

# CAT

The Newsletter of the Cumbria Amenity Trust  
Mining History Society

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Dinorwic Quarries. The cloud lifted and the sun came out! CAT meet, April 2019.  
Photo by Michael Oddie

# **Cumbria Amenity Trust Mining History Society**

## **Newsletter No 135, May 2019**

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## **Editorial**

I include this piece, written in newsletter No 16, April 1987, by the then editor Alen McFadzean.

'The A.G.M. is over and the dust has more or less settled for another year. Several members lobbied quite passionately for the continued production of the Newsletter in its present form, maintaining that if funds could not cope with the printing costs, members' subscriptions should be raised accordingly. This was put to the vote and carried. Faith in the paranormal wholly restored I set about my Cumbrian gammon steak with vigour. The arguments from the floor had been as sound as a brass knocker:

"We must never let it slip our minds," they said, "that up to 80% of our membership do not go underground, do not use our tackle, and are only in the society for the information which drops through their letterboxes."

So true! Cut back on the information and you isolate a sizeable majority of the membership, many of whom are already isolated geographically. In my own experience I have seen several caving/mining groups collapse into ruin and in every case a major contributory factor has been the breakdown in communications, the lack of consideration shown by the nucleus of the society for the non-active members. Thankfully we have not fallen into this trap; our publications continue to appear and, consequently, the society continues to flourish. That, then, is the main reason for financing a newsletter.

Another important reason, and one which again concerns our silent majority just as much as it does the hard core, is the need to provide a medium in which the results of mine exploration and research can be made available on a regular basis. Knowledge is power, someone whose name escapes me once said - I don't know about power but I can vouch that it can be damned useful at times. Unpublished research is no use to anyone and never will be.'

As true today as it was in 1987!

**New members.** Welcome to:

Daniel Whiteford, from Newburgh, in Fife. Danny is looking to 3D scan a chamber in an old lead mine and is seeking information or advice.

Adam Walton, from Penrith. Adam is a Trainee Mine leader.

Costas Andreou, from Lamplugh, in Cumbria.

Iwan Fletcher, from Wythop Mill, Cockermouth

Celia Burbush, from Cockermouth.

Celia joined because, as an artist, she has recently started to record the sites of old mines in Cumbria. She is interested in the way these mines, and the history and traditions of the mining communities are as important to Cumbrian identity, as the landscape itself.

## **Public Liability Insurance and BCA Cards**

Since there has been some discussion among members about the issue of BCA insurance cards, and when they should arrive, the following notes are intended for clarification.

CATMHS's Membership year runs from 1<sup>st</sup> November to 31<sup>st</sup> October, meaning members are expected to pay their subscriptions on the 1<sup>st</sup> November or immediately afterwards.

The BCA Public Liability Insurance year runs from 1<sup>st</sup> January to 31<sup>st</sup> December, meaning that if you have renewed your CATMHS Membership by 20<sup>th</sup> December by paying your subscription, then even though the BCA has not actually received the renewal premium, you have insurance cover for the following year. Please note: - **the fact you have issued a cheque for your subscription is not payment of that subscription until the cheque has cleared through the banking system**, which is why payment via the website is encouraged, since as soon as you make payment via PayPal the money is received by CATMHS.

The Treasurer details all those who have renewed at 20<sup>th</sup> December and makes application to the BCA for PLI cover both for the Society and for those individual members. These members should receive their cards in January.

Those renewing after 20<sup>th</sup> December have insurance as soon as they have made payment. However the Treasurer only forwards renewals to the BCA at the end of each calendar month; so late payers may well not receive their BCA cards for 6-8 weeks after their renewal. Should you fall into this category and are in any doubt about your insurance status then don't hesitate to contact the Treasurer, who will be able to confirm receipt of the renewal subscription.

If you are renewing using cheque or cash to renew membership, you are **strongly recommended** to do so well before the 20<sup>th</sup> December deadline.

## **Lambton mine plans**

As reported in NL 131, through the good offices of Julian Lambton and Peter le Fleming we have been allowed to copy five historic mine plans of Coniston, Tilberthwaite and Skirwith, belonging to the le Fleming family, first discovered in a metal tube in the cellar of Carter Jonas, Land Agents to Rydal Estates. As they were scanned in very high definition the file size is very large, difficult to store or to transmit. We have therefore had full size paper prints made of each plan, in effect a facsimile, and these have been deposited in the CATMHS archive at the Armit Museum and Library in Ambleside.

## **Eric Holland collection**

Mo Holland has passed on to us more documents from Eric's collection, consisting mostly of memorabilia, documents and plans from Hodbarrow and other West Cumbria mines. There is also a collection of ephemera from Greenside mine, including some interesting historic photographs. Thank you Mo.

## **Lake District Mines Forum. Threlkeld National Park Office, Feb 22<sup>nd</sup>.**

Present: LPDNA: Eleanor Kingston, Environment Agency: Liz Withey, Hugh Potter, NAMHO: Peter Claughton, National Trust: John Malley. Coniston History Society and Honister Quarry: Alastair Cameron. Honister Quarry & Threlkeld: Donald Angus, CATMHS: Warren Allison, Ian Matheson and Mike Mitchell. Coal Authority, three delegates.

### **Updates:**

#### Coniston Copper Mines

The Coal Authority is working with the Environment Agency regarding diffuse pollution and its effects on the water course. There is to be a drone survey of the area and a hydrospectral survey. This should determine the mineral pollutants in the water and locate their sources. Once the results are known targeted work will be carried out.

Alastair Cameron reported an Extreme Weather Event that took place at Coniston and Tilberthwaite last October, causing minor damage and washout.

#### Force Crag

John Malley reported two instances of attempted forced entry. The experimental water treatment plant was removing 80-90% of metals. However the target of 3m/sec was not being achieved, 2m/sec being the norm. They are considering ways to improve the permeability of the material, perhaps adding gravel. The system only copes with dry weather flows from No 1 Level. There are probably about 2/3 tons of zinc in the lagoons with traces of cadmium and lead. This will have to be extracted at some point in the future.

The crown hole above Level 0 is discharging again. If the problem of surface water entering Level 3 was solved then this should stabilise. Delay in tackling this work, which was agreed to be carried out by CATMHS, is due to legal and technical problems regarding accountability for potential problems in the future. It is hoped that the Coal Authority will take over responsibility.

A conservation management plan for the whole area is to be prepared. Warren Allison suggested that the NT might purchase the rail that CAT bought when the mine closed and reinstate it outside No 1 Level. The rail is stored at Ashfell Farm, Ravenstonedale, and is now surplus to CATMHS requirements.

#### Greenside

The John Muir Trust is taking a lease of the area, but most of the mine is outside the area of their lease. The LDNPA are talking to the JMT. Warren Allison is to conduct a field trip for the John Muir Trust in May on the occasion of their AGM.

#### Greenburn

Alastair Cameron reported that some dressing machinery, probably the base of a set of stamps, had been exposed by water flushing during work on the hydro-electric scheme in the valley.

#### Goldscope

The Elizabethan(?) dam at the head of valley had been damaged by storm Desmond. The NT has carried out repairs.

#### Tilberthwaite

A report is imminent on the Tilberthwaite Mine survey for the Coniston Copper Project. Conservation work has now been completed.

#### Threlkeld

Donald Angus reported that repair work to Blue Dam and Yellow Dam has been completed. A penstock has been installed to control water flow and a catchment for the outflow provided. A site has not yet been chosen for a prospective treatment plant.

#### Honister

The Alastair Cameron and Liz Withey book on the history of Honister quarry is due out soon. Income from Honister is increasing year on year, 55% from manufacturing, 45% from tourism. A long term resource of dark green slate had been obtained by developing Kimberly No 5 level.

Use of tramways to move materials is to be discontinued, all future movement of materials will be carried out by front end loaders or dumper tucks. A new computerised saw has been installed and most of the polishing machinery has been replaced. The lease expires in 2042.

Two mine tours are currently available and an underground climbing facility is envisaged. There has been trespassing by individuals abseiling into the mine. Eleanor Kingston raised a concern that an emphasis on so called 'Adventure Activities' might take over from Heritage. Donald Angus said he thought that he was the only guide who talked about history on his tours; a new automated self-guiding system to be installed might lose even this. Honister is to re-apply for their zip wire project.

