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The Newsletter of the Cumbria Amenity Trust Mining History Society

Coal fired boiler house and remains of cutting sheds at Rhiwbach Slate Quarry. Photo Mark Hatton

No. 133 **November 2018**

Cumbria Amenity Trust Mining History Society
Newsletter No 133, November 2018

Contents:

Membership

AGM & Dinner

As for the past eight years our AGM and Dinner 2018 will take place at Rydal Hall on Saturday 8th December 2018. A booking form is included with this newsletter. This is always an enjoyable event, and has special importance this year due to the proposal to convert to CIO status. On the Sunday following there will be a family friendly meet at Tilberthwaite.

CATMHS 40th anniversary

Cumbria Amenity Trust (CAT) was officially formed at a meeting at Stainton Old Hall on 9th October 1979, so our 40th anniversary will be in 2019. A lot has happened during that time, and there have been many changes. In order to record and celebrate our history and achievements I intend to produce a special publication, based on a timeline prepared by our archivist Don Borthwick, with photographs, reports and articles on significant aspects, to be launched at the 2019 AGM & Dinner. IM

Change to Charitable Incorporated Organisation (CIO), Special General Meeting

The CATMHS Committee proposes that the Society should convert to a Charitable Incorporated Organisation. (CIO). CATMHS was originally set up as, and still is, an Unincorporated Charitable Association, which is registered as a charity with The Charity Commission. In effect, if anyone wants to contract with CATMHS, take an action against CATMHS or claim against CATMHS, then it is the Trustees individually and/or collectively who are personally liable to the full extent of their wealth, and there is no form of indemnification against being sued.

The Charitable Incorporated Organisation is a relatively new legal structure designed specifically and only for charities. Incorporation quite literally means "become a body", meaning CATMHS itself would exist as a body recognised by the legal system, the Trustees simply acting as Directors or Managers of that body. Trustees would no longer be personally liable as long as they act responsibly and legally. Many charities are changing to a CIO for the protection it provides to the trustees. A new constitution based on the Charity Commission model has been produced and agreed by the Charity Commission, and is available on the CATMHS web site. A hard copy can be provided.

The Committee has made provision for conversion to a CIO and it has been approved by the Charity Commissioners and entered onto the Register of Charities. The objective is to convert the current Society into a CIO with as little change to our current way of life as possible, whilst meeting the new criteria. In order to complete the process, authority to transfer the CATMHS assets and then to dissolve the old charity must be obtained from a Special General Meeting (SGM). It is proposed to seek this authority at an SGM immediately preceding the AGM in December, so that the committee are empowered to act without delay. Notice of the SGM is included with this Newsletter. If you have any queries about the proposal, please contact any member of the committee.

New members

We welcome new member David Stock from near Lewisham, London.

Editors Rant

Since its inception, nearly forty years ago, CAT has provided an organised meets programme and kept a written record of those meets. Part of a Meet Leader's duties used to be to write a report in the meets logbook (those logbooks are in our archive at the Armitt Library), but later, so that they would be available for all members read, meet reports were published instead in our quarterly newsletter. Since the inception of social media lots of stuff appears on Facebook. However, this doesn't provide a proper and permanent record of CATMHS activities.

I appeal to all meet leaders to arrange for a report of their meet to be provided for the newsletter. A minimum would be a basic account of the proceedings, together with the names of participants, but better, put in context with brief history, plans and diagrams, photographs and conclusions, and perhaps also references and further reading. The newsletter is always published in the first week of November, February, May and August. So that current material can be included my deadline is always the 20th of the month preceding publication. Complications that can arise from the use of different software programmes can complicate the processing of material to fit my layout, so last minute submissions can cause problems.

Facebook is good for dialogue and for sharing photos. Many of the photos posted are of very high quality, but often they have no context, sometimes not even a mention of where they were taken so, sadly, they are just passing images and have no lasting significance. This newsletter, No. 133, is part of an unbroken record of CATMHS events, and past accounts and reports now have archival significance. It would be a pity not to continue this tradition ….. IM

Newland Furnace Trust Heritage Open Days

Heritage Open Days is England's largest festival of history and culture, bringing together over 2,500 organisations, 5,000 events and 40,000 volunteers. Every year in September, places across the country open their doors for free to celebrate their heritage, community and history.

This year HOD took place over two weekends, and Newland Furnace was open to the general public on both of them. Dave Robson, Peter Sandbach and Paul Timewell, supported by Barrow exile Brian Cubbon, were on hand to greet visitors, conduct guided tours of the site and to answer questions. A display of information and artefacts, which gets better each year, was mounted in the charging house.

Sixty six adults and six children visited over the four days. The NFT received £134.55 in sales and donations.

Dave Robson, NFT Chairman, talking to visitors on Heritage Open Day.

Mines Forum, 16th October 2018

The meeting held at the National Trust Office, Bowe Barn, Borrowdale, and was attended by representatives from Lake District National Park Authority, National Trust, Historic England, Environment Agency, Honister Slate Mine and CATMHS.

Updates: Coniston

Philip Johnson has applied for and received planning consent to erect two water wheels on his site at Bonsor Upper Mill. He also wants to install a replica of the large sawmill waterwheel, using the original leats and rebuilding the stone towers. He provided photographs of damage and erosion in Coppermines Valley caused by the recent heavy rain.

The Environment Agency has applied for funding for a 10 year water quality management plan. They are investigating sedimentation in Little Langdale Tarn, which contains some cadmium and copper

Force Crag

There was a break-in at the Mill last weekend. Intruders cropped the padlock on the track gate in order to drive up to the mine, where they attempted entry by undoing nuts and bolts on the main door. No obvious damage appears to have been done.

The Coal Authority is to carry out a pumping exercise in 0 Level in order to try to develop a system to stabilise water levels in the mine.

The water treatment ponds developed blue/green algae. The substrate has been refreshed by the addition of coarse material. Newcastle and Lancaster Universities, together with the British Geological Survey and the National Trust, met recently at the mine to try to better understand ground water flows. This is a three year project and will provide a method statement of requirements.

Fencing has been refreshed around the high level stopes

Greenside

The Coal Authority put a camera up a drainage pipe close above the Lucy Level adit. They saw a lovely stone arch and more structure. It is thought to be worthy of further investigation.

The LDNPA are to consider future plans for the site, which is on the ‘At Risk Register’.

Sam Murphy, the author of the definitive book about Greenside, ‘Grey Gold’, bequeathed his archive to Warren Allison.

Tilberthwaite

Alastair Cameron has been examining the Henry Mellon survey, of 1911, which shows slate workings above the Horse Crag Adit, which are no longer accessible.

Slate quarries
No 5 Level at Honister is producing good slate and can be further developed. The Company has recently purchased a new drilling assembly and a circular saw. There was no information available regarding their re-submitted application for a zip wire.

Burlington Slate are having to carry out work to stabilise the top of Elterwater and Broughton Moor quarries. They have a planning consent application to re-open Peat Field Quarry at Tilberthwaite. Apparently they intend also to 'beautify the surface of the tip and to fill in a closehead with spoil.

Mike Mitchell and Mark Simpson have a project to make an aerial photographic record of every quarry in the Lake District, Eleanor Kingston offered help with obtaining permissions.

Alastair Cameron is to record the history of smaller quarries and to make a photographic record. His records will be accepted by LDNPA Heritage Environment Record.

Yewthwaite
There is concern regarding stability at Yewthwaite mine because of serious water erosion. What remains should be recorded before it is lost.

Coniston Copper Project.
The Project is nearly finished. As well as the reports, booklets and trail guides, a Learning Resource has been produced for use by schools etc.

There is still an interpretation panel to erect at the Ruskin Institute. It will be in the form of a timeline on the wall of the Institute building leading to the start of the Coniston Copper Trail at the Ruskin Museum.

Restoration and drainage of Deep Level Adit is still to do, and it is hoped to use remaining grant money to stabilise the banks and erect a footbridge over Red Dell Beck just south of the Deep Level adit.

Scheduling of Sites
A list of sites with potential for Scheduling was compiled some years ago, and is still current. It was suggested that the Mines Forum Group should revisit the list. Andrew Davidson, Inspector for Historic England, suggested that if those that conform to scheduling criteria were selected before submission, that would increase the chance of success.

An application has already been submitted for listing of Yew Crag incline, and it is intended to do so for Penny Rigg Mill at Tilberthwaite.

Archive Storage.
There was discussion as to the best way of storing archival material. No conclusion was reached; however the LDNPA Heritage Environment Record would be a safe backup.

The next meeting will be held on 26th February.

Coniston Copper Project

The Coniston Copper project, which received a £455,000 grant from the Heritage Lottery Fund (HLF) in 2016, is now almost finished. The project was a partnership between Lake District National Park, the Land owners of Coppermines Cottages and Rydal Estate, Ruskin Museum, YHA Coniston, Grizedale Arts, and Cumbria Amenity Trust Mining History Society.

Approximately half of the grant money was spent on the conservation of mining structures in Coppermines Valley and at Penny Rigg Mill, Tilberthwaite; the remainder on research, surveys, education and management. Several information structures have been placed around the valley. Coniston Coppermines have been taken off the English Heritage 'At Risk Register'.

A programme of archaeological surveys and excavation was funded through the project, designed to engage local volunteers in the history and conservation of the site through hands-on training, and to prepare a detailed analytical survey of the surviving earthworks and structures.

