Cumbria Industrial History Society

BULLETIN

www. Cumbria-industries.org.uk

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CONTENTS

EDITORIAL

The spring Bulletin usually announces the start of the Society's summer programme of outdoor meetings. This year's programme looks very exciting with a range of topics and areas being covered. The committee has now decided that along with charging for non-members to attend meetings they would also appreciate that members do not bring their dogs to the meetings. (Guide and Assistance dogs allowed)

At the AGM this year after the Spring Conference the committee has decided that the Society's rules need updating to keep us compliant with legal requirements and also to make the running of the Society easier. The details are on the reverse of the AGM agenda.

I am getting close to being able to produce the next edition of the Industrialist, I require another article. So if anyone out there has an article in them please get in touch to discuss with me. I can provide help with writing articles and what style is most appropriate for the journal.

The committee is working very hard on your behalf, but we are needing inspiration. If you feel you could join the committee please complete a nomination form which is enclosed. If you do not feel you could join the committee but have ideas for either summer meetings or topics/speakers for a conference the committee would be very keen to hear from you.

Lets hope for a fine summer for the field trips and I hope to see a lot of you there.

Front Cover Photograph. Lambley Viaduct on the Haltwhistle to Alston branch line. The May walk will cross the structure.

SOCIETY EVENTS 2015

SPRING CONFERENCE 18TH APRIL 2015 SHAP WELLS HOTEL

INDUSTRY AND THE ARTS IN CUMBRIA.

Details and booking form is enclosed.

TINDALE TO LAMBLEY. SATURDAY 9TH MAY 2015. 10.15 am.

Meet at Coanwood car park NY 679 595. We will then transfer in as few cars as possible to Tindale.

A walk along Lord Carlisle's railway to look the site of Tindale Zinc Spelter and at various coal mines finishing at Lambley Viaduct. A flat walk except for steps to get onto the viaduct.
NO DOGS ALLOWED AS WE WILL BE CROSSING PRIVATE FIELDS.

JUNE EVENING MEETING. WEDNESDAY 17TH JUNE 2015. THRELKELD QUARRY AND MINING MUSEUM.

A visit to look round the museum and the outside exhibits. (The railway will not be running and the 'mine experience' will not be available.

NORTH ULVERSTON SUNDAY 19TH JULY 2015 10.30 AM.

Meet at Ulverston Station SD 285 778 for a walk around the north end of Ulverston to be led by Roger and Dan.

CARROCK MINE SATURDAY SEPTEMBER 12TH 2015 11.00 am.

Meet at end of the Mosedale Rd. NY 326 326.
A look around the only Wolfram mine in Cumbria and at the work recently done on the site by CATS. To be led by Warren Allison

OCTOBER CONFERENCE SATURDAY 17TH OCTOBER. 9.30 am

To be held in Market Hall Egremont. To look at the industries in the Egremont area.

NOVEMBER EVENING MEETING KESWICK QUAKER MEETING ROOMS. DATE TO ARRANGED.

A talk by John Mather. **Sir Thomas Bouch was born in Thursby, near Carlisle, and became one of the most celebrated bridge builders and railway engineers in Victorian Britain.**
"As well as designing over 300 miles of railway and large bridges throughout Scotland and Northern England (including the Cockermouth, Keswick & Penrith line) his greatest achievement was building the Tay railway bridge in 1878. This bridged the two miles wide mouth of the river Tay near Dundee. National recognition and a knighthood followed.
"Bouch's good fortune, however, did not last. The Tay bridge collapsed the next December, dragging a passing train and passengers into the River Tay, with tragic consequences. His reputation lay in tatters. He remains to this day, the main scapegoat of the disaster.
"John talks about Bouch's fascinating life and times. He also wishes to take the opportunity to examine if he was unfairly judged. He intends to examine the issues leading up to the tragedy and then also discuss whether he was a victim of circumstances or the author of his misfortune.

INDUSTRIAL ILLUSTRATOR

A recent Lancaster Regional Heritage Centre Study Day looked at the impression the Lake District made on some of its nineteenth century visitors. Foremost among the subjects were John Ruskin, J W M Turner and Harriet Martmeau. A lesser known visitor was Richard Samuel Chattock [1825-1906] a notable painter, etcher and illustrator from Solihull.

