CAT

The Newsletter of the Cumbria Amenity Trust Mining History Society



Meet Leader Andrew Woolard - Burtree Pasture Mine

No. 119

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Cumbria Amenity Trust Mining History Society Newsletter No 119, May 2015

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Editor's rant

In 1979 the Cumbria Amenity Trust was formed by a group of individuals who had become interested in mines, mine exploration and conservation. They wanted to purchase an iron ore mine site at Henning Valley, in Furness in order to protect it from destructive development. The name was chosen with a view to raising funds for the prospective purchase. They did not succeed in their aim, but the trust grew and developed and gained a reputation for adventurous underground exploration. It became known as CAT, for short.

As the trust grew and became more widely known, it established links with authorities and other like-minded groups, becoming a member of the National Association of Mining History Organisations, NAMHO for short. It became apparent that the title 'CAT' could cause confusion, as it gave no indication of our interests or purposes. At an Annual General Meeting it was decided that in order to rectify this we would add the words 'Mining History Society' to our title, CATMHS for short. This is a rather cumbersome title to be sure, a bit long winded and not easy to pronounce but at least it says what we are about.

We might have dropped words 'Amenity Trust' to make 'Cumbria Mining History Society', but we didn't. 'catmus' would have become 'cwums', still awkward to pronounce. So, CATMHS is who we are, and it is part of our history.

Nowadays it irritates me that people, both within and without our society; sometimes refer to us as 'CATS'. I know that I am pedantic, but what do they mean? Is CATS the plural of CAT? It can't be, we are one society. Does CATS refer to the members, each one being a cat? Or do they mean mean Cumbria Amenity Trust Society?

Please can we be clear about who we are. CATMHS is the proper acronym, whilst CAT is an affectionate abbreviation that alludes to our history, but CATS? NO!

Environment Agency Coniston Coppermines Water pollution Study

The Environment Agency is currently conducting a Catchment Characterisation Study to look at impacts of mine waters at the Coniston Coppermines. Church Beck and Coniston Water are both impacted by copper and zinc, and as a result aren't achieving good ecological status under the Water Framework Directive.

There is an extensive legacy of metal mining at Coniston, including many shafts, drainage levels and large areas of un-vegetated spoil and smelting wastes. Some spoil tips have steep, unstable slopes that are being constantly eroded at the base by Church Beck, and this also contributes to the pollution. Using funding from Defra, we've started monitoring water quality in the river and mine water discharges at various points in the valley. This will allow us to work out how much pollution there is and where exactly it comes from. We will then work with the Coal Authority to identify what feasible treatment options there are to clean up that pollution.

We need you! In terms of mine drainage, we don't really know what's happening underground at Coppermines. We have a monitoring point at Deep Level Adit on Red Dell Beck, and we would like to know more about how the water makes its way here. We're asking mine explorers to help us understand this - you may have some experiences, photographs, diagrams etc that could really help us, if so we would like to hear from you.

Please contact Liz Withey on 01772 714336 or email <u>elizabeth.withey@environment-agency.gov.uk</u> for further information.

NAMHO conference

A reminder of this year's NAMHO Conference, which is to be held on $22^{nd} - 24^{th}$ May. It will be held at Nenthead, hosted by the Nenthead Mines Conservation Society.

Amongst the events, Warren Allison will be giving a presentation on The History and Conservation of Carrock Wolfram mine, Rosemary Vidler will be leading several underground trips into Carr's Tourist Mine, John Brown is leading a trip into Hudgillburn Mine and there is to be a talk by Tony Harrison, John Dale and Pete Ryder on Hudgill Burn Mine Caverns: Britain's Biggest Maze Cave.

Another event is to be 'Running a Tourist Mine in the 21st Century. An informal discussion about operating a remote lead mining attraction.' by Mike Boase, who is the manager of Killhope - The North of England Lead Mining Museum.



These photographs of Killhope Mine were taken in the 1960's and in 2001 by a young Rudy Devriese



West Cumbria Coal mine

West Cumbria Mining report that the first phase of their investigation work has been completed, with the successful drilling of four boreholes to enable extraction of samples of coal for quality testing. These boreholes have each been grouted and correctly left so that there are no lasting impacts.

The quality assessments from the test laboratory, together with the previous knowledge gained from the extensive historical data they have, confirm that there is good potential for extracting high quality coking coal from the planned mine near Whitehaven, and they are now starting their Phase 2 work programme.

They intend to drill up to ten offshore boreholes in the sea off the West Cumbrian coast and a further two boreholes will be drilled from onshore to investigate specific offshore geological features. This drilling will further define the extent of the coal seams and continued viability of the project, and as with previous works these will be conducted with minimal disruption and an absolute focus on returning each site to its former state upon completion.

In addition to this they will be commencing a detailed design study to develop their plans. Part of this will be an option study to explore the potential location of the minehead. For more information visit <u>www.westcumbriamining.com</u>

Meets

A reminder that the Thrang Quarry meet originally scheduled for 25th May will now be on Sunday 14th June.

New Book

In a recent newsletter CATMHS member Brian Cubbon published an article on Salt from Walney Island. Now he has produced a book on the subject entitled 'Barrow Salt'.

Barrow Salt 'There are substantial deposits of Rock Salt deep beneath Walney Island, Barrow in Furness, and this account tells for the first time something of the attempts made during the late 1890's and early 1900's to establish a salt industry there. The industry was short lived, but was well founded, involving a number of prominent local business-men well versed in such matters, and the enterprise deserves a mention as a significant part of Barrow's Industrial Heritage.'



The book is thorough and well researched, and covers the discovery of the salt vein, the various companies set up to exploit it, the processes of mining and refining it, the decline and closure and what remains of its structures. It tells the story of a little known industry that no one else has covered.

Hardback; 140 pp; Frontis plus 17 plates; 13 text figs. Available from Bookshops in South Cumbria or from B D Cubbon at Finch Field, Rectory Road, Edgefield, Norfolk, NR242RJ. $\pounds 16 + \pounds 1.50$ p&p.

Mines Forum, 16th February. At the LDNPA Northern Area Office, Threlkeld

There were representatives from the Lake District National Park Authority, Environment Agency, National Trust, National Association of Mining History Organisations, Cumbria Amenity Trust Mining History Society, Coniston Local History Society, Cumbria Ore Mines Rescue Unit, Mines of Lakeland Exploration Society.