Volunteer teams recorded some of the previously un-surveyed areas of the monument. Topographic, earthwork and building survey were included in the project to provide a comprehensive record of the complex. Archaeological evidence of many of the key aspects of the copper-ore processing were identified during the survey. Each of the four archaeology projects resulted in a detailed report:

Penny Rigg Copper Mill, Tilberthwaite, Coniston, Cumbria
Community Archaeological Landscape and Building Survey.

Coniston Copper Project Community Excavation, Penny Rigg Copper Mill
Archaeological Evaluation Report

Tilberthwaite Copper Mine, Coniston,, Cumbria
Community Archaeological Landscape and Building Survey.

Low Bonsor Dressing Mill Coniston, Cumbria
Community Archaeological Landscape and Building Survey.

An animated film was made, showing how the site may have looked during its heyday around 1865. All can be download from the website, www.conistoncopper.co.uk

Volunteers were trained to carry out research in local archives. Two booklets, 'Mine and Mill, The History and Archaeology of Tilbertwaite Mine, Coniston' and 'The People of Coniston Copper, Life and Death in a Mining Village', present some of the findings that relate to the copper mines and the mining community.

Three self-guided trails can be downloaded for free from the website and are also available from outlets at Coniston. Their titles are 'Miners Lives', 'Introducing Coppermines Valley' and 'Land of Power and Ore'. There is a Learning Resource for the use of schools.

Credit must be given to the tenacity of former LDNPA Archaeologist John Hodgson for obtaining the English Heritage Grant after a bid under the Higher Level Stewardship scheme failed because not all of the commoners would sign up to it, and to Eleanor Kingston, Lead Strategy Adviser: Historic Environment at the LDNPA, who has managed the project throughout.

Conservation work in progress at Bonsor Upper Mill.

Meets

Skelton Park and Spa Wood Ironstone Mines, 29th July

Present : Chris Twigg (ML), Mark Hatton, Dave Young, Carl Barrow, Derek Mitchell, Magnus Mcintosh, Steve Sim and Dave Donkin.

Note: Both sites are private with residential properties and cannot be visited without prior arrangement (please speak the meet leader if you're ever in the area)

After months of unbroken sunshine, seven hardy souls joined me in the rain at the wrong end of the A66. Skelton Park Ironstone Mine was operated by Bell Brother between 1872 and 1923, then via merger by Dorman Long and Company until its closure in 1938. English Heritages Monuments Protection Programme describes it as "by far the best iron mining site nationally", and through the efforts of Simon Chapman the principal buildings were listed at Grade II in 1987, with his study of the site resulting in a runners-up prize in the 1988 Association of Industrial Archaeology Fieldwork Awards. Simon's investigations were subsequently published in a book in 1999 and in recent years the Cleveland Mining Heritage Society have invested a huge amount of time and effort into maintaining the site, with weekly visits to clear 80 years of vegetation and rubbish, allowing it to be fully interpreted for the first time.

Skelton Park Chimney dig

The group toured the remaining buildings which include a Schiele Fanhouse, Winding House, Power House, Boiler and Chimney Bases, Blacksmiths, Joiners Shop, Provender House and some rather fine netties (with original miners graffiti still on the white-washed walls)

The two 115m deep shafts are now flooded to 60m, so sadly zero possibility of any underground exploration, however a couple of the group were cajoled into sliding into a chamber under the fanhouse, which served as part of the mechanism for reversing airflow.

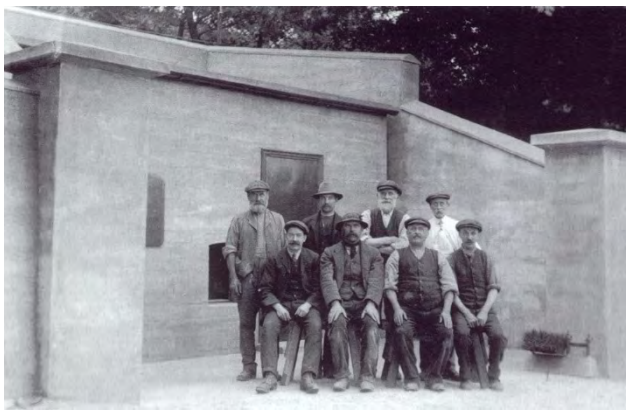
Skelton Park Fan House

A short drive took us to Spa Wood mine, where the ironstone outcrops at surface; this site was built about 1897 by Sir Bernard Samuelson and Company, also ending up under the control of Dorman Long and Company until closure in 1930.

Armed with a 4-gas detector, we entered via a fanhouse, which intersects underground workings from an earlier incarnation of the mine, which was operated by the Weardale Coal and Iron Company from another location a mile further south-west. The triangular shape of all the drill holes in this area indicates they were driven by hand with a 'jumper' drill, rather than with later rotary or ratchet drills with produced a round profile.

Numerous artefacts such as boots, bottles, pipes and kettles were seen, along with copious scallop (pecten) fossils in the mine roof. At least 120 miles of passages are shown on the abandonment plan, but only a tiny amount can be visited today, due to low oxygen conditions in the mine. Today was a particularly 'poor air day' so the group was driven back relatively early and unable to visit some areas seen in a previous CATMHS trip back in 2011.

A short walk outside to the opposite end of the site took us to the Powder Magazine where we successfully managed to recreate a group photograph taken during its construction.



Finally, we had a quick look into the travelling drift, which always has very poor air, where much to everyone's surprise, we discovered a live chicken trapped in the mine, so after a short pursuit in low oxygen the ML managed to rescue the chicken and avoid a rather embarrassing Darwin Award.

Chris Twigg.

Further Information :
https://www.moorebooks.co.uk/Skelton-Park-Pit-Ironstone-Mine.html
https://www.moorebooks.co.uk/Guisborough-District-Mines.html
https://ourindustrialheartland.co.uk/skelton-park/

CATMHS Meet on 19 August 2018 – Rhiwbach Slate, North Wales.

Expertly led by Michael Bill Oddie – Michael Pringle, Derek Mitchell and Charlie & Sue Fowler were the happy team, who he enthusiastically showed around one of his new passions, a large Welsh slate mine near Blaenau Ffestiniog.

We started at the bottom adit in Cwm Penmachno , surrounded by extensive well-preserved structures and inclines and the enormous waste tips.

As you can see from the plan at:
http://rakelane.anduin.org.uk/cal/rhiwbach-new-map.pdf
the access adit is 550m long to the main workings. This then becomes a spine incline up through the mine providing access to seven levels, the lowest of which is flooded. (Unusually, this incline took slate up out of the mine rather than down which prevented the normal gravity balance system, so was powered by a large steam engine. After processing, the finished product was moved along the Rhiwbach Tramway to the Ffestiniog railway)

The numerous chambers are visually stunning due to their huge size – and pretty impressive when you remember that they were worked mostly by hand with only candles. These were tough guys! Electricity finally came to the mine in 1934. There are quite a few artefacts still, including a large number of tools and a couple of well-preserved slab wagons. The suspended block handling chains hanging from such great heights also looked impressive.

Despite previous rumours to the contrary, there was absolutely no danger of inundation, with Michael's captaincy, of the trip across one flooded chamber in an inflatable – although little faith in this was demonstrated by one of the team who chose to walk around instead. More adventure was added by a brief zip wire across another chamber, with Michael showing his traversing expertise on a difficult route around it.

Notwithstanding a recce the day before, the rain had fallen overnight in true Welsh style, providing an extra interesting dimension to the epic climb through the mountain, up the steep incline which at places was more of a waterfall – a slip here would have been embarrassing, bruising and very wet.
Once again, our bait break was atmospherically lit by Michael's candle with much entertaining banter.

Our exit from the top of the mine into earlier surface workings enabled a brief walk into the remains of the mine village and mill areas – both large atmospheric complexes with a surviving engine house chimney. The great day culminated in the walk back down the mountain to Cwm Penmachno – surprising us with just how far we had travelled underground. (This mine is well managed by Cave Access Ltd and efficiently gated so preplanning and access agreement is necessary – but easily arranged)

To make the most of our weekend away, we took our own wee trip to Nant Gadwen Manganese and Ironstone mine near Llanfaelrhys just before Aberdaron towards the end of the Llyn Peninsula. Many easily accessible short adits and a large flooded stope – all accessible from a footpath down to the beach. If anyone wants any more details – please get in touch.

Sue & Charlie Fowler

Carrock Mine Photography Workshop, 9th September
The workshop was designed for beginners who wish to improve their underground photography.

Attendees were: L Withey (ML), D Donkin, R Gear, C Harvey, K Crisp, L Crisp, R Mayor, S Fowler, C Fowler and W Allison.

There are a number of members who are taking photographs on meets, some of who have just started to, and it was felt that there should be a meet where it would be just to allow those members to have the time to experiment with their cameras and to use the experience of others who have been taking photographs for some time.

It was decided that Carrock Mine would be a good site as there is a lot of interest in there, from the rock and mineral formations to the hoppers and other mining remains. So, we all gathered near the bridge, with Sue and Charlie being the last to turn up, having been delayed by the bacon sarnies at Rheged. Arriving at the mine, Warren did a brief history lesson before we entered the Canadian Cross-cut and down onto Smiths Vein, where people dispersed into the various workings and started taking photographs.

Photographers at work, images by Liz Withey

Image courtesy of Dave Donkin, composite in-camera image on the Olympus TG-5

This had been an enjoyable day, and all agreed that the meet should be repeated at other mines, with one being planned for November 2018 at Tilberthwaite Horse Crag Level.

