

Lead Mining around Linley Hall

Roman & Medieval Working

It is hard to believe but this pleasant rural scenery was once the site of a thriving mining industry which extracted lead, zinc, copper, barytes and other minerals. In 1875, this small area produced over 10% of the UK lead ore and up to the First World War produced about 25% of UK barytes.

The Romans were the first to commercially exploit lead in Shropshire and they mined some of it near Linley Hall. A favourite exploration technique of theirs was “hushing” where a small dam was made at the top of a slope and then released. The water would remove the soil and expose the underlying rock, including any minerals. If lead ore was revealed, they would excavate this by means of open trenches and shallow levels and shafts. Ingots (called pigs) of lead from that period have been found as follows :-

- 1) Weight 190lbs, dated AD117-138, found 1767, probably 3 miles NW of Bishops Castle. Now at Linley Hall.
- 2) Weight 193lbs, dated AD117-138, measuring 22” x 7”, found 1796 at Snailbeach Farm (this is the old Snailbeach Farm which is the half-timbered house behind the large grassed-over hillocks). Now at British Museum.
- 3) No details and has not been seen since 1827,
- 4) Weight 185lbs, dated AD117-128, found 1851 at the Roveries Snead, ¾ mile NE of church and 1 mile W of Linley Hall. Was at Liverpool Museum but now believed lost.
- 5) Weight 173lbs, AD117-138, found in 1851 near to where (2) was found earlier. There is no record of it so it may be confused with the original find.
- 6) A lead pig was apparently found in the open workings at Roman Gravels but nothing further is known about this.

Most of the pigs found in Shropshire bear the inscription IMP HADRIANI AVG (Emperor Hadrian ruled from 117-138AD). 144 English pounds are the equivalent of 200 Roman pounds and this may be the weight that the Roman lead manufacturers were aiming at in producing the Shropshire lead ingots.



Replica of the Roman lead ingot found in 1767, made by the Shropshire Mines Trust Ltd in 2003, it weighs 190lbs and was based on the one held at Linley Hall.



Detail of the inscription on the SMT replica. Most of the Roman ingots found in Shropshire bear the inscription "IMP HADRIANI AVG."

Mining methods would have changed very little in the centuries after the Romans left and workings would have continued to be shallow and drained by levels driven from the valley sides. Lead continued to be a valuable commodity and, although there is no mention in the Domesday Book of lead mining in Shropshire, there are some early references to mining in this area. Following the Norman conquest, the area was designated as a royal forest called 'Tenfrenstanes', from which the name Stiperstones is derived. Towards the end of the 12th Century, this was under the care of Baron Peter Corbet of Caus Castle but he seems to have upset King Henry II at some stage. It is recorded that the King 'engrossed' the whole or a great part of, the profits of the Shelve mines, owing to Corbet, baron of Caus Castle, being in disgrace".

Shelve was an important lead mining centre for the area and the mines referred to are likely to have been the nearby Grit and Roman Gravel Mines, which are equally as old. Control of mining in the area was delegated to an official called a 'Justice of the Forest', to whom payment was made for a lease to work the mines. The Justice would then pass this money over to the Sheriff of Shropshire who accounted for it to the King.

Mining in the area was obviously an important income for the King and he took this as either money or lead itself, depending on his needs at the time. Lead for the King always seems to have been sent to Gloucester first and it would have been transported by boat along the River Severn from Shrewsbury. The following records from the time give an idea of what was happening :-

- 1179 Thomas Fitz-Bernard, a Justice of the Forest, leased the lead mine at Shelve to one Nicholas Poncler for one year at a rent of £55, to be paid by even installments at Easter and Michaelmas following. The Justice paid this over to Hugh Pantulf, Sheriff of Shropshire, who delivered it in full to the King the following year upon receiving an order to do so.
- 1180 Thomas Fitz-Bernard let mines for 40 Marks (£26.13s.4d) and paid this to Hugh Pantulf. The latter accounted for forwarding 60 cart loads of lead worth £21, for the King's use. Also 120 cart loads of lead to Gloucester by the King's order. After deducting transportation costs, he paid a balance of 6d into the Treasury and was quit.
- 1182 Hugh Pantulf forwarded lead worth £389 from Shrewsbury to Gloucester, as certified by witnesses. The latter process is possibly because of the extremely large value of the consignment, indicating that the mines must have been very productive at that time.
- 1182 Hugh Pantulf purchased 110 cart loads of other lead for the King costing £38.10s.0d. This was sent to the convent of Amesbury in Wiltshire, which had been dissolved in 1177 on the grounds of immorality! The lead helped to re-roof the buildings which were re-colonised by a 'purer sisterhood'.