#### Coniston Copper Project

This project is coming to its conclusion. Approximately half of the Heritage Lottery Grant has been spent on conservation and half on education, local involvement and interpretation. Conservation work should be completed by the end of March. Contingency money has been used to stabilise quarry closeheads and buildings above Penny Rigg mill. Deep Level entrance will be stabilised unobtrusively by installing a drain and repairing the portal. Mike Mitchell asked if a footbridge could be placed across the beck below Deep Level Adit. Ian Matheson asked if ivy could be removed from Miner's Bridge, but apparently it is outside the area of the Project and special permission will have to be obtained from the owner.

A celebration event will be held in May. Two publications are being produced, one on Tilberthwaite and one on the researches carried out by volunteers. There is to be a computer model of the Bonsor Dressing Floors circa 1850. Donald Angus pointed out that similar models on lime kilns and on the Yew Crag incline could be found on the LDNPA website.

#### Other business

Concerns have been expressed regarding the condition of Yew Crag Incline. It was suggested that it might be scheduled. Alastair Cameron said that he had put the results of his enquiries regarding cave pearls on the CATMHS website.

#### Water Environment Grant.

A Water environment grant can provide up to 100% funding for improvements to water status in rural areas. Phase 1, which expires end March has £9m; a prospective second tranche would provide a further £11m. This is European funding to deal with problems such as those at Goldscope or level 0 at Force Crag.

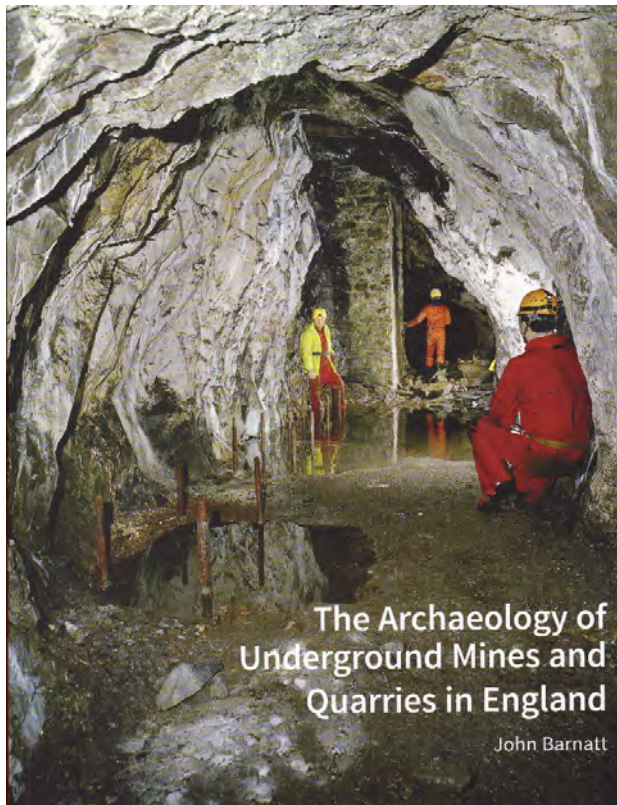
The next Mines Forum meeting will be held on June 26<sup>th</sup> at Coniston.

#### Book review

### **“The Archaeology of Underground Mines and Quarries in England”**

**John Barnatt, Historic England**

ISBN 978-1-84802-381-9. 136 pages £24



As I suspect the Newsletter Editor would observe, “Let’s get the Rant over at the very beginning”.

It would have been much better if a book of this quality had covered the British Isles rather than England alone; obviously “Historic England” cannot publish a work which includes Wales and Scotland but surely some collaboration with the other two historical bodies was possible, since for all of the relevant time period the mining and quarrying industries worked over the whole land area without differentiation, as I suspect do modern industrial archaeologists and mine explorers.

No English resident is going to refuse to visit Dinorwic because it’s in Wales! (On the other hand the author’s “Freedom Pass” was declined by the bus driver at Pen-y-Pass due to his non- resident status).

Enough! This is a high quality work, physically the binding and printing are first class, which is rarely the case nowadays. The selection and reproduction of the photographs is excellent and the text equally good, with ample footnotes. There is a comprehensive glossary of technical terms, an Appendix on “Access and Making Contact” and a very comprehensive Bibliography. Highly recommended.

John Taylor

**Coniston Deep Level, adit, bridge and water wheel.**

Phillip Johnson is continuing his project to restore the Sawmill waterwheel on his property at the Bonsor Upper Mill, adjacent to Deep Level.



The Coniston Copper Project has been finished but work is in progress to reinstate a footbridge over Red Dell Beck near the Deep Level Portal. The portal was damaged by a landslip in 2013 and is to be gated and repaired once the bridge has been installed.





## Greenside Mine trip, 20th January

Warren Allison (ML), Jim Cannell, Alasdair Roberts, Steve Sim, Robert Gurr, Magnus McIntosh, Rosemary Vidler, Mark Willey and Liz Withey.

After gathering everyone up in Glenridding, we got into as few cars as possible and drove up to the mine. Once people were kitted out, a brief resume of the day's trip was explained, including that this was not a race and there was plenty of time for everyone to do what they wanted to. I cannot spend enough time at what is without doubt my favourite place, due to the family connections with the mine and parish.

Opening the lid to the Lucy Tongue Level (the miners always called it the Lucy Level), we dropped down into it. Questions were soon being asked as we slowly made our way up the level as to what the timbers at various points were. These were originally installed to carry the bare electric wires for the first electric locomotive in a UK metal mine (which my Great Grandfather drove for most of its working life). However today was going to be quite special, as two of the original conductors, which I purchased off Ian Tyler when he closed the Keswick Mining Museum, were to be reinstated on one of the original timbers.

This was going to be easier said than done, as it was difficult to find a timber where you could get your hand on the top to put the nut on. However, Jim found the perfect timber right at Bad Uns Drift, where apparently the surveyor got his calculations wrong and took the level off in a totally different direction. After a little while the conductors were installed on the original timber, and mighty fine they look.



We carried on up the level and eventually reached the site of the first and second digs, which CATMHS and MOLES undertook in 1992 when the level was re-opened. Explaining how we cleared these falls, it brought back memories of Pete Blezard and myself lying in the water coming over the top of the falls, plugging the holes in the roof where timber had rotted allowing debris to fill the level. The digging team had taken a gas detector in as well as oxygen bottles as, from memory, the oxygen levels were down to around 12%, but no other nasty gases. Us smaller people seemed to cope, but taller folk soon had a headache.

Fall three was reached and it never ceases to make one wonder how much effort went into clearing the forty yard fall and I can still remember certain moments as if they were only yesterday. Two in particular were when Pete Blezard had gone skiing and left instructions that the legs had to be placed at three feet centres. We thought he wouldn't notice if we pinched a bit and put them at four feet. Boy, did we get into trouble when he got back. The second one was when we had to drill holes by hand in a large boulder so we could plug and

feather it to split it. I wanted to see what it was like doing it by candle light, just as the old men would have done, but for some strange reason no-one took up the idea.



Passing falls four and five, we arrived at the High Arches, where the level had been stone arched in a very similar way to the Pennines. Trying out the Christmas present of a new helmet and lights, some of the photos did not turn out too bad, but more practise needed.

### *High Arches*

Soon we arrived at the flooded stope at the Lucy Shaft, some three-quarters of a mile in and people started taking photos of it, which is very difficult to do. Carrying on, passing the side-drive used for the chemical toilets for the scientists who came from Aldermarston at the end of the 1950's (more about this later), we came to the sixth fall which was dug through at

the four-way junction on Warsop's crosscut ending at Smiths shaft. Here I explained about the original electric winding engine and how Warsop's crosscut was the first in a Lake District mine to have been driven by compressed air, after the directors of the company had been to see them in use on the Thirlmere Aqueduct.

According to Sam Murphy in his book "Grey Gold" my Great Grandfather took the contract to take away the first lead ore that was brought up the shaft with the electric winder. Someone decided that as it was well after noon, it was time for lunch, but there was time to take photos here and not just of the level and shaft, but of the artefacts still left.