Liz Withey and Warren Allison

Bannerdale Mines & Quarries, 23rd September

This meet was cancelled due to an appalling weather forecast. We will reschedule in due course.

Dalehead mines, 14th October.

Mark Hatton (ML), Dave Donkin, Michael Oddie, Michael Pringle, Derek Mitchell, Magnus Macintosh, Lorraine Crisp, Kevin Crisp, Julian Cruikshank, Robert Gurr, Angus Gurr.

After two monsoon like days, Sunday delivered dry, mild and calm weather, perfect for mine exploring. The walk up Newlands to Dalehead provides much of mining interest to see, discuss and appreciate. But the interest level shoots off the scale when you reach Longwork. A slight logistical problem was crossing the Beck which was still rather full, frothy and furious. Once that mission was safely accomplished our group delighted in exploring the Elizabethan workings and associated processing floor. Several mortar stones were quickly identified and explained, before walking through the emptied vein. The gutter at Pluckhor is a delightfully functional feature of this working and the same as those seen at Goldscope nearby. We crossed the valley floor along the line of the vein, noting the numerous different workings and springing gazelle like across several more steep becks.

We then girded our loins and set off up the steeply inclined zig zags to Dalehead Mine. This seldom visited site consists of a bothy, processing floor and three adits that worked a copper vein that courses through the mountain at well over 2,000 feet above sea level. The processing floor is a patchwork of mining history, beautifully decorated with

numerous turquoise coloured rocks providing ample evidence of how rich was the copper content hereabouts. A select group of hardy souls with a sound head for heights then set off along the Miners trod across the vertical face of the crags to explore No. 1 Level. This delicious mine working pierces the breast of the Crag from which today a torrent of water was energetically flowing. Everyone was captivated by the charm of this level, whose wooden rails and mini stemples do much to create.

We then descended the zig zags as the sky cleared of all of its morning greyness to be replaced by a bright blue to equal the colour of the rocks under our feet. We explored another adit on the way down, then examined the large copper heap near The Great Bunch. This heap was estimated to consist of well over 20 tonnes of copper ore ready for transport to the smelter.

The mystery is why, after so much work was needed to get it to this condition, it never made that journey. The consensus was that the smelter must have been destroyed during the English Civil War making this copper ore effectively useless. So 375 years later the heap remains on the fell side to remind us of the hard work done by the miners here in such turbulent times.

The group then crossed back over to Longwork and plunged into the multi coloured depths of the cross course adit that undercuts and de-waters sections of the open work above. The colours and formations in here are quite extraordinary and the ladders create a powerful link with the miners who worked here.

Finally the walk back down the valley in full autumnal sunshine was a delightful end to a beautiful day. Dalehead is such a lovely place to visit and we all enjoyed our time there today.

Mark Hatton.

Copper Heaps near Keswick

To produce upwards of 100 tons of dressed copper ore must represent a huge investment in time, effort and money. And considering this effort was expended three or four hundred years ago, makes it even more remarkable that this copper ore was then abandoned. “Why would this happen?” is a question that has intrigued generations of mine historians in The Lake District.

The copper veins to the west of Derwent Water were vigorously worked during the 16th and 17th centuries in Borrowdale and the Newlands Valley. A lot of the ore extracted here was bucked (ore separated from rock) and cobbed (ore broken down into small pieces) by hand, using hammers and mortar stones. This process must have been very laborious and time consuming. Where water powered stamps were installed the bucking and cobbing process (collectively known as “dressing” the ore) would have been been carried out on a much more industrial and efficient scale. But the cost of installing such stamps was very high and could only be justified where the scale of the mining operation was large and a suitable water supply was reasonably accessible.

So where are these Copper Heaps and what do they look like today? The biggest heap is on the shore of Derwent Water and was such a distinctive feature that the bay itself and the hill beside it have been named after it. Copperheap Bay and Copperheap Hill are in the North West quarter of Derwent Water on land owned by the Lingholm Estate. This heap is by far the largest of the three Copper Heaps that we know of in the area.

The heap looks like around 50 tonnes or more of dressed copper ore, and one side of the heap has clearly been dug into. The heap is within a couple of yards of the shore and it appears a landing stage and small building would have stood here when the copper heap was laid down. This was where early miners loaded copper ore onto boats to be transported across Derwent Water to Keswick. At Keswick the ore would have been taken by cart to the smelter at Brigham. Today the site of Brigham is underneath the A66 where it crosses the River Greta on a high bridge.

The smallest copper heap is at Manesty, to the south west of Derwent Water about 2 miles south of Copper Heap Bay. This copper heap lies in a field beneath a stand of trees and looks to be about 5 tonnes of dressed copper ore. There are copper mine workings very close to the heap on the Salt Well vein and further larger workings a short distance to the south, near Grange, which were called Copper Plate.

The third copper heap is at the southern end of the Newlands Valley, underneath Dalehead. This heap is beside a copper mine working called The Great Bunch.

We know that these copper mines were worked during the 16th Century by the Society of Mines Royal. This society was incorporated in 1566 with Germans and English shareholders. It employed many skilled German miners and smelters who found, worked and smelted copper ore. Whilst the venture was an operational success (in as much as it found plenty of copper ore and built an efficient smelter to convert that ore to copper metal) it wasn't a commercial success. The cost of the operations exceeded the income from selling copper by a ratio of around 2:1. At times the operation produced significantly more copper than it could sell, which left it with large stocks of copper on hand. In 1577 the German Business that held shares in the Society of Mines Royal went bust and after that time the Society did little if any mining. Instead it issued leases and licences to third parties to carry out the mining operations. The actual men who worked in the Mine didn't change however, although their German surnames became gradually corrupted to more English sounding names.

Over the next 70 years the copper mines and the smelter continued to work. As the veins in Borrowdale and Newlands were depleted more copper mines were discovered, most notably at Coniston. But copper mining and smelting appears to have come to an abrupt halt in the 1640's.

The most likely explanation for this is that, during the English Civil War, Parliamentary forces destroyed the smelter at Brigham. A reason they did this could well be that the mining operation was still paying royalties to the crown and supplying metal for armaments. Or it might simply be that in the chaos and carnage of the Civil War, the markets for copper were badly disrupted and men conscripted or chased away, so that the mining operations fell into decay. *Present day site of Brigham Smelter.*

So we return to the Copper Heaps themselves and ask ourselves, why are they there? To my mind there are a number of possible explanations, including:

1. When the smelter at Brigham was destroyed there was no way to convert copper ore to a valuable copper metal. So all copper ore that had been made ready for the smelter became effectively worthless. So it still sits today in exactly the same position in which it was stored on the fateful day when the smelter was destroyed. No smelter was ever rebuilt at Brigham, suggesting its destruction had been very thorough. So the copper ore lay exposed to the

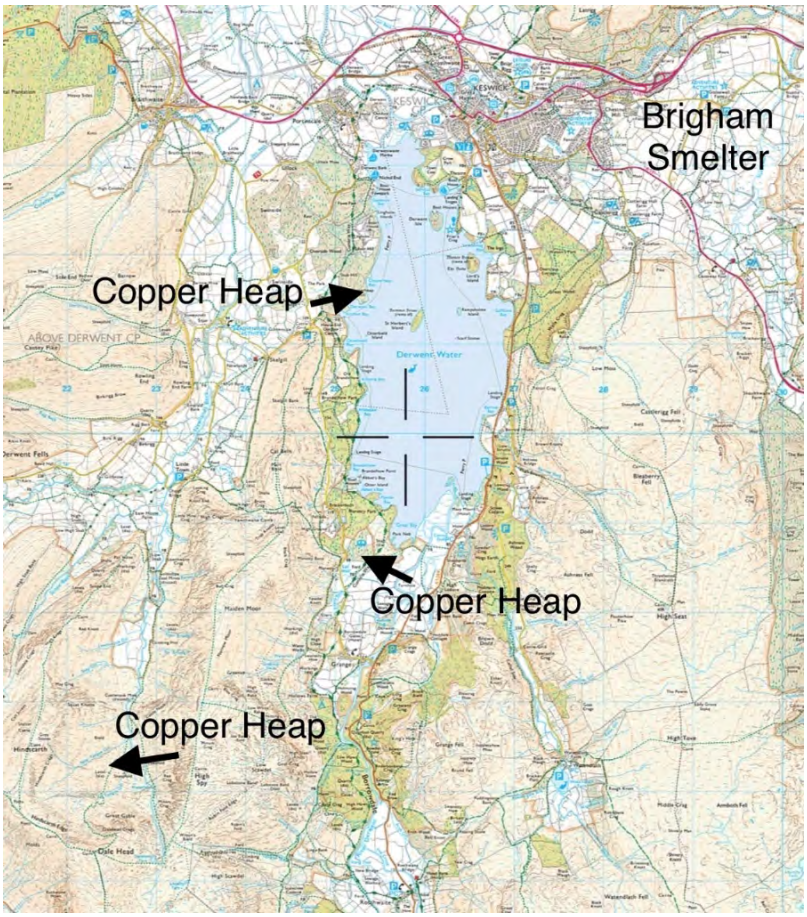
elements for many years. The ore would oxidise and calcify, rendering it useless for smelting at a later date.
2. Maybe the copper ore simply represents a time when the output of ore exceeded the demand for ore so it was effectively surplus stock. And due to the weathering process perhaps this stock became obsolete.