Lead continued to be forwarded to Gloucester by the Sheriff, ie

DATE	AMOUNT	VALUE	TRANSPORT
1183	30 cart loads	£10.10s.0d.	£18s.9d.
1184	not known	£4.11s.0d	£8s.3½d.
1185	30 cart loads	not known	£1.8s.9d
1185	30 cart loads	not known	£2.6s.3d

Of the two consignments in 1185 as above, the first was sent from Shrewsbury (on the River Severn) and the second direct from the mines. The reason for the latter is not known as it obviously cost more to transport it overland. Perhaps there was an urgent need for it and the King could not wait.

1220 Robert Corbet paid tithes to Shrewsbury Abbey of his share of the produce of the Shelve mines. Tithes were a religious tax and this only seems to have been a temporary measure since his descendant Thomas was no longer doing this in 1270. Thus the fitting out of Shrewsbury Abbey was partly financed by local lead mines.

1278 3 wagon loads of lead were sent from Shelve to Builth Castle.

18th–20th Century Working

As ore became exhausted, the miners had to go deeper and faced the problem of removing water from the workings. Where drainage levels from adjacent valleys could not solve this problem, the water was removed manually in barrels drawn up the shaft by windlass or horse whim. Other mines used waterwheels to operate pumps but the major problem with these was that the water supply tended to dry up in summer and freeze in winter, thus causing the lower workings to flood. This state of affairs continued until the late 18th century when the invention of the steam engine revolutionised the local mining industry.

In 1775, Boulton and Watt formed their famous partnership and began to manufacture steam engines near Birmingham. The mine adventurers of Shropshire were not slow to take advantage of this new means of power and nine Boulton and Watt engines are recorded at local mines before 1800. After 1800, the Boulton and Watt monopoly expired and engines from other manufacturers began to appear on the scene. The mining industry began to expand and by 1850 the view from the Stiperstones would have included a dozen engine houses, each with its tall chimney capped with a plume of smoke. By the 1870s, it was said that there were 17 engines at work in the Rea Valley alone, with four more on order.

Steam engines worked by introducing steam into a vertical cylinder fitted with a moving piston, thus forcing the piston down the cylinder. This piston was connected to the end of a beam which was pivoted on the wall of the engine house, with the other end projecting over the shaft. As the piston was pushed down the cylinder, it pulled down the "indoor" end of the beam and thus raised the "outdoor" end. In most engines, the outdoor end of the beam was attached to a series of joined pump rods in the shaft which were connected to pumps at the shaft bottom. As the piston came to the end of its stroke, the weight of the pump rods pulled the outdoor end of the beam back down and thus raised the piston back to the top of the cylinder. In other engines, the beam was attached to a crank which operated a winding drum or crushing machinery.

Boulton & Watt did not manufacture everything on their engines, only the more specialised parts. John Wilkinson's foundry at Bersham made the cylinders and the rest was made by local blacksmiths and mechanics on site, using plans and drawings supplied by the partners. Payment for the engine was also unusual in that it was not an outright sale. An annual

payment was negotiated, based on fuel costs shown by the engine as compared with a Newcomen engine of the same power. These payments were to last until the partners' patent expired in 1800. In South Shropshire, where some of the mines found it hard just to keep in business, the partners must have found it difficult to collect their dues!

The erection of a new pumping engine at a mine was quite an important event and at the Bog Mine in 1838 "... Mr Cross of Chester put in motion a steam engine of 370 horsepower to conquer the deluge of water. About 1pm, this grand piece of machinery began to have fresh fuel added to its boilers and for several moments the spectators were breathless with anxiety till the beam lifted its majestic head and Mr Cross named her "The Queen Victoria" amidst the tremendous cheering of a vast multitude, the band playing "God Save the Queen". The company retired to a large booth where several hogsheads of most excellent ale and large quantities of bread and cheese were distributed to the workmen and multitude after which some hundreds footed it on the "light fantastic toe" to Cambria's favourite instrument, the harp and two violins, while members sat down to an excellent dinner in the office of the company and adjoining rooms..."

Production of lead reached a peak in the latter half of the 19th century but, by 1885, cheap imports from abroad had caused the price to drop from a high of £20 to only £11 per ton. This brought disaster to many of the district's smaller mines which could not make a profit at this price and had to close. Even the larger mines were on the wane by 1900 and they had to turn to mining barytes to make ends meet. Of the two largest mines, Huglith Mine closed in 1947 and Snailbeach Mine in 1955. There has been no serious mining since but there are large reserves of zinc ore left underground.

The Miners

Although miners were brought in from places such as Cornwall or Derbyshire, most of the men who worked here were locals. Their women and children worked on the surface crushing and preparing the ore for smelting (a process known as dressing the ore). They had to work in all kinds of weather with minimum shelter, a miserable life that would never be condoned today. Adjacent to many of the mines you will find ruins of houses which were abandoned when the mines closed forever. If you visit the head of Perkinsbeach Dingle or Blakemoorgate you can see the remains of whole abandoned villages.