Environment Agency

Liz Witney reported that they were three months in to a twelve month water quality sampling program at Coniston. Help from Alastair Cameron and Philip Johnson was acknowledged. The EA are looking for copper and zinc in the water and are moving up the catchment area. Sampling points include Deep Level adit, Low Water beck, and the Bonsor spoil heaps. The lowest site is the Church Beck outlet to the electricity plant. Cadmium has been found blow Bonsor Level. The Tilberthwaite catchment will be considered once the Coniston program has been completed. Alastair Cameron reported that the Coniston & Crake Rivers Trust were concerned about heavy metals in the lake.

National Trust

John Malley reported that the Coal Authority has issued a report on the experimental Force Crag mine treatment plant. The system is proving 99% efficient in removing metals from the water. In order to obtain consistent results a flow rate of 6 litres per second from the out flow of No 1 Level was being filtered. This is the equivalent of the lowest summer flow. In winter rates can be 40 - 60 litres, and higher rates will be considered once basic results have been obtained.

Zero Level at Force Crag is still blocked and the water level in the mine is normally about 75 feet above the road. There is a repetitive build up and discharge of about 1.5 meters. The Coal Authority continue to monitor this. Water gets into the mine via No 1 Level, which in turn is fed from No 3 Level. It is believed that preventing water from flowing down the shaft inside No 3 would go a long way to solving the problem of the water in 0 Level. This was suggested by CAT years ago. The Coal Authority are now keen to do it and have asked CATMHS to reinstate the portal of No 3 level to deal with this.

Natural England are interested in recording the internal systems of mines which are listed as 'declining' Peter Claughton said that the only way they could do this was with the help of mining history groups.

Newcastle University have a PhD student working on a design for a micro power generating system for use at remote locations such as the Force Crag dressing plant.

Dave Blundell's CAT logs which the NT obtained from Cathy Blundell are being transcribed and collated.

The NT are the feasibility of a hydroelectric scheme at Greenburn to supply the National Grid.

LDNPA

Eleanor Kingston reported that a quadricopter survey of the lower workings at Greenside mine had been carried out. English Heritage is to pay for a survey of the whole of the monument to produce a report with a view to improving the site, which is on the Monuments at Risk Register. They hope eventually to be able to take it off the register. Backbarrow Iron Smelter - Nothing to report.

Coniston

It had been decided not to submit The Heritage Lottery Grant bid for Coniston Coppermines in time for the February deadline as more work was needed to ensure its success. It will now be submitted for the May deadline and we should find out in September whether or not it has been successful. The ten sites identified by the Conservation Management Plan will be addressed. There will be a 20% contingency fund.

Threlkeld and Gatesgill

Work is in progress to re-route the culvert at Yellow Dam. Recording is being done as the work progresses

Fix the Fells

There is a scheme at Coniston to deal with erosion above Low Water and they are looking for sites to obtain suitable stone. Two sites in Red Dell and one in Pudding Stone Valley are being considered. At Honister work is to be carried out to repair the foot path adjacent to the Tramway.

CATMHS

Warren Allison reported that at the Tilberthwaite Penny Rigg Horse Level dig they were through the second fall and were busy clearing the tail of what is thought to be the final blockage. Eleanor Kingston said that, as part of the EH bid, detailed surveys would be carried out at Penny Rigg Mill and Tilberthwaite Gill mine, and at Low Bonsor.

All CATMHS mine plans have been scanned by the Royal Geographic Society and should be on the BGS website in due course. The CATMHS website is to be upgraded and it is hoped that it will be able to show 3D surveys.

We hope to produce a book about the history of Tilberthwaite mine, which will include present day history. It will have about 96 pages and should be published in about a year

Mike Mitchell reported on the 3D photography project carried out by himself and Mark Simpson. Mike also distributed some of the new CATMHS business cards that he has produced, which are useful to give out on site to interested passers-by. They were well received.

Mines of Lakeland Exploration Society

Donald Angus reported that MoLES was virtually wound up and its capital had been shared out amongst the membership.

Yewthwaite Mine Nothing has been done recently and the mine will deteriorate

Alastair Cameron

At Honister a variation of planning consent has been submitted regarding extended use of Dubs and Hopper quarries. Stone crushing would cease but sorting for building stone would continue.

The next Mines Forum meeting will be on June 2nd.

The Coniston Coppermines Mine Plan

Early in 1990's a number of reports on the Coniston Coppermines were published which included mineplans. At the time it seemed clear to me that we needed to have a complete overall single plan of the mine which gave as clear indication as we could get of the underground layout. As far as I could see there was no such complete plan in existence and therefore it would be a case of starting from scratch. Eighteen months later it was finished!



The late Peter Fleming showed great interest in this and gave a lot of encouragement and help. I decided to use laser-copying techniques to produce a few copies for sale. This covered the cost of the original production of the Plan.

In 2002 some corrections were made to the original copy and I destroyed any former copies as they were now obsolete. (You can tell which is the original copy because the word 'Bonsor' in Bonsor Dressing Floor is spelt wrong!). Since then the Plan has been used by several agencies and authorities, most recently the Environment Agency in their work detecting the source of the heavy-metal pollution in the outflow from the Mine.

I think the Plan now needs to be updated again. We have more information on the extent of John Barratt's work below Deep Level in the Paddy End area and I think it is time to put all the levels in the area of the Bonsor Vein onto the Plan (I intentionally left off the 20, 35 and 110 fathom levels to avoid that section appearing too cluttered). Grey Crag Level was also taken further along the Paddy End Vein beneath Levers Water than the current Plan shows (that bit was originally copied from Eric Holland).

It is now probably a good time for me to do this with the planned conservation and interpretation work in the Coppermines Valley now looking much more certain. I intend start this during April so if anyone has any other suggestions for modifications, please give me a shout. I should point out that the Copyright of this document is still with me, which basically means no copying '*for publication or sale without approval and reference*'.

I am in the process of making a mounted and framed A2 copy to put up on the common-room wall in the Coppermines Youth Hostel. This is in return for all the tea and coffee they have made for us during the freezing weather in January when we were up there sampling mine-water outflow for heavy-metal analysis with Liz and Susannah from the Environment Agency. Alastair Cameron

Dave Blundell's Diaries

Many CAT members will remember Dave Blundell, who was one of the most active industrial archaeologists in the region in the 1980's and early 90's. On 14th August 1994 Dave died while attending a CAT work-meet at the Hudgill Burn Mine in the Nent Valley.