3. Or maybe this ore didn't smelt very well, so when other sources of ore (such as from Coniston) came on stream, this ore became redundant.

4. Or just possibly the skills needed to smelt copper ore died out. The smelting process was highly technical and many of the secrets involved were very closely guarded. Perhaps some key techniques required were only known to one or two men, having been passed down from German Father to Son for a couple or three generations.

5. Or just possibly everyone died out. Plague hit Keswick during the 1640's and the population fell sharply. The plague would have created a huge disruption to the normal life of the town and surrounding areas. Perhaps industry ground to an abrupt halt and the mines and smelter with it.

6. Or maybe this ore is the product of a later generation of miners who were getting it ready for a smelter that was never rebuilt or that never worked properly. Maybe the cost of transporting the ore to other working smelters 100's of miles away simply was not viable so as to render this ore uneconomic and so surplus to requirements.



With more research and imagination further possible explanations may be put forward. But the fact that we don't know for sure why these Copper Heaps are here only adds to their allure. If only they could talk, just imagine what tales they could tell.

If anyone has any further information or ideas to shed light on this conundrum, I would be very interested to hear from them.

Mark Hatton.

Social unrest in 1566 – a letter from Daniel Hechstetter.
The arrival in Keswick of Miners from Germany did not go entirely smoothly. A letter from Daniel Hechstetter (the boss of the German team) dated October 1566 gives us a wonderful glimpse of the problems these Germans had.

The first extract (first as drafted, then as I have "translated") concerns the construction of the smelter buildings at Brigham :

"there hath been X.XIIII Carpenters woorckynge but XII had hen sufficient and therefore upon Saterday do I mynde to dischardge XII of them and the other XII also with VIII days after. Yt is a shame to see that so mouche monye bath ben spent upon so lyttle woorcke, but the cause thereof is that thinge necsarie were not provided in convenient ryrne and throughe the laysie woorckinge of the English Men, but nowe I trust all thinge shall go well forwarde".

"here were 24 carpenters employed at the site but we only needed 12. On Saturday I decided to lay off 12 of them. I laid off the other 12 carpenters 8 days later. It is a shame that so much money has been spent with so little achieved. The cause of this is that the building materials we required did not arrive at the right time and the English workforce was lazy. I now trust that things will go smoothly".

The second extract (first as drafted, then as I have "translated") concerns the way the German Miners were initially treated by some of the local population of Keswick.

"As concernynge the tumulte or disquietness that hath ben I Send youe hearwithe the xaminacon of Certayne of oure men. And I do fynde the matter so to fall out, that if there be no other order taken with the offendours than hitherto bathe ben, I feare me wee shall not be able to kepe oure men longe, unless it be to oure extreeme Coste and Chardigies for that they will not hasard theire lyves in souche sorte. Considerynge that they have no more wages heare with this daunger than they might have at home with quyetnes. For the offendours goe heat· daylie up and downe before oure facies bragginge and thretninge oure men of furder mischiefe especiallye that naightie man Fissher who bath hen the Ringleader and Chiefe occasion of the villianous murderinge of Leonearde Stoult, who defended himself at longe space against XX of theim, untill the S01me of John a Woode stroke him upon the anne with a Staffe that he Could not any longer lyfte up the saine for his defence. And then they fell all upon him and piously murdered him."

"I have spoken to certain of our men about the recent severe unrest, and here is what I have ascertained. If the local offenders are not brought to book better than so far has been the case, I fear that we shall not be able to hold on to our German workforce for much longer unless we pay them far more than we currently do. They will not risk their lives here for the same rate of pay that they can earn back in Germany where life is so much easier. The local offenders are tormenting our men each day by openly bragging and threatening them with further harm. The worst offender is that rogue called Fisher who was the ringleader and chief protagonist at the villainous murder of Leonard Stolz. Leonard defended himself against the mob of 20 men for a long time. But when John Wood broke Leonard's arm by striking it with a staff he could no defend himself with his own staff. At that point the mob jumped on him and mercilessly murdered him".

Mark Hatton.

Sam Murphy's archive

Sam was a very good friend and when his eyesight was starting to fail, he moved from Crook into Kendal and was going to throw out a lot of his personnel archive, which contained material on his research of Greenside Mine for his book "Grey Gold", as he didn't have the space at his new home, I offered to store and look after it, otherwise it would have gone in a skip, which he was very grateful for. However, Sam still had a substantial archive of documentation (some relating to other sites outside the county) including many original photographs of Greenside Mine, a lot of which were taken by Cyril Conner (who was the mine manager from the mid 1940's to late 1950's) who had handed his collection to Sam. Other people had also given Sam photographs and many, but not all, were used in "Grey Gold".

Between 1999 and 2003, together with John Hodkins, a friend who worked with Bill Shaw at Force Crag Mine in the 1960's, who also had photographs of Greenside, I (with help from CATMHS members) put on an exhibition in Glenridding Public Hall on the mine and life in Patterdale Parish while it was working, which Sam contributed to as well. I discussed with John and Sam and people who gave me their photographs of the mine about one day producing a book of photographs on Greenside, with the proceeds going to support the public hall and possibly other projects in the parish, but there never seemed to be the time to do it.

A number of years ago, Sam became ill and unfortunately he passed away in June 2018. I knew that when he first became ill he had bequeathed his archive to me, so, in August, I met with Gil (his wife) and Annabel (his step daughter) to collect the archive, except for the books. (that is for a later date) I have started sorting the photographs first and the ones relating to Greenside are done, with work underway on those which relate to his research from the Pennines to the Lakes.

It is with Sam's passing, that this has given me the impetus to move the original project forward and the intention is to publish a book in a similar format to "Life and Work of The Northern Lead Miner" by Arthur Rastrick and Arthur Roberts. That book has very close to 200 photographs in it and the Greenside collection will have that number and probably more, making it possibly one of the finest collections on a single mine in the country, and it would also compliment "Grey Gold" by having the photographs in one place, many of which were not available to Sam when his book was published in 1996. Although some were used in his reprint which was done as a disc. In amongst Sam's photographs, I found some of Carrock Mine (early 1980's) and Honister (marked on the photo as 1978?) which are published below. Warren Allison.

Carrock Mine

Entrance to Canadian level on left

Processing mill

Processing mill

Pipework at the bottom of Emmerson vein (gulley)

First World War workings with pipe (left hand side of gulley- Harding vein) to take the slurry from the mill into the old stopes. The First World War processing plant looks to be in much better condition.

Honister

Mike Mitchell

Top of incline, marked later one (Kimberly)

Incline

Trolley for moving the clogs

Counter weight

Loading a clog

Birk Gill Mine

During a period of recent illness, I decided to sort out the hundreds of photographs I had amassed over the years, which had got into a bit of a mess. Realising that many were taken when I was a member of the Mines of Lakeland Exploration Society (MOLES), when it managed to get permission from the LDNPA as land owner to re-open a number of levels on the Caldbeck Fells. Unfortunately some of the research was not published, especially photographs, so I have decided to write several articles for the CATMHS newsletter on the work that was done at that time, to ensure that there is a record in the public domain.

In addition, it will add some flesh to the bones of the articles that Jeremy Hunt has been writing on his exploration of the Caldbeck Fells. My first article is on Birk Gill Mine near Fellside where, in the August newsletter, Jeremy mentioned that "at the head of the ghyll, there is evidence of two levels, neither of which appear to have been excavated or explored since their working". Permission was granted by the LDNPA to re-open the top level and work started on 6th October 1996. The debris from digging was wheelbarrowed and placed on the edge of the spoil heap near the entrance, so effectively it was being extended and followed what the old men would have done.

The dig starts

The spoil heap being extended

Entrance re-opened

Level mouth

The ground was loose and digging was relatively easy, but we ended up with a cutting some 20 yards long and close to 20 feet high to get to the bedrock and the entrance. Due to the poor nature of the bedrock and the loose material above, we decided not to dig he level to the floor and, on 3rd November,

after a few weeks of digging we broke through. Before we explored the level we extended and shored up the entrance in the interest of safety. The level had been driven for a distance of 80 yards to the vein, where an angled rise some 20 feet high had been put in, but no mineral was found.

There is very little known about the history of the mine. Ian Tyler in his book "Roughtongill and the mines of the Caldbeck Fells" states that the first recorded date of working is 1700, with work re-commencing in September 1724 by the partnership of William and Phillip Bowerbank and Walter Bramwell, but this was finished within three months. The third period of working started in September 1861 by the Red Gill Mining Company and was still being worked in June 1862.

Entrance shored up

Main drive

Bottom of angled drive

Unfortunately, Ian does not state his sources, but the First Edition Ordnance Survey Map surveyed in 1863 and published in 1865 shows the two top levels marked as "levels" suggesting that they were being worked at the time; the lower level is not marked on the map.

The bottom level was re-opened on the 30th December 1990, in the days when we did not ask for permission. The miners had driven a crosscut to the vein some 62 yards and then 18 yards along it, but no workable mineral was found. My photographs of the level were poor and not worthy of including in this article. The middle level was not re-opened. Warren Allison.

Entrance to the bottom level, December 1990.

Beckermet Mine

The mine was the last deep working iron in Europe and is located near Beckermet in West Cumbria. It was sunk in 1914 and worked in conjunction with Ullcoats mine from 1917, until it finally closed on 13th September 1968. Beckermet Mines, which was part of the British Steel Corporation took over Ullcoats Mine in 1969, pumped out the water and linked it to Beckermet Mine. The ore was brought up Beckermet shaft and sent to the Workington steel works. However, as part of a rationalisation process, the British Steel Corporation closed the mine on the 3rd October 1980.

