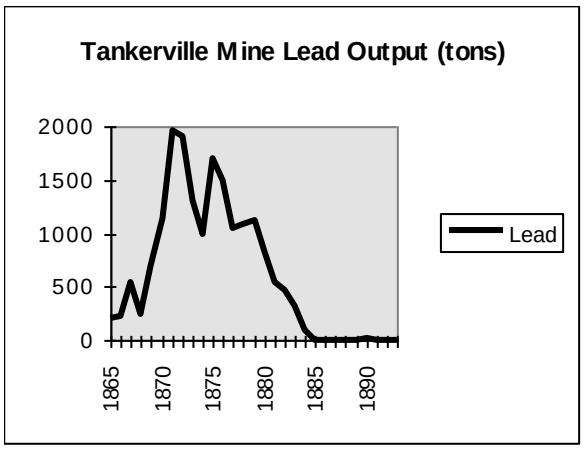
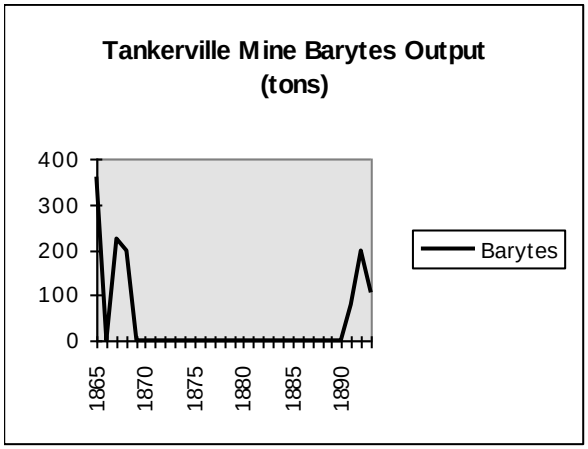
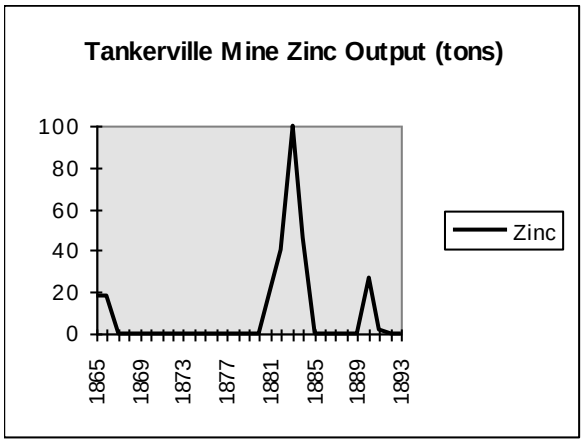
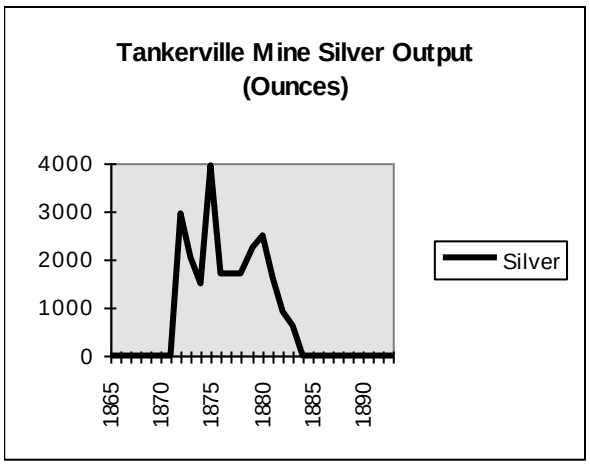
Appendix 1 - Output

| Year | Lead (tons) | Barytes (tons) | Zinc (tons) | Silver (ozs) |
|---|---|---|---|---|
| 1865 | 204 | 360 | 18 | |
| 1866 | 226 | | 18 | |
| 1867 | 542 | 225 | | |
| 1868 | 250 | 200 | | |
| 1869 | 685 | | | |
| 1870 | 1,132 | | | |
| 1871 | 1,970 | | | |
| 1872 | 1,903 | | | 2,960 |
| 1873 | 1,304 | | | 2,050 |
| 1874 | 997 | | | 1,512 |
| 1875 | 1,700 | | | 3,948 |
| 1876 | 1,500 | | | 1,720 |
| 1877 | 1,053 | | | 1,688 |
| 1878 | 1,080 | | | 1,728 |
| 1879 | 1,130 | | | 2,260 |
| 1880 | 830 | | | 2,490 |
| 1881 | 542 | | 22 | 1,626 |
| 1882 | 460 | | 40 | 920 |
| 1883 | 310 | | 100 | 620 |
| 1884 | 101 | | 46 | |
| 1890 | 10 | | 27 | |
| 1891 | 7 | 79 | 2 | 5 |
| 1892 | 8 | 200 | | |
| 1893 | 5 | 104 | | |
| Total | 17,949 | 1,168 | 273 | 23,522 |



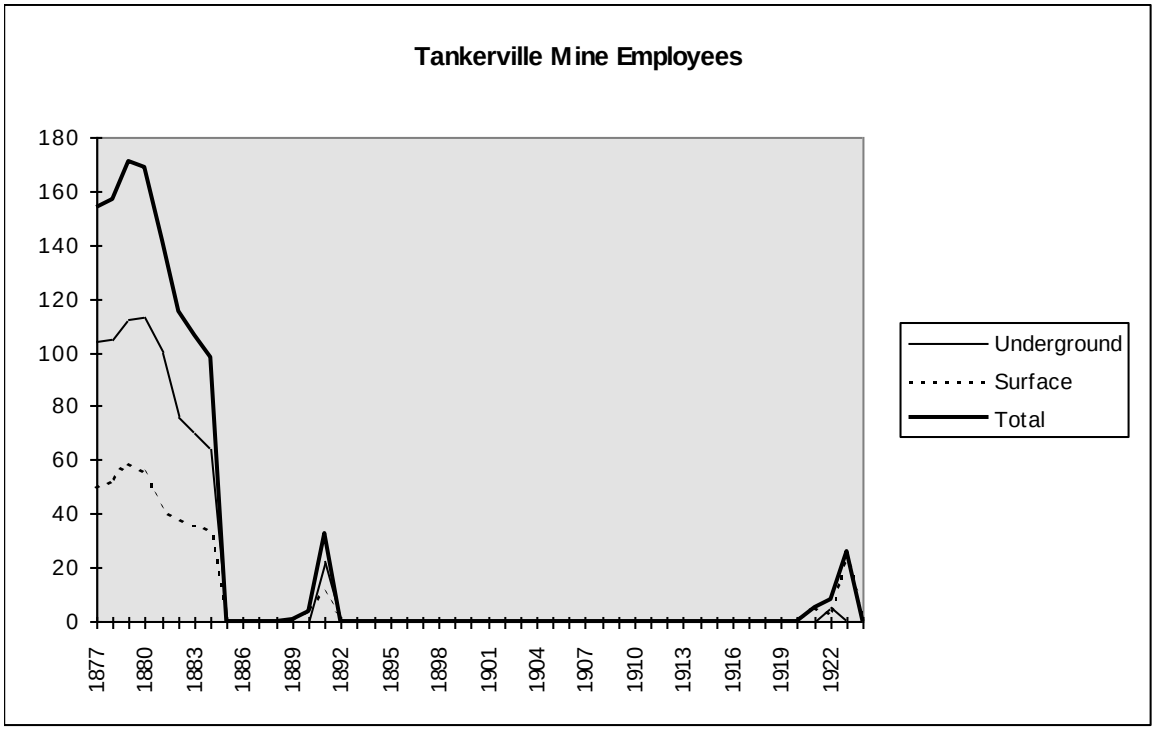

Tankerville Mine Barytes Output (tons)
400
300
200
100
0
1865
1870
1875
1880
1885
1890
Barytes


Tankerville Mine Zinc Output (tons)
100
80
60
40
20
0
1865
1869
1873
1877
1881
1885
1889
1893
Zinc


Tankerville Mine Silver Output (Ounces)
4000
3000
2000
1000
0
1865
1870
1875
1880
1885
1890
Silver

Appendix 2 - Employment

| Year | Underground | Surface | Total |
|---|---|---|---|
| 1877 | 104 | 50 | 154 |
| 1878 | 105 | 52 | 157 |
| 1879 | 112 | 59 | 171 |
| 1880 | 113 | 56 | 169 |
| 1881 | 100 | 41 | 141 |
| 1882 | 76 | 39 | 115 |
| 1883 | 70 | 36 | 106 |
| 1884 | 64 | 34 | 98 |
| 1889 | | 1 | 1 |
| 1890 | | 4 | 4 |
| 1891 | 22 | 11 | 33 |
| 1921 | | 5 | 5 |
| 1922 | 5 | 3 | 8 |
| 1923 | | 26 | 26 |
| | 771 | 417 | 1,188 |



# Bacheiddon Mine

## Roy Fellows

This exploration was undertaken as part of my ongoing project of trying to access workings not previously entered by modern explorers.

The centre of the mine is situated at NGR SN837971 and is very close to the mountain road from Llanidloes to Machynlleth, the workings actually passing under the road. The obvious sign of mining activity is an open gunnis just south of the road, which is now filled with scrap motor cars and other rubbish. Slightly further to the south and downhill there is an open level heading north. To the north of the road there are two other levels heading towards the workings from the other direction, another upper level and a deep adit, both run in. The deep adit is very conspicuous by its very large amount of spoil, this would indicate very extensive underground workings. David Bick mentions a 50 horsepower horizontal engine pumping via flat rods through the deep adit. It is highly likely that there is some of this equipment left in situ underground and this was part of the incentive for the project. On the other side of this valley are the workings of Rhoswydol, which was worked with Bacheiddon up to 1863 when the mine closed.

The open level is a cross cut and, after about 20 yards, it leads to a lode stoped out to the left of the level to depth. After a further 20 yards the main lode is reached, seen on the surface in the form of the gunnis. This area is very unstable, with rusty car axles hanging from the roof and a steep slope of rubble to the edge of a drop of unknown depth. West along this lode is another possible route down but large amounts of loose rock again make this too dangerous to attempt. Returning back along the level, I decided to go for the first, or south, lode. Here there was a pitch with a mass of loose rock on the right but, by a bit of clearance work and "bombing", I was able to establish a reasonable route by placing bolts on the left (footwall) side. The pitch was 12ft to a ledge, then a further free-hanging descent of just under 30ft to a steep rubble slope. At the bottom of this rubble slope, there was a further descent of about 25ft down a drystone lined shaft reminiscent of the North Pennines. This shaft is probably free-climbable but should be considered dangerous due to the slope of loose rock leading down to it. I should remark in passing that this mine is best explored in dry weather. The entrance cross cut varies from bone dry to thigh deep wading, dependent on the weather, and in wet weather water runs down the various pitches and tends to act upon the masses of loose rock which prevail in this mine. Be warned!

The second pitch is in a stope with a solid roof and two further winzes, gained after more scrambling up and down rubble slopes. One is blocked at the top but the other at the end is open, although there was a large boulder balanced on the edge. I destroyed this at a later date with a sledge hammer, so as to provide an alternative route to the one I am about to describe.