It is only recently that Dave's own personal diaries have come to light. John Malley, a neighbour of the Blundell's was asked by Kathy if he would like to have the diaries. John is a member of the Mine Forum Team and realised their importance. The diaries were then passed to Jamie Lund, the National Trust archaeologist, who has arranged for transcripts to be made. This work is still going on but transcripts are available for the period of 1981 until 1989.

The entries are extremely clear and factual with the most minute detail recorded. Below is a small extract from the diary for a CAT trip on 21st March 1981 which was held at the Tilberthwaite Mine where the aim was to try to gain access to Horse Crag Level by abseiling down from Waterfall



Adit. This extract begins when six CAT members enter Waterfall Level and make their way through the mine to locate the top of the shaft that they thought might take them down to the Horse Crag Level.

.....past sump (flooded) in floor with an ore chute above, over floor collapses (timbers ropey) to the top of a shaft – dry with ladders in position. M Wickenden, C Jones and A McFadzean descended on abseil – depth 150'. M Mitchell, P Dawes and I returned out, checking side passages en-route. Then down to the car park.

Time was getting on so we decided to check on Chris Jones and Co. Pete Fleming had turned up so we went back up to Waterfall Level, left Pete at entrance, Mike and I retraced steps back to top of first pitch – decided to wait 15 mins and if no sign of life, abseil down and shout through the squeeze. 15 mins passed, it was now 5.50pm.

Mike had already clipped onto the rope when Chris appeared – he had laddered back up and appeared shattered. Others coming behind. Mike and I exited and informed Pete and we all returned to the car park. Back at bottom for 6.40pm, changed and hung around until 7.45pm then set off home with instruction that in case of panic to phone us at home. Pete Fleming set off back up the hill with lamps to meet them – no phone call so all must have been OK. C Jones later reported on the descent; 50'abseil, 150' abseil and 185'abseil down to Deep Level which was initially waist deep then completely flooded. Large mine bogies still present

One can imagine Dave returning from an epic trip such as this and making sure that everything was recorded and his diaries were up to date before retiring for the night. Alastair Cameron

From Advanced Digging to Advanced Driving.

The Darlington Branch of the Institute of Advanced Motorists asked me to speak on mining history at one of their regular meetings. I suppose like most other groups, they are always looking for different speakers to stimulate their minds, especially on a cold dismal January evening. Looking around the room, it suddenly occurred to me that 'Advanced' may not just be a description of their driving skills, it also confirmed my suspicions about the lack of younger members of society becoming involved in things other than Social Media. We are not alone!

Their meetings take place at Sherwoods of Darlington, a Vauxhall and Chevrolet dealership, their conference room being hired out for such events as this. Upon my arrival I was met by the Dealer Principal who is also a very good acquaintance, but he was unaware of what the talk was about until he asked me. He surprised me by telling me that he had qualified as a mining engineer in South Africa and worked in the gold and diamond mines there. I was aware he had a fairly lengthy career in the army before taking over the Darlington dealership, so his time in the mining industry must have been short. Needless to say, he could not stay because of a prior engagement that evening, so there was no time to hear more about this, but it will be a good opportunity to collar him the next time I see him.

It seemed this would be a good opportunity to tell them all about CAT, from its inception and formation thirty six years ago in 1979 to the present day, and show some of the many achievements during this period. So, armed with sixty slides, I proceeded to tell them about how it was formed from the attempt to buy land containing mining remains in Furness and how it grew to become very active in Cumbria and at the same time generating active groups in other areas of the country. Newsletters, Journals containing original research work and Trail Leaflets I had put on display. Mention was made of the generosity of members having produced other publications over time, which helped to fund the running of the Society and its various projects. Our very own business card, which were designed and printed by Mike Mitchell were distributed to all present.

To keep it brief, for this could take forty five minutes, the slides showed the great diversity of mining in Cumbria and the multitude of projects in which we have been involved and also our links with other bodies. Time was given to explain about the various active groups within CAT involved in surveying, exploration and conservation work. The audience was also given some idea of the remoteness of some of the locations and the amount of preparation required before any of these projects can begin, let alone the effort needed whilst they are ongoing.

During 'Any Questions' at the end, came most of the questions you would expect from giving such a talk. For example questions relating to exploration and conservation work underground:

- Do you have a radio link or a telephone to the surface?
- What happens if your lights go out?

- How do your wives and loved ones know if you get into difficulty?
- Why do you do it?

The last question always gets a reply from me "if you need to ask the question....."

Generally most of the audience had not a clue about what is below their feet when walking in The Lakes, North Pennines or any other mineral bearing areas that have been mined, but hopefully they are now much more enlightened.

John Brown

Doctor Descender

9th March 2015

Dear Descender,

Two weeks ago a colleague attempted to attend a CATMHS meet in the North Pennines, but failed to appear at the appointed hour or indeed before the meet was declared over at the unusually early hour of 1230 (caused by events outside the control of the Meet Leader i.e. appallingly cold weather, the inability to locate the drain to the mine and the point blank refusal of the attendees to contemplate immersing themselves in the chest deep water). Since he is usually assiduous in turning up promptly his absence provoked comment, which became vocal and incredulous when a text arrived announcing he was stuck in a snowdrift. None of the rest of the party had seen more than 15-20mm of snow anywhere so a further text several hours later that he was still digging was very perplexing. Subsequently it transpired that his attempt to traverse the highest route in the country between Teesdale and Weardale had been a mistake not helped by having neither shovel nor gloves.

This past weekend I was also attending a meet in the North Pennines and since I was approaching from the south decided that given there was little or no snow on the tops and the weather good I would follow the same route. Approaching a level portion on the climb to the watershed I noticed a shallow covering of snow some forty metres wide crossed the track ahead, pressing on I found that after about ten metres the snow was quite deep and the wheels having broken through the frozen crust my vehicle was suspended on the snow surface with all four wheels revolving to no effect. Naturally I sprang into action with gloves and shovel and set to work to clear the remaining thirty metres of snow down to ground level, I was surprised to find that the depth was mid-thigh and subsequent perusal of the map suggests that this was the site of a small hush. As I completed the clearance it became clear that the Landrover was now perched on top of the snow with no way of persuading it to descend into the cutting, much work ensued clearing the snow from beneath the axles and differentials and carrying trug loads of stones to pack under the wheels. Finally after two hours effort I was underway.

Arriving a mere hour late at the Meet I found as I expected that in deference to my experience and seniority the Leader had waited for me rather than pressing on regardless. I write however to complain about the Meet Leader's (a mere stripling at that!) use of what I can only describe as an "opprobrious epithet" in suggesting that he would report my presence at the meet under the pseudonym "Captain Cockup". I trust you will join me in deploring the use of this sort of language.