Some of the redundant miners set up the Egremont Mining Company and although demand for iron ore had fallen, the mine produced 500 tons a year of Haematite ore for the annealing industry, products for the cosmetic industry and high-quality minerals.

Unfortunately, Florence was finally forced to close in 2007 due to the cost of pumping. British Nuclear Fuels Ltd had been paying the pumping costs to remove 400 tons per hour to be used at their site. They found an alternative supply and so had no need for the water from the Beckermet Mine and ceased their support, which meant the mine had to close.

A couple of years before the mine closed, I was lucky enough to be on a trip round the mine arranged with Gilbert Finlinson the mine manager who took us down the incline (as the shaft could not be used due to safety reasons) into the workings and it was like an Aladdin's cave. This was a working mine and it was a privilege to be shown around, there were Eimcos, drilling rigs, locos, lots of tubs, etc. The only problem was that we didn't have enough time to be able to photograph it well and my camera was also playing up.

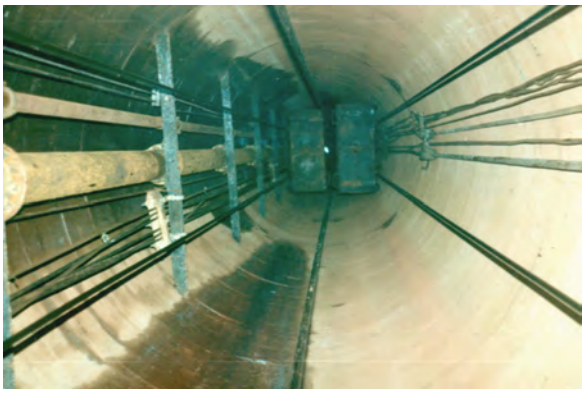
The shaft top

The top of the incline

Drilling rig

Hand dill

Ore shoot



Looking up the shaft with the two cages suspended in it

Eimco with tyres

Loco

Loco and mine tubs

However, I was fortunate at a later date to be on a trip with the late Paul Deakin who at the time was considered one of, if not the best underground photographer in the country and with his friends, we spent a whole day underground. Paul was very generous in letting me have a set of the photographs he took.

Warren Allison

Thirlspot Mine

The mine is located on the fell at Thirlmere to the north-east, just behind Thirlspot, in a gill. According to several sources the mine is reputed to have been worked by the Germans, and in his book "Thirlmere Mines and the Drowning of the Valley", Ian Tyler gives more detail on who was working the mine and ore raised by the Germans, and then, in 1840, a lease was drawn up to work the mine; unfortunately he does not quote his sources.

On the 10th April 1988, a small group of us had been looking around Birkside Gill Mine and as we had time went to Thirlspot Mine and dug the entrance out, which did not take long to do. Unfortunately we were unable to drain all the water out of the mine and so went in up to waist deep and still knee deep at the foreheads. The level was driven to a good size and meandered around looking for the vein (which was exciting at the time, not knowing which way the level was going to turn), which was not found, with the total distance driven being 79 yards, a great disappointment to the lease holders.

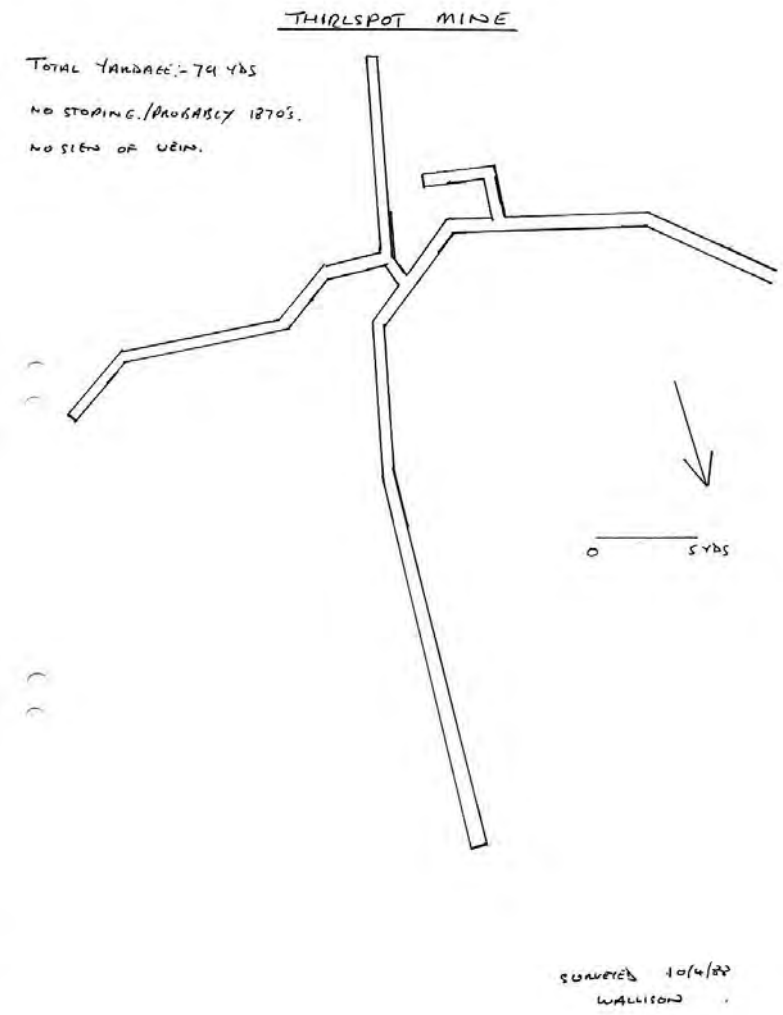
Apologies for my plan, but it was one of my earlier attempts at drawing up an underground survey. Conditions were also not particularly good for taking photographs.

It would be worth spending a bit of time here having a good look over the whole site as we did not spend as much time as we should have done and perhaps there is more to discover.

Junction of first side drive

Junction of second side drive

Forehead of second side drive



Warren Allison.

Children at work in the Lake District Mines

I recently obtained copies of the Royal Commission reports into into the employment of children and young persons and their condition and treatment in the lead-mines in Durham, Northumberland and Cumberland and the Mines and Quarries in North Lancashire, published in 1842 (and were instigated by the House of Commons on the 4th February 1841) and which also gives background information into how the mines were worked. They are very interesting reports. The mines in Cumberland were Roughtongill Mine near Caldbeck and Greenside Mine, while the mines in North Lancashire covered Coniston Copper mines.

The Royal Commission visited mining areas all over the country and the reports have been republished by The Coal Mining History Resource Centre, Picks Publishing and edited by Ian Winstanley and the following exerts are taken directly from the reports.

The children appear to have been better treated than those working in the coal mines, and the London Lead Company, along with Greenside and Coniston mines seemed to be quite benevolent towards the children and young persons and ensured they were treated properly However, it does not detract from how hard the children and young persons had to work, and strangely Coniston Copper Mines were the only ones in the Lake District to employ girls. It must be remembered that these were very different times compared to today, but even then, the companies were keen to ensure that the children received some form of education, especially in the winter months when they could not work. For me, the saddest part of the reports was that children as young as six and seven were working at Coniston Copper Mines, both male and female, these were certainly hard times.

However, the lodging shops at all the lead mines in the reports were not good places to live in; some were better than others, but overall, they seem to be desperate places, even for just a week before the men and boys travelled back home to see their families for the weekend. There were no lodging shops at Coniston Copper Mines as there appears to have been enough accommodation in the village, or the men and boys walked in daily from the outlying villages.

ROUGHTONGILL MINE

No. 36 John Wallace.

The washing apparatus of the Roughton-gill Mine was invented by Mr. John Leathart, of Alston, in Cumberland. It was put up last year [1840], and has since been improved and is found to be of great use, not only in facilitating former operations but also in enabling to wash poorer lead than formerly would have paid the expense.

The grand principle is the separating of the different kinds of ores by passing them through plates full of holes of different sizes.

The ore after being brought from the mine is grated, that is to say, certain portions are thrown away which are considered not to contain lead. The large pieces of ore are broken up with hammers and are made to pass through the crushing-mill and the other ore is broken and made to pass through the crushing-mill; in fact all the ore passes through it. After passing through the mill the ore comes on the separator, which is a broad plate with holes in it of half an inch diameter; what remains on the plate which cannot get through the half-inch holes is sent back to the crushing-mill to be ground again; what passes through the holes is carried by the water down to plate No.2, of which the holes are a quarter of an inch diameter; what

remains on plate No. 2, and which is too large to pass through the quarter inch diameter holes, is taken to the sieve or the shaking apparatus, where it is shaken, and the small particles called smiddam go through, and the cuttings are thrown out, and the small ore at the bottom is taken to the bingstead. Plate 3 is an inclined plate, the smiddam goes over, and the sludge goes through. The chat-mill is similar to the chat-mills in other places. The chats come out of the sieves or shaking apparatus and are ground and come to a plate, No.1, the holes in which are a quarter of an inch in diameter: the rough cannot pass through the holes, and it is taken off, and is sent back into the chat-mill again; what falls through is carried by the water to the surface of plate No.2. Plate No.2 is inclined; the smiddam goes over and the sludge goes through; the smiddam is then put into the shaking apparatus to be again separated in the same manner as in other washing places; the cuttings are taken out and the lead is removed to the bingstead.