In 1820 William Wordsworth published his poem *"The River Duddon "* written in the form of a series of sonnets. It received a less than euphoric reception from critics of the day - Why should a distinguished poet write about so "insignificant a river with such a barbarous name?" one wrote. With the passage of time opinions clearly improved and in 1884 the Fine Art Society commissioned a special edition of the Duddon Sonnets with a series of folio etchings by Richard Chattock, following the course of the river. This edition is now a rare collector's item, copies changing hands for £300+. Occasionally prints of Chattock's Duddon scenes, such as Birks Bridge and Ulpha Bridge and Church appear for auction. Although scenic and rural subjects were the most familiar and commercially successful of Chattock's output he is also admired for his depiction of examples of industrial processes particularly in the Black Country of his native West Midlands. [For details see: www.bclm.co.uk and search *Chattock prints.]*

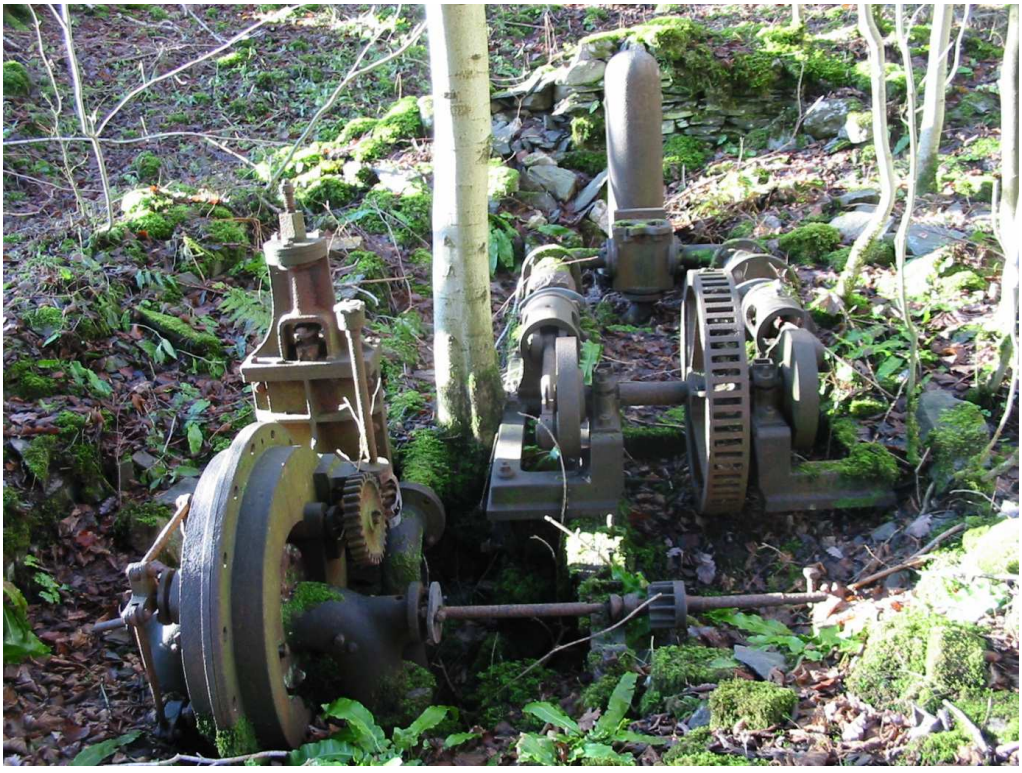
Of the etchings in the 1884 Wordsworth edition perhaps the most interesting is No. 13, described as "The prospect overlooking Dunnerdale" but actually is a view across the Duddon estuary as seen from somewhere near Broughton Tower. While most of the etchings provide what may be regarded as a reliable representation of the rustic scenes that stirred Wordsworth's poetic juices, Chattock's view from Broughton across the estuary is fascinating chiefly because of the features it includes that did not exist when the Duddon Sonnets were written sixty years earlier.

Slightly left of centre in the etching is the crisp trackbed of the Coniston Railway line curving round from its junction at Foxfield towards the station at Broughton, which nestles at the

foot of the viewpoint. This section of railway line was built by the Furness Railway as an extension from its original destination at Kirkby in 1848 and which was continued through to Coniston in 1859. The main railway line along the coast to Whitehaven reached Broughton from the north in 1850 and can be seen as the straight line crossing the water to the right of the hillock in the centre of the image. A measure of license has been applied here as the length of the embankments is exaggerated. The viaduct across the river channel is shown to be several hundred yards from the southern bank whereas in reality it is quite close to the bluff of higher ground. Furthermore once the river channel has been crossed the railway line makes a sharp turn west towards Millom. The elongation of the railway crossing perhaps indicates Chattock's wish to include on the horizon of his prospect representations of the then present realities of the Duddon estuary. New centres of industrial endeavour impend on the view: the chimneys of Barrow on the left and the ironworks at Millom on the right. Is this Chattock's parting reflection on the idealised lyrical stability of the Lakeland rural landscape in Wordsworth's sonnets contrasted with the dynamic world of heavy industry, greater mobility and urban living?