Although some miners lived in villages, many more preferred to live in smallholdings scattered over the surrounding hillsides. Landowners encouraged their miners to "squat" on their land and to make small enclosures. In this way, they could collect rent from the miner as well as obtaining his labour. From his cottage, the miner used to walk many miles to the mine, both day and night in all kinds of weather. There was no social security in those days and the miner had a stark choice, if he didn't work he didn't get paid. To offset this, many miners formed friendly societies whereby they could receive a weekly payment if they were off work due to sickness or accident.

Each cottage had a number of acres of land and this allowed the families to supplement their income by growing most of their own food. This led an irate mine owner of the 19th century to remark that, because of the need to cultivate their own land, the miners were not entirely dependent upon their earnings at the mine for subsistence. This was apparently an undesirable trait as it made the miners too independent! Their houses were small with no more than 2 bedrooms upstairs and a living room and pantry downstairs, occasionally with lean-to buildings at the side. The miners built their own houses out of local stone with a thatched roof, with neighbours often lending a hand. Outbuildings were also thatched but the walls were made with a frame of wood filled with a mixture of gorse, turves and mud.

The smallholding was usually sufficient to provide enough grazing for the milking cow in summer and hay to last the winter, while some miners also kept pigs for bacon or as porkers. Poultry were common, as were sheep which were allowed to roam the hillsides. Since the miner's family tended to be large, he was therefore of necessity a keen gardener, using his vegetable garden as an important additional food supply. The children were expected to help out by collecting whinberries and blackberries from as far away as the Long Mynd to supplement the family diet. This was so important that schoolmasters often had to close the local school at those times of the year when wayside fruits were ripe. A miner's main meal might consist of bacon and vegetable stew with homemade bread. To eat meat supplied by the butcher was highly unusual.

Sunday Schools thrived and the big occasion of the year was the 'Treats'. In hard times, these might only consist of marching behind a local brass band, followed by a picnic on top of Corndon Hill. Later trips were made with the children riding in horse drawn wagons and eventually in charabancs to places as far away as Rhyl. The chapels organised Eisteddfodau at holiday times with singing competitions and another popular local activity was football. Thrift was encouraged by means of the Chapel clothing clubs and charity took such forms as paying a child's school pence when the father died.

Mining Methods

The system of working the larger mines was by shifts of men every 8 hours for 5 days per week. On Saturdays only a third of the miners were at work, between the hours of 6am and 12 noon. The remaining two thirds of the men were thus idle from Friday night to Monday morning. These long weekends were not usual at the time and were unpopular with the mine owners who still had to keep the mines pumped dry. All attempts to introduce a full day's work on Saturday were as unsuccessful as that at Roman Gravels Mine in 1870. The workers from other mines induced the men to stop Saturday working by means of threats and intimidation, saying that they were breaking the rules of the country. In 1871, the miners were also taking a day's holiday immediately following the monthly payday. The lunch hour, taken during the shift, was a full hour or more. Both these facts appeared to cause the mine management a great deal of frustration.

Unlike modern mines, very few miners were actually full-time employees of the mining company. The exceptions were the mine captains, engineer, engine drivers and perhaps a few other specialists such as the men who maintained the shaft. It was even known for particularly skilled captains and engineers to be employed by more than one mine, dividing their time between them. All other workers were employed on a monthly contract and they had to compete to sell their skills in a type of auction known as the monthly reckoning. In this, the captain would offer different types of work for the forthcoming month and it would be given to the miners who quoted the cheapest rate.

The men formed themselves into small teams and would offer to work a particular part of the mine for which the mining company would pay them an agreed rate for a set weight of ore brought to surface. Pumping and winding costs were borne by the company but the men were obliged to buy gunpowder and candles from the company. Depending on the custom, some mines accepted ore as it was brought from the mines, others required the mining teams to deliver it already dressed for smelting. In the latter case, the teams would have to employ their own people to dress the ore on surface. To prevent ore becoming mixed up, each kibble or wagon of ore was marked to show where it came from and was dumped at surface in separate compartments known as ore bins.

Underground, the teams had discretion in how they mined the ore. This was subject to some restrictions, however, and the mine captain was responsible for ensuring the safety of the mine, having the right to insist that timber supports were installed if necessary. This wasn't

particularly for the benefit of the men - he was more concerned that the workings did not collapse and interfere with the profits! A typical mining team consisted of two experienced miners, a labourer for the heavy shovelling and perhaps a young boy to carry the ore to the shaft bottom. The mine workings would be divided into many different working areas, each with their own mining team. It was always a gamble because, depending on the richness of the vein, a team could either make a big profit during the month or a loss. Surprisingly enough, this system was very popular with the miners who valued their independence and appreciated the chance it gave them to make good profits. It also suited the mining companies because it encouraged the teams to deliver as much ore as possible to surface.