The Sludge Separator.
The sludge is carried by water to the surface of plate No.1. The holes are one-eighth of an inch in diameter. The rough sludge is carried off by the water and the small falls through the holes and runs into the sludge-trunks or buddles. The rough goes into another buddle. The rough and the small sludge are treated in the same manner as in other washing places on the old system.

The slime has a special apparatus; it is made by water to pass over a plate, No.1; what comes over this plate is dirt or stones and the lead passes through and is carried to plate No. 2, which is inclined. The rough passes over and the small falls through, and is afterwards treated as in the old way. The lead which remains at the high end of the buddle or trunk put into the dolly-tub and the matter at the lower end is put into another separator of exactly the same kind.
The cuttings which come from the sieves are carried by water to a small grate. The stones remain above the grate and are then removed and thrown away. What falls through the grate on to an inclined plate with holes in it. The rough goes over and is put back again to undergo the same operation and the small goes through and is sludge, which is treated as other sludge.

No. 37 John Walton.
I have worked at Roughton-gill, washing and inside together, 14 years. There are about 80 men inside. We have two levels into the hill, which enables us to have good ventilation. We have drifts above the levels and shafts below. The air is good. There is no limestone but only rock. We have had only one accident in seven years, and that was a fiery shot and two men were hurt but they recovered. We have no boys only in winter, when some fathers take in their children [the eldest of them]. Partners divide into two sets and they work at different times for the greater convenience. We have had partnerships divided into three sets but not at present. We are not fashed with foul air. In charging the stone round the tamper we use iron drivers and not copper-headed driver as the drivers all are at Greenside. We have none of them. We use the patent fuse in the work, in the dry work we use the ordinary squib. The miners, take them altogether, in Roughton-gill, may average 15s. a-week. I never resided in the lodging-shops. They are most disagreeable places.

The washing-boys begin to work at eight on Monday morning and work till seven. In the winter they work from the first light in the morning to the last light at night The usual number of hours is 12, out of which is one hour for dinner. All the washers stop at the lodging shops. The lodging shops are never washed. The beds and bed-clothes are washed

once or twice a-year, being taken home by the men. The master finds the bedsteads and men find the beds and bed-clothes. The lodging-places are close and a great stour in them. The washers on the average, make 20 or 22 days a-month, that is, by deducting the Sunday and such days as they do not work. They lose many days by wet weather. If there be a week or two of soft weather, that is weather without frost, in the winter time, the washers go out to work. Their hands suffer a great deal sometimes. Nothing but hard frost stops them. They often work all day in wet clothes. They often get colds but, on the whole, they keep their health's very well. Sheds might be put up under which most of the work might be done.

GREENSIDE MINE

No. 38 William Eddy.

I have been a washer of ore at Holyfield Mine and Hudgill Burn Mine, in Alston Moor. After the bowse-washers had done their work at the end of the year we continued on till we had washed all the sludge, slime and cuttings. The year's work of the men is reckoned up to Michaelmas (29th September) and we washed until we had got all the ore cleaned which had been got out before Michaelmas. When we began again, at Lady-day (25th March), we entered on the work of a new account. We have washed till very late in the year. Once it was till after Christmas; after we had once left off we never began again till Lady-day. It was very cold towards the ends of the year, several got cold, many had the hands cut by the cold, the finger-ends, or points of the fingers and the hollow part between the thumb and the first finger. It was cold at the commencement after Lady-day but it grew gradually warm. The washers are liable to be knocked off after that by snow. The trunk or washing department ought all to be covered or done under a shed, on account of the cold and rain and in summer of the heat too. When persons are warm much and then have to wait awhile, they take cold. All the washing department might very easily be covered. It would not be so easy covering the men wheeling away the cuttings to a distance.

I went to work at the mine at Holyfield. We drove a level and went up to three flats. In the upper flat it was exceedingly bad air. Two men worked, and one managed the candles. I was one of the three; the two others were taken ill, the doctor said from the bad air. One died before the three months bargain was up and the other died a few weeks after. I caught a pain in my side, of which I have never yet fully recovered.

The roofs are supported in the mines of Alston Moor by cross-beams of great strength and thickness and other beams crossing them about three inches diameter. Large stones are put above them to break the fall of anything falling down. Such beams generally form a protection, but not always.

I went to work in Greenside four years. Our lodging-rooms were such as not to be fit for a swine to live in. In one house there was 16 bedsteads in the room upstairs and 50 occupied these beds at the same time. We could not always get all in together, but we got in when we could. Often three at a time in the bed and one at the foot. I have several times had to get out of bed and sit up all night to make room for my little brothers, who were there as washers. There was not a single flag or board on the lower floor and there were pools of water 12 inches deep. You might have taken a coal-rake and raked off the dirt and potato peelings six inches deep. At one time we had not a single coal. After I had been there two years rules were laid down, and two men were appointed by the master to clean the house upstairs twice a-week. The lower apartment was to be cleaned twice a-day. Then the shop floor was boarded, and two tables were placed in the shop. After that two more shops were fitted up,

but the increase of workmen more than kept up with the increased accommodation. The breathing at night when all were in bed was dreadful. The workmen received more harm from the sleeping places than from the work. There was one pane of glass which we could open but it was close to a bed-bead. The mines at Greenside were well ventilated and, in that respect, there was nothing to complain of. In the winter time the icicles came through the roof, and within 12 inches of the people sleeping in bed. During a thaw water dropped plentifully into the beds. In the upper beds the person sleeping next to the wall cannot raise his head or change his shirt. Very few accidents occur at Greenside. There is most powder exploded at Greenside of any mine known in this part of England, including Alston Moor. Four men will explode 130lbs., being five quarter barrels, in 13 weeks. The reason is, the ore is found in solid primary rock and not in strata, as at Alston Moor and that country.

No. 39 Joseph Eddy.

I have worked as a washer of ore for three years and a half, and as a miner for five years at the Greenside mine. It is well ventilated but when the air brought the powder reek of other parties upon us, it was as bad as if we had suffered from our own reek. I consider the lodging-shops more injurious to the health of the miners than their work itself. So many sleep in the same room, so many breaths, so much stour arising from their working clothes, so much perspiration from the men themselves, it is impossible to be comfortable.

Two miners occupy one bed, sometimes three. The beds are shaken once a-week on the Monday morning, when the miners come. Some miners make their beds every night. The rooms are in general very dirty, being never washed and very seldom swept, not over once a-month. There is no ventilation, so that the air is very close at night. The men 55 cannot have any clothes over them in summer, it is so warm. If anyone is unwell he disturbs all the rest. Men are coming out of the mines at all hours, 10 at night, 12, 1, or 2; and when they fry their bacon the smell is enough to suffocate the men in bed. I have taken off 12 fleas from my flannel-shirt in the morning; other vermin get admission.

The young persons and boys sleep exactly in the same way, along with the men. I used to leave Penrith on Monday at four o'clock and travelled 15 miles to Greenside with a week's provision and left at 12 on Saturday when I was a washer and returned 15 miles. I had the Saturday night's comfortable sleep and had to get up early on Monday. I had always been used to it and knew no better, but it is like transportation. I became a miner. I had 40s. a-month for the first two months of the quarter, and at the end of the third month of the quarter they reckon and settle. I know men who have nothing to receive for the third month, but often it is otherwise. It is a good mine, on the whole. When a man undertakes a portion of the washing, at a price agreed on per ton, still they make the man give in a weekly account of all the people whom he employs for him, and what they have earned, so that if he be found to make a higher gain than the masters think fit he should have, they lower the price when they make the next bargain. There ought to be more shelter for the children engaged in washing the ore.

The miners work five eight-hour shifts in the week. The washers work from Monday morning to Saturday at 12.

Men who go to the lodging-shops take with them on Monday from a quarter to half a stone of bread, few more than a quarter of a stone; one pound of bacon; some a quarter, some half a

pound of sugar; two ounces of coffee and oatmeal to make crowdy in the morning and sometimes in the evening and a few potatoes. Some take no bacon at all.

One man who worked along with me lived for three years on oatmeal and water and never had anything else, unless the other men gave him bread. He had 9s. a-week and had a wife and family to support. The boys and young person's live in the same way at the lodging houses. The boys at washing have very little shelter, which might very easily be afforded them.

No. 40 William Walton.
I am 22. I went to smelt lead ore at 16 and I have also been employed in washing and I have been working at the slag-hearth. They do not take any under 16 as regular workmen at smelt-mills. In the smelting-furnace there are three sets of men and we work 10 hours, two men on at a time and then the next set come on for 10 hours; and after that the third set come on for 10 hours then the first set begins again, and so on; so that we are 10 hours on and 20 hours off, and go on day and night from one o'clock of Monday morning to two on Saturday afternoon. Some shifts are at work 11 hours, so as to make the time come to two on Saturday. The smelting is as good for the health as any other work about the mills. The people about the smelting-mills are very healthy. They are not so robust and strong as country people. They are better in health than the miners. There are now two men working at our mills upwards of 80 years old. The smelters are whiter looking than the farmers labourers and do not bear so much flesh.

We smelt a bing of ore at a heat and do it in five hours. Some ores are much easier smelted than others. We have some ore that requires six hours to smelt a bing. I worked a while at roasting ores. We were eight hours on and eight hours off all the week, the whole six days from six on Monday to two on Saturday afternoon, day and night, that the furnaces might not cool, which would lose a great deal of time.

Roasting does not injure the health much, not any more than smelting, if they work the same hours. We roast a bing of ore in two hours and a half.