The drystone winze was descended, after placing a bolt in the footwall at its head. At the bottom was another short rubble slope under some very rotten timber supporting tons of deads. The way on here was blocked by a very large boulder but with a gap of a few inches at one end. I tried to enlarge this with a sledge hammer but to no avail. I therefore decided to dig underneath it. This squeeze is very tight and is actually worse then it looks. Be advised that I am a 39 inch chest and rescue from beyond this point would be impossible. The squeeze leads directly into a very steep rubble slope and a handline is mandatory here. I placed a rebelay bolt just above the boulder for this purpose. Without a rope, there is no way anyone would get back through the squeeze, or indeed up and down the slope in relative safety.

At the bottom of the slope is a short 20ft pitch and a rebelay here to some sound stemples is essential. At the bottom, I found a cross cut heading north with chest deep water. The south lode continued for another 15 yards or so after climbing over a bank of deads. The flooded cross cut went for about 20 yards or so, passing a blind heading on the left. Just past a hopper with a mass of boulders above, I reached the main lode. Because of all the water, I thought that I had reached the deep adit but this was not so. The water had built up behind a collapse to within a few inches of the roof. I soon cleared a way through, producing a rush of water which poured down a shaft a few feet beyond. Crawling through, I found myself in a large stope which haded up in the direction I had just come from. To the left (west) there was a steep slope of rubbish from the surface openworks. There was the carcase of a dead sheep and even a dead rat. To the right (east) the stope ended a few feet past the rubble pile. The pitch in front of me was much too dangerous to descend, being overhung with rubble and junk from above.

I should like to end with a few comments. A disappointing feature of the workings gained was almost a complete absence of artifacts, I only found a few bits of ironwork and a rusty tin. In addition, a curious feature of the

underground workings is the fact that, while the south lode (the one I descended) is very ochreous, the one to the north has a complete absence of this material.

Another point is the question of where the upper adit on the north side enters the workings. I saw no sign of this underground, although it appears to be on the same horizon as the upper adit on the south. I feel that it must come in further to the east, probably into the area of workings filled with old cars. The upper south adit probably represents the first level driven, then at a later date the two northern levels were put in by the Rhoswydol people for easier tramming to their dressing floors.

The large amount of spoil at the deep adit does not seem to me to relate to the scale of the workings as explored. It is possible that the north lode has stopes from the level I reached right down to deep adit but I think that this is unlikely. A considerable amount of material was probably removed from the underground shaft and exploratory drives to the east and west.

Finally, although the pitches are novice standard in terms of depth, the whole mine is very unstable, particularly in wet weather. It should therefore be explored with the greatest of care. I am very doubtful about whether the deep adit could be gained, even after a lot of clearance work to secure the final pitch. I would expect the pitch to be blocked some way down. I also feel that the deep adit is probably flooded to above roof level. After my explorations, I went down the other valley to the site of the deep adit to check on the amount of water leaving the workings, remembering that I had released quite a torrent. The water leaving the adit, however, was just the usual trickle so water must be backed up to quite a depth.

# Memories of Ifton Colliery

## Harry Richards

## (Edited by Adrian Pearce)

The site of Ifton Colliery is in Shropshire but geologically it is on the southern edge of the North Wales Coalfield. Due to the dip of the strata, most of the haulage roads and all of the coal faces were inclined by as much as 1 in 3. This made it very difficult to work and the miners often said that if you could work at Ifton then you could work at any pit in the country or, in a lighter vein, that to have one leg longer than the other was a definite advantage! Imagine working on a coalface where your tools, props, etc were continually moving downhill, making the job twice as hard. It would have been nice to have the luxury of working on the flat but this never happened.

Although the colliery is generally called Ifton nowadays, it was originally known as the Gertrude Mine, named after a female member of the Craig family who founded it. As officials, we always used the name Gertrude on our daily reports.

I left elementary school at 14 and, since my father and brothers were already miners, it seemed the natural thing to follow them into the pit. I well remember meeting my father as he came up the shaft and then going with him to see the manager in his office. He immediately told us that I could start work underground on the very next day. Jobs were easy to get in those days providing your father was reasonably respected as a workman by the management. Up to then, I had been working part-time for a bread delivery firm after school hours so was used to the idea of working. The thought of finishing work early in the afternoon at 2.30-3.00pm was great but little did I realise that I would have to start at some unearthly hour in the morning!

Going down the shaft on my first day was a frightening experience. Between 12-14 men were cramped together in the cage, either standing, crouched or sitting since there was no room for movement. As the cage gathered speed on its descent into the depths, I remember experiencing a terrible feeling that the bottom of the cage was falling out, leaving me stranded in mid air. This feeling stayed with me for quite a few descents until it eventually became normal procedure. The exception was when a certain winding engine driver called Jim Evans was on duty. After a particularly rough ride, you would always hear the older miners say “Mad Jim’s on today”. After a week or two, I was able to buy a new pair of moleskin trousers which were the normal things worn. An old miner remarked “He’s signed on for life” and my subsequent 41 years proved him nearly right.

In the pit, wooden doors were fitted on the roadways to control the direction of the air flow. My first job was to open and shut one of these to allow ponies to pass through with a train (or journey) of tubs. My next job was to couple together journeys of tubs for the ponies, the tubs being pushed manually to the shunt by men called hutchers. The tubs were coupled together loosely by links and, as each link tightened as the pony began to move, the pony could tell how many tubs were in its journey. If any attempt was made to increase the allotted number of tubs in the journey, the pony would refuse to advance until the extra tubs had been uncoupled. The only names I can remember for the ponies were Prince, Bob, Dobbin and Ned.

At that time, roof supports in the roadways consisted of horizontal wooden bars across the roof with vertical wooden supports. On one occasion in a roadway, the roof had lowered due to weight on the supports and the floor had risen due to heaving so the pony was catching as it passed by. The drivers were very attached to their ponies and this particular driver (not very bright) refused to take his pony under the roof support and sent for the deputy fireman. On arrival, the deputy grabbed a pick and proceeded to make a temporary job since the accent was on output and the roof supports would be changed on the repairing shift. As the deputy was making a hole in the floor to increase the height, the pony driver was heard to say “his head’s catching not his feet”!

I can remember listening to a debate on TV on how the well-off members of the community enjoyed riding with the hounds. Someone said that he knew some miners who went horse riding and Arthur Scargill immediately answered “So do I, pit ponies”! The ponies at Ifton between 1928-30 were reasonably well treated but theirs was a hard life, only being brought to surface during holiday breaks. They were housed in comfortable stables underground and were well fed and watered by an ostler. At the end of their shift they would run out to the stable at a considerable rate, taking everything before them. Some drivers would indulge in the dangerous practice of riding on them, giving conviction to Scargill’s remarks.

Later on I became an engine driver, which was an important job with the emphasis on production. Tubs of coal from faces below the main level were winched up an incline, whereas those from faces above were lowered down by a method called jigging. In this, there was a full tub at the top of the incline connected to a cable which passed around a horizontal sheave wheel. The cable then passed to the bottom of the incline where it was connected to an empty tub. By using a brake on the sheave wheel, the full tub was lowered down and, in doing so, lifted the empty tub up to the top. These crude methods were phased out in 1930, soon after I started work - mechanisation was coming to Ifton.

The worst thing that could happen was to make an error and stop the flow of coal out of the mine. These were stationary winding engines without any method of gauging position and I tell people today that they were harder to drive than an aeroplane.

I then became a face worker and quickly found that it was a very hard, tedious operation. There were usually teams (sets) of three men working a section of the coal face, two colliers (coal hewers) and one filler, who was quite often a son or other relative of one of the colliers. The method used was a procedure called "bottom holing". Lying in a cramped position for hours at a time, the colliers would cut a section out of the bottom of the face using a hand pick. This was called "holing out". Wedge-shaped wooden sections were then placed into the gap at intervals and the face was ready for shotfiring.

Shotholes were bored by hand using a long cumbersome screw drill, which was secured with wooden props to keep it parallel to the face. This was a very skilled job since the shotholes had to be positioned just right to safely bring down the maximum amount of coal when the shots were fired. The filler's job was to load the loose coal into tubs and to push these along the roadway to the shaft. If a tub was thought to contain any substance other than coal, eg rock, dirt, etc, it was rejected and turned out at surface for everybody to see. The filler had all the blame for that too - "Poor filler, what a baptism"!

Each set filled and sent to surface over 20 tubs each shift, the tubs containing 7-10 cwt each. To identify the tubs, each set would have its own numbered tallies, made of leather and attached to the tubs with strong string threaded through two holes. At surface, the mine owner had a weighman who weighed each tub as it came out of the cage. He would record the weight of the tub and the set it came from, thus ensuring that each set received payment for their recorded tonnage. The miners also clubbed together to pay the wages of a checkweighman, who checked that the tubs were correctly weighed and allocated to the proper set.

The colliers provided their own tools and, at the end of each shift, would bring out their picks and drill bits to be sharpened on the surface ready for collection the following day. The colliers looked after their other tools themselves and I can remember turning the grindle stone while my father sharpened his pit axe.

Each set was only paid for the amount of coal it sent out of the mine and there was no minimum wage in those days. This piece rate method of working suited the mine owner because it encouraged the men to send out as much coal as possible. Where coal was easy to cut, it was possible to make good money but there were times when geological problems interfered with the cutting and there was less coal sent out as a result. These lean times made the men frustrated and short tempered and even my father, normally a pleasant, placid person, was subject to these moods at times. I did most jobs at Ifton during my employment but I am convinced that my father in his time worked much harder.

After hand cutting was phased out, coal was produced from 4 or 5 longwall faces, approximately 100-120 yards long. The coal was cut by machine in the middle of the seam to a depth of about 3-3½ft. Holes were then bored into the top half of the face and the coal was brought down and broken up by shotfiring. It was then loaded or "handfilled" onto the Shaker Pan conveyor. After this, the bottom section was removed in a similar way. The seams worked at Ifton were 5ft, 6ft and 7ft, we never worked in small seams as were common in other mines. In fact, some of our seams were too big for comfort and almost unmanageable. When our faces became fully mechanised, Ifton produced a lot of coal due to the size of the seams. It does not take much imagination to realise that a "strip", a complete cycle up and down a face, produces much more coal on a 6ft seam than a 2ft one.

In the mechanised cutting process, the shearer disc cut and turned the coal on to the moving chain. Stable holes were prepared by hand using shotfiring methods, while the shearer moved upwards, ready for its advancement on its return. The machine cut on its upward journey and ploughed downhill. Advancement, or "pushing over", was done by automatic rams attached to the conveyor chain. Before this was done, however, the machine was advanced into the prepared stable in the roadway.

Another innovation was the introduction of storage bunkers. When a stoppage occurred to the flow of coal out of the mine, it could be directed into the bunkers so production could continue at the face. When the coal began to move again, the bunkers could be emptied. Stoppages were frequent due to haulage mishaps on the inclines. In later years, conveyor belts replaced rope haulage and most of Ifton's production was conveyed by belts to a loading point less than 100 yards from the winding shaft.