The rate for a particular area of the mine could vary from month to month. If a team found a rich vein which was easily worked, they would obviously make a large profit. This would encourage the mining company to offer a lower rate for that area at the next reckoning and this ploy worked because there were always other teams willing to take on rich areas. Conversely, if an area proved poor during the month then teams would be unwilling to bid for it and the company would have to increase the rate before it was taken on. The monthly reckoning was a general holiday and there was no school that day. The reckoning at Roman Gravels Mine was accompanied by a fair held at the crossroads, where hard earned money could be exchanged for necessities.

Grit Mine

Location - SO326981

Minerals - Barytes, Calcite, Lead and Zinc

This mine was originally worked as a single sett but it was split into two separate entities for a period, viz

- East Grit (also known as Old Grit)
- White Grit (also known as West Grit Mine).

Although a Roman pig of lead was found here in 1767, there is no other evidence of Roman working but references indicate that mining was being carried out in medieval times. Henry II laid down conditions governing the mining of lead in the Forest of Stiperstones and it is believed that the Grit Mine was working at this time. Working after that time would have been intermittent and relatively shallow.

In 1760, John Lawrence created the Whitegritt Mining Company with some partners and took on the lease of Grit and Ladywell Mines. On January 18th 1783, Lawrence contacted Boulton & Watt on behalf of the Whitegritt Mining Company and asked for the approximate costs of erecting an engine at the mine to lift water 60 yards up 13" diameter pipes. He also asked for an estimate of the daily coal consumption for such an engine. The shaft was stated to be only 12 yards below adit level (22 yards total depth) and it was proposed to use the engine to sink 60 yards. Watt replied that the engine could either be a 37½" at a cost of about £1,100 or, if the pumps were smaller, a 30" at a cost of about £900. His letter gave details of coal consumption and the premium to be paid to the partnership for use of their invention, ie

Coal consumption @ 10 strokes/min = 136 lbs/hour
Consumption of a Newcomen type engine to give
the same duty being about 3 times as much = 408 lbs/hour
Saving by difference = 272 lbs/hour
Premium due to Boulton & Watt = 272/3 = 90 lbs/hour
= (90 x 24 x 365)/2240 tons/year

= 391 tons/year

At the then price of coal premium = £90 per year.

In February, Mr Joshua Blakeway, another of the mine adventurers, wrote to Watt to say that they had discussed the engine and were apprehensive about the length of the stroke. They did not think that 6ft was adequate and thought that 8ft would suit them better. Watt was asked to give his opinion on such an engine, which was to be similar in all respects to the 30" erected at Bog Mine shortly before. They expected "¼ more execution" from the engine due to the longer stroke and stated that the engine would not be expected to exceed 120 gallons per minute at first, although this would be increased with depth. Coal for the boilers would be of the best and largest, coming from one of the neighbouring collieries. The mine at that time was coping with water by using 2 horses, 6 hours at a time, to work a horse gin. The water was drawn in a 72 gallon barrel, which usually "lacked only 5 or 6 gallons", but at the time of writing the horses were having difficulty in keeping up with the water.

The sale was eventually approved and a long legal agreement drawn up between the two parties. There was also a short agreement covering the annual premium, viz

"27th March 1783 Memorandum that Joshua Blakeway Esquire, John Lawrence Miner and Thomas Lloyd Anwyl, Gentleman, on behalf of themselves and the rest of a Company called and known by the Name and Description of the Whitegritt Company and Messrs Watt and Boulton Engineers agree as follows:

The said Messrs Watt and Boulton grant a license to the said company to erect a steam engine at the Whitegrit Mine with a cylinder of 30" in diameter which will effectively and properly work a pump of 10 1/2" in diameter, eight foot stroke and eight strokes/minute, to raise the water 60 yards and to consume only 136 lbs of coal per hour. The said company paying them the said Messrs Watt and Boulton £90 per year and that if the said engine shall by any accident that may happen thereto stand and not be worked for one month or more at any time they the said Messrs Watt and Boulton shall and will make to the said company an allowance of the above mentioned sum or premium of £90 per year proportional to such space of time exceeding 30 days as the said engine shall stand without working at each such time of stopping. And they the said engineers also agree to send a proper person to the said mines to assist in putting the said engine together, the said company paying such person £1 6s 0d per week whilst he is employed by the said company. And they the said Joshua Blakeway, John Lawrence and Thomas Lloyd Anwyl on behalf of themselves and the rest of the said company agree to pay to the said Messrs Watt and Boulton for the considerations and subject to the allowances aforesaid the said sum or premium of £90 per year and also to the beforementioned proper person apportion the said sum of £1 6s 0d per week. In witness whereof the said parties have here unto signed their names the Day and Year above written.