Yours sincerely, Infuriated Idiot of Ealing

Dear Idiot,

Given this comprehensive account of your own absolute incompetence and folly I can only say how delighted I am that the Society is still producing Meet Leaders with an unerring ability to succinctly and accurately sum up the qualities of the attendees at their meets, his waiting for you displays a degree of forbearance and sympathy you are unlikely to receive from your usual companions.

Yours Dr Descender

Dear Doctor

I realise that normally you deal with individual consultations, but there appears to be a common problem affecting Landrover owning officers of the club when travelling from Teesdale to Weardale. It appears that the Webmaster is not alone in getting stuck in the snow, and the Treasurer has now succumbed - delaying the start of the meet. Can you offer any assistance?

Anon

Dear Patient

I have analysed these two cases, which, whilst ostensibly appearing similar, do have many points of difference, such as age of patient, type of vehicle, transmission etc. I can only conclude that driver competence is the underlying problem and should you wish to avail yourself of my "high speed driving course", which has been endorsed this year by the North Wales Police, then please attend my surgery. Note that the course <u>does not</u> involve digging to ensure speedy progress.

Doctor Descender

Meet report – Burtree Pasture Mine – 8th March 2015

Andrew Woollard, John Aird, Ian Hebson

The Burtree Pasture mine worked several veins that converge upon the Burtreeford Disturbance, including the Burtree Pasture, Breckonsike and Coptcleugh veins. The Burtreeford Dyke is a complex belt of faults and a monoclinal fold in the ground that runs approximately north south between the South Tyne and the Lunedale valleys. The mine in its entirety extends vertically through the strata from Gowlands level, above the horse level in the Lower Felltop Limestone, to the bottom of the Engine shaft in the Jew Limestone bed.



Burtree Pasture mine was originally worked for Lead as a partnership mine, known as Broadmea mine. The mine was owned and operated by the Blackett and then Beaumont families following purchase of the Broadmea, Breckonsike and Greenfield mines as an auction lot for £750 in 1791 by Sir Thomas Wentworth-Blackett. Ownership of the mine passed through his illegitimate daughter Diana to Thomas Richard Beaumont in 1792 and is generally referred to as the Blackett–Beaumont Company who operated the Allendale mines.

In addition to the lead mines in Allendale that the Blacketts had begun to operate in 1684 following purchase of the Manor of Hexham, the family had leased mining rights in Weardale since 1698. The Blackett-Beaumont company was responsible for the development and standardisation of the mine, operating a bargain formula for driving levels at 6ft high above the sleepers and 3 1/2ft wide with a 4 in 1000 incline to aid drainage. They sunk the engine shaft and installed 3 underground water wheels and a



horse gin. The two 3ft wide water wheels between the horse and water levels were used to pump water out of the lower workings that eventually would extend to 160 fathoms below the Horse level. The upper wheel was a 36ft diameter wheel and the lower, a 28ft wheel, the water from the tailrace of the upper powering the lower wheel. There was also a 30ft diameter, 4ft wide reversible waterwheel installed on the horse level (circa 1825) to provide haulage in the engine shaft. A Horse Gin was also installed to provide power to haul ore when water was in limited supply. The Horse Gin would also have been used to service the pump rods for the lower workings.

By 1818 the Horse level had progressed beyond the Great Cross vein intersection with the Burtree Pasture vein and by 1825 good ore had been found in the Great Limestone beyond the cross vein. This part of the mine experienced significant



difficulties with ventilation, until the driving the Low Broad Mea Slitt, connecting to the horse level at 150 yard intervals.

Ventilation continued as a problem until the sinking of the Middlehopehead shaft and the installation of a furnace to provide a draw on the mine. By 1840 the fortunes of the workings

in the Breckonsike vein had improved with ore discovered below the horse level in the Four Fathom Limestone.

By 1864 the horse level extended over 2 miles from surface, was 105 fathoms below the surface of Middlehopehead and extended a further 131 fathoms down the level head engine shaft, with 5 levels below the horse level. The mine fell into disuse following the collapse of lead prices in the 1870's – 1880's, with abandonment plans drawn in 1899.

The Burtree Pasture mine was re-opened in 1948 and efforts were made to exploit the



Coptcleugh vein by the Weardale lead mining company although this was not commercially viable. It wasn't until the rise in the demand for Fluorspar that the mine was reopened in 1971 to exploit the unmined sections of the vein and the reserves left in stopes, either as gangue (solid formation on the walls of the stope left following extraction of the lead ore from the middle of the vein) or from back filled materials.

A new winding chamber for a 300 hp electric winder and headgear over the level head engine shaft were installed and a project to drain and straighten the shaft began. The project to drain the shaft was scrapped in 1975 following painfully slow progress and a change in the Weardale Lead Mining Company management. In the 18 months that had passed, Foraky Ltd, contracted to dewater the shaft had encountered a high make of water and 3 blockages, limiting progress to 105m of the 260m total depth, giving access to Gargetts and Kellots levels. Gargetts level was explored for production and access gained to a number of old stopes, although the investment required to upgrade the shaft for production prohibited further exploitation and the venture was abandoned in 1977 just before the Swiss Aluminium mining UK Ltd (SAMUK) took bought out the Weardale Lead Mining Company.

Following the takeover of the mine by SAMUK, an incline was sunk NE into the Great Limestone below the Horse level working the vein for 47,200 tons of fluorspar ore, however the mine was closed by 1981.



The meet began with a prompt 10am start at 11:15 after Mr Aird's snowy excursion over the tops from Teasdale to Weardale. We descended into the mine through the climbing shaft and onto the Horse level. Proceeding out-by first, we visited the modern winding chamber,

The meet began with a prompt 10am start at 11:15 after Mr Aird's snowy excursion over the tops from Teasdale to Weardale. We descended into the mine through the climbing shaft and onto the Horse level. Proceeding out - by first, we visited the modern winding chamber containing the 300Hp electric winder. Most of the equipment remains in the chamber, although the ropes and drum brakes have been removed from the winding drum. Speaking to the local farmer, it appears that installation of the winder and part of the shaft rehabilitation was grant funded on the condition that the winding equipment was left in place, should the venture close. After stopping for a quick brew we proceeded up the incline out of the winding chamber to inspect the modern headgear over the level head engine shaft.









From there we pushed along the horse level passage in the direction of the Breckonsike vein, encountering some very unstable ground, beyond which the level improves for some 150 yards. At this point the level is un-supported





and appears to be a modern enlargement of the original 6ft x 3.5ft level to approximately 10ft x 8ft and with a rectangular profile.