Alan Postlethwaite

THE WATER SUPPLY TO WITHERSLACK HALL – OPEN TO INTERPRETATION



Witherslack village lies just off the A590 between the two limestone ridges of Whitbarrow to the east and Yewbarrow to the west. Witherslack Hall was built

between 1871 and 1874 for the Hon. Frederick Arthur Stanley (later the 16th Earl of Derby). It stands about a mile to the north of the village in the sheltered gap between the two ridges.

In the woodland next to the lane between the village and the hall – at about the 150' contour - are the remains of the machinery that pumped water up to the top of the Yewbarrow ridge where a reservoir was constructed to then supply the hall below with water.

Since the CIHS visited the site in June 2010 I have been back a number of times and spent ages trying to get to grips with the technicalities of turbines and pumps without really getting to the bottom of what happened there. So here is an outline of what's on site, and my interpretation of how it all worked, on which I hope the more mechanically minded amongst you can build. Please let me know what you think

What can you see?

The building.The machinery lies within the remains of a rectangular building made of slate, with external dimensions of 30'x18' and walls 3' thick. This is divided into two rooms – one at 9'x12' inside containing the pumps and turbine, the other at 15'x12' inside containing a large cyclindrical tank. There is a 5' wide doorway to the tank room but no obvious way in to the turbine room. There is no evidence of roof supports, but there are reports of the slate being taken when the place was abandoned. The building is shown on the 25" OS map of 1897.

The outflow. Water flows out of an underground culvert 6' from and 2' lower than the building. There is no sign of where water enters the culvert.

The turbine. A Williamson turbine in 32.5" casing. Gate valve attached on the up side with hole for a 6" pipe. Mechanisms on both sides of the casing (presumably to control the rate of flow and thus speed of the turbine within). Outflow (exhaust) pipe to sump below. Horizontal drive shaft from centre points to rear of pumps.

The pumps. A pair of parallel, reciprocating, mechanically driven pumps supported by an iron frame at ground level parallel to but forward of the turbine. Gearing connecting to the crankshaft is missing. Made up of…
1.5" connecting rods eccentrically mounted on the drive wheels (to create push/pull motion)
12" collar midway along (protecting the change to horizontal motion)
18" piston housing from each of which a 3.5" pipe leads to
A junction with two 3.5" holes above and a vertical 3.5" pipe below, behind which is A pressure relief valve with a 3.5" pipe below heading back towards the turbine sump

The iron tank. Within the larger room of the power house building lies a cylindrical iron tank, 3' in diameter and 7' long, with curved ends. The tank looks to be lying on its side – on the photo you can see the 17"tall x6" diameter 'chimney' with a dial on top furthest from the turbine, and an elliptical 'access hole' 22" at its widest in the centre. At the end nearest to you (and furthest from the turbine) are a couple of 1" holes with a pipe leading out of one of them.

The stone tank . A spring issues from the limestone 20' above the building. 12' from the stream and level with it a tank has been constructed at and below ground level. Stone lined with slate slabs to cover. Slightly curved – 9'x2'6"x36" deep – so that one end faces the spring and the other end faces the turbine. Holes in each end – 6" diameter – midway down at the stream end, near the bottom at the turbine end.

The dam. The stream flows down across the hillside to where there is evidence of a small dam and pool. This lies below the level of the stone tank but directly above the iron tank.

The reservoir. Half a mile from the pump house, on the ridge above the Hall, is a large rectangular reservoir of 70'x40'x10' deep. Its walls are 2' thick made from rendered stone with substantial stone-face earth banks against them. Surrounded by a ring of conifers and iron railings. Within and against the north end wall (nearest the Hall) is a semi-circular building 12' in diameter which probably housed a filter system. There is no sign of the supply pipe from the pumps entering the reservoir, nor the delivery pipe to the Hall. The latter would presumably be below ground level, but the former should enter somewhere near the top of the reservoir wall. Neither is there any sign of the pipe leaving the pump house below or any supports on the way up the hillside, although a pile of stones looks to have been cut through on the route towards the field corner.

How did it work?