Witness Signed John Scrymster""

Boulton & Watt contracted out the manufacture of the cylinder to Bersham Foundry and sent a man named Law to supervise the erection of the engine. The job did not go smoothly, however, due to delays in delivery of essential parts and Lawrence complained about the financial loss to the company. On April 10th, however, Lawrence wrote to Watt to inform him "that evening at about four o'clock we put the engine to work and mean to continue working it for some time". The former hoped that this would be for at least 3 months. In December, a further letter confirmed that the engine "goes very prosperously being steam and air tight but that the boiler is very bad". Watt was asked for his advice on a new boiler, it being proposed to use a round one, similar to the original, but with a tube through it.

In June 1785, Grit Mine was said to be worked out and so the engine was stopped. By the end of the year, the company offered to sell the engine to a mine at Logelas in Cardiganshire or anyone else that Boulton & Watt cared to recommend after a valuation. Lawrence confirmed that he would run the engine "in 10 or 12 days time to wash out the pumps". It was dismantled in May 1786 and taken to Shrewsbury, where it was last heard of on the quay awaiting transport to Popham & Partners. The site of this engine is now believed to be on what is known as Old Grit Shaft. The shaft is still open here but only two walls of the engine house are still standing. An engraving of the engine as envisaged by the Boulton & Watt draughtsmen in 1783 indicates that the building was tall and graceful.

The mine was acquired by Messrs Lewis & Phillips in 1825 and, despite several lawsuits being taken out by Lawrence the previous lessee, much development took place. It was during this period that several shafts were sunk, including New Engine and White Grit Shafts, an engine house being erected at the latter. White Grit Shaft has now collapsed and the engine house has suffered badly over the years, leaving only the lever wall and parts of two others standing to the west of the road.

Lewis & Phillips gave up the lease in 1848 and the sett was worked separately as East Grit and White Grit until 1860. In 1862, John Taylor & Company acquired the lease and drove exploratory levels from the old White Grit Shaft. His main effort was at East Grit, however, and he erected an engine on New Engine Shaft. This was undoubtedly used for both winding and pumping but no details are known about the engine. The most striking feature is the large slot in the north wall which housed the flywheel, the axle of which was inside the building. The pit on the east side housed the winding drum and the cylinder was mounted on the raised foundation in the centre of the building. New Engine Shaft has now collapsed and the lever wall of the engine house has fallen.

There are a number of other shafts on the sett and one of these to the south west is called Flat Rod Shaft. This seems to indicate that the shaft had pumps operated by flat rods from one of the engine houses, possibly the one at New Engine Shaft. An incident in one of the pumping shafts in the late 19th century was published in the Shropshire Magazine :-

"... The water had been pumped out to enable some repairs to be made to the pump at a low level. The pipe already mentioned had been unbolted and the upper part raised to give access to the interior. However, a workman inadvertently left a hammer lying on the flange of the pipe and, when the top portion was lowered again, it dislodged the hammer which fell into the pipe. When the engine was started, the hammer became wedged in the open valve and prevented the pump from functioning. While the trouble was being diagnosed, the water in the mine rose above the level of the valve, which was thus no longer accessible.

The only solution was to obtain the services of a diver some days later. When he was ready, candles were placed as near the surface of the water as possible to light up the shaft and the diver went down. He removed an inspection plate, or again separated the pipe, to retrieve the hammer. His boots were heavily weighted with lead, yet I was once told he descended head first. While under water, the diver was supplied with air from a two man pump at the surface. The operators were told that, whatever happened, they must never stop pumping. However, in the excitement they worked faster and faster and, when the diver regained the surface, they were rewarded not with thanks but - what d'you b..... well think you were trying to do, blow me up?".

There is another building at the mine which is worthy of examination and this is the small round powder house to the east of the road. It consists of two concentric circular stone walls with a roof which enclosed the whole. The outer wall has a door and the inner wall a serving

hatch, allowing for one way movement of miners collecting explosives. The building is in an advanced state of decay and the drawing is a reconstruction. Although a pointed roof is shown, it is possible that it had a flat sloping roof.

Surface Remains

The whole site has been worked extensively, producing a large confusing area of gruffy ground which is here described vein by vein.

White (or West) Grit Engine Shaft is situated at the junction of the A488 with the road to Priestweston. The shaft, which was sunk on the intersection of the Rider and Dingle Veins, is completely blocked but a reasonable amount of the engine house still remains. The tips have been completely removed for roadstone. The arched drainage level is in the wood to the south, it is almost silted up but still issuing water. There is a line of air shafts heading north-east, mostly collapsed. One is open and is 3ft diameter with ginging, blocked at 10ft depth. Another just to the east of the road has been filled but this is slipping.