Towards the end of the 150 yard drive, the air quality diminishes to the point that further progress through the next section of unstable ground would not be advised. Returning to the engine shaft we visited the underground horse gin room. From there we circled round through the shunting passage that used to extend through to the Burtree Pasture vein and into the SAMUK incline. This then allowed for some time for individual exploring of the gin room, water wheel pits (all 3) and the engine shaft.



Andrew Woollard

SOME FOOTNOTES ON BURTREE PASTURE LEAD MINE

Period of Operation

At least 300 hundred years prior to initial closure 1890's, re-opened 1970's for fluorspar, final closure 1981.

Output

Minimum of 175,000 tons lead concentrates prior to 1890, 47,500 tons crude fluorite ore extracted after reopening.

Water Supply

By leat from the discharge from Killhope wheel (approximately 3 miles away) first to the Winding wheel and then to the Pumping wheels, additional water from within the mine was fed to the pumping wheels.

Upper Pumping Wheel

36' X 3' Associated Pumps (3 sets) Milburn to Garrets Level 177 feet 7.5 inch / Donaldson Level to Milburn Level 159 feet 7.5 inch diameter /Sump to Donaldson Level 213 feet 6 inch diameter. **Lower Pumping Wheel**

28' X 3' Associated Pumps Garrets Level to Water Level 153 feet 9 inches diameter Total pumping height 702 feet

Steuart reported on the mine in 1883 suggesting the reorganising of the pumping arrangements so that the upper wheel handled the first and third set of pumps and the lower wheel the second and fourth set of pumps, which would have been much more efficient, he was also critical of the amount of water which was allowed to escape and flow back down the shaft at the changeover levels from one set of pumps to the next. (In a similar vein it is interesting to note that during the reopening no effort was made to use the Water Level meaning that all the water make had to be pumped up to the Horse Level, which must have added very considerably to operating costs).

The Tindale Drift in the Whin Sill was 48 feet below Donaldson Level accessed by a sump sunk 1800 feet east of the pumping and winding shaft and was pumped using power transmitted by flat rods along Donaldson Level from the main pump rods, an arrangement that would challenge most modern mechanical engineers.

At each of the levels ore that had been trammed was transferred to skips for winding and then retransferred to tubs at the Horse Level to be taken out to the mill (Cost of transport per ton in 1884 10/-). In 1884 the miners were still climbing the shaft either on ladders or by footholds in the brick lining. To avoid the material re-handling and loss of working time Steuart recommended fitting guides to the shaft and using cages big enough to handle tubs and safe enough for man winding.

Obviously ventilation at the base of the shaft was extremely poor and in the very lowest sump in the Tynebottom limestone the vein was found to be only a few inches wide.

Despite the obvious good sense of Steuarts' recommendations the calamitous fall in the lead price in the 1880's was reflected in the fact that in 1854 the total direct labour force (men and boys) was 475 but by 1880 this had reduced to 40 and obviously no funds were available to implement the necessary changes, leading inevitably to closure.

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K C Dunham, Burtree Pasture Lead Mine, Weardale/Industrial Archaeology Review Volume 1 Issue 1 October 1976

Tilberthwaite Horse Crag Level dig- update

The break through on the second fall was reported in the last newsletter and since then we have been slowly clearing the tail of some 40 yards to the third and probably last fall before work on digging the fall can start. Material is being taken to a large chamber approximately 70 yards back down the level, where the pack wall is now five dumpy bags high with another three feet of debris on top giving a total height of close to 20 feet- see photograph below.



We have estimated that digging through the second fall approximately 400 tons of debris has been re-moved to build the pack wall, but the material can actually be moved eight times from digging it at the fall into the buckets (trugs), to putting it on the trolley to transport it to Pete Blezard's tub (as it catches on the steel due to the bends in the level) to dumping it at the pack wall meaning that we could have actually lifted the equivalent of around 3000 tons by hand. This is probably why we are continually refining the techniques all the time, especially as two thirds of the digging team at the moment are now grandads. The photograph below shows the tail of the fall where we are currently at ,where the level turns to the right and continues up to the fall proper and the original rails are still in-situ.



It was reported in the last newsletter that we were also filling the chamber at the end of the second fall, but due to the sheer effort in getting the debris up there and large lumps have been coming off the roof we have decided to close the access to the chamber off, which is on the right hand side of the photograph- note the curve of the steel to the right before it turns to the left, as a result of having to follow the original rail when digging through the fall.



Discussions have started on producing a book of approximately 96 pages on the history of Tilberthwaite mine which would also include the upper part at the head of the gill where it may be possible to identify the original workings known as the 'Three Kings' worked by the Germans, as well as including the re-opening of the Horse Crag Level by the society.

Warren Allison

Lake District National Park Volunteers visit to Greenside Mine

Holly Beavitt-Pike from the LDNPA asked if some of their volunteers could visit the Lucy Level instead of doing the usual Himalayan Balsam and Bracken bashing. Three trips during February were arranged with seven to eight on each trip and the volunteers came from all over the county.

Meeting at the mine, a brief history of the site was given before walking along the Lucy Level to the bottom of the shaft from the Alma stope and back, which took between four and five hours. For most of the people this was the first time they had been underground and they were all amazed and extremely impressed at the work that the miners had done, but also at what CATMHS has accomplished over many years in digging through and securing the six roof falls.

No matter how many times you go down the mine it is still an impressive place, full of history and amazement at what a group of 'amateurs' can do especially on the third roof fall with determination and tenacity which started many years ago in 1992, something I don't think has been repeated elsewhere in the country.



The trip on the 3rd February at Smiths Shaft - one mile underground!

Warren Allison

Myres Head Mine also known as Low Hartsop mine

The last newsletter (Feb 2015) contained an article on a document which related to the supplying of the troughing and headstock for the waterwheel at Myres Head Mine.

This mine is situated near to Hartsop in the Parish of Patterdale at the Southern end of Ullswater near to the junction of Pasture Beck and Hayeswater Gill, and is reputed to be very ancient. It is now a scheduled monument and is a very interesting and spectacular site with the remains of massive stone pillars carrying the troughing to the waterwheel pit all still intact, which served the pumping of a 30 fathom shaft and levels off it. In 2000 work was carried out to repair the structures. The mine is the only one in the Lake District which was lost due to flooding of the shaft when the miners broke into a large cavity in the vein. There are also four other levels close by, two which go under the road to Hayeswater and two stone arched levels by the side of Pasture Beck along with surface workings.