I was eventually made a Deputy and placed in charge of a section of the mine called a working district. I was responsible for the health and safety of the men and answerable to the manager for the working of that district. He was required to make statutory reports daily, which were signed by over-officials and kept securely on the surface. In the old days, the Deputy was called the Fireman and fired all the shots. In later years, second grade Deputies were introduced to fire most of the shots and they were called Shotfirers. This allowed the Deputy more time for his other duties such as supervising work, safety and of course production, which was always the dominating factor. To become a Deputy, I had to pass an exam for (air measurement) gas detecting, etc. This detecting was always done by reading the down turned flame on the safety lamp which Deputies always carried.

In the old days before mechanised mining, the Deputy measured the work done by each set of road rippers, etc and recorded any allowances due to them for other work. Unlike the colliers, these sets were engaged on non-productive but essential work, such as driving roadways, and they were paid per foot of passage driven. The Deputy would mark the side of the passage at the extent of their work and measure the distance back to the mark made the previous week. The difference would be the distance on which their pay was calculated.

The Deputy's lot was not an easy one. The responsibilities were massive and, with the manager on one side and the men you had grown up with on the other side, it was very difficult (if not impossible) to find a happy medium. Looking back over the 20 plus years that I was a Deputy, however, I pride (or console!) myself that I came through reasonably well and that I can look both the men and the manager in the eye when we meet today.

One thing that I remember well were the mice that lived underground. They had presumably first come down in the ponies' food but, when ponies were phased out in the 1930s, they had to look elsewhere and preyed on our food. We had a constant battle with them over our "snapping", which we used to hang from the roof. For some reason, they could negotiate string but not wire. If you did not have a tin container and had wrapped your food in paper hung up by a string, you could guarantee that the mice would get to it before you! I remember once coming off the face at snap time to where we had hung up our food. One miner was in time to see the mice scampering away, with large holes where they had burrowed through the paper into his butties. Nonplussed he reached for his snapping and one of his mates was shocked that he was going to eat it. He replied, "If its good enough for them its good enough for me". One of the roadways was nicknamed "Mouse's Alley" - it was so low that even the mice caught their backs on the roof! All of the roadways had names such as Lloyd's Dip, Hatton's Level and Rodway's Crut.

Around 1930, a terrible disaster happened at Gresford Colliery, about 10-12 miles from Ifton. I didn't know a lot about practical mining at that time but I remember my father telling me that bad mining practices had played a part in that terrible happening. Repair of airways had been neglected since this was regarded as dead work, ie non-productive. On that memorable Sunday afternoon, an enterprising bus contractor organised a conveyance to Gresford. There were hundreds of sightseers at the pithead and I regret to say that I was in the crowd. It struck me at the time how helpless everyone was and from that time I decided that, if my future was to be in mining, I would make every endeavour to be of some use. I decided then to become trained in the Rescue Brigade.

You couldn't just become a Rescueman and it was some time before I was even given the chance to attend a selection course. This involved daily attendance over a period of two weeks for extensive training. We had to spend 2 hour sessions in a prepared gas-filled chamber erecting sandbag stoppings, etc. This was very strenuous work and it succeeded in its objective of "separating the men from the boys". I am pleased to say that I came through successfully and I stayed in the service for over 15 years, only leaving because of the age limit.

After qualifying, rescue practices consisted of four visits per year to the Rescue Station at Wrexham or at one of the neighbouring pits. Rescuemen always visited other pits in their area to become familiar with them in case of emergencies. At the station each man assembled his own apparatus, which was checked by the Captain before we entered the gas-filled chamber for a gruelling 2 hour session in a red hot atmosphere.

The cumbersome apparatus consisted of a heavy canister containing a supply of over 2 hours of oxygen, which was breathed through the mouth and controlled by valves. There was a clip over the nose and, of course, no talking. After donning the apparatus, everything was done by a code of signals sounded on a small hooter attached to the apparatus. The Captain gave the signal for each operation and was required to make a detailed report after each session.

Rescue teams were a vital part of mining and every colliery had to have by law a percentage of trained rescue men. Ifton had two teams of 5-6 men. It was a voluntary service for which we received no extra pay, until later years when a small retaining fee was paid. The job was very strenuous and demanding but the worthwhile feeling of being prepared and involved gave us all a great deal of satisfaction. I became Captain for a number of years and received the three medals awarded for 5 years (Bronze), 10 years (Silver) and 15 years (Gold) long service. We attended most pits in the area during that time, mostly for underground fires, etc but were fortunate that no lives were involved. Underground fires were quite common and I remember one time where our team was on duty waiting to go down. The manager came over and remarked "We can't sell our coal as people say it won't burn - they should see it down there!".

I well remember the first callout that came soon after I joined the Rescue Brigade, to a fire down a small old pit called Llay Hall near Wrexham. I was the youngest member on the team and the hundreds of villagers sightseeing at the pithead did not help my composure as it brought back memories of Gresford. The fire was situated at the bottom end of a face where the coal cutting machine turned round. That machine cut a long wall face (a method not used at Ifton) as it went up and down, cutting in both directions. Again, bad practice had prevailed with the stable (turning point) not being packed off securely. There was water available so we proceeded to put the fire out with hoses. We did a two hour stint that night before being relieved by another team and found that the fire had been extinguished when we returned the following day.

During the years, I saw some phenomenal changes in the pit. Ifton changed over to longwall faces, a new steel headgear, electric winding engine and a modern washery and screens at surface. One of the most welcome changes in later years was the pithead baths - Ifton was then really "on the map". The changes underground were intended to make it safer for working but they were not always welcomed by the older miners who were set in their ways. Wooden roof supports were replaced with steel props on faces and steel arches on roadways. Coal dust in the air could be a danger as it sometimes exploded, so dust suppression was introduced on faces and at loading points. Better lighting and first aid appeared, together with compulsory steel helmets and safety boots for the miners. As trained first aid personnel we had access to morphia, which we were able to administer when necessary because it took so long to get a doctor to the scene.

Despite rigid safety measures, accidents occurred at regular intervals and some of these were fatal. It was noticeable that there was a spate of bad accidents when long wall faces came into vogue. I will give two examples of bad accidents to demonstrate how dangerous the job was.

In the first example, a friend of mine in my early days was waiting to unhook a journey proceeding up dip. An overhead girder snapped and fell, striking him on the head and killing him instantly. The girder was a used tram line, a cheap form of roof support that had found its way into mining. Following the accident, this type of girder was condemned since it was realised that they had lost structural strength and could snap like a carrot at any time.

In the second example, I had a rare week off work and my workmate was allowed to change shifts from nights to days. During that week he was crushed between tubs and a steel girder which crossed the roadway to carry a motor and gearing to drive a small conveyor at a loading point. Again, this method of operation was condemned after the accident and a new construction was erected on future loading points.

We took these occurrences in our stride at the time but they gave cause for much reflection in later years. One old miner often said that there was no such thing as an accident, the fault could always be directed at somebody. I also remember the first overman in charge I worked for, who often spoke in similes. He would say "Its surprising what a lot of difference a bit of difference makes". He would use these words when a lift or some help was required because many jobs were much easier when done by two persons.

During my time, Ifton had always been connected to Chirk Green pit, the latter acting as the upcast shaft. After Black Park Colliery closed, I recall a connection being driven to join up with that as well. As a safety measure, officials had to regularly travel these roadways to check on their condition. They went one way

underground and returned on the surface. It was necessary to be familiar with these ways out in case of emergency where we couldn't use the main shafts.

As the colliery began to expand, the National Coal Board built a number of new houses to accommodate the influx of workers from other areas, whom we in the village regarded as foreigners. One such family came from the Midlands and was obviously used to different ways from us. Their father sadly died quite young and the 17 year old son Frank, who was working with us, was asked by the deputy in charge when his father's funeral was to be held. He replied "I don't know yet but I hope its not on Saturday as the Wolves are at home"!

Closure of Ifton was due to several reasons, the chief one being the underground fires which we referred to as "heating". We encountered a lot of trouble over the years with heating at our colliery and I firmly believe that bad mining practices were the main reason for their occurrence. Old workings and roadways were often not packed with waste or sealed off securely and this allowed oxygen to circulate. Even where packing was done, this sometimes included combustible material such as coal which would readily ignite.

There was only one sure way of dealing with breakouts of fire and that is by erecting a complete wall ("stopping") of sandbags on the intake side. This sealed off the workings and prevented any further oxygen getting in. The problem with this, however, was that it meant the loss of a working face and complete stopping was only done at Ifton as a last resort. The alternative usually employed was to dig the burning coal out of the sides of roadways and to replace it with sandbag stoppings. In later years, a quick setting cement mixture was pumped into the cavities instead.

We once had a rather long fight against a fire at our colliery over several days. Our team went on duty on the afternoon shift to do our allotted two hours stint and we were met by the Overman. He informed us that good progress was being made due to the help of the rescue team preceding us, who had organised the filling of sandbags and thus released men for other jobs. Such work was outside the required duties of the rescue team, which was supposed to only be on standby with apparatus fitted ready for emergency.

A member of our team appointed himself as our spokesman and bluntly informed the overman that we intended to comply with the regulations. The manager was informed and he came down to speak to us. He hadn't been at the colliery long and he was a real down to earth product of South Wales. I well remember his words "What's going on here lads! When I went home last night my daughter said 'Who's this strange man'. It was that long since she had seen me. We all want to get home so let's get this job done. It's our pit". Needless to say we all got stuck in!

The bottling up procedure for fires went on for some years and, with constant observation of danger spots, proved quite successful. In the last few years, however, breakouts became more frequent and too close to the main shaft for comfort. I was at Ifton until the end and have a photograph of a small consignment going down on the last shift, taken by a local paper.

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# Mamble Colliery

## David Poyner & Robert Evans

Introduction

The Wyre Forest Coalfield can be conveniently thought of as forming two distinct basins, one in Shropshire centred on Highley and Kinlet, the other just across the county border in Worcestershire. The southern part of the coalfield contains only seams of Upper Coal Measure age. In most parts of the country these were rarely worked as they are thin and often contain large amounts of sulphur. In the Wyre Forest, however, these measures were worked almost continuously from at least the 16th century until 1971. Probably the most long-lived colliery was that of the Blount family at Mamble, 3 miles south of Cleobury Mortimer. This article gives a brief history of the undertaking and describes the extensive surface features which still exist.

History

Mining in Mamble was certainly underway in the mid-17th century, with workings on the outcrop in the neighbouring Sakenhurst Estate [1]. The Blount family owned most of the eastern half of Mamble, centred on their hall at Soddington, and land tax returns suggest that their coal works began some time between 1700-1730 [2]. In 1759, Sir Edward Blount was one of three Wyre Forest coalowners advertising in Berrows Worcester Journal [3]. In 1771 the mines in Mamble, as well as those to the north in Bayton, were leased to a local collier Francis Bint. Bint claimed to have spent over £1,200 in constructing adits to drain the mines but, by 1777, he had given up his lease [4]. Shortly after this date, the presence of the coal mines began to feature in the plans of local canal promoters. In 1791, work began on Leominster Canal that was planned to run from Kington in Herefordshire to the Severn at Stourport, via Leominster and Mamble. Heavy engineering works meant that the canal was not finished and actually only ever ran between the latter two places. The Blount collieries were connected to a wharf on the canal by a tramway. Although the failure to complete the canal was a disaster for shareholders, it mattered little to the colliery, which now had a means to send its coal into the heart of the Herefordshire countryside. Here it was able to undercut competing collieries on the Clee Hill.