*One of the fire buckets*



*Cigarette packets*

Once lunch was finished, we cracked on and soon stopped to look at the area which the company hired out to rock drill companies to test their new drills, before arriving at Hicks sump where the level widens out considerably. After passing through the water coming through the roof of the stopes from surface (at this point you are directly under the large

collapses on surface), we passed Shaw's sump, with the ladder still going down into the inky depths of the flooded manway. There is a lovely piece of the vein still in place here.

People were now spread out along the level as they took photographs, but this was not a race to cover as much ground as possible, but to take our time. The ones at the front had stopped where the level has a branch which takes you to what is now called the "blue lagoon", a flooded stope where the water level is well below the Lucy level. Again, out came the cameras as I explained how many years ago, excited by the sound of water dripping, a group of us put a dinghy into the stope thinking we could get a long way under the level, possibly as far back as Hicks sump. Alas, it was to no avail, we were stopped after about 20 yards, where the roof of the stope came down to meet the water.

Carrying on, we walked down the bypass tunnel to just before the Alma stope, where there was a branch off to the right for about forty yards to a forehead which had a block of concrete in the floor. This was apparently used to stand the seismic monitoring equipment on when the tests were being carried out by the Atomic Weapons Establishment at Aldermaston at the end of the 1950's, which proved the theory that a nuclear explosion could be hidden and so the test results (non-nuclear) meant that America and Russia did not sign the nuclear test ban treaty.

Passing the hoppers serving the Alma stope, which was used in times right up to the end. For example, when maintenance was being carried out to Smiths Shaft, ore could still be brought out of the mine, as the stope was above the Lucy Level. We arrived at the shaft which is the route down from the Glencoyne Level and although the Lucy level continues for about half a mile, we did not proceed any further as the air is very poor. The reason for the extension of the level was that the company intended to sink a single shaft down to the lower workings so everything could be brought up in one lift, but although the geologists had said the Skiddaw Slates would come in at 300 fathoms, when the vein would pinch out, they actually came in at 237 fathoms which spelt the end of the mine.

Starting the journey back we stopped off to look at the side drive near the Alma which goes to past collapsed hoppers and a level in the stoping. Here there are remains of newspapers probably dating back to 1960.



Walking back down the level we stopped off to visit the part of a stope above the Lucy Level, which even now is still awe inspiring. The last area we looked at was the compressor room near Warsops crosscut with artefacts still in place. The chamber was shot

out in the 1930's by the Basinghall Mining Company to install electrical switch gear to power

the air compressors and other equipment. Two miners, Jackie Coulston and Cyril Conner (his father was one of the managers) carried out the work. I have some colour photographs taken when the mine was working, including some of the compressor room, and it is easy to see where the switch gear was located.

I knew Jackie and others who worked there and should have recorded their memories, specially my uncle's, but have started to do it with my Mum who was the wages clerk at the mine and was the person who got me interested in mining.

We now started the slow walk back to the entrance after a very enjoyable day with good company. It made those of us who have been along the Lucy level many times before realise that there is still so much to see and photograph; some of those taken on the day by various people are superb.

Warren Allison

### **BAIML at Greenside Mine**

A friend of Liz Withey organises various activities for the British Association of International Mountain Leaders (BAIML) to enable them to keep their qualification, and part of this is about understanding and interpreting the landscapes they are working in. Liz and I were asked if we could organise a surface trip to Greenside, which was arranged for Saturday 2<sup>nd</sup> March.

We met in Glenridding on what was, a sunny day and then travelled up to the mine. We spent nearly an hour discussing various aspects of the site, many questions were asked and answered.

Moving on we walked up the old incline to the bottom section of the crushing plant at Low Horse Level but stopping several



*The group just before we set off*

times on the way to point out and talk about the various features in the landscape. The group were truly amazed at how every piece on the Lucy and Low Horse Level dumps had been picked up by hand or on a shovel.

Arriving at the point where the incline is exposed, it gives one a very good impression of how the land is being reclaimed by nature. Walking on we got to the drum house and made our

way up to the waterwheel which powered the crusher, and then on to where the bridge used to come across from the Low Horse Level on the other side of the beck, where we stopped for lunch. The idea was to have a short trip into the level, but the previous night rain had filled the level to over knee deep and so we beat a hasty retreat.

Arriving at the settling ponds for the mill at Top Dam (local name for the reservoir at the High Horse workings), they were all starting to see features in the landscape left by mining. Walking on we stopped at the bridge and this gives a superb view of the collapses on the vein where, on a Sunday in 1862, 120,000 tons of rock which had been undermined fell through the workings, but no-one was in the mine at the time.

Walking round to the High Horse Level, the sleepers for the tramway were pointed out and one person remarked “we would not even notice them before today, but now we have a better idea of what we are looking at”. At the level I described the conditions of the lodging house on either side as reported in the 1842 Royal Commission report where it stated, “they were not fit for swine to live in”.

We walked up to the lower of the collapses and had a look inside at the remains of drill holes and galena which had been left, but the memory they took away was how big the hole was and that the work had been done by hand. The weather had now taken a turn for the worse, it was raining, getting quite windy and the cloud was coming down, time to get back to the cars.



On getting back to the cars, people remarked how much they had enjoyed the day and had learnt so much. It was one of the nicest groups that I have met and to finish the day off we ended up in a café in Glenridding with the rain still sheeting down, but it did not put a damper on what had been a superb day.

Warren Allison

### **Goldscope Mine photography meet, 24<sup>th</sup> February.**

Liz Withey (ML), Mark Hatton, Dave Donkin, Jim Cannell, Alasdair Roberts, Clare Harvey, Alistair Cameron, Kevin Crisp, Lorraine Crisp and Warren Allison.

This was the fourth photographic trip which allows members the time to hone their skills without feeling that they have rush to keep up with everyone else. Meeting at the bridge below Little Town on a beautiful sunny day in very unseasonal conditions, we made our way up past the lovely Newlands Church and onto Goldscope Mine which is one of the most intriguing and interesting sites in the Lake District.

Gathering at the bottom of the lower spoil heap, there was much discussion about the history of the mine and why the upper spoil heap overlays the lower one in the way it does, but that is for another article. We slowly made our way up to what is known as the “Grand Level”, where more discussion was had in the sunlight, with stunning views up and down the valley. After donning helmets we made our way into the level, with Warren at the back, who was busy photographing the structures in the floor at the entrance, where there is a course of walling in the shape of a square with a wooden floor and a launder which captured the water exiting the mine.



*Launder*



*Square stone structure*

Arriving at the wheel pit chamber which is probably one of the finest sites in a Lake District mine, people were very busy setting up their cameras trying to get a photograph of the beautifully carved wheel pit, the wooden staging and mineralization. It is hard to imagine how that the wheel pit has been carved by hand, never mind the level driven some 247 yards from surface, quite incredible.

On leaving the mine, we found it was after noon and some stomachs were starting to rumble. However, we decided to traverse the fell and then head up to the top of the copper vein to where Mark had led the first part of the group. The surface workings, which are flooded, are fascinating; some of them have intricate hand chipped gutters to take the water away. Mark led us down a well-engineered track to where the copper vein at surface had been extracted to form a huge open stope which descends through the wheel pit chamber and below, here were the remains of a coffin level, with only the floor and some of the sides remaining. It is hard to comprehend that this was done by hand. Alistair was already at the area where the water from the dam about a mile up the valley was taken by a leat and into the mine onto the top of the waterwheel. It was here that we lunched before some of us moved onto Sealby's level further

up the valley, leaving Mark to rig the pitch at the end of the level, with Clare keeping a watching eye.

Passing the “Great Crush” where the Lead vein had come to surface and collapsed, there are the remains of the waterwheel pit which powered the pumps and haulage carved into the solid rock. Goldscope was effectively two separate mines, one for copper and one for lead. (At different periods Ed.) It was at this point that Warren mistakenly pointed to the spoil heap on the fell side and said that was Sealby’s. Arriving at the entrance, we descended underground into water which was over welly depth and soon ended in a collapse. On exiting Warren, who had been up to the German working above the level, apologised and said that we needed to traverse the fell to the correct level.

Arriving at Sealby’s which was also known as being driven on the Sandy Vein, it was noted how much the rock had changed and walking up the spoil heap was like walking on sand. There is much interest in the level, from the mineral formations to the wooden rail, various wildlife, etc. We descended to the leat and walked back to where we had lunch, meeting the other members exiting the level. It was decided that we had to go and look at the bucking stone that Mark had found last year just below the main track to the mine.