Little has been written about the mine probably as it had a relatively short life and there appears to be some confusion about which mining company worked the mine. It apparently worked a NNW-SSE vein by a series of open pits, two stone arched levels and a shaft with a second vein running NE-SW by two levels (I Tyler). The First Edition OS map (1863) shows the areas where three of the levels are noted as old lead mine (abandoned), so presumably the levels were driven pre 1863. The 1914 Second edition OS map clearly shows the waterwheel pit and associated stone pillars.



The 1863 First Edition 25 inch Ordnance Survey map

The 1914 Second Edition 25 inch Ordnance Survey map

W T Shaw states that in 1870 the shaft was being sunk by the Patterdale Mining Company who may also have been working Eagle Crag mine in the nearby valley of Grisedale. He

states that this company with Richard Grenfell as manager (*born at Madron, Cornwall and moved to Glenridding in 1863 to become mine manager at Greenside Mine*) worked the mine until 1877 when the shaft flooded. One of the miners told Shaw's father that the flood followed them up the shaft.

However Tyler states that in the early 1860's the Low Hartsop Mining Company was formed by Mr Coultas Dodsworth of Haydon Bridge along with Mr George Head-Head and Mr Jameson who were directors of the Greenside Mining Company and sank the shaft around 1866 which by the end of 1867 it was down to 30 fathoms. He then says that reports dated April 1868 confirm that there was a major problem with water and so a project to install new pumps powered by a 30 foot waterwheel on the opposite side of the beck to the shaft was commenced and completed by November 1868. He goes on to mention reports of repair work being carried out to the wheel during 1877 and 1878 and shortly afterwards the mine was flooded and lost. However Tyler also mentions in his writing on Dodd End Mine which is on the side of Hartsop Dodd above Myres Head Mine that the Patterdale Mining Company was working this mine in 1871 and were also working the Myres Head operation.

Unfortunately neither of them make any reference to where they got their information from and there is some confusion in understanding what has been written.

Shaw also mentions that several parcels of ore were probably sent away in the period 1870-77 and Mr Hedley Grenfell, son of Richard Grenfell, told him that he could remember a load of lead ore going away. He said that it was loaded on to a four-wheeled flat wagon drawn by

three horses whose harness were covered in with polished brass and would be 10 years of age at the time, so this was in 1876, but there is no written record of any ore raised. He also says that Hedley Grenfell spent many hours watching the great wheel turning steadily and the action of the sliding rods across the beck. It performed its task night and day without stopping. His father had proposed to lighten the load on the pumps by diverting the beck away from the porous vein, but unfortunately died before the plan could be put into action.

Tyler goes on to say that any remaining mining equipment was auctioned off on the 11^{th} March 1884 and the waterwheel was bought by Cumberland Lead Mines Ltd for £85 and was erected at Thornthwaite mine near Keswick, where it worked until 1920.

This series of photographs shows the remains as they are today which are remarkably intact.

The take off point behind the tree was by wooden boards with a cobbled front wall (remains still in situ) to send water to the waterwheel.



Looking over the stone launders to the waterwheel pit and beyond to the shaft with the tree sticking out of it



Looking across to the waterwheel pit from the shaft



The two stone arched levels, probably pre 1863



The top of the shaft with rubbish in it



Site of Dodd End mine, which worked a NW-SE vein.

The road to the mine takes you past the remains of a corn mill thought to date to the 18th century and last worked around 1900 by Mr John Grisedale. Apparently it was still partially roofed in 1934 with the mill wheel being removed for scrap during the Second World War. There are three grinding stones still inside the main building.



Having spoken to Jamie Lund, the archaeologist for the National Trust who own the land, about the document, potentially removing the debris from the top of the shaft to see if the pumps at the bottom (which should still be in place) could be photographed using an underwater camera, re-opening the four levels, especially the two stone arched ones, which could shed some additional light on the mine, he was of the opinion that CATMHS could submit a proposal. This could be a worth while project for the society on what is very interesting, although small mine.

Warren Allison

Development and demise of the Tilberthwaite Copper Mine and Penny Rigg processing plant.

During his working career John Barratt was considered to be one of the finest, most innovative and competent mining engineers of his age. It is strange therefore that one of the last capital projects that he embarked on seems to have 'fallen apart' so catastrophically before it was completed.

Development of the Tilberthwaite Mine was intentionally delayed by Barratt while he finished tackling the problems of the Coniston Mine. But in 1848, with the Coniston Mine now in a reasonable operational state, he decided to review the potential of the Tilberthwaite Mine. His review showed that the mine was worth developing. It had sound but not extensive reserves of copper ore, but the 'Deep Bottoms' were difficult to access and frequently flooded. His plan to drive an access tunnel from a point close to the Tilberthwaite Road into the Deep Bottoms was innovative and became one of the major mining projects in the district at that time.

The tunnel took 10 years to complete and became known locally as The Thousand Yard Tunnel. While it was being driven Barratt was also involved in many other projects including the building of the Coniston Railway. He realised that if ore could be primary processed at Tilberthwaite it could be carted directly from there to the planned new Copper Station at the head of the railway.

With this in mind Barratt designed a mill at Penny Rigg, close to the exit of the tunnel. This was a completely new installation on a new site, unlike the Bonsor Mill at Coniston. Sourcing capital seemed to have been no problem and one assumes that he was able to spec the most up to date equipment available at that time for the new mill.

So why did it all fail? Why did the mill create problems due to frequent breakdowns after commissioning? Why was it abandoned, well before the operating life ran out? And why did the tunnel become blocked by roof-falls on at least two occasions during its useful life, each time requiring several years' work to re-open? These questions have worried local historians for some time.

There are a number of interrelated factors that might have caused this to happen and last year it was decided to review those most likely to have contributed using a 'desk-top' exercise in the form of 'vertical time-lines'. We looked at all the factors that might have caused problems such as the price of copper, the weather (long dry summers could have affected the mill operation), other neighbouring industrial sites such as the Penny Rigg Slate Workings, landlord problems etc etc. In the end the time-lines did conclusively show the reason, but not one we had expected.

A small portion of the time-line is reproduced below. It shows clearly that illness and premature death within the Barratt family is almost certainly the cause of the demise of the Tilberthwaite Mine and possibly caused the premature run-down of the Coniston Mine as well. The Hext family, descendents of John Barratt still reside at Coniston. They are convinced that because of illness, John Barratt hardly ever returned to Coniston after about 1859 and spent the rest of his life in Devon. Barratt's father and grandfather, both of whom, in their day, ran the Wheal Friendship Mine at Mary Tavey in Devon, died of arsenic poisoning. Arsenic contamination arising from the mine is still a serious problem at Mary Tavey today and the family are convinced that this was the cause of John Barratt's death as well.