The first part of the 19th century probably saw Mamble Colliery at its most prosperous. The Ordnance Survey preliminary drawings of 1817 show 11 shafts, concentrated in three areas and linked to the canal by tramways [5] (see Fig. 7). This state of affairs would have lasted until the middle of the century, when the Shrewsbury & Hereford Railway arrived in Leominster and probably destroyed Mamble's market with cheaper and better quality coal than it could provide. The canal, by now very run down, was finally drained in the 1860s and Mamble had to rely on purely local trade. In 1869, the Blount family abandoned all direct interest in the mines, leasing them to Thomas Aston, a local coal master. The Aston family were to run the mines for the next half century and did rather well from them. Thomas's son, Edward, managed the mines and a farm, as well as being a District Councillor and JP. Not for nothing was he known as the "King of Mamble".

Mamble worked throughout the First World War and into the 1920s. Winding of men and coal was by hand windlass, up shafts about 30 yards in depth. Underground, a collier worked in conjunction with a loader and youth, who pushed the tram of coal to the pit bottom. The technology had essentially not changed in 100 years and would still have been recognisable to the miners 100 years before that. The end was brought about by a dispute over the lease. The bulk of the Blount estate's mineral rights had been leased by the Bayton Colliery Company in 1921. Aston was working at the very boundary of his area and allegedly took coal demised to the Bayton Colliery Company. When this was brought to light, he abandoned the mine in 1925 and (briefly) worked an entirely new mine on the adjacent Sakenhurst Estate.

The Bayton Colliery did not sink in the immediate area of Mamble village until 1934, when New Mamble (Bayton No.5) was opened. This was never very successful, ironically part due to water seeping out of Aston's flooded workings. Its closure in 1944 finally brought mining to an end in Mamble village.

The Site Today

In the course of 200 years, Mamble Colliery extended for about a mile in an east-west direction and half a mile in a north-south direction. This survey has been conducted from public footpaths so significant areas have not been examined in detail, particularly wooded areas. This can thus only be a provisional report. Even given these limitations, however, it is clear that the site is of considerable interest.

**Fig 7 - Mamble Colliery Reconstruction**

Workings proceeded in an easterly direction over the years, away from the outcrop. Given this knowledge, and limited information from Ordnance Survey and estate maps, it is possible to provide approximate dating for the features on the ground. A speculative reconstruction of the colliery (see Fig. 7) is based on available maps and field evidence. The surviving features of the site today are shown in Fig. 8.

The most westerly part of the site that has significant remains is west of Whatehall Farm. Significantly, in the 1770s, this provided the name for the colliery. The Marl Brook cuts a deep valley through here and the ground is very disturbed with the indistinct remains of old spoil tips. A public footpath follows part of the line of the tramway built in the 1790s to reach the canal terminus at Sousnett, about ¼ mile away. In fact the tramway line appears intact all the way to the canal basin, where the impressive Wharf House fronts onto a stretch of canal turned into fishponds.

Returning to the colliery and proceeding eastwards, the Marl Brook opens out into an extensive flat area, the site of many shafts marked by the Ordnance Survey in 1817. The 1903 OS map showed three of these still open, just to the north of the brook, and one had an intriguingly square section. They have been filled more recently but a collapse has revealed another shaft north of the brook, whilst flattened spoil tips to the south suggest one or two more shafts. There are two cottages by the brook and a third on the hill which are probably contemporary with the colliery. Indeed one called Footrid Cottage proclaims its age as 1812 with a cast iron plaque. It is the hydraulic engineering which is the most intriguing feature of this part of the site. Marl Brook is carried underneath a causeway at the eastern end of the area in a brick culvert about 36" high and 28" wide, originally some 70 yards in length. A curved culvert of similar length but approximately cylindrical in section (now 40" high by 44" wide) carries it to the cottages. A shorter culvert is behind the cottages, and two more much shorter structures act as bridges further down, one carrying the tramroad over the brook. These structures must have taken some effort to build but their purpose is unclear. At the start of the 19th century, this was a key area in the mine as it was the point where the various feeder tramways converged onto the main line to the canal. One possibility is that the culverts were built to drain and protect this area from flash flooding of the Mark Brook.

The name of Footrid given to one of the cottages here indicates that this was also the approximate site of the drainage adits for the mines. Of course, the culverts may be connected with this but the most likely site for an adit is several hundred yards further west, in the deep brook valley. On the south side of the brook there is a strong feeder of ochre-impregnated water. There is no trace of any tunnel but this may simply reflect collapse of the original portal. The site may also have other adits but these are even less obvious.

In the early 19th century, workings extended in a broad north-south band beyond the immediate valley of the Marl Brook. Nothing of these is now obvious, as the land has either been reclaimed for agriculture or covered with trees. However, the wooded area appears to have suffered from considerable subsidence and a number of large pools have been created in it. From at least the 1830s, this area was also the site of a brickworks with associated clay pits. The route of the tramway apparently climbed away from the Marl Brook to intersect a smaller stream which eventually flows north into Bayton Brook. In the pasture land here, there are again impressive remains of grassed-over spoil tips. At the western end, where the tips probably date from the 1830s, they are typically 4-6ft high, forming a circle perhaps 20 yards in diameter around the shaft depression. In the centre of the site, developed in the 1870s and 1880s, they can be up to 10-12ft high and 40 yards in diameter, with the shaft depression at one end. At the eastern end, the 20th century workings have left flattened mounds extending over perhaps 50 x 30 yards, with no trace of the shafts.

Perhaps the most interesting features at this end of the site are the remains of the tramway. There is a prominent embankment, up to 6ft high and 6ft wide, running through a wooded area and then branching into two on entering a field. These branches run to old shafts, with the southern branch dividing again. It is possible to identify short, curved embankments leading from individual shafts to the main lines. One branch of the tramway ends at a shaft which was shown as active on the 1883 OS map, suggesting that the system long outlived the canal to which it was originally connected. In some cases, a tramway leading from a shaft was used for tipping spoil. A basically circular spoil tip has a short northwards extension associated with a tramway embankment. There are also two linear spoiltips. These have depressions in the centre marking the sites of shafts but the spoil has obviously been trammed away along just the one axis.

There are a number of fragments of plate rail to be found on the site, usually associated with the spoil tips. Until a few months ago, a 4'6" section was still embedded in one of the linear mounds. The rails are of two types with flange x bed measurements of either 2" x 3" or 1" x 3". They have holes at either end for fastening to sleepers.

**Fig 8 Mamble Colliery Present Remains**

Conclusion

Mamble Colliery is not particularly well documented but, by relating what is known of its history to the OS plans, it is possible to arrive at approximate dates for the features which exist on the ground and so follow the development of the mine. There is scope for much more fieldwork at this site, particularly examination of the culverts, the possible adit site and the wooded areas. What is certain is that it is one of the best preserved "primitive" colliery sites in the area and as such deserves greater recognition.

References

1] Worcester Record Office (WRO) 5278/15
2] WRO 6442/1
3] Berrows Worcester Journal (BWJ) May 17th 1759
4] BWJ October 30th 1777
5] Birmingham Reference Library Map 661185

Also List of Mines (HMSO) and documents in the authors' collections.

# The Miners Welfare Fund in Shropshire 1920-1947

## Ivor Brown

The facilities provided from the Miners' Welfare Fund in most Shropshire mining villages are still, by and large, giving good service, although nowadays to a different clientele and under new control. Their "Halls" and "Institutes" are now being recognised as much a part of our industrial heritage as the mine buildings themselves, even though the present users may have little understanding of their beginnings. Shropshire is fortunate that it has so many survivals, they are a real memorial to both the owners and the miners who had such foresight.

The First World War did much to break the mould of 19th century British society. Not only did it cruelly remove so many of the heirs of the mineowners by its indiscriminate killing of young men (Sir Arthur Anstice of the Madeley Wood Coal & Iron Company lost his son in 1915 for example) but it gave the working man aspirations for a better life. One result of this was the passing of a statute in 1920 which inaugurated the "Miners' Welfare Fund". Its aim was to provide educational, welfare and recreational facilities for miners and their communities. Money for the fund was to come from two basic sources :-

1. The mine owners, who were required to contribute one penny (0.42 new pence) per ton of saleable coal produced

2. The coal owners, who were required to contribute one shilling (5 new pence) in the pound on net mining royalties.

Coal was effectively nationalised in 1938, so that the Government would then become liable for the levy on royalty. The coal mines themselves were nationalised in 1947 so that the nationalised industry (NCB) then became liable for the tonnage levy also.

In any case, the sum available annually was relatively small and, even in the 1930s, the Shropshire District Fund Committee set up to disperse the money were always complaining that they really hadn't sufficient to do all that was required. The sum was only about £800 and this had to cover new projects and maintenance of those existing. The Committee was in 1939, for example, made up of 10 persons :-

5 representing mine owners :-
- St V Champion Jones, Lilleshall Company
- T H Stonehouse, Highley
- J A Jackson, Madeley Wood
- A N Fielden, Hanwood
- T E Freestone, other mines (he was also Chairman).

5 representing miners :-
- R Ward
- A Robinson
- S Gill
- G Davies
- A Hoggins.

Ifton Colliery was, as usual, taken to be part of North Wales District but is included here due to its location in Shropshire.

The general policy of the Fund was firstly to obtain land for a recreation ground (or "rec" as it was called locally), then if necessary provide a Welfare Hall or Institute, then as soon as practicable provide a pit head baths complex at the mine itself. In the years under consideration, grants were provided as follows :-

- Recreational 14 (but some were extensions to existing schemes and this included sports grounds, halls and institutes)
- Pit Head Baths 1
- Canteen 1
- Cycle Store 1
- Educational 11 (including 2 mining science labs and 9 general education)
- plus a number of individual scholarships for study

There had also been grants to provide classroom accommodation for war-time evacuees at Hanwood and a grant for a colliery band (possibly the Lilleshall Collieries Band).

"Recs" were provided at least at the following centres beginning early in the 1920s (although this list is not in chronological order) - Ifton, Madeley, Highley, Hanwood, Donnington Wood, Wrockwardine Wood, Priorslee, St Georges, Oakengates and Dawley. Then beginning about 1929, substantial welfare halls were provided at St Georges (1929), Ifton (1932), Highley (1933), The Nabb (1936) and Hanwood (1938). These are described in the Appendix (there could be others at yet unidentified). Madeley does not seem to have had a hall at this stage (although it had a "rec" from 1922), probably due to the Anstice Memorial Hall & Working Mens Institute being available. This was already miner-biased, owing to its origins as a Memorial Hall to the local mine owner John Anstice. The Madeley miners, however, became the first to obtain a Miners' Welfare pit head baths / canteen complex in 1941 (for the background to this see PDMHS Bulletin, Vol.12, Part 6). A modern recreational hall was provided at Madeley later in that decade.