In the slag-furnace we used cinders along with the slag. It is healthy work enough slag work. Much depends on the contrivances which we have for taking away the smoke. I have not worked at refining, but I think the men at it are much the same as to health as the rest of us.
There are mills where things are badly arranged, and the people suffer very much from the smoke, there not being proper flues to take the smoke away.
I have been told of smelting where the smoke was not carried off properly and the men suffered very much. If there be not a good draught of air and there is smoke it is most injurious to the men. Reducing the litharge to lead is the worst job there is. There is a dust rises from the litharge and it hurts the health. It is heavy work, and the dust is of an injurious nature.

No. 41 George Metcalf.
I have been a smelter and a roaster in the smelt-mills. Boys are not employed, except to wheel in peats or lime, or such like. Sometimes a man takes in his own son, or perhaps another boy, to help him. A youth of 16 may be taken into the roasting of ore, if strong enough. I consider that the smelting-mills are sufficiently healthful, if they are kept clear of

reek. The chimneys ought to be carried to a great distance, in order to produce a draught, and thereby remove the reek and all foul air and draw in good air into the mill. A well-ventilated mill is more healthy than the mines. I have tried both and like the mill best. The men get from l5s. to 16s. a-week.

No. 42 Thomas Dixon.
I have been two years and a half a smelter at Greenside. I work three days in a week. I go on Thursday and work to Saturday night. I come back again on Monday morning and work to Wednesday night. There are two hearths at work and there are two men for each hearth. We work 17 hours generally, but on Wednesdays we work 12 at smelting and when that is done weighing the lead which we have made in the six days, which is usually eight tons. We have a certain quantity of ore to smelt every week and if we that we are behind we sometimes work 21 hours a-day. At the end of Wednesday night, we have a week's cessation from labour, until Thursday the following week. Working so many hours near the hot smelting hearths is injurious to our health. The hours are much too many and the work is hot. During the week of idleness, we come home, and do nothing, spending the time in dozing and sleeping to recover ourselves from the exhaustion. Other men take our places during the six days that we are not at work.

The men approve of this arrangement, chiefly on account of having a week's rest. We are paid for the three days ending on Saturday the wages of a week and also the same wages for the three days ending on Wednesday. Men do not suffer more than the men who go into the mines. Some break down from weakness of constitution.

COPPER MINE AT CHURCH CONISTON.

I visited a copper mine belonging to the Coniston Mining Company. A considerable number of young children and young persons are employed here.
Their occupations are above ground and are principally washing and sorting stones which contain the ore. The number is as under:

Children - Males. 3 of 7 years old, 3 of 8 years old, 8 of 9 years old, 5 of 10 years old and 8 of 11. Total 35

Young Persons. 10 of 13 years old, 8 of 14 years old, 12 of 15 years old, 3 of 16 years old and 2 of 17 years old. Total 35.

Of these 70 children and young persons, there are only 8 or $11^{1/2}$ per cent. can write. Of these 8 only one is under 13 years of age.

The number who can read amounts to 63, or 90 per cent. Those who attend Sunday Schools are 53 or nearly 76 per cent. 81 per cent. attended public worship.

The wages average 3s. 5d per week, the highest being 8s., the lowest 2s.

Females. 1 of 6 years old, 1 of 7 years old, 2 of 9 years old, 4 of 10 years old, 3 of 11 years old and 5 of 12 years old. Total 16.

Of these not one can write, 154 can read and 14 attend Sunday Schools. 14 attend public worship.

The wages average 3s. $7^{1/2d.}$ per week, the highest being 4s. 6d. the lowest 2s. 6d. 231 adult males and 7 females are employed.

HOURS OF WORK.
The hours of work are from seven o'clock in the morning till six o'clock in the evening in summer but as the work is almost in the open air, and a lighting of the place not very practicable, no work is done in winter before or after light. One hour is allowed at mid-day for dinner.

In the mines where adults are employed, the work is carried on day and night, except on Sunday on which day no work is done. The shifts are eight hours, three sets of hands being engaged. Thus, each set labours 8 hours out of the 24.

NATURE OF THE EMPLOYMENT.
The nature of the employment of the children and young persons, male and female, is various. When the ore is brought (by waggons on a tramroad) to the open air, it is broken by some boys and girls* with hammers. For this they get paid $1^{1/2d.}$ per barrow, about half a cubic yard.

It is then washed and broken while still wet in another shed by smaller boys and girls. In this shed the ground and the tables on which it is broken are always in a wet state. The children wear the Lancashire clog with a sole of wood about 1 inch or $1^{1/4}$ inch-thick which is the best protection and there is no necessity for getting their body clothes wet. They are obliged to handle the cold, wet stone constantly with one hand and this in winter time must be painful employment. There the ore is sorted. The next preparation for the children is what they call tubbing. This used to be done by hand by the children and was by far the worst part of the work. [When I was in Ireland, at Banmahon, in 1834, it was so performed.] This tubbing is now in the more modern phraseology, called jigging and is performed by machinery. The ore, when passed through a crushing-mill, is placed in large sieves, formerly held in the hands of children who stooped with them over a tub or a small reservoir of water and agitated them till the ore separated from the stone, but now, immersed in a tub or reservoir each sieve is agitated by machinery driven usually by water power. After a certain quantity of agitation, the water is let off and the refuse is separated from the ore by the boy, who holds in his hands an iron scraper for that purpose. This is performed only at considerable intervals of time, and it is scarcely necessary (though perhaps not easily avoidable) to wet even their hands. This work is performed in a shed open in the front. Another employment is separating with shovels certain portions of finely pounded ore, which is brought down by a stream of water from the stamper. The ground of the shed is always damp, or even wet but as the work is performed by shovels there is no need of getting wet in any other part than the feet or soles of the clog, if the clog be waterproof.

The children suffer considerably from the cold, though in severe frosty weather no work is done and they of course, complain when they get home. A witness (Ann High, No.27) who has four children working at the mines says:

"When the children work in winter they complain of the cold a little, It does not give them chilblains. They could not work for a good bit in the bad weather." In the same page, witness No. 28 says, "Never any ill effects produced by the cold in winter but it is very severe. No persons are employed in drawing, as in some coal-pits. Horses only do this work, the adits being made high enough by cutting away top and bottom to admit them"

STATE OF THE PLACE OF WORK.

The places of work for the children and most of the young persons are described above.
One or two of the boys who are apprenticed to the mining business work underground.
The mine is entered by level adits, which are from five to six feet high and three feet wide. The one I entered was rather wet from the drippings of the roof, below this there are other levels.
The shaft of the mine which leads the lowest level is descended by ladders or steps, each ladder being not more than 24 feet long and resting upon a platform or landing-place sufficiently large to prevent the descent of anything which might fall beyond the foot of the ladder. This precaution is necessary because the men carry with them a considerable load of tools which are slung at their backs. Occasionally one of these slips and falls out. Those below would run great risk of being killed if this mode of construction were nor adopted. [The same method is used in Cornwall at some of the deep mines.] The angle at which the ladder is placed if carefully attended to by Mr. Barrett and is always that which is the easiest of ascent and descent. The period of work underground called eight hours but seldom exceeds seven.

*This work is done in a shed having a roof and walls on three sides, open to the air on the fourth side.

ACCIDENTS.

Accidents rarely happen.
Every possible precaution is taken and there are strong coverings of timber over the ladders at every 10 or 20 fathoms. One man was killed within the last two years though his own negligence by falling into a shaft.

WAGES.

The amount of wages earned by the children and young persons had been already stated. The generality of them are paid daily wages. About half a dozen dressers of ore are paid by the quantity. Another occupation, wheeling the ore from one place to another, is sometimes paid by the barrow, about half a cubic yard, i.e. 18 inches cube. The master or head superintendent pays them.

TREATMENT AND CARE.

Great attention is paid by Captain Barrett, a proprietor and superintending agent, to the welfare of these youths and no corporal punishments are inflicted. Witness No.27. and her companions, confirm this. Not only is their physical welfare attended to but their moral also.
There is a sick fund also, but this is confined to the adults.

The Rev. Thomas Tolming, the incumbent, said that "Mr. Barrett, the superintendent of the copper-mine, is particular as to the character of those he employs," (No.29), "They are

therefore not so much demoralised as might be expected by their assembling together in great numbers and hearing the conversation of adults." Their physical condition is good.
Their work is in the open air, with protection from storms of wind and rain and every attention is given to prevent all unnecessary exposure to inclemency of climate. I need not therefore dilate on this point.

I have the honour to be,
Gentleman,
Your most obedient servant,
ANTHONY AUSTIN

No. 23 Mr. John Barrett. May 10th.
He is a shareholder in the copper mine and the resident manager. The number of children and young persons employed at the works is about 100. Of these every few (perhaps not one) under 18 years are employed underground. Their occupation above ground is washing, breaking, picking and sorting ore. The youngest is about 8 years of age. He has been obliged to reject some this summer on the consideration of their being too young. Parents are anxious to get their children employed as soon as possible and there is not other employment for them. The parents are chiefly miners. He endeavours as much as possible to separate the girls from the boys while at work and there is a person appointed to superintend the place whose moral character is attended to. He is not allowed to use corporal punishment and is desired to prevent the use of improper language. We subscribe to a day school which is supported by the joint contributions of Mr. Marshal, Lady de Fleming and the mining company. We require as far as possible the attendance of the children at school in the winter, when they are unemployed. The parents are beginning to see the value of education. At the first establishment of the night school, the young persons of 18 to 20 years old objected on account of the payment of 1d. per week. Since then instruction has been (for that reason) given gratis the attendance is good and the boys advance rapidly.