Rider Vein can be followed east from White Grit towards the trees on the hilltop. Three blocked shafts without names are encountered before Blue Pit, situated in a large spoil tip. On the way up, the unique circular magazine is passed on the right. Blue Pit is filled but the vein can be followed further up the hill, past some opencast workings and a collapsed shaft, to Rider Shaft on the other side of the fence. This small square shaft is open and is situated in a large spoil tip, which bears a circular depression which may mark the position of a horse gin. Rider Shaft has been measured in the past as 200ft to water, which suggests that Wood Level is backed up (calculated depth is 230ft below Rider Shaft collar). It was descended in 1994 to a blockage (including a dead cow) at 130ft. At 100ft there is a level off the shaft but this has collapsed after 5ft.

A short distance to the south is another unnamed shaft, now blocked, and a few yards to the north is an open stopehead. The latter was descended for 30ft in 1994 into an excavated vein. There is a squeeze into Rider Shaft and workings heading west for 40ft to a collapse. From Rider Shaft, the line of the vein can be followed to the remains of Old Grit engine house. The pumping shaft here is open but flooded a short distance down. The three other shafts in the area, including Foxhole Air Shaft to the north-west and Bye Pit to the south-west, are blocked. Excavation of the tips at Old Grit has revealed that they consist largely of boiler ash.

South-west of Old Grit there are dressing floors and the winding engine house of New Engine (or East Grit) Shaft. This led to workings on Engine Vein, which intersects Rider Vein at Rider Shaft, but the shaft is completely filled. The engine house is similar to the one at Ladywell in that the rear wall contains a slot, presumably for a flywheel to drive winding

or dressing machinery. Near this are the remains of ore bins. The track from here can be followed back to the A488, near which it crosses over Dingle or Squilver Vein.



On the south side of the track, Dingle Shaft is completely blocked, though a large stream sinks in this area. Footway Shaft, just to the north of the track, is also blocked. On the brow of the hill, Hampsons Shaft is filled but Flat Rod Shaft is open to a rubbish infill at 60ft. The next shaft encountered is Stone Shaft, now blocked, followed by an area of gruffy ground in which Gardens Shaft and Old Shaft are located. The last shaft, Gough's Shaft, is by the side of the road and is blocked.

Rhadley Mine

Location - SO344957

Minerals - Barytes and lead

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

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

Trials for lead were apparently carried out at several periods in the 19th century, eg in 1874 a 'caunter' lode close to the north-east boundary was being investigated. Several shallow pits and collapsed shafts can be traced on the line of this, on a steep slope close to the edge of a forestry plantation. At the foot of these workings can be seen a collapsed adit, with a tip containing some barytes but largely quartzite. All these workings are probably in quartzite, a rock unfavourable for any economic mineralisation. The adit is shown on an old plan to extend into the adjoining Rock Mine, another small barytes and lead mine.

The first success at Rhadley came in the 1880s when the barytes vein on the hillside was discovered. It carried an orebody about 60 yards long at surface containing up to 8ft width of solid barytes, with some calcite and scattered galena crystals. The deposit was

discovered by Edward Wardman in 1883, who worked it on his own for 12 months before taking on local miners. The barytes and lead was carted to Minsterley station. Between 1887-1890 Wardman sold 2,670 tons of barytes worth 13/- per ton. In 1891 it was worked by the South Shropshire Barytes Co Ltd, who sold only 278 tons before the mine closed the same year.

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

Barytes veins cut in the adit are as follows :-

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

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

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

Between 1932-1935, Mr E Murgatroyd of Keighley, who had been involved in barytes mining in Yorkshire during the war and later at White Grit, worked the mine. He also drove a trial adit eastwards from a nearby hill. Up to 5 were employed but no underground work was done after 1933.

Surface Remains

The main adit can be identified by a fair-sized tip by a track on the north side of the hill. There is approximately 1ft of water on the floor and it goes some distance past a clay blockage to a brick wall, beyond which the stopes have collapsed. In front of this is a 36ft winze leading to a short drivage. The rock was removed by a tramway which divided at the level mouth, the left branch going to the main tip and the right possibly to a simple dressing plant and loading bay. A building by the level portal was presumably a changing room, office, smithy and probably housed a small compressor. Another open adit 250 yards to the north-east can be identified from its tip.

The opencast on top of the hill has been bulldozed almost flat. There are two adjacent adits open to the south, which connect inside, and further up the hill is a collapsed adit. A very long tip to the north-west is connected with Murgatroyd's Adit, driven in the 1920s, which has collapsed. There are, however, the remains of a compressor house.