The Welfare Fund Committee was also keen to improve "the landscape", particularly in town centres, and their most commendable work was the removal of a large spoilmound to form a "rec" in Oakengates. This was situated between the Hartshill and Hadley Roads and was opened by Herbert Smith, then President of the Miners Federation of Great Britain. Opposite this was another site reclaimed by the international peace volunteers in the 1930s. The Committee were not always successful in removing pitmounds, however, such as in 1935 when they added a bowls pavilion at St Georges on a site which lay at the foot of a tip. No encroachment onto other property was permitted. To overcome this, they had to burrow into the tip and, using reinforced concrete walls which doubled as retaining walls, produced a half-buried structure. This had "... two small rooms, one for men and one for women", with a "combined glazed metal screen and doors opening onto a small veranda". The total cost was £198 and it was opened in December 1935.

Financial problems were beginning to be experienced in the mid-1930s. It was reported in 1938 that annual income was still only £800 due to the depression and "... this small sum must be eked out to supply the needs of 4 district areas and 9 separate schemes". In the main area (Coalbrookdale?) where the schemes were normally self-supporting, there was now severe unemployment. On the other hand, two schemes serving outlying areas were maintained by means of contributions from the parent colliery company and by a colliery levy on the men of so much per week out of wages. It was also reported that a re-appraisal was to be carried out. One site (Dawley?) had already been disposed of and it was hoped to concentrate activities in another area on one site (St Georges). On the brighter side, a hall had been opened at Hanwood and planning was underway for a pit-head baths at Madeley.

The report for 1939 was still quite gloomy, although employment had picked up because of the war. The costs of maintenance, however, were still a problem. No new schemes had started and a proposal for a bathing pool at Priorslee had been dropped, as had a new football ground at Wrockwardine Wood. The Committee was critical of the local reactions to its centralisation plans "... the difficulties at Priorslee were impossible to overcome but it is felt that, if local restrictions could be set aside, the difficulties at Wrockwardine Wood could be solved by centralising the football section at St Georges". The sites at The Nabb, St Georges and Donnington Wood had, however, been well maintained with a new hockey pitch and hard tennis court provided at the second site and tennis courts at the third.

The Committee was always keen on education and, over the years, had provided new mining laboratories at the Walker Technical College (1924) and a substantial grant to Oswestry Technical College. Educational classes had been held in all the halls but were particularly successful at Highley and Hanwood. The latter was notable because, after its construction in 1938, "... the paint was scarcely dry before the first lecture was delivered, the torch of learning must needs burn brightly for the electricity supply is not yet available in the area".

Except for the construction of the pit-head baths at Madeley, against many difficulties (see separate paper by the writer), no new schemes were developed during the Second World War. Immediately after the war, the income and responsibilities for pit-head baths were taken away from the Fund Committee but it still continued to develop the recreational side. Perhaps its major achievement in this period was the new hall at Madeley but this has since been demolished. It is understood that none of the surviving schemes are maintained by the Welfare Fund at the present time.

Appendices

Miners' Welfare Halls in Shropshire, as described at opening date (this may not be a complete list). Pictures of all these halls are shown in Figs 9-17.

1. **1929 St Georges** - Replaced an old wooden hut, new one is brick with cement asbestos tiled roof, cost £920. It has two large dressing rooms, each having a bath 9ft 6ins x 3ft 6ins x 2ft deep attached to it. There is a folding partition so that the rooms can be combined on special occasions. The grounds include a football ground with cycling and running tracks around it, also 2 grandstands, a cricket ground, 4 tennis courts, bowling green, quoits pitches and associated pavilions.

2. **1932 Ifton** - A large institute of brick with artificial stone dressings and a slate roof, cost £7,500 (furnishings £950 extra). Consists of a hall to seat 444, with stage and cinema projector and rewinding rooms. Also rooms for billiards, games, reading, library and kitchen. There is in addition a lean-to with separate rooms for bowls and tennis players and a groundsman. "... As there is no electricity within several miles a power plant has been installed".

3. **1933 Highley** - A hall to seat 260 persons, constructed of timber framing, roughcast on metal lathing and lined with matchboard and insulating boarding. Foundations are of brick and roof of asbestos tiles, cost £1,892, including furnishings.

4. **1935 St Georges Bowls Pavilion** - as described previously.

5. **1936 Nabb Institute** - Replaced an earlier corrugated iron building. No details available but had a brick base and appeared to be of timber.

6. **1938 Hanwood** - A hall of brick and tile construction, cost £1,000. Has a central club room large enough for social functions and educational classes.

7. **1941 Kemberton Pit-Head Baths** - "... the only pit-head baths in operation in this District" (Shropshire). Built of brick to accommodate 560 men at a cost of £13,853. A canteen is included at a cost of £785.

Note 1 - The present condition of the above buildings has not been checked and I would like to know of any changes. Also of any demolitions and any other Miners' Welfare buildings discovered in the county.

Note 2 - Madeley Miners' Welfare Hall was built in 1950 (outside the period considered in this paper but included for sake of completeness). It was a large single room of concrete block construction with a kitchen-annexe. Demolition took place about 1970 as part of the Madeley By-pass project. The Anstice Memorial Hall & Working Men's Institute at Madeley was built in 1869 as a memorial to a well-respected local mine owner. It survives, crammed into a 1960s shopping complex. See Summer issue of "Below", p.13.

**Figure 9 - St Georges Welfare Hall**

**Figure 10 - Ifton Miners Institute**

**Figure 11 - Highley Miners' Welfare Hall**

**Figure 12 - St Georges Bowls Pavilion**

**Figure 13 - The Nabb Institute**

**In 1933** **In 1936**

**Figure 14 - Hanwood Welfare Hall**

**Figure 15 - Kemberton Pit-Head Baths**

**Figure 16 - Madeley Miners' Welfare Hall c.1960 (after veranda added)**

**Figure 17 - Anstice Memorial Hall c. 1941**

# Cwmbrwyino Mine

## Roy Fellows

This mine is situated just off the A44 Aberystwyth road, about 3 miles West of Ponterwyd. There is a minor road on the left, just before the bends, which gives access to the site. Proceeding up a hill, you pass the run-in Deep Adit down in the valley to the right, as well as the rubbish-filled Western Shaft on the hillside to the left. Soon, extensive spoil heaps come into view, emanating from the run-in Upper Adit, which must have been the main tramming level. Above the road is the open Shallow Adit, at about NGR SN704806, and higher still is a row of shafts. All the shafts are blocked some distance down except for one, which connects with the forementioned Shallow Adit.

Shallow Adit is driven as a crosscut and, after about 25 metres of knee-deep wading, the vein is reached. This is all the water there is as the rest of the mine is quite dry. There is a collapse on the vein but a way on to the left. A short crawl reaches a point where daylight comes in from above and the level breaks into the head of a narrow stope, which hades down to the left. Shallow Adit is explorable for some distance through collapsing workings but the main way on is down. Damian McCurdy informs me that he explored this level some years ago and that there was no way down, so there must have been a collapse which opened this pitch up. The whole place is very unstable so care is needed, more on this later.

I placed some bolts in 1994 and made a partial descent but I decided that it was far too dangerous and came back up. In 1995, I returned and cleared a lot of rock from the pitch head. I also took out the upper part of a stull a few feet down. It is now reasonable with care but a boulder the size of a fridge is best avoided. The pitch itself is an easy 50ft down the footwall, the landing being a pile of debris in Upper Adit.

Upper Adit is explorable in both directions. East passes through some interesting small stope workings to a collapse at about 45 metres. The passage floor here was a mass of clog prints and there were no signs of any previous modern explorers. West passes a winze on the left to reach a collapsed stope. This was almost passable by a ledge on the footwall but for the last few feet. I have fitted a traverse line here, of good quality climbing rope. It is an easy traverse which belies the difficulty I had doing the job! At one point, there was nowhere to place a piton but, by sheer luck, I noticed a shothole just above my head. Also by sheer luck I found a drill steel to fit it. On the other side of the traverse was a pile of loose boulders but these are now all on the bottom of the stope. The passage gained was about 40 metres of interesting level to a forehead. There are many tallow candle stubs on the hanging wall and a climbing chain leads up to a working platform.

The forementioned stope can be freely descended via a rubble slope but it is blind. The winze back down the level has a heavy baulk of timber across it, suitable for a belay. I have also placed two bolts nearby as a backup. A short length of electron ladder or a daisy chain is needed to get in and out at the top. The pitch is just over 30ft free hanging to a narrow sloping ledge, where the pitch breaks into the roof of an enormous stope. This position is very exposed. There is then another 70ft of near vertical descent with no rebelays necessary. The floor has a lot of rubble from collapses of major sections of the hanging wall. To the West is a rubble slope from the collapse of the stope in the level above and there are huge boulders perched above your head. To the East it is possible to negotiate more huge boulders to reach another large winze.

It looked about 60ft but too dangerous to descend. A rock thrown down produced a splash and I had the impression that this area is all resting on timber. What may be the 32 Fathom Level can be seen breaking in about 20ft up but cannot be reached.

When cleaning the ropes after my last visit, I was alarmed to find that the rope used on the first pitch was cut about a third of the way through. I never noticed this when I was prusiking out, although I did hear a fall of rock while in the mine but thought nothing of it. I would therefore strongly recommend that an exploration group leave someone watching the rope at the head of the first pitch.

**Figure 18 - Accessible Workings of Cwmbrwyno Mine**

# Linley Caverns, Walsall

## Steve Powell

The Linley Caverns (NGR SK038004) are in fact old limestone mines, that formerly began as surface quarries until a drift heading was driven in the late 1700s. This was followed down dip through the nodular bedded limestone until it intersected the Lower Wenlock Limestone. Underground quarrying was to continue up until the 1930s, creating a very large underground complex. The Linley Limeworks linked up with the Daw End Limeworks towards the closing period of the mine.

As with other mines in the Wenlock Limestone, such as Castle Hill at Dudley and Lincoln Hill at Ironbridge, the mine found great popularity with public visitors. One of these, William Hawkes Smith who wrote "Birmingham & its Vicinity" in 1836, states "... the silent foresaken caverns, exhausted of their stores, are of considerable extent and very strong in their arrangement. The massive square columns, regularly disposed, give an Egyptian character to the labyrinthine halls and gloomy crypts of these once busy scenes". A few years later, E L Glew in his "History of the Borough of Walsall" in 1856, wrote "... in the limestone mines at Daw End are caverns of immense extent, which lead to a subterranean lake and known by the name of Linley Caverns. They are visited in the summer by numerous parties when they are sometimes brilliantly illuminated, producing a fairy scene of extraordinary splendour".

It has been stated that the caverns were used in the Second World War as an ammunition dump. Recent exploration was made by Birmingham Enterprise Club in 1971, who declared them very disappointing and entirely flooded, apart from a small incline to water. Early in 1994, myself and a mate Paul Downton found a couple of hours to kill so we decided to search out the caverns and see what existed. After scrating about for a while and finding only old crown holes, I decided to ask for local knowledge from some youths who seemed to know every nook and cranny of the woodland. Five minutes later we were making our way into the caverns, where we were able to access 2 chambers before hitting water. Looking in front and to the sides of a strong support pillar, I presumed that it might be possible to access further chambers by boat and so promised that we would return in the near future.