No. 24. John Borrick.
He is 11 years old and has been at work in the mine for 2 years. His employment is sometimes picking (ore) sometimes wheeling [in barrows]. The wheeling is the hardest work. He comes to work at 7 o'clock in the morning and goes away at 6 o'clock at night but never works later. He brings his dinner with him and breakfasts before he comes. He does not go home. He has 1 hour allowed for dinner and no time allowed for tea. His hours of work are in winter only from daylight to dark. He has 1s. 6d. a week. He attends Sunday School and can read very little. [He is a fine, robust, healthy looking boy.]

No. 25 Mark Millican.
He is 16 years old and works at the copper mine. Tubbs, that is, works the jigging machine. He does not work in the winter and has been at work for about 65 years. He gets 1s. 2d. a day. He never went to day school but learned to read at Sunday School and to write at night school. He learns ciphering and knows figures but has not yet learned much. He works 10 hours a day.

No. 26 ------- Jackson.
He has a son who works underground, He is now just gone to work [we did not find him]. His son is 16 years old. The time of work is now from 2 o'clock today till 10 at night. They rest from 10 to 6 in the morning. He will go tomorrow at 6 in the morning and come away at 2 in

the afternoon and rest till 10, work from 10 till 6, rest from 6 till 2 and so on. The shifts being 8 hours. [In 48 hours they have three times 8 hours work and three times 8 hours rest]. They are never underground more than 8 hours at a time.

No. 27 Ann High.
She has 4 children working in the mine. The eldest 15, gets 8d. a day, a boy who wheels, The second is Anthony, just turned 13 who wheels and picks for 7d. a day. They have worked there for 2 years. The third is 10 and gets 5d. a day. The youngest is 7 years old and has just gone. He gets 2s. 9d. a month. Her husband works in the mine. He has worked 9 days at the mine. He was a shoemaker before. They have 8 children and the rest are too young to work. They get no relief from the parish. They were obliged to apply in winter and got some clothes. The children could not work for a good it in the bad weather. When the children work in the winter they complain of the cold a little but it does not give them chilblains. They are not such bad masters. They send them home if they misbehave. They are sent home to their parents and they beat them, they are forced to. They could not get a living without the children's work.

[Betsy Harcourt was present and said the same. She said that the overlooker over her children was a nice little man as could be. They were not allowed to beat the children. They were never misused.]

No. 28 Anna Fleming.
She has 7 children alive and her husband died 7 weeks ago. He had worked in the mines. He took bargains, sometimes he made money by the bargins, sometimes made scarcely any. During his lifetime he never set the children to work in the mines. One of her sons has set up for a joiner but he is a wild young man. One worked at the smithy and one at the mines. They maintain themselves but are not able to help her. When she applied to the overseer after her husband's death for relief, he refused it. (She had nothing from him to bury her husband.) He asked her why she did not send her children to the mines. The one is 12 years old and is very unhealthy. She is now taken by the Miss Beavers (who have assisted them very much and do assist the poor of the parish and are very kind to them), to try if change of air will do her good. The other was going on 10. She does not work. The younger one goes to school. Miss Beaver pays for her going and did pay for the elder's schooling when she was well enough. The widow Stewardson has only one little boy working in the mines. He is a fine, sharp, stout healthy little boy. Never has there been any ill effects produced by the cold in winter but it is very severe.

No. 29 Rev. Thomas Tolming, incumbent of Coniston Church.
The principle employment of the children in this village is at the copper mine. They do not work underground. The employment above ground is very cold in the winter season. The mothers complain that their children suffer from this. He is not aware that it brings on any disease. Consumption is the most prevalent disease of the district.

There is an excellent Sunday School. Some ladies of this parish superintend it with great care and attention and are of considerable assistance in improving the moral condition of the children and young persons in the parish so that they are not so much demoralised as they might otherwise be from assembling together in works where the moral conduct is not made the principle object of bringing them together. Mr. Barrett, the superintendent of the copper mine is particular as to the character of those he employs and a register is kept. Persons

proved guilty of gross misconduct would be duly cautioned or dismissed. The mining company contribute to the daily school and some of the children who work at the mines in summer attend at the school in winter. It is the wish of the manager of the mines that they should do so. Several of these children go to the mines at an early age having no previous instruction. In cases where the poverty of the parents who have a young family has compelled them, to apply to the relieving officer for relief he has made this one of his pleas for refusing it. "You have children. Why do you not send them to work in the mines?" This has been said where the children were so young that they ought not to have been sent to work and in other cases the delicate health of the child rendered it dangerous to send it. In the cases alluded to he thinks that the ages were from 7 to 12.* There are some in the parish who can earn about £50 to £60 per year who will not send their children into the mines. Those who do send them are almost always in so poor a state that they are compelled to send their children for the sake of the assistance derived from the produce of their labour. He thinks that they are anxious to have their children educated and as a proof of it, when a night school was established during the winter, it was attended by about 30 who were employed chiefly in the mines during the day.

*These are the widow Fleming's children (see No. 28.)

TWO TRAGIC ACCIDENTS TO YOUNG PERSONS

The local newspapers reported on two tragic accidents to Sarah Duke aged 14 years and working at Coniston Copper Mines and James McIntosh aged 12 years working at Greenside Mine which show the dangers to the children and young persons of even working on the dressing floors.

Westmorland Gazette and Kendal Advertiser 21st June 1845

FATAL ACCIDENT AT CONISTON- CORONERS INQUEST- A inquest was held at Coniston on the 13th inst; before William Blendall, Esq, coroner on view of the body of Sarah Duke aged 14 who was employed at the Coniston copper mines and came to her death under the following circumstances- Joseph Braithwaite stated that on Wednesday the 4th inst, about noon, his attention was attracted by an outcry amongst some girls, near the level mouth that leads into the mines. On hastening to the spot, he found deceased lying beside the waggon rail, with one of her legs badly bruised. It appeared to be sloughed. He took her up and carried her home. She told him that it was done with the waggon wheel- Isabella Robinson aged 13, said that she together with the deceased and several other girls were playing near the level mouth during dinner hour on Wednesday week, when a train of laden waggons came out of the mine, and deceased ran and got on the couplings between two waggons to ride. After riding a few yards, she jumped off again and her clothes caught the coupling pin, and she fell. The waggon wheel "sledded" against her leg and cut it. Does not know whether those who drive the wagons saw deceased jump on or not. One of them was before with the horse, and the other was shutting the door which leads into the mines. Thought they did not see her. Knew that they (the girls) were forbidden to ride on the waggons by the masters - Mr Gibson, surgeon to the mines, stated that he was called to the deceased on Wednesday the 4th inst. Found her with an extensive lacerated wound on the posterior part of the right leg and the powers of life greatly depressed. Stitched up and dressed the wound. Thought amputation of the limb would be necessary when she rallied. Had a consultation the next day with Mr Fell of Ambleside. The depression continuing, they agreed the operation could not be

performed without greater risk of the patient sinking under it and that if the case went on tolerably well a favourable result might be hoped for without it. Continued to attend deceased, and on Wednesday 11th found that the symptoms of *traumatic tetanus* (locked jaw arising from wounds) has set in. Mentioned her danger to those around her. The symptoms increased and at witness's last visit on Thursday at noon saw she was sinking fast. Was told she died about three the same day. The cause of her death was *tetanus*, which was caused by laceration of her leg - Verdict; Accidental death.

The Carlisle Journal 12th November 1861

FATAL ACCIDENT AT GREENSIDE MINES- On Friday last an inquest was held at the Royal Oak Inn, Keswick, before Thomas Howson, Esq, deputy coroner of the Western Division and a respected jury, on view of the body of James McIntosh who was accidentally killed at Greenside Lead Mines on the 5th instant.

Charles McIntosh gave the following evidence- I am brother of the deceased. He was twelve years of age and had worked at Greenside Lead Mines about one and half years. He and I worked there on the 5th instant. He was a driver and had management of a pony which was used for drawing waggons on the tramway. He had also to shift the points to let the other wagons past; He used a coal-rake for that purpose. About half-past four pm on the day in question, someone shouted he had fallen over the wall, which is a few feet from the tramway. I looked towards the place and saw him lying on the edge of the rocks having fallen a distance of twenty feet. I made towards him, but before I could reach him he fell down the embankment into the water which runs from the reservoir. I endeavoured to get hold of him, but the water was running so strong that it carried him over a waterfall before I could do so. I then lifted him up, he was bleeding about the head and seemed to be much injured and begged of me to lay him down again. I think he must have been in the act of turning the points when he fell for they were half turned after the accident had occurred.

Teasdale McIntosh, father of the deceased, stated that he lived at Brigham and was working at Greenside on the day his son was killed, and assisted in conveying him home. He died on the turnpike road, when about three miles off. He was attended by Dr. Rumney of Watermillock who stated death was caused by a fracture of the skull and compression of the brain.

The jury without hesitation returned a verdict of "Accidental death" and presented the father of the deceased with their usual fee of six shillings.

Since the accident occurred the company have caused railings to be placed by the side of the wall alluded to, in order to prevent accident in the future.

James was probably working on the processing area at the Low Horse level.

Warren Allison.

CUMBRIA AMENITY TRUST MINING HISTORY SOCIETY

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