Ladywell Mine

Location - SO327993.

Minerals – Lead

This mine was part of a sett that included Grit Mine and it was leased by Messrs Lewis & Phillips in 1825. After miners driving the Wood Level discovered several veins on the property, the mine was worked via Ladywell Pit in the wood but there is no evidence that an engine was used. The lease was eventually acquired by John Taylor & Co in 1862 and they eventually decided to split the sett and concentrate on Ladywell Mine. The landlords refused to do this however, and so Taylor surrendered the lease in 1865. The lease was split eventually and in 1871 Ladywell was acquired by the Ladywell Mining Company.



Ladywell Pit was deepened and a new main shaft was sunk which, by 1874, was at a depth of 16 fathoms below the Wood Level. A portable engine being used to wind on both of the shafts while the new engine house was being built. The engine and crushing machinery were made by the Sandycroft Foundry at Chester and were operational by 1875. The mine was never a large producer and there were few underground workings. It was unfortunate for the mine that, after the great expense of erecting the engine, the price of lead dropped and after 1882 it became uneconomical to continue operations on a large scale.

The engine house, which is built of red brick and local stone, appears to have housed an engine which could be used for both winding or pumping. The long slot in the front wall housed the flywheel, which was used to transmit the reciprocating motion of the beam into rotative motion for winding. On the right hand side of the engine house is a walled-in trench, which would have been used for the winding drum and the 'walking beam' for transmitting motion to the pump rods. A clutch mechanism, consisting of an iron key or sprocket, would disengage the pump rods when winding was under way.

The engine house is unusual in that there are two 'wells' in the floor inside. Since a normal pumping engine must pause at the end of the down stroke for the pump buckets to fill, these would have held two different sets of controls since continuous motion was required when winding. Ladywell Mine is reputed to have been very wet and the old miners stated that, when the pumps failed to cope with the water, they had to make a quick exit before the mine flooded. According to measurements by Mr R.Haszard, this engine only appears from the foundations to have had a mere 22" cylinder and the double duty of pumping and winding may account for the occasions when the mine became flooded.

It appears that flat rods or a winding rope ran from this engine to another shaft across the road in the plantation and the chimney is believed to have been sited on the opposite side of the road as well. The boiler house contained two boilers and was sited between the engine house and the road. Only the engine house remains today and it forms a prominent landmark beside the road to Shelve.

Plans in the possession of Mr K.Lock show a proposed engine for the mine in 1873. These were drawn up by the Sandycroft Foundry and show a building 26ft 11ins x 14ft 1in. The foundations were for an engine described as a horizontal high pressure type, with a 14" cylinder, 24" stroke, boiler and 24" crushing mill. This engine was presumably intended to operate crushing and dressing machinery.

Surface Remains

Ladywell Pit has collapsed. Air Shaft is situated in a large spoil heap and is open with trees growing out of the top. It was descended in 1993 to a rubble blockage at 230ft.

New Engine Shaft has been capped and even the 2" air pipe left through the capping is blocked. The engine house is still standing and shows an unusual design worthy of preservation. It is set back from the shaft so the pump cannot have operated in the normal way. The same engine also drove the winding gear.

First Roman Shaft, on the Wood Level, is amongst the trees but has been filled. Second Roman Shaft is brick-lined and in good condition, though blocked to near surface with corrugated iron and rubbish. Other shafts in Ladywell Plantation are blocked with spoil.

Foxhole Mine

Location - SO323983

Minerals - Lead

Foxhole Vein can be followed north-west from Old Grit to Foxhole Shaft near the corner of the next field. This shaft is now blocked and, from it, the large tip surrounding Foxhole Drawing Shaft can be seen in the distance. This shaft has not been inspected closely but, from the large amount of farmyard scrap surrounding it, it is assumed to be blocked. It was open in 1960 when it was estimated to be 200ft deep. Climbing Shaft would appear to be in the middle of the farm, so is also assumed to be blocked.

Rock Mine

Location - SO347963

Minerals : Barytes, Lead

The remains of the dressing floors and a circular pond are present just below the road. Two adits enter the hillside from here but both are blocked, although a stream of water issues from one of them. On the other side of the road, just below The Rock, is the open main shaft. This has been descended 220ft to water. A deep stope leads off 50ft down and, further down, a level leads off but it has not been entered as it is on the wrong side of the shaft for safe descent. At the bottom, levels lead off in both directions along a vein. A length of rising main protrudes from a sump at the shaft bottom. Just to the south-west of this shaft is a small collapsed shaft. The adjacent tips are very large with much galena.

A short distance towards Rock Cottage is another shaft blocked with rubbish and the adjacent building may have housed a winding engine. In the opposite direction, near the remains of another cottage, is a small blocked shaft.