That promise was to take 2 years! In March 1996, myself and another mate Colin Bradford turned up at 6.00am loaded down with ropes, lamps, dinghies, etc. We set out to see what we could access but the first mistake of the day was blowing the boats up on the surface, as we found as we struggled to push them through the narrow slot entrance. After sliding down a greasy slope with all our equipment, we finally launched ourselves in the boats onto the water. We first floated over to the point where the roof closes down to water. This gave us the advantage of being able to see the extent of the workings in either direction. It turned out that there was plenty of scope for a good 2 hour trip. The water gradually deepened from ankle depth to 5 metres and, between the flooded pillars, we could see the workings gradually deepening below at a 10° angle. The workings on the left quickly petered out down under the water, apart from an area where we were able to land the dinghies (Point A of Fig.19). This area of small pillar and room workings was very unstable and we were able to get from chamber to chamber by scrambling up boulder slopes and crawling through small gaps left near to the supporting pillars.

We again set sail and ended up mid-stream of the accessible workings. I managed to leave the dinghy and scramble into what we thought looked like passages (Point B of Fig.19). These were in fact solution cavities , although a few steel bars were left in the rock for some unknown purpose. The one small opening quickly disappeared into the deep water. The quarry at the extreme right was very interesting, as it was possible to float round numerous stone supporting pillars. The water appeared to be very deep at this point. We were again able to go by foot (Point C of Fig.19) for a short distance between pillars. Oil drums and refuse were evident at the topmost corners of the mine, showing that the workings had some time been open to surface. At this point there were also some heavy calcite deposits running down one of the supporting pillars. After completing a sketch of the workings, we made our way back to the entrance.

From here we discovered 2 more interconnecting entrances into the woodland. A very tight squeeze was found in one chamber at the base of the floor, which accessed another chamber. Other crawls were tried but ended in blind headings. These chambers were very unstable and are probably only 5 metres below ground level. One further entrance was found which had a row of brick stairs and a handrail leading down towards a surface opening. I believe that this may have been the main incline entrance. A short slide down a debris slope led to backed-up water and the end of our visit.

**Figure 19 - Plan of Linley Caverns**

**Figure 20 - Surface Features of Linley Caverns**

**Figure 21 - Section of No.1 Entrance, Linley Caverns**

**Figure 22 - Plan & Section of Nos.2 & 3 Entrances, Linley Caverns**

**Figure 23 - Plan & Section of No.4 Entrance, Linley Caverns**

# Some Mining Remains in Ireland

**Nick Southwick & Mike Moore**

Introduction

Mining in Ireland is known to have taken place since the early Bronze Age (2,500-1,270BC), evidence of which has been found at Mount Gabriel, County Cork and various other locations. Until recent times, the main period of mining activity was during the 19th century, with large mines at Abbeytown, Allihies, Avoca, Glendalough, Knockmahon and Silvermines (see Fig.24). Most of the other ventures were on a small scale, employing less than a dozen men and producing only a small tonnage of concentrates. Minerals extracted were mainly lead, copper, zinc, barytes, pyrite, iron and gold, the former two being the most important.

Most of the money was made by fraudulent claims by the promoters to investors who were tucked far away in England. The mining companies were generally English owned and usually employed Cornish miners, evidence of which can still be seen in the remaining Cornish engine houses which, sorry to say, are in a very poor state of repair.

After the end of the 19th century, like most other areas in the British Isles, metal mining almost came to an end and one time it was stated that "*Ireland has no economical mineral deposits left worth exploiting*".

In the late 1950s, however, prospecting on a large scale was resumed by various large international companies and, in 1973, the Irish Association for Economic Geology was formed to advise on and oversee mining prospects in Ireland. Since the 1960s, new mineral deposits have been located and large scale mining has been and is still taking place. The Tara Mine is becoming one of the largest producing base metal mines in the world. With a recent report of a large deposit of gold-bearing ground discovered in County Mayo, it looks like metal mining in Ireland is set to continue for the foreseeable future. A 1996 report gives details of even more working deposits of base metals (lead and zinc).

The following report is written as a useful guide and record of club visits to Southern Ireland during 1994 and 1995. The main purpose in 1994 was to have a holiday in Kenmare and to tour the mines in the West Carberry area. It soon became obvious that, with the exception of Berehaven, information on these mines is not recorded in a fashion that is helpful to mine explorers and cavers.

It was during the visit to the first mine, and the difficulties in locating it, that we decided that we should record as much useful information as possible for future publication. The 1994 Summer visit was followed by visits in November 1994 to Glendalough and Tara, then a further Club trip in October 1995 where further site visits took place. Several of us joined the Mining History Society of Ireland and attended its inaugural AGM in February 1996. It should be noted, however, that this list of mines is by no means comprehensive and many more sites are worthy of full investigation, surveying and recording. If other groups have visited these and other areas then perhaps one day the information can be brought together and a much fuller publication can be produced.

Avoca Mines (OS 199825)

There were three main ore bodies on this site - East Avoca, West Avoca and Cronebane. These were worked on both sides of the valley, making this site the second largest copper mine in Ireland. There is evidence to suggest that Avoca was worked for copper as long ago as the Bronze Age and possibly through medieval times. Its subsequent development shows how a mine can survive by turning to other minerals when the main deposits become exhausted. From the 12th century, the site was mainly producing iron but this had been exhausted by the end of the 17th century. Lead mining took over until about 1750, subsequently followed by copper mining until around 1812. Sulphur from the pyrites was produced between 1840-65, when the UK's major supply from Sicily was interrupted, and intermittently until 1949, especially during the two World Wars.

A modern operation between 1958-62 produced over 3 million tons of 0.6% copper ore (chalcopyrite) and another between 1970-82 produced 8 million tons. Over the years, small amounts of gold, silver and zinc have also been extracted but these were never significant. Some efforts were made in recent years to extract gold from the tips but not very successfully. Today, there are plans to turn the site into a mining heritage centre and we hope this succeeds.

**Fig 24 - Irish Mineral Deposits**

**Fig 25 - Mountain Mine Engine House, Allihies**

**Fig 26 - Coom Mine Engine House, Allihies**

The modern day remains of the tips and buildings are clearly visible from the road on both sides of the valley. All dangerous shafts and stopes have been fenced for safety. The following description is of the remains to the north-east but there are also others to the south-west which have not yet been visited. A track can be followed from the road all the way to the top of the hill and this is the suggested route. The first feature is the Deep Level on the left, which still has a good flow of mine drainage water. The track passes under a railway bridge and there are massive ore storage bins and timber frameworks on the left from the modern workings. Just beyond this is a low, narrow tunnel at track level which may have been for flat rods. Beyond this, take the track that turns off up to the left and below it is a flat area where the modern access adit is sited, now blown in. A little further up the hill on the right is the engine house and chimney of Williams Shaft. This is in good condition but you may have to fight your way through undergrowth to get close to it.

The track continues to wind its way up the hill and, at the top, there is a wide area of dressing floors. Another engine house and chimney on the left may have been for operating crushing machinery, since the open Farmer's Shaft is some distance away on the right side of the road. Further on there are the wall foundations of a crusher on the left. The track now deviates to the right to follow the edge of a huge opencast, in the bottom of which some old men's workings have been intersected by the modern opencast workings. In the first large pit, the Club entered two levels at the base of the pit. One was quite short but with a diggable cross-cut apparently leading in the direction of the other level. The second level was a cross-cut into the vein, which involved a climb down that went a reasonable distance with potential digs. There was an obvious level well up on the opposite face of this pit. Further up the hill, there was a much bigger opencast with at least three visible levels intersecting the far face. Back below the first pit (nearer the main road), there was a covered shaft which looked as though it had potential for descent.

Berehaven Mines, Allihies

Mining historians visiting Ireland should try to include this site since it has some of the best remains in Ireland and attempts are being made to preserve it as a tourist attraction. The history and surface remains of the site have been well described in Alan William's book "The Berehaven Copper Mines". We have therefore left you to read this book which gives a far better description than we can. There are a number of individual mine sites and buildings in the area but the open shafts and stopes have been well fenced. We have given a selection of sites below.

Dooneen Mine (OS 577458) - There are a few remains of trials at sea level and a large quartz vein juts out to sea with obvious copper staining on it. Nearby are the foundations of an engine house and a number of filled shafts.

Mountain Mine (OS 591458) - This has a very prominent and photographed engine house (see Fig. 25) sitting on top of the hill above the dressing floors. It operated a man engine and is surrounded by a series of open stopes which lead down to the blocked adit, below which the workings are flooded. There are several open shafts and remains of buildings and reservoirs.

Cornish Village (OS 592458) - A couple of the buildings are still occupied but others remain as ruins. Nearby is a very well preserved powder house.

Caminches Mine (OS 594456) - Very little is left on this part of the site except for a couple of shafts, remains of buildings and a boiler from a portable steam engine..

Coom Mine (OS 597455) - The engine house (see Fig. 26) is at the end of a winding road, 440 yards from Camminches Mine. Apart from the engine house, fenced shaft and remains of buildings, very little else can be found.

Kealogue Mine (OS 586438) - Continue along the minor road for about ¾ mile from Allihies and an engine house and row of shafts can be found.

Dunboy Castle & Bay - This was once the home of the Puxley family who owned the mines and is well worth a visit. The bay was used to load the copper ore onto boats to Swansea.

Ballycumnisk Copper Mine (OS 098032)

An adit can be found at the base of spoil heaps alongside the remains of a mill. It is hidden in bracken and brambles and, although the portal remains open, the water is 3-4ft deep and a shaft about 150ft from the entrance is filled with rubbish and debris. This was not checked but may be worth investigating. In this area, spoil heaps abound and there are the remains of a mill and foundations for the buildings.

The dumps are particularly interesting with many minerals found, including tetrahedrite $(Cu,Fe)_{12}Sb_4S_{13}$ and chalcopyrite $CuFeS_2$.

| Date | Tons of copper ore produced |
|---|---|
| 1814 | 16 |
| 1815 | 42 |
| 1857 | 17½ |
| 1869 | 671 |
| 1877 | 63 |
| 1878 | CLOSED |

Cappagh Copper Mine (OS 098335)

There are two shafts at this site, one has collapsed to leave a 5ft cone at the top and is full of rubbish. The other is flooded with a barbed wire fence around it. The only significant buildings are a row of deteriorating miners cottages and an interesting chimney. The spoil heaps are small, indicating little output.

The mine was worked before 1819 but little record of output can be found. Between 1863-73 the mine produced 877 tons of bornite ($Cu_5FeS_4$) copper ore. It closed in 1874.

Carravilleen Mine (OS 082041)

At this location there is a filled shaft, debris and foundations of a small engine house. There is a pier and an old winding mechanism to the sea, presumably for loading of materials as this would have been a difficult site to reach by road.

Copper was produced from chalcopyrite and tetrahedrite between 1840-79 but there is no further record of any output.