Arriving back at the cars just before five pm, there was much congratulation as to how well the day had gone and everyone was looking forward to the next photographic meet.

Liz Withey and Warren Allison

### **SRT Rope Rescue Techniques, 10th February**

A day designed for members who have SRT skills and experience, aimed to develop strategies to overcome potential problems on climbs and pitches. CATMHS contributed to the cost of providing the course, but there is no report of the proceedings. For the record, this was taken from Facebook:



‘I think everybody will agree we all had a Brilliant Day! with a

good amount of humorous moments thrown in for good measure 🤔 although having your rope cut whilst dangling was no laughing matter 😊 a BIG thanks to [Graham](#) for his super pro attitude as always towards teaching us some potentially life-saving new skills. A few more lessons and we’ll be ready for the COMRU initiation Ceremony 😊 Jason Atwood.’

## Welsh Weekend at Dinorwic, 16<sup>th</sup> and 17<sup>th</sup> March 2019

Meet leader Michael Oddie, Bob Mayow

The weather forecast was pretty poor and this put a few people off. Unfortunately, Charlie and Sue that were coming had to cancel due to a knee injury. This did leave a non-refundable bed and breakfast available that the meet leader was very grateful for and would like to offer his thanks again, as it afforded me greater comfort than the planned campervan.

### Day 1

Bob met me at the hotel Saturday morning due to the fact the meet leader's wiper motor had decided it didn't want to wipe anymore. Owing to the weather we opted for a few things instead of the planned Dinorwic surface walk.

We started with RAF Reserve Depot (or Bomb Store) The Air Ministry got approval to use the disused Glynhonwy quarry for the storage of 18,000 tons of explosives. The building had a concrete roof installed with various bays for storage. A branch line from the main railway leads directly via a tunnel into the complex where the bombs were unloaded under the cover of darkness. We spent a good hour looking at the large lifts, storage areas and the 'emergency' back door tunnel.



Rumour has it that half of the complex collapsed under the weight of the spoil on the roof and the bombs had to be removed via a back tunnel and craned up a shaft. Myself and Bob traced this tunnel and found it led into various other workings that I had explored on a previous occasion. This was nice for the meet leader to link previous explores with this one.



Next visit was a tunnel I had spotted on the way into Llanberis that I wanted to investigate. This turned out to be the main railway line tunnel that has since been extended to pass under the main road. Nice brickwork arching was noted.



With the weather getting worse we then opted for the Slate Museum. Unfortunately we found that this doesn't open on Saturdays owing to the fact it is run by volunteers. The meet leader then directed the driving Bob up to the Dinorwic Quarry Hospital. This is a small private road and we were swiftly followed by a park ranger in his 4x4. The meet leader smiled nicely and explained we were very wet and wanted a little look around and assured him we would only be parked for a short while. The Ranger kindly agreed, so me and Bob set off to explore the Vivian Quarry and Incline. We headed to the higher drum houses and made our way down the miner's path, stopping to admire the workmanship of the various, steps, riving sheds and weighbridges. We had a good look around the open Vivian Workings and chatted to the divers that agreed we were wetter than them!

We ended day one in a Pub that Bob wanted to show me. Refreshments were taken before heading back to the Hotel to enjoy the rugby and the fine Welsh Ale!

## **Day 2**

The Sunday started with better weather, so we drove to the highest point available to the public and headed into the Quarry. We entered Dalis Hole and marvelled at the height and depth of the first quarry. We by-passed the chain climb as there was only the two of us and headed into the hidden tunnel that leads into Australia. This is probably the largest of the many quarries in Dinorwic and its scale is beyond comprehension. Wagons and rusty lumps of metal litter the quarry floor. We scaled the loose slate scree slope to a flat working area full of blast shelters, riving sheds and small unknown buildings. Next comes the old miners access ladders, these are



pretty wobbly and very high, so lots of care is needed. A short breather at this point before heading down to the Lost World.

At this point the meet leader was winging it a bit (I hadn't been to this section before! HA) but we found the abseil point and I plunged over the edge. Time was pressing on, so the meet leader assessed the further abseil points before returning to Bob, who was standing guard at the pitch head. The weather deteriorated on the ascent and the meet leader returned to Bob in a full-on blizzard!!!

Discussions were had about returning the easy way back to the car, but Bob was enjoying himself so much we decided to press on!

We pushed on up to the large abandoned cutting sheds that fortunately had been cut off by quarrying in Australia, meaning the scrap men could not access this area easily. Twenty plus cutting tables sit in eerie silence with the riving compartments sitting opposite them. One can only imagine the noise that would have been ringing out during the place being operated.



We pushed on to the top where we met the access road to the Hydro Electric top draw off pond. Continuing on we rounded the top of Australia in blizzard conditions; we were a little cold and decided to take shelter and food for a moment. During our brief rest the snow stopped, the



cloud lifted, and the sun came out! (See cover pic. Ed.) We were then treated to the most beautiful panorama of the whole of Dinorwic, certainly a treat!

Rejuvenated we laughed and joked all the way back to the car and discussed the amazingsness of this stupendous quarry. Thanks to Bob for driving and being great company.

Michael Oddie

## **Notes on establishing a copper mining industry in Cumberland during the reign of Queen Elizabeth 1<sup>st</sup>.**

In Newsletter No 134 (February 2019) the transcript of the debate that had taken place over Christmas, of the early years of the Elizabethan working of copper ore in Cumberland, was included by the editor. The excellent article by Mark Hatton giving his opinion of the history of the site was also included.

The notes below are slightly different! Since January work on this subject has progressed considerably. Over past years a lot of myths and incorrect assumptions have been made and written up in the literature on this subject and part of the recent work has consisted of trying to correct some of this data. We are progressing with this, but, first, we decided to have a quick look at the origins of this phase of the industry

Our story starts in November 1558 when, on the death of Queen Mary, Elizabeth succeeded her to the throne, at only 25 years old. Despite her young age she had been very well educated and was well versed in the issues of the time. Within a few months she had obviously drawn up a 'to-do' list, which included the urgent need to make her realm self-sufficient in essential minerals.

Queen Elizabeth could speak several languages and within two years had started discussions with "German" mining specialists in Bavaria. By 1564 two skilled mining experts, Hechstetter and Lomer, accompanied by twelve skilled men, travelled from Bavaria and arrived in Keswick after a long and arduous journey. Keswick must have seemed to them to be a huge step-back in time! In our research we have realised that, in engineering and production techniques at least, they were well over three hundred years ahead of those of the British Isles. These guys started work almost immediately on their task.

Their first job was to examine a number of sites in the locality where ore outcropped, and very soon ore extraction was taking place at several of them, including Scope End, Copperplate and Salt Well mines. Part of the extensive time-line which we developed relating to this era is reproduced below.

Generating quantities of copper ore was clearly of little use without good smelting facilities to process the ore. And so, by 1567, a further group of men had arrived from Bavaria, skilled in the design and operation of copper smelters. This created a team whose knowledge of smelting techniques was far more advanced than anything that had been seen in Britain before.

Records show that by the year 1568 they had started work to construct a copper smelter on the banks of the River Greta at Brigham.

The smelting process was complex. The control of temperature and time was clearly critical as was the blending of the ore at the start of the process to allow a certain level of 'impurities' to remain, such as sulphur. Records of the time show that this was critical to the successful completion of the process.

The type of smelter installed was a blast-smelter, where the ore and fuel (stone-coal and peat) were thoroughly mixed together before roasting started. The first design of smelter installed at Brigham would therefore most likely have been, technically, an open roasting-stall blast-smelter. Brief details of the smelter operation can be found scattered amongst the primary literature of the day, and much would have been translated from the 'althochdeutsch' language spoken at that time in Bavaria and clearly the language Hechtstetter and his team would have used to draft their operating procedures.

When I started last year to look at the smelter operation it seemed incredulous at first that this type of process could ever work without reliable process monitoring systems. Over several weeks I was scratching my head over the apparent lack of process control, but realised in the end that at least temperature control would have been covered by the expertise of the operators, who would be skilled at 'feeling' the level of heat coming from a roasting and possibly by the colour and appearance of the charge as well. But weight control was a huge puzzle.