Dates	John Barratt	Thousand Yard Tunnel	Penny Rigg Mill
1845	1849 - Barratt starts to review Tilberthwaite Mine.		
1850	1854 - Barratt takes over Hodbarrow Mine	1850 - Construction of tunnel commences	
1855	1856 - Ann Barratt dies (John's wife)		
1860	1864 - John Barratt's youngest son dies aged 28.1865 - John Barratt's middle son dies aged 32.	1860 - tunnel complete	
1865	 1866 - John Barratt dies at Torquay on April 14th, aged 72 years. Buried at Mary Tavy. 1869 - John Barratt's eldest son dies aged 42. 		1865 -Penny Rigg Mill under construction 1867 - Penny Rigg Mill commissioned
1870			1870 - Mill out of use for 7 weeks.
1875		1875 - 1st Collapse in tunnel	Mill only used intermittently
1880		1883 - tunnel re-opened	
1885		1886 - 2nd Collapse in tunnel	

Without Barratt's expertise it is very likely that no pre-commissioning inspection of the tunnel ever took place and the installation of the 'state-of-the-art equipment' within the Penny Rigg Mill was not carried out correctly.

Poisoning from arsenic doesn't explain the very premature deaths of John Barratt's three sons. The Hext family suggests that the cause of death in each case was liver failure, possibly a result of the leisured life-style the boys enjoyed at Holywath while their father was away. Before John Barratt became ill he was clearly a 'total workaholic'. As well as his work at Coniston and Tilberthwaite he also was very much involved with Hodbarrow haematite mine and also Wheal Friendship and seemed to travel frequently from one to another. This meant that not only did his influence on his family suffer but he had little time to train up a sibling to take over his work.

It's interesting that little has changes since the Victorian years. Many small family concerns suffer from exactly the same problem today!

Alastair Cameron

Threlkeld Mine in 1937

The Cumberland & Westmorland Herald which serves the area around Penrith and Appleby is a wonderful source of information on mining both in the Lake District and the Pennines. Over a number of years I have read through them on the micro-film at Penrith Library from 1865 to 1970 and made notes on any mining related articles, but recently re-read the one reproduced below dated 3rd April 1937 which refers to Threlkeld Mine re-opening:

LEAD MINE TO RE-OPEN

Good News for Threlkeld Closed for Seven Years.

There is good news for Threlkeld. The local lead mine is to re-open on Monday, when eight men will be put on exploratory and repair work under Mr G Hewitson, the former manager who is being brought back from Derbyshire, where he had obtained a similar position, to take charge of the work.

It is seven years since this mine closed down owing to the unprofitable price of lead and zinc, which fell to ± 10 and ± 12 a ton respectively. Since then Threlkeld has been hit hard owing to there being no other outlet for these workers and also owing to the recent shortage of work at the quarries.

The consumption of lead and zinc has risen greatly, particularly during the last few months and the price of lead has risen to $\pounds 31$ a ton, and of zinc to $\pounds 33$ a ton. The increasing demand is due to improving trade and a growing world demand for metals. Lead is principally used in electrical plant, in batteries of all sorts and in paints and zinc mainly in galvanising and in all brasses.

The work of reopening the mine will be gradual, as there has been little or no upkeep work done since it closed and the condition of the levels is unknown. The falls will have to be looked to, and, for the time being it will only be possible to work in two places. It will probably be two or three months before other men can be put to work and the mine resume production.

When fully employed, the mine gave employment to about sixty men, but it is hoped to work it on a larger scale this time, and if this is done work will be found for even more than sixty men,

Quite recently some of the Threlkeld lead miners went to the Greenside Mine at Patterdale to work.

Ian Tyler in his book titled 'Carrock and the Mines of Skiddaw and Blencathra' makes no mention of the mine re-opening in 1937, only that it was on a care and maintenance until 1939 and that all the levels were standing open and ready for development.

Warren Allison

Penny Bridge Furnace

The last newsletter mentioned a flax mill at Penny Bridge with a 40 hp waterwheel. The 1834 survey stated that it was owned by Harrison Ainslie & Co. A later survey in 1850 did not give the purpose or ownership of the mill but stated that there were two waterwheels, each 10 Ft wide and 20 Ft diameter. Neither report mentioned that the mill was built on the site of a charcoal blast furnace.



The furnace was built in 1748 by local wood owners led by William Penny who believed they were not getting a fair price for their charcoal. In 1766 it was leased to Daniel Frearson

for making utensils and edge tools. A condition of the lease was that their iron was bought from Spark Bridge forge. In 1787 the furnace was owned by the Backbarrow Company with William Penny holding 8/94ths of the company. According to Phillip Ridden the furnace last

worked in 1780 and was demolished in 1791, with a flax mill built on the site in 1805. This is contradicted by Backbarrow the which journals imply that the furnace was working until at least until 1787.The flax mill under Thomas



Pearson lasted only two years before he was declared bankrupt. It was to be let again in 1826 after Mr Kaye gave up the lease and again in 1860, but when W Dixon was charged with lamping salmon in the tail race in 1867 it had been converted to a paper mill.

I was very surprised on a recent walk to find the sluice gear largely intact, but more remarkable still is the number of mossers about the site. This is not blast furnace slag (of which there is none to be found) but conversion slag from a finery forge such as the one at Spark Bridge. It is odd that they should be here, where there is no forge recorded.

A mosser. Photos P Sandbach

CAPITAL FLAX MILL AND MA-CHINERY. TO BE SOLD BY AUCTION, (by the Assignces of Mr. THOMAS PEARSON, a bankrupt)

At Mr. WORTHINGTON's, the sign of the Sun, in Ulverston, in the county of Lancaster, on FRI-DAY the 22d of April, 1808, at five o'clock in the afternoon ;

WO UNDIVIDED THIRD PARTS of and in all that newly-erected, substantial, and well-built

MILL OR FACTORY,

Calculated for SPINNING FLAX, and very advantageously situated at Penny-bridge, about four miles from Ulverston; being in length 74 feet, in width 29 feet 6 inches ; with an L 34 feet long, and 20 feet wide, three stories high, built of stone, and slated ; together with the WATER-WHEEL, 14 feet high, and 81 feet wide, and the HEAVY STANDING and GOING GEERS.