Coosheen Mine (OS 094031)

The shafts to the west are filled with rubbish. Shallow Adit was not found but Deep Adit, which was open until Summer 1993, had been bulldozed by the council. The same had happened to the engine house at Nallins Shaft, as it was considered to be an eyesore! A golf course now covers most of the lower remains which included the dressing floors.

The mine was worked 1840-1907, producing 1,957 tons of copper raised between 1840-47. As well as copper ore (cuprite, malachite and tetrahedrite), a quantity of haematite was also obtained.

Crookhaven Copper Mine (OS 805253)

The mine can be located on the headland by turning right through the centre of the village. Park by a gate marked private and seek the permission of farmer. Just through the gate, there is a fenced and rubbish-filled shaft with the remains of an engine house. On top of the headland can be seen a large circular powder house (see Fig. 27), which is completely intact and well worth a visit. Follow the cutting at the side of the powder house and cross over a wall. Here you can climb into another cutting on the side of the cliff and this leads to a short climb into a large chamber on the right. The passage has collapsed and a flooded stope forms part of the floor. A careful traverse to the left on your knees leads to a further passage which is knee-deep in water. This runs about 250ft to a cross cut, which is blind to the left and runs right 70ft and left a further 20ft until blind. Off the main passageway, a short 30ft level leads out to daylight halfway up the cliff, with some old steps carved into the rock. Further round to the headland are two fenced water-filled shafts.

The mine was worked 1860-65 and produced 43 tons of copper ore (bornite). The dumps were worked 1903-05 by the Berehaven Copper Mines Ltd but no record of output has been found.

**Fig 27 - Crookhaven Mine Powder House**

**Fig 28 - Glandore Mine Engine House**

Dereenalomane Barytes & Copper Mine (OS 095038)

This is 4 miles north-west of Ballydehob, on the south side of Mount Corrin, County Cork. On the site there are remains of a crushing mill, grinding mill, shafts and stopes but most of the site has been bulldozed and is much overgrown. The shaft to the west is filled with burnt household rubbish and the shaft and open stope to the east are water filled. There are no adits.

The mine was worked intermittently from 1820-1920, producing a small tonnage of copper (bornite) and approximately 22,000 tons of fine barytes.

Glandore Manganese Mine (OS 125038)

There is an engine house (see Fig. 28) in a reasonable state and a large open stope was located amongst briar and gorse. A reported line of shafts were not explored but could be seen also amongst the briar and gorse. On the opposite side of the road, an adit was located but could not be investigated as it was dammed and sumped for a water supply. The farmer indicated that he had filled the shaft directly in line with this some years before.

Minerals mined were manganese, iron and copper. Between 1812-1819, some 313 tons of copper were produced from turf containing 10-15% copper when burnt. Between 1840-1880, the mine produced 17,800 tons of manganese and 1000 tons of iron.

The mine was prospected again in 1965 when the main lode was found to contain 23% manganese, 1.7% barytes and 0.75% copper but no further mining has taken place.

Glendalough Mines (OS 095965).

Interestingly, the footpath from the village car park to the head of the valley is marked as the Miners Walk to the Cornish Village. This walk takes about 30 minutes and the site is found just beyond the upper lake. Glendalough means “glen of the two lakes” and the area has long been regarded as one of the most picturesque settings in Ireland. A circular walk (see Fig.29) can be made to take in both the Glendalough and Glendasan mines and this will take about 2½ hours.

Today, the monastic round tower and the shores of the lakes make a popular stopping place on the way to the Wicklow gap but few visitors make the 3km trek beyond the lake to the abandoned mine workings beside the Glenealo River. Two hundred years ago, the upper reaches of the valley were genuinely remote and one of the mines became known as “Van Diemen’s” because it seemed so far from civilisation!

The granite rocks of the glacial valley contain quartz veins with silver, lead and zinc mineralisation. The other major rock type is schist, formed when the molten granite metamorphosed the older sedimentary rocks. Glendalough and the next valley, Glendasan, were extensively mined between 1800 and 1920, employing around 2,000 miners at the peak of production. Some levels are reputed to stretch the 2km from one valley to the other.

The eye-catching white spoil heaps can be seen as soon as the walker emerges from the lakeside wood. What is less expected is an almost intact roller crusher at the foot of the dumps, inscribed “J.MILLS FOUNDRY LLANIDLOES NORTH WALES”. The gently rusting relic rests on concrete foundations beside other relatively modern building remains and was probably used for re-working the dumps. The cast iron rolls have replaceable steel tires which are worn into shallow grooves and a nest of powerful springs held the rollers together as the rock passed through. The ore hopper has been removed but the iron sides still lie near the crusher. The brass-work of the bearings is gone but the gears and shafts are in good condition. There are building remains nearby and there is a hidden flooded adit just behind the buildings. Two further adits can be reached by scrambling up the loose scree, these were both explored and were found to have collapsed.

The tips above the crusher are well-graded and are obviously the work of some other earlier crushing plant higher up. At this point, the locations of many of the mines levels can be seen high up amongst the screes on the northern valley side, marked with large linear spoil dumps. A level was explored here by the Club which went a reasonable distance, traversing a ledge with possible descent to lower workings and pushing through one constriction until blocked.

**Fig 29 - Glendalough & Glendasan Mines**

The main site of Glendalough mine is soon reached. South of the path is an area of ground distinguished by a kerb of stones, with substantial retaining walls beside the river. There are the stumps of wooden posts inclined together, which probably supported a trestle bridge. To the north is a well-preserved stone-built ore hopper or bouse-stead, with smoothly cobbled interior surfaces and a flanged cast-iron pipe emerging from the ground.

A little further upstream are the stone walls of four single-storey buildings. These may be miners' dwellings but they are very close to another building, which is probably the earlier crusher house. This has thick stone walls two storeys high with the usual collection of enigmatic openings for machine shafts and bearings. One speculation is that this contained a waterwheel-powered ore crusher of a much earlier date than the Mills machine.

It could well have been another roll crusher but using a weight on a lever arm to hold the rolls together and a raff wheel to return partly crushed ore to the top of the mill. It is now on an island in the Glenealo river but the course of the stream may have changed since it was in use. Between this building and the river is a smoothly cobbled floor, which may have been used for hand bucking of ore with hammers. Below the crusher house, there is an area with fine slimes and wooden launders which was presumably a dressing floor.

The zig zag footpath by the river can be followed to the top of the hill where the spoil tips of Van Dieman's Lode Mines can be found, with various remains of tracks, inclines, barracks, collapsed adits and spoil tips.

Glendasan Mines (OS 099981)

From Van Dieman's Mine, turn due north for a trek of about two miles over boggy land to the mountain top, which brings you over into Glendasan Valley (also known as the Wicklow Gap). From this point, it is possible to look down onto the mine workings in the valley. It is possible to intersect a path which leads over the mountain to the top of an old miners' path. This can be followed down past various workings with two shafts and two open wet adits which were not explored. The path turns into what appears to be a tramway and starts to flatten out, at which point there is an old iron stamp head lying on the ground. The tramway continues around the valley to some well-preserved cobbled dressing floors, where buddles, waterwheel pits and building foundations point to the Cornish influence at these mines.

There are lots of open adits in this area and many are worth investigation. In the area below the dressing floor, amongst the undergrowth, at least two wet adits can be located. One of these has a surface stream entering from the roof where it has broken through and there is a large windlass over a shaft. The more obvious spoil tips on the opposite side of the valley lead to a collapsed adit.

This is a very spread out site (see Fig.29). There are several adits, some of which are very wet, but all are worth preserving. Those on the north side are generally trials and do not provide any real access but the dressing floors and buildings are well worth a visit as they are particularly well preserved. By following the track above the dressing floors, and after a fairly lengthy climb, other adits can be found but these were not explored due to lack of equipment and bad weather conditions.

The Glendalough and Glendasan mines were worked between 1795-1957, although the main period was 1850-1880. The approximate output was about 60,000 tons of galena (PbS) with some sphalerite (ZnS). Many of the adits were re-opened and investigated between 1943-1957.

The Glendamur valley is the next one across from Glendasan and the Club examined two locations here. One near the start of the valley (west) was where a level was remembered from a previous trip but only the top of a possible open shaft was found. At the end of a road, near the Youth Hostel, the obvious spoil tips on the north of the valley were climbed but there were no obvious levels. However, more spoil tips on the south of the valley were investigated and a level flooded to the roof was found.

Gortavallig Mine (OS 081041)

To find this site proved quite difficult, although it is easy to see as a deep-cut inlet with the only access by some steep overgrown steps. These have been washed away at the bottom and it requires a careful traverse along a small rock face. At the top of the steps, there is a overgrown gulley and at the top of the hillside there are the remains of a winding house, which presumably hauled materials out of the bay.

Actually in the bay there is a small adit entrance and, after another 10ft climb, access can be gained into some small passages where there is a small stope and flooded shaft.

On the opposite side of the bay there is a large walled adit entrance, access to which proved difficult. Once inside, the adit was waist-deep in water and was not investigated, although it obviously continued for some way.

This mine was worked in conjunction with Carravilleen, Killeen and Glanallin Mines. They produced a small tonnage of copper and 2dwt of gold per ton. It was worked between 1840-90.

Ladyswell Barytes Mine (OS 140038)

A few buildings are left but the mill area has now gone. A shaft has been capped and marked. If you scramble down the spoil heaps to the sea, evidence of water running out of the spoil can be seen which indicates a probable bulldozed adit.

Opencast mining began in 1852 and was carried on intermittently until 1922, when it was abandoned. It was prospected in 1976 and reworked 1979-85. The total production was about 300,000 tons of barytes ($BaSO_4$).

Silvermines (OS 801701)

The site is reputed to have been worked by the Danes in the 9th century and it has been continuously worked from the 16th century up to 1986 for lead, silver, zinc, copper and barytes. The 19th century workings consisted of a group of mines with names such as Smallee West, Smallee East, Gorteenadiha, Garryard, Cortshanneroe,Knockanroe, Ballygowan and Cooleen.

There are several distinct sites to be visited. Just at the top of the main street of Silvermines village is a footpath by the school which leads to an old Cornish engine house and dressing floors (see Fig. 30). Most of this is overgrown and little can be seen. Further over, a set of more modern buildings can be seen with a concrete capped shaft.

**Fig 30 - Silvermines Engine House & Processing Plant**

Travelling away from the village, spoil from a large opencast barytes mining operation can be seen. This appears to be a large quarry with spoil tipped above the hole. In the base of the quarry an underground working leads off but this is thought to be collapsed. It would be worth obtaining permission to visit the site. On the opposite side of the road there is the site of a former drift mine. The area is well fenced and gated but most of the buildings have been flattened and the adit is collapsed. The only sign of mining is the large raised tailing bed, which is about 8-10ft above the natural landfall and about ½ mile square. This gives some indication of the former mining operation.

Further down the road remains the most interesting part of the area, where there are some old Cornish engine houses covered with ivy. Fences of gorse and bracken indicate where the shafts and stopes are sadly all filled or collapsed. Across the fields, there are signs of spoil and open cuts but none lead to anything. Also on this site are several modern buildings, some of which were obviously laboratories with lots of old chemical containers strewn around. Several of the buildings are used to store literally thousands of core samples (see Fig. 31) on racks of trays up to ceiling height. These were from the now defunct mining operation, during which part of the mining method was to take regular core samples from the mine for the geologists to determine the best places to work. The old mine manager's house is beginning to deteriorate badly, the roof is still intact but the floors are rotting and collapsing.