In all present day production systems of this complexity, control of weight is essential. Without proper control the losses can be huge and businesses can close down as a result. So what did they do in the late mediaeval times?

There appeared to be no monitoring of weight of ore leaving the mining site, or records of stocks of ore subsequently. It was while looking at the costs paid for the transport of ore that I suddenly realised that there was perfectly effective weight monitoring; it was just that it wasn't measured in pounds, kilograms or one of the mediaeval other units of weights; it was actually measured in kibbles.

The output of the mine was recorded in kibbles, the quantity shipped down to the lake shore was also measured this way. The carters who brought the material down from the mines were paid by the number of kibbles carried, as were the boatmen who transported the kibbles over the lake in their 'Great Boats' (large flat-bottomed crafts). Finally, at the smelter, the batching recipe included the quantity of ore required per batch measured in numbers of kibbles. The basic recipe for the first of three roasting stages at the smelter consisted of ten kibbles of ore, nine horse-loads of peat and five horse-loads of 'stone-coal'.

It is recorded that the kibbles used by the Bavarian team at Keswick held 110lbs of ore in today's values; just about the maximum that could be lifted by a young, fit "German" lad. There was no need anywhere along the production line from mine to smelter for any cumbersome industrial weighing platforms. Operatives just had to count kibbles (and remember to accurately record the results!).

The process of smelting has also received a lot of attention and data translated from primary sources has been used where possible. Smelting appears to have been a three stage operation with a final refining stage, using charcoal, to purify the 'rough copper'. A diagram of the various stages is included.

At some point in about 1575 work appears to have been carried out to upgrade the smelter. Today this is not an unusual procedure for a new, complex piece of production plant. After a

five year period there are frequently modifications and upgrades required. And it's sensible for project teams to make sure finance is available at the initial commissioning to carry it out if required. There is quite a bit of evidence that this happened at this time.

During these early times records suggest that 'new smelter operations' were being introduced which might have been the basis for the upgrades, and the new operations may have been a change in design from a blast-smelter to a reverberatory smelter where the fuel and ore are kept separate rather than mixed together. Records show that this type of smelter was actively being developed in Britain in the 18<sup>th</sup> century, but who knows where the original idea came from, and the Bavarians, who were still streets ahead of the rest of Europe in this type of technology, could well have used it for the Brigham upgrade.

But what about Copperheaps? They were clearly a means of storing ore from the mine. The heaps at Copperheaps Bay were unlikely to be of ore that couldn't be used; in fact the heap photographed by Mark Hatton shows that part had been removed after the heap had been created, one assumes for use in the smelter at some point.

We know that dressed ore from the mine could vary in quality, in particular in the level of sulphur minerals. The old records also clearly show that a certain level of sulphur was required in the ore to allow the ore 'masse' to remain porous and 'breathe' after the first roasting stage had been completed, and some form of blending of ore is bound to have been required to allow this to happen. It is just possible that from time to time the blending of ores took place at Copperheap Bay because of lack of space, rather than at the smelter.

The storage of ore in heaps might have been a technique previously copied from the Bavarian smelting operations. In March I sent a copy of Mark's photograph of the heap at Copperheap Bay to a friend who was formerly from Coniston but now lives with her partner in Germany. They frequently drive down to Bavaria to spend long weekends at their holiday home and they have offered to take the image to one of the mining museums in the area to see what light they can throw on copperheaps. Still awaiting their reply!

Finally, for those older members of mining history groups, with little knowledge of European History, the text below on the amalgamation of Bavaria with its northern neighbour, Germany, is taken directly from Wikipedia:

*"When did Bavaria join Germany?*

*It joined in 1871.*

*When France declared war on Prussia in **1870**, the south states of Baden, Württemberg, Hessen-Darmstadt and Bavaria joined the Prussian forces (whereas Austria did not) and ultimately joined the Federation, which was renamed Deutsches Reich (German Empire) in **1871**."*

So the guys who came over at the request of Elizabeth 1<sup>st</sup> were clearly from Bavaria and not Germany. In fact Germany, as such, didn't exist then.

Alastair Cameron.

## Section of the Time Line drawn up demonstrate important events during the 16<sup>th</sup> & 17<sup>th</sup> Centuries

1550-1554

1555-1559 Elizabeth succeeded to the throne, aged 25, 1558

1560-1564 Discussions started with "German" mining experts in Bavaria, 1560  
Hechstetter, Lomer and 12 skilled men arrive at Keswick, 1564

1565-1569 **First group of sites identified including Greenhead Gill and Copperplate site, 1564 / 1565**  
**Work starts at Scope End, Copperplate and Salt Well, 1566**

The technique of level-driving introduced to Cumberland, 1567

Society of Mines Royal established, 1568

**Work starts on the construction of the Brigham Smelter, 1568**

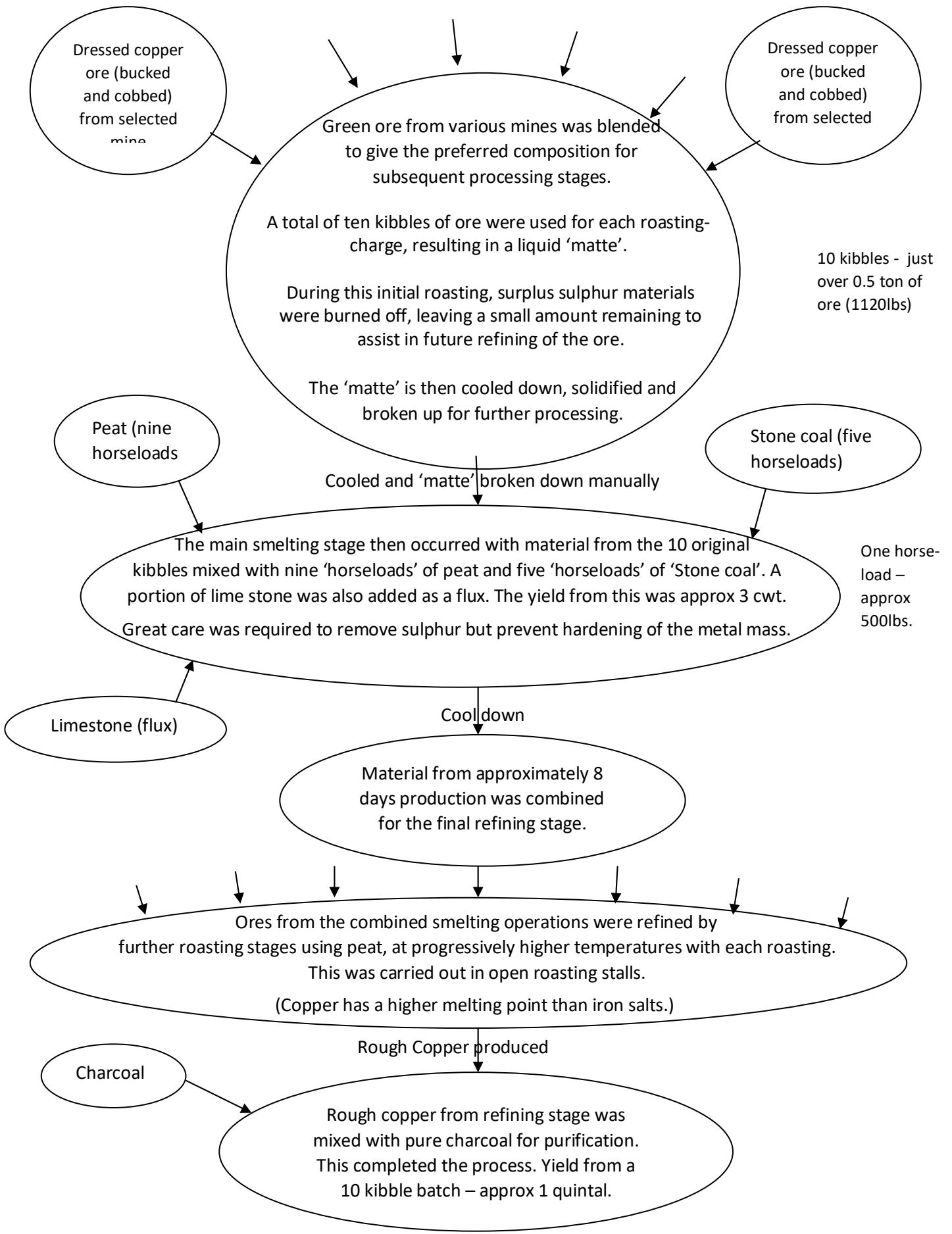
**Work started on driving St Georges Level, 1569**