Also, of and in THIRTEEN COTTAGES, STORE-ROOM, JOINERS SHOP, and other buildings and conveniencies belonging and contiguous to the said mill.

Also, the REMAINDER of a TERM of YEARS (about eleven of which are unexpired) granted by lease, in the other ONE UNDIVIDED THIRD PART of the said MILL, BUILDINGS, and PRE-MISES, subject to the yearly rent of 801 Also, the WHOLE of the MACHINERY in

the above Factory, made upon the best and most modern principles, all in excellent condition, and nearly as good as new, via 11 of while double

3 Flax Slivering Frames.

- 2 Ditto Drawing Frames, one head each.
- 2 Ditto Roving Frames, one of 3 heads, the other 4 heads.
- 20 Ditto Spinning Frames, of 28 spindles each.



111 111 4 Carding Engines. Tumming ditto, evel intent, to Or Altahashi 2. Tow Roving Frames, 4 heads each. -14 Ditto Spinning Frames, 24 spindles each. Reels, 2 Lathes, 1 Circular Saw, and a variety of other implements. N. B The Mill and Machinery will be sold either together or separately, as will be fixed at the specie The Mill is freehold of interigance, poissons an abundant supply of water, in all sessons, and has a communication with the sea very near thereto. Also, the REMAINDER of TERM of YEARS (six whereof will be .- expired at Old May Day next) granted by lease, of and in a cooremient and next DWELLING HOUSE, OFFICES attached, good GARDEN, and two CLUSES of GROUND, situate at Penny-bridge, lately occupied by the said Mr. Pearson; with THREE COTTAGES and other conveniencies adjoining: And on SATURDAY the 28d of April, 1808, at the Several HATCHELS, in very good condition, a quantity of SMALL TIMBER, several LADDERS, and other UTENSILS, late belonging to Mr. Pearson *5 . The whole of the said premises may be viewed at any time previous to the sale, by applying to JAMES MOUNSEY OF JOHN POLLADO AL Penny-bridge ; and further particulars may be known by resorting to Mr HoLBROOK GASKELL, of Wat-rington; Mr. RICHARD MATCHELL of Liverpoof; Mr. THOMAS TOWNDON; auctioneer, Ulverston ; or to Mesers MARON, WILSON, and JENEINSON, SO MARCH 23, 1938.

References:

A gazetteer of charcoal blast furnaces, P Ridden Backbarrow Journals. Z188 - Z195 at Cumbria Records office, Barrow

Coober Pedy Opal Mines, South Australia.

As part of our visit to South Australia, Eileen and I decided to drive 860 kilometres from the Yorke Peninsular up to Coober Pedy to the Opal Mines.

Coober Pedy and the residents certainly add character to the locality! We stayed for a few days, based in one of the numerous underground hotels, meeting with our guide on the second day. He drove us out into the desert, mountains, creeks and cattle stations, travelling off road and away from the usual tourist routes.

The third day our guide drove us to his family opal mine a few kilometres away from town. We drove into an area festooned with 'Keep Out' and 'Permit Only Zone' notices. Eventually we reached an area smothered with cones of spoil, at the base of every cone there was a metre wide shaft, level with the ground, open and unprotected. The shafts were either dug traditionally or drilled later by a Calweld drill or similar, using an auger screw bucket. The shafts tested the area for the thin lines of fracture that indicated the presence of opal bearing

seams More notices appeared by the track side. 'Look out for shafts, do not walk backwards'.

Our guide took us to an area where all the top soil had been removed to one side and a steep decline, bulldozer wide, allowed us access down to an excavated quarry face, all the material to that face had been processed. We were now approximately 20 metres below the surface.



To the front and side of us huge cathedral entrances pierced horizontally through the quarry face. The tunnel to the front was 100 metres long. (Claims pegged out were either 50 metres



by 50 metres or 50 metres by 100 metres). Tunnelling machines with rotating disc cutting heads had cut a series of horizontal tunnels, overlapping as they moved forward close to the surface. The material was removed and treated, then the cutters dropped down a metre and repeated the process. They were backed up by boggers (front end loaders) and bulldozers and wagons removed the rest. The rotary score and teeth marks

were clearly visible. The results was a 6 metre wide tunnel, about 12 metres high with an arched roof pierced in numerous places by old shafts.

To the side, some of these shafts descended into the old miner's workings and chambers, small levels wandered haphazardly intersecting several small chambers. We explored a number of the passageways, some were recent and others quite old. Thin yellow seams ran horizontally through the rock face and these were indicators for opal bearing ground, some opened up into large loughs. The silica solutions were



deposited in cracks and crevices over 150 million years ago. These seams, cracks and crevices were handpicked and followed for some distance. We had lunch in the main drive accompanied by a mouse, lizard and red backed spider. (Who had, had lunch previously having eaten her mate!).



Our guide explained the mining operation; two shafts were usually sunk in a promising area, one for climbing and the other for the blower - a huge suction vacuum unit mounted on the back of a wagon. This sucked all the material up into a large drum where the dust was blown high into the sky. Rocks and pebbles were saved and released through

the drum to the ground where they were removed for further inspection by hand.

No miner ever climbed the vacuum shaft as static electricity was created by the dust and stones rattling up the metal tube. Our guide has seen sparks jumping 150mm to the shaft side. Promising material was then placed on a conveyor belt and passed through a darkened room where UV lamps picked out any opal bearing rock; unfortunately this method





does not detect any opals underneath the material. Our guide's family have invented a further detection operation that substantially cuts down the loss of any opals, though obviously he couldn't detail this operation to us. The opal and dirt (sandstone) were placed in a tumbler and mixed with water this removed most of the sandstone and further cleansing was done by hand using a pair of snips. Finally waste rock was dumped out on the surface and at weekends the family come out to do some 'noodling'.

It was our turn to 'noodle'. A couple of shovels full of dirt were thrown into a large sieve, under which there was a smaller sieve. The material was shaken and inspected in each sieve. Then it was a case of hand picking and licking each promising piece. Eileen's third attempt and there was a cheer, she had found an opal 12millimetres wide by 30 millimetres in length, a bit of cleaning and licking and it sparkled fire in the sun (40 degrees C). Eileen's Opal was valued at \$800 unpolished! Me, I found nothing! What a wonderful ending to the day.



Coober Pedy residents usually 'noodle' on the town dump where material from the underground homes and hotels have been tipped. Many gem quality opals have been found here. Richard E Hewer. February 2015

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