**Fig 31 - Core Samples at Silvermines**

The only accessible mine workings are in the quarry behind these buildings. These consist of large pillar and stall workings with about ¼ mile of passages. The floor is very wet and muddy and two flooded inclines can be seen. In two places the pillars have been robbed an the roof has started to collapse. There are a series of upper levels but most of the floors have been quarried away.

Modern mining operations between 1968-1984 extracted 10,783,859 tons of 2-7% lead (Pb) and 7.36% zinc (Zn). By 1985, the site had produced 4 million tons of 85% barytes ($BaSO_4$). The known reserves are 6,894,929 tons of 2.26% lead and 4.98% zinc.

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# The Central Snailbeach Lead Mine

## Andy Cuckson

Introduction

This is a brief account of one of the speculative failures among the mining ventures which arose in the south-west Shropshire orefield in the middle of the last century. It was a small concern and, as such, information is expected to be scarce. The most unfortunate aspect of the research, however, is the seeming lack of hard facts about Central Snailbeach Mine when in the hands of Powell & Co and their predecessors (they may have been one and the same), for this was when the sett was actually raising ore and this is a point which tends to be overlooked. My impression is that, whereas the later operators were "chasing the Holy Grail" in their search for a rumoured extension of the Snailbeach Vein, the earlier lessees must have prospected and worked the ground in a more informed, professional fashion and then gave up when they knew it was dead. Sad to say, there are no Mineral Statistics for the period to tell us hw Powell and the others actually did fare. Tankerville records may yet fill in these details.

The bulk of the story concerns how the two later companies succeeded in extracting more and more money out of their shareholders but utterly in vain. The majority of the facts are from the Company Registration documents but the construction placed on them is entirely mine and is presented as an honest attempt to make sense (and interesting reading) out of bald data. I invite readers to separate the events and dates from the narrative and judge for themselves. One simple question you could ask yourselves is: what reason could a person have for wanting to start up a company in order to buy the one they already have control of?

Early Days

This mine in the district of Upper and Nether Heath (a part of Worthen) occupied land which was originally part of Hogstow Hall Farm, property of the Joint Lordship of Lloyd and Tankerville (1). The sett was being mined in the early 1850s, when some pipes of ore were being worked successfully by a private company (2). Central Snailbeach was known to be owned by J Powell & Company from 1860 to 1866 by the Mining Records Office (3), although this is not supported by other evidence from this source concerning Powell's successors, the Central Snailbeach Mining Company, who were in existence from 1862. Edmond Wardman was Chief Agent from 1860 to 1863 but this post was then taken by Job Taylor until 1866. Since Taylor was prominent in the successor company, as will be described, it seems likely that the Mining Records Office was given unreliable or incomplete information and that the Central Snailbeach Mining Company Ltd were in occupation from 1864.

Central Snailbeach Mining Company Ltd

Under a lease made with John Arthur Lloyd (4), this venture took over the sett in a supposed bid to find a westward extension of the rich Snailbeach Vein (5). The company was registered in February 1862. Chief among the promoters were Job Taylor, a coal owner from Dudley, and Edward Henry Lowe of Shrewsbury. Lowe variously described himself as a wharfinger and general merchant. He lived at Bridge House, owned wharfeage on the Severn at Shrewsbury and was prominent in the trade of building supplies. Several local miners held shares (6).

J Powell & Co continued in occupation until at least 1863 and meanwhile the new company was planning its takeover. To finance the work, they initially authorised shared capital of £10,000 to be raised but, by 1864, only a little over a quarter of this sum had been pulled in. In July 1864, an Extraordinary General Meeting with Job Taylor in the Chair resolved to increase the capital to £40,000 (7) and, in the same year, they published a shares prospectus which included photographs of the surface works (8). New spoil heaps are visible in these and, since Job Taylor took command as Chief Agent in 1864, there is no doubt that the work had started in earnest that year.

Time wore on and the money ran away with itself. Mining engineer John Kitto from Llandidloes replaced Job Taylor as Chief Agent in 1867 (9). There was no lead to be found as yet and the Company was desperate for some revenue. The lease on Central Snailbeach was renewed with Charles Spencer Lloyd on 24th April 1867 for a 30 year term. They then took another lease, again with the Joint Lordship, to work the Hill Sett in Mytton's Beach from 31st January 1868 for 21 years (10). It was formerly worked by Messrs Horton, Stainsby, Jones and Johnson in the 1850s, followed by Heighway Jones, at which time it was known as the Mytton's Beach Mine (11). Success was not immediate for the new lessees and, when it came, the winnings were not spectacular.

By February 1868, a total of about £16,300 in share capital had been raised, although calls for over £18,000 had been made (12). While legally obliged to pay up when a call was properly authorised, there was an understandable lack of enthusiasm among shareholders when there was nothing to show for 5 years of throwing money down a worthless pit. Workings at Central had reached a depth of 164 yards by this time (13) and the calls for money continued. As well as opening up the Hill Sett, the partners still believed strongly enough in the Central mine that they were prepared to re-equip it for further trials. In about 1870, share brokers Liscombe & Co of Liverpool confirmed that Central Snailbeach sett "... has not yet proved productive of ore. Last year a new engine was erected to enable works to be carried to a greater depth" (14). By November 1870, the company was raised a further £3,000 from its badly singed shareholders to pay for these developments (15).

The company's registered office was that of Samuel Harley Kough, a solicitor of Swan Hill, Shrewsbury, who became Company Secretary (16). Kough, like Lowe and others in Shrewsbury, was doing his best to capitalise on the mining ventures in the Shropshire hills (17) and as Company Secretary would stand to earn an extra salary. In 1866, the mining agent Thomas Thompson of 12, Old Jewry Chambers, London was appointed the company's London Secretary and this might be seen as a bid to approach more potential investors. They would also be far from the scene of the daylight robbery. Thompson's address also became the registered office rather than Keogh's (18). Having a City address has always proffered an air of respectability to any business.

New Central Snailbeach Mining Company Ltd

By 1869, a group of principal figures in the Central Snailbeach Mining Company had seen an opportunity to improve things for themselves, if not for the general run of shareholders. In a written agreement, a new partnership including Job Taylor, Lowe and Thompson proposed to purchase all the assets of the Central Snailbeach Mining Co Ltd, including any minerals and the two mining leases currently in force. There was no fixed price mentioned however. The plan was to liquidate the old company and two liquidators were appointed at the same time, these being Thompson and a coalmaster named William Pearson. Their handwritten agreement and the new company's statement were both registered on 30th November 1869 (19).

The old company was never properly wound up. No record exists (as there should) of an Extraordinary General Meeting being held to put forward any proposal for dissolution, let alone any offer of cash being made to its shareholders to buy up the shares (20). In fact, in the period February 1868 to November 1870, the old company was still making calls on its shares as described earlier, while at the same time plans were being made to steal the operation from the majority of helpless shareholders.

The newly registered partners must have known that, as they stood, the workings had no real value and the only worth of the operation was the sale value of the mining equipment (if indeed the terms of the lease allowed the lessees to sell it). If the old company's debts approached that figure, the shares would have been worthless and the takeover bid no doubt played on this idea. Thompson held the Company Secretary's post for both companies and shamelessly assumed the role of Liquidator, which effectively meant that, unless challenged, he could keep the financial details close to his chest. There is no record of any offical liquidation ever taking place and the Central Snailbeach Mining Co Ltd was finally dissolved by the Companies Registrar in 1882 (21), some 5 years after the New Central Snailbeach Mining Co Ltd had held its own final Extraordinary General Meeting and agreed to quit (22).

Liscombe & Co apparently believed that the New Central Snailbeach was the correct name for the Hill Sett, rather than simply the name of the operating company. Their report, from the same publication as the earlier quotation, gives a neat description.

"NEW CENTRAL SNAILBEACH

Adjoins central Snailbeach, and belongs to the same proprietary. The sett contains a large amount of ground, stretching from the base to the ridge of the Stiperstones hills, and, being pierced by a deep gouge, can readily be opened up by deep adit levels. In a level now driven a good course of ore has been cut, and is being sunk upon" (23).

The output of New Central Snailbeach Mine in 1871-72 is said to have been 626 tons of lead ore (24). This is highly unlikely to have been raised from Central Snailbeach itself and will surely have come from the vein that Liscombe mentioned or another on the Hill sett.

**Fig 32 - New Central Snailbeach Mine**

Part of OS County Series Shropshire sheet XLVIII 5, 1st Edition 1881. The shaft and an indication of the headgear and the surrounding spoilheap are obvious. Of the group of mine buildings directly north of the shaft, the small unshaded square is the chimney and the unshaded part in line with the shaft is the winding engine house. Plot 620 contains the Mine Agent's house. The New Central Snailbeach Company's last chief agent was Enoch Parry. He retained the house after the company folded and, in the 1880s, part of it became Central Stores when Enoch retired from mining and became a retailer. To the right of the Cross Guns Inn is the terminus of the Snailbeach District Railway. Snailbeach Mine is about half a mile to the north-east.

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The map extract (see Fig.32) is used by permission of the Director General of the Ordnance Survey - Crown Copyright is reserved.

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| | |
|---|---|
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| CRO 4640 | Ditto file 4640 The New Central Snailbeach Mining Co Ltd BT 31 1497/4640 |
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3 Burt et al p.32
4 CRO 2567
5 Brook & Allbutt p.81, 4.3
6 CRO 2567
7 Ibid
8 Brown p.96
9 Burt et al p.32
10 CRO 2567
11 Brook & Allbutt p.83, 5.1
12 CRO 2567
13 Brown p.96; Brook & Allbutt p.81, 4.3
14 Liscombe p.39
15 CRO 2567
16 Ibid
17 CRO 5490. The South Shropshire Railway Ltd was Kough's early (1871) attempt to promote a railway to serve the orefield. His second attempt was in 1872 under the South Shropshire Railway Bill. Both were successfully opposed by the Snailbeach Mine Co Ltd.
18 CRO 2567
19 CRO 4640
20 CRO 2567
21 Ibid
22 CRO 4640
23 Liscombe p.40
24 Brook & Allbutt p.87. Source: "The West Shropshire Mining Region" by H G Dines. No detailed return of production was found by Burt et al.

# Membership List (as at October 1996)

## HONORARY MEMBERS

| | |
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| David Adams | 2 Princess Gardens, Newport, Shropshire TF10 7ET T. 01952-810681 |
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| Sheila Newton | (as for Malcolm Newton) |
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| | |
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| Kim Yapp | (as for Andy Yapp) |

## JUNIOR MEMBERS

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| Gemma Cashion | (as for Jon Williams) |
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| Gemma Moseley | (as for Alan Moseley) |
| Jennie Moseley | (as for Alan Moseley) |
| Julie Pearce | (as for Adrian Pearce) |

## ASSOCIATE MEMBERS

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