1570-1575 **Work completed on the construction of the Brigham Smelter, 1570**



An example of a typical mining kibble used for hoisting ore up shafts and transporting it away from mining sites for further processing. Kibbles were also manufactured from timber. The type used in the Keswick area during the 16<sup>th</sup> Century would have been very similar the one shown here

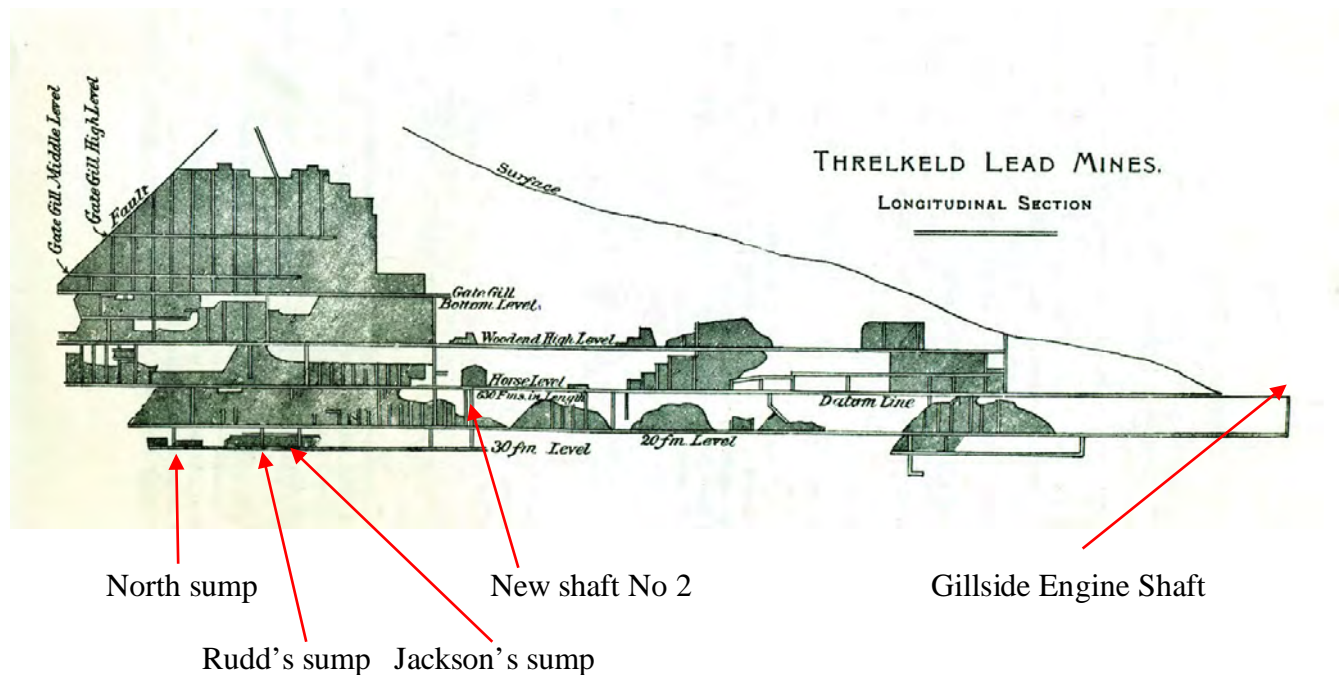
# Copper Smelting at the Brigham Smelter



## Reports into the re-opening of Threlkeld Mine

On recently visiting a second-hand book shop, I came across a booklet on the proposed re-opening of Threlkeld Mine, near Keswick. According to Ian Tyler, in 1913, Anthony Wilson was forming a company called Threlkeld Lead Mines Ltd, so presumably the extracts from various reports which are quoted will have been used to help raise the capital required. The mine was a large producer of lead and zinc and was reputed to have started in the Elizabethan period.

I had not seen the booklet before and thought that it might be of interest if it was transcribed and have also included a sectional plan of the mine from "Mines and Mining in the English Lake District" by John Postlethwaite, so the areas discussed in the report can be visualised.



**Threlkeld Lead Mines,**  
Threlkeld, Cumberland

### Extracts taken from Reports

MADE BY MESSRS, MATTHEW FRANCIS & SON,  
Halkyn Lead Mines near HOLYWELL.

Wm, H, Borlase J.P. M.E.,

Greenside Lodge, GLENRIDDING,

General Manager, Greenside Lead Mining Company

J. M. MORRIS, A.R.S.M., A.I.M.M.,

Salisbury House, LONDON, E.C.

W. BAWDEN, M.I.M.E.

Consulting Mining Engineer, KESWICK

W. H. BORLASE, JUNR.

Mining Engineer, THRELKELD



Extracts taken from the  
**Report of Messers. Matthew Francis & Son**  
Halkyn, Near Holywell  
April 22<sup>nd</sup> 1914

Messers, THE THRELKELD LEAD MINES, LTD

Dear Sirs,  
THRELKELD MINES

We inspected these mines on the 3<sup>rd</sup>, 4<sup>th</sup> and 15<sup>th</sup> inst.

The mine is situated at the base of Saddleback, a little under two miles from Threlkeld Station, on the C, K, & P, Railway and is served by an excellent road.

The property is commanded by two shafts, one sunk from surface to a depth of 20 fathoms, and the other, known as the New Shaft, sunk to 30 fathoms below the Horse Level at a point 400 fathoms from its mouth.

The most important ore body lies in the neighbourhood of the north sump..... The stopes both north and south of this sump carry Lead Ore and Blended to good value, as shown by the samples taken by Mr. Morris, and the Vein increases from a width of 6 feet at the top of the sump, to 11 feet at the bottom.

There is a nice run of Lead ore worth about two tons to the fathom in the sole of the level neat Jackson's sump..... We were told that this was 40 fathoms long.

The 30-fathom level has been driven along the Woodend Vein only, the eastern branch, or Gategill portion, being virtually intact for a length of 50 fathoms. A level has been driven for a length of about ten feet on this branch, and in it the Vein, although not to value, presents a promising appearance. Judging by the behaviour of the branch in the 20-fathom level above, it should certainly prove to be productive in this section, but until a level is driven upon it, we do not feel justified in considering it as ore in sight.

We saw nothing to lead us to believe that the Vein diminished in value in depth. On the contrary, at the northern end there appears to be an enrichment rather than otherwise.

From the above it will be seen that a fair amount of payable ore, probably about 12,000 tons, remains to be won between the 20 and 30-fathom levels, and this chiefly at the northern end of the workings. This, of course, is not a large ore reserve to commence production upon, and during the time the concentration plant is being improved and re-erected, we consider the following development should be carried out as expeditiously as possible,

1. To connect the detached portions of the 30-fathom level in order to reduce the cost of winning the ore already exposed.
  2. To sink the New Shaft and North Sump a further 15 fathoms, and connect them by a level at this depth after equipping same winding and pumping arrangements, which should be designed for a further depth.
- To extend the Horse level northwards, in order to prove the Vein beyond the fault.  
To drive the 30-fathom Level S, in order to intersect Ore Shoot No. 2.

To undertake this, we consider a working Capital of £10,000 should be provided.

All the work can proceed concurrently, and if compressed air drills and suitable pumps are installed, it should not take more than, say, six months to complete the sinkings, and considerably less to connect the ends of the 30-fathom level.

The feed of water which has to be dealt with does not exceed 6,000 gallons an hour, though the pumps now installed scarcely allow sufficient reserve of power.

Working Costs, exclusive of the charges for the development outlined above, should not exceed 13/- to 14/- a ton, provided the concentration plant is brought up to a capacity of 50 tons a day. The necessary foundations are already prepared, and you have practically the whole of the required material for the purpose on the ground.

Power is provided by an efficient 200 h.p. Crossley Suction Gas Plant generating electricity, which should be ample for some time to come, and the property is equipped with offices, shops, concentration plant etc., the latter, as we mentioned above, requiring re-modelling to give the best results.