On the east side of The Rock, at the edge of the wood, is a collapsed adit and large spoil tip with remains of associated buildings. A collapsed shaft to the west is on the line of the adit.

Cefn Gunthly Mine

Location - SO331950

Minerals : Barytes, Lead

The workings are divided into two areas, one on the west side of Cefn Gunthly Hill and one on the east side working three parallel veins. On the west side there is an adit south-east of Pultheley Farm, now used as a water supply for cattle. This has been explored for about 30 yards in 3ft deep water to a blockage of stone and rubble. An old blacksmith's sledge hammer was found in this adit, which was driven in 1832. In the wood further up the hill is a square shaft in good condition but blocked 50ft down. This probably corresponds to the blockage in the adit. Further along the same line, in the next field, is a collapsed adit and infilled open stoping can be followed up the hill from here to another shaft. The latter is blocked with a large number of dead sheep.

There is a line of collapsed adits up the north-east side of the hill and a line of collapsed shafts on the hill top. On the east side, an obvious spoil tip can be found by following the track to a field boundary. It is associated with a adit containing deep water and 2ft airspace. This was explored in 1964 to a blockage after 33 yards. Further up the hillside is a depression marking a collapsed shaft, corresponding to the blockage in the adit. Various depressions can be seen up the hillside, leading to a more obvious line of filled surface stoping which ends at a collapsed shaft. Adjacent to the adit entrance is a wet depression in the hillside, perhaps another adit.

By following the line of workings down the hill to the stream, another adit can be found which has collapsed for some distance but still issues water. On the same bank of the stream, 200 yards to the north, is an open adit driven to intersect a vein. There is an open shaft just above the adit and a badly covered shaft further up the hillside. Another shaft higher up near the track has collapsed. The adit is 45 yards long in 3ft deep water, leading to stoping and an upper level before the shaft. It is possible that the last two adits were the workings known as Heathmynd Mine.

Leigh Level

Location - SJ331035

Minerals - Drainage Level

This was originally meant to drain East Roman Gravels, Roman Gravels, Ladywell and Grit Mines but it only reached to just beyond Batholes. The level entrance is open in a wood and a small flow of water issues. Tree roots are pushing out the arching at the entrance and this may cause collapse in the near future. There are small shafts offset from the level at 350 yards and 750 yards from the portal but both are filled to surface. There is believed to be another air shaft south of these but it has not yet been located at surface.

The level is completely blocked at 1,100 yards by the infilled Blue Barn Shaft. Milne Shaft near Batholes was capped with concrete in 1967 but there are local rumours that there is a stable block at the bottom of it. There is bad air in this level and recent exploration has only been possible with breathing apparatus.

Nipstone Mine

Location - SO354969

Minerals : Barytes

Nipstone Level is on the west of the road with a large tip. It appears to be used as a water supply but it was described as collapsed on previous visits. It has been explored for 100 yards to a stope, in which the water level used to fluctuate by at least 60ft. This was surprising since the workings are drained by the Boat Level. The stope was descended during a dry period and a drop of 40ft led to a rubble slope ending in water, the chamber at this point being 15ft wide and 60ft high. The water was dived for 20ft to a 5ft square level leading off.

To the east of the road is a deep opencut but no apparent adits off. Further south is a collapsed adit.

Norbury Mine

Location - SO359943

Minerals : Copper

Old maps show 3 shafts to the west of the track near Clapper Farm but there is no obvious trace other than various areas of gruffy ground. A local shepherd had no knowledge of the shafts, which were visited by E C Gray in 1921, but knew that copper mining had taken place in the area. To the north-east, on the other side of the track, there is a collapsed adit where a few pieces of barytes were found.

Murchison refers to workings at Norbury in Palaeozoic slaty rocks and Dines also refers to such rocks but Norbury Hill is clearly composed of red Longmyndian sandstones. Greig et al have suggested that these descriptions may refer to workings in Shuttocks Wood. It is most unlikely that Murchison would describe these distinctive sandy rocks as Palaeozoic slates. The mystery remains unsolved.

Shelve Mine

Location - SO339991

Minerals : Lead

A large spoil heap marks the site of More Shaft, sunk as a trial between the wars. It has completely collapsed. To the north-east is the silted up entrance to a stone arched adit with a long spoil tip, which may have drained the workings. It was open in 1964, when it was found to be filled to within 30" of the roof with thick grey mud and was not fully explored. An air shaft to the south-east, on the other side of the track, is collapsed.

Shelve Pool Mine

Location - SO332979

Minerals : Barytes

The shaft and both adits are blocked.

Shelve Trial

Location - SO331986

Minerals : Lead

There is an open adit with a concrete step and 3ft deep water behind. It has not been explored.