In conclusion, we consider that in the Threlkeld Mines you have a property which we believe is going to prove a substantial success, and it is rarely been our good fortune to be called in to report upon one in which the risks have been eliminated to such an extent.

The lode has, in the past, yielded large quantities of ore, whilst considerable sections of ore ground are already opened out and waiting to be mined, and the presumption is that the development in contemplation will soon result not only in great additions to those sections, but to the discovery of more important deposits of ore, and having regard to the economical conditions of working, the comparatively small feeder of water, and the ruling high prices of metals, they should be won at a very fair profit.

Yours faithfully,  
(Signed) MATTHEW FRANCIS & SON,  
J. L. FRANCIS A.R.S.M., Assoc. Inst, M.M.

Extracts from  
**Report by Mr. Wm. H. Borlase, J.P., M.E.**  
Greenside Lodge, Glenridding  
(General Manager, Greenside Lead Mining Co., Ltd.)

September, 1913

#### THRELKELD LEAD MINES

The 30-fathom level is extended about 180 fathoms North of No.2 shaft and Jackson's Sump from the 20-fathom level is connected therewith. The North Sump is sunk to the base of the 30-fathom level, but as the level is not far enough North there is no communication effected. A level is driven South of this Sump within 28 fathoms of accomplishing this object, but work was suspended before this important work could be done, and I say, without hesitation, had this work been done, the mine would not have been stopped, as it would have given direct communication with No 2 Shaft, a most valuable section of ore ground, estimated to contain 20,000 tons of ore stuff, containing 15 per cent ore.

Provided sufficient capital is available for properly laying out the mine for an expeditious transport of the stuff underground for a continuous output of only 70 tons a day, say 1,800 tons of Crude ore per month, and taking 13 per cent. as the mean content, I estimate a working profit on this output should reach from £700 to £800 per month after paying development costs.

I am sure there is not another Lead and Blended proposition in this country offering such elements of success for such small outlay, and I have every confidence in the property increasing its production if the development is vigorously prosecuted.

Extracts from

**Report by Mr. J. M. Morris, A.R.S.M., M. Am. Inst.M.E., A.I.M.M.,**  
of Salisbury House, London, E.C.

7<sup>th</sup> November, 1913.

#### THRELKELD LEAD MINES

The principal portion of the 20-fathom level has been opened northwards from the new shaft. The shaft is an internal one sunk on the dip of the Lode from the plane of the main or Horse Adit, and is situated 2,200 feet North of the entrance to this level.

At the new shaft the Lode begins to show greater indications of productiveness, and generally speaking increases in width and value up to the north Sump, a distance of 1,250 feet north of the shaft. The Lode . . . . . thickens very considerably by the time it reaches the North Sump, where it is 12 feet wide. It also appears to be wider at the bottom of the North Sump than at the top. This stretch of lode, assuming it to continue at its present size and value in depth, would suffice to feed a dressing plant capable of handling a minimum of 50 tons of crude ore a day. It should be possible to win a much better grade of ore than was formerly the case, but this can only be achieved by the provision of ample development.

With a minimum of 18 months ore ahead and a dressing plant capable of handling, at any rate as a beginning 50 tons of crude ore daily, the Mine shows every promise of giving a very fair return on a reasonable capital.

Extracts From

**Report dated 2<sup>nd</sup> Oct., 1913 by Mr. W Bawden, M.I.M.E.,**  
Consulting Mining Engineer, Keswick.

#### THRELKELD LEAD MINES

On the opposite side of the Mill is laid out a Terrace form of floors ready to be roofed over and to receive duplicate washing plant. Much of these requisites are now on the Mine to be erected, and when completed a further 30 to 35 tons of crude ore per day may be washed, equal to 65 tons per day . . . . . The largest output in one year was 770 tons of lead and 1,066 tons of Blende ore. This clearly proves the productiveness of the vein.

I recommend operations at first be confined to two points, the driving of the 30 forehead north of No 2 shaft and the 30 fathoms level south from north sump- the distance between these two foreheads is 28 fathoms. Three months ought to see these ends connected, when thorough ventilation of good air will be effected, also a large section of ore vein laid open for stoping of 15,000 tons. I estimate this tonnage to yield 7 per cent. lead and 9 per cent. blende, which gives 1,050 tons of the former and 1,350 tons of the latter ore. The process would probably be: Lead £12 per ton, £12,600; Blende ore, £4 10s. per ton, £6,075;

total, £18,675. The cost to mine this ore, to bring it forward to surface, to wash and dress the ore to full market value, will cost by careful estimate 12s. per ton crude ore, i.e. £9,000. To this must be added the cost to unwater the Mine, £700 and other work of repairs will be necessary, £300; total £1,000; leaving a nett profit on this section of vein of £8,675.

The monthly output, 1,560 tons, will give lead

93 tons at £12 ...	... ..	... ..	... ..	...£1,116	0	0
And Blende, 124 tons at £4	10s	...	...	558	0	0
						1,674 0 0
Total cost, 1560 tons at 12s. per ton						936 0 0
Profit per month						... £738 0 0

..... I have witnessed the working and mining of this Mine from the highest to the lowest level and without hesitation I state there is no diminution of the vein as depth is attained. I recommend the undertaking as one above a speculation.

**Extracts from the Report by Mr. W. H. Borlase, Junr.,**  
Mining Engineer, Threlkeld.

September, 1913.

#### THRELKELD LEAD MINES

The Reserves unbroken in the Mine I estimate at 20,000 tons. Part of that quantity has been proved on three sides, and I estimate the value of the same at 25s. per ton or £25,000. Assay results give considerably more.

Life of the Mine. This is quite an indefinite period. Judging from explorations now made and suggested, the Lode is stronger in character, and its Ore values in the deeper development are shown, no change is anticipated, more than probable will continue productive to a considerable depth. The datum level (No.2 Woodend) should be driven northwards, as from indications and work disclosed in No.1 Woodend, there is every reason to believe further productive ore bodies will be opened out in virgin ground at least 1,000 feet high.

I might point out that this work was contemplated by the late Company, but could not be taken up for want of capital. In following the Sectional plan, Ore chute No.2 having a larger Northern dip than No.3 in the deeper working, it is reasonable to assume they will join, making the run of Ore ground as exposed longer.

One will now gather it is not necessary nor is it the intention to drive long levels in the future working of the Mine through unproductive ground. As a Main Shaft is now fixed in the large Ore body, this will enable the work to be carried on much more economically, and larger outputs handled at decreasing working costs.

£10,000 is, in my opinion, sufficient to bring the property into a profitable state, a reasonable amount being allowed for contingencies.

**Extract from Report by Mr. J. M. Morris,**  
Consulting Mining Engineer, London.

3<sup>rd</sup> September, 1913.

At the New Shaft the lode begins to show signs of productiveness, and generally speaking, increases in width and value upto North Sump. A stope off Jackson's sump to the

south gave the following results over a width of 66½ inches sampled; - 1.1 per cent lead and 3.5 per cent zinc, equals 1.3 per cent galena and 3.2 per cent blende.

At about 360 feet north of the New Shaft a horse of ground comes in approximately 300 feet long and 90 feet thick at its maximum width. The north diversion carries blende, and the south both lead and blende. 15 inches of lode at the entrance to the north drive gave 17.7 per cent. of zinc, equal to about 10 per cent of blende on a stope width of 42 inches. At rather more than half way along the South branch, or 190 feet North of Jackson's sump, 18 inches of lode gave 17.7 per cent lead, or 8.8 per cent galena on 42 inches, and at 210 feet North 14 inches of lode gave 31.4 per cent lead, equal to 12.1 per cent galena over 42 inches.

At Rudd's sump 160 feet North of the point at which the lode re-unites the South face of a stope between the 20 and 30 fathom levels gave on a width of 62 inches 9.3 per cent lead and 15.8 per cent., zinc, equal to 10.7 per cent galena and 23.6 per cent. blende.

At the North sump the lode is of good value in the 20 fathom level, and of still better appearance and width in the 30 fathom level.

The South face of the drift from the North sump on the 30 fathom level gave an average value of 5 per cent lead and 12 per cent zinc over a total width of 131 inches, equal to 5.8 per cent galena and 17.9 per cent blende. The whole lode was not exposed at this point.

Fifty-five feet back from this face, 44 inches measured from the foot-wall of the lode upwards, gave 1.72 per cent lead and 18.2 per cent zinc, equal to 2 per cent galena and 27.2 per cent blende.

In a small drift North from the middle of the North sump, two samples over a width of 38 inches of the upper portion of the lode gave 20 per cent lead and 21.7 per cent zinc, or 23 per cent galena and 32.4 per cent blende.

A short drift south from the sump at this point looks even better than the above over a width of 42 inches.

On the 20 fathom level, 40 feet north of this sump, good ore is shown in an underhand stope over a width of 6 feet. It will probably average 6 per cent galena and 23 per cent blende.

From the above results it will be noticed that the foot-wall portions of the lodes carry mainly blende and the hanging wall portions mainly lead.

With regard to the latter point the pay sections of the Mine appears to stretch from about 200 feet south of Rudd's sump to some distance beyond the north sump, a distance of approximately 700 feet. The lode is not wide at the south end of this section, but it thickens very considerably by the time it reaches the north sump where it is at least 12 feet wide. It also appears to be wider at the bottom of the north sump than at the top. This stretch of lode, assuming it to continue in depth would suffice to feed a dressing plant capable of handling 50 tons of ore per day at a cost of about 18s. per ton treated and inclusive of all shaft sinking and development charges. On present indications this should yield a fair profit even with a lower price of metal than that of to-day.

On a rough estimate I put your present ore on sight in this section at about 12,000 tons averaging 10 per cent blende and 6 per cent galena, but of course a certain amount of development remains to be done to render it completely available for stoping.

There are strong grounds for believing 50 per cent of this area will prove payable. The payable tonnage would be in the neighbourhood of 20,000 tons for each lift of 15 fathoms, and promises to be of distinctly better grade than the average hitherto produced by the mine.

The present power plant will suffice to meet all requirements for a considerable time to come. There is also, I am given to understand, ample water power available in the neighbourhood.

Warren Allison.

### Historic Photographs of Honister Slate Mine, circa 1929

The following photographs of Honister were found amongst a set of plate glass negatives when Plas Waenydd at Llechwedd Slate Mine was being cleared in late 2017, prior to its conversion into a hotel. It appears that these images may have been part of a set, not all of which have come to light. They were used by Martyn Ivor Williams-Ellis (Llechwedd Engineer and General Manager) and Hadleigh Seabourne to accompany a lecture titled "The Quarrying and Mining of British Slates with some Notes on Slating", which was delivered to the Birmingham School of Architecture in conjunction with the Birmingham Architectural Association on November 22<sup>nd</sup> 1929. Copies have been passed to Honister Slate Mine.

Jon Knowles



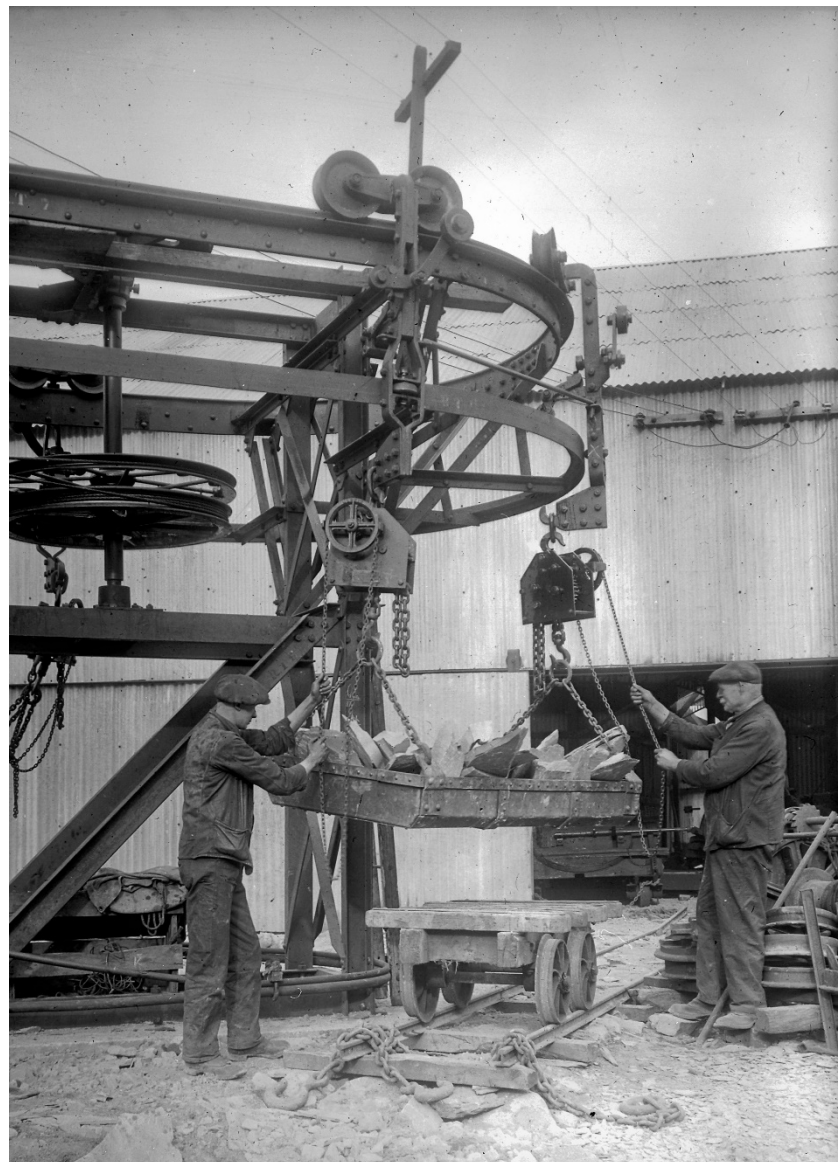
*Aerial ropeways station at Honister House.*

*Transition from rail to aerial transport. Note that the blocks do not appear to be tied to the crates.*





*A loaded  
crate  
descending.*



*Close up of unloading  
at the Hause.  
The crates are being  
lowered by chain blocks  
which must have been  
very time consuming.  
Note the very small size  
of the blocks.*

## Force Crag Mine

In May 1984, the New Coledale Mining Company, whose directors were Anne Danson, Pete Blezard, Mike Sutcliffe and Lindsay Greenbank, took a lease and made a valiant effort to work the mine. Members of CATMHS helped to try and make this a success.

From around 1988 to 1990, Ian Tyler and I were generously allowed by the company to explore the old workings in preparation for Ian's book "Force Crag, The history of a Lakeland Mine". From time to time, as a thank you, we would help with various jobs around the site, one of which was to repair the potholes in the road down to Braithwaite, where Neil Barnes, whose family had previously worked at the mine, would bring spoil down in the digger for us to spread.

I took some photographs of the mine while we were there, but with hindsight not as many as I should have done, given this was to be Lakeland's last working metal mine, and some are reproduced in this article.



*View of the mill with various pieces of equipment such as the generator.*

*Looking down onto No. 1 level and the mill with the loco shed on the right, now gone.*







*Lyndsay Greenbank on the loco coming out of No. 1 level.*



*Ronnie Calvin on the back of the Hudson tub (ex-Greenside Mine?) loaded with ore as the bend is negotiated.*



*Loaded tub on the way to the grizzly.*



*Lyndsay Greenbank,  
Neil Barnes and  
Ronnie Calvin  
tipping the ore into  
the grizzly.*



*Ore coming out of the  
grizzly*



*Ore going up the conveyor belt to the mill*



*Zinc in the right hand bunker ready for sale*



*Eimco arrives at the mine on the 12<sup>th</sup> March 1989 with Pete Blezard and Lyndsay Greenbank looking on*



*Eimco in No. 1 level.*

These were good times, sadly never to be repeated, but with many happy memories.

I well remember visiting Pete and Anne at Ashfell Farm and Lindsay at Kendal to purchase good quality mineral specimens off them, which is another hobby of mine, and you were always made so welcome. When Lindsay, who had a fantastic collection, sold up, he offered me specimens from Force Crag which were collected while they were working it before he offered them to anyone else, as he wanted the specimens to stay in the county, which I did and Lindsay was very grateful for. He included a plan of the mine with the exact location where they were collected from.

Warren Allison

# CUMBRIA AMENITY TRUST MINING HISTORY SOCIETY

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