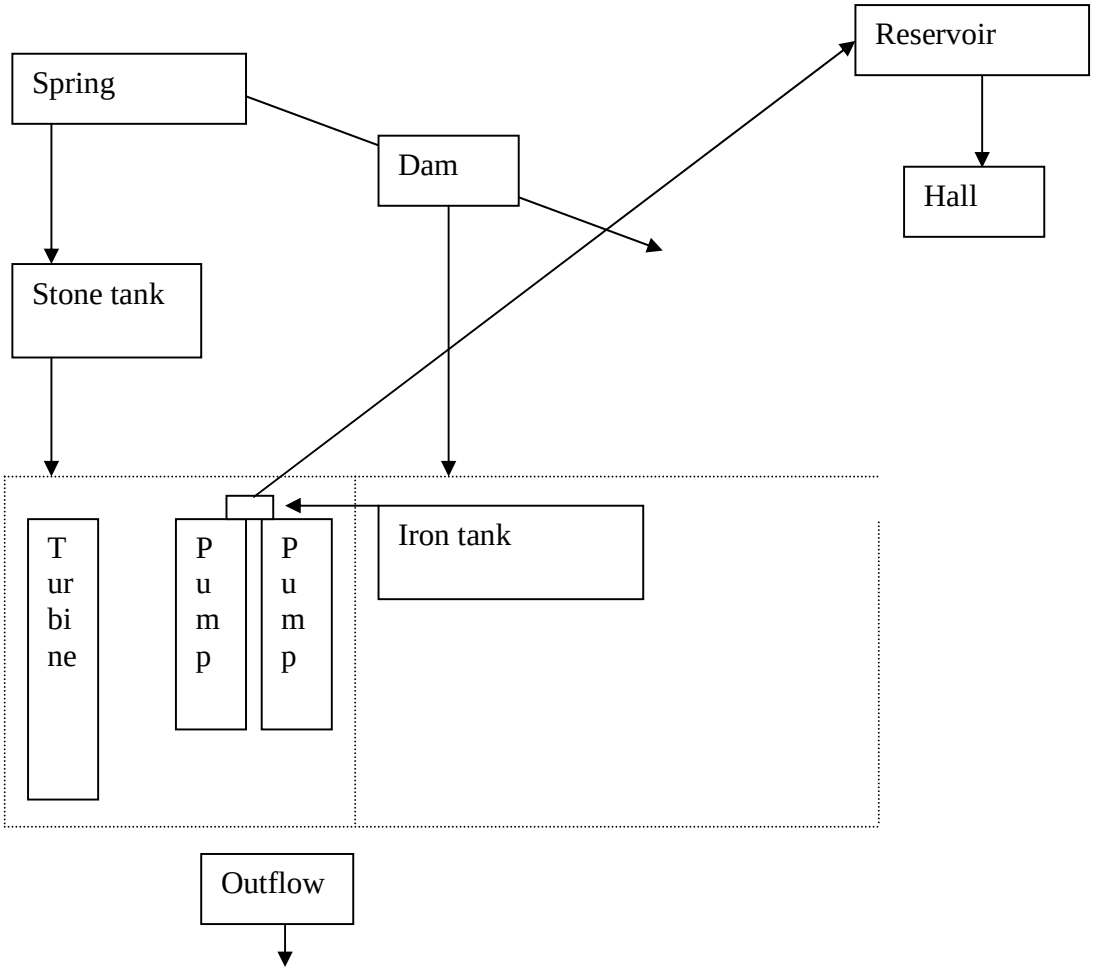
The machinery appears to consist of a water powered turbine mounted vertically which drove a couple of pumps mounted horizontally at ground level which pushed water uphill for a distance of half a mile to the reservoir on the 300' contour.

Where did the water come from to supply the turbine? The turbine appears to have been fed by water from a stream that issues from the limestone about 20' above the site, which was piped into a stone tank which in turn supplied the turbine.

Where did the water come from to supply the pumps? The options appear to be either
a) by gravity from the stream above which looks to have been dammed to create a pool of water to feed a pipe leading down to the pumps possibly using the iron tank (a redundant boiler?) as a cistern to store a reasonable amount of water, or
b) by suction from water under the pump house. The volume of water issuing from the outflow outside the building – which has no obvious source - suggests that this may have been constructed over another spring at a lower spring line, the water from which was then used to supply the pumps.

In operation, the stone tank and the pipe down to the turbine gate valve filled with water from a pipe connecting it to the spring. When the stone tank was full, the gate valve was opened to start the turbine which turned the drive shaft which was connected to the pumps. The two pump rods moved alternately backwards and forwards – the backward stroke drew water into the piston cylinder, the forward stroke pushed this water up a pipe mounted on the junction to the reservoir. This process continued until the stone tank was empty of water to power the turbine. The gate valve was shut.

Witherslack Hall pump house – schematic diagram - not to scale



Many thanks to Mark Brennand for guiding me around the site and discussing its complexities, but the responsibility for this interpretation (and the imperial measurements) lies with me alone. The site is on private land.
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BENEATH LAKELAND FELLS Part 2.

By Arnold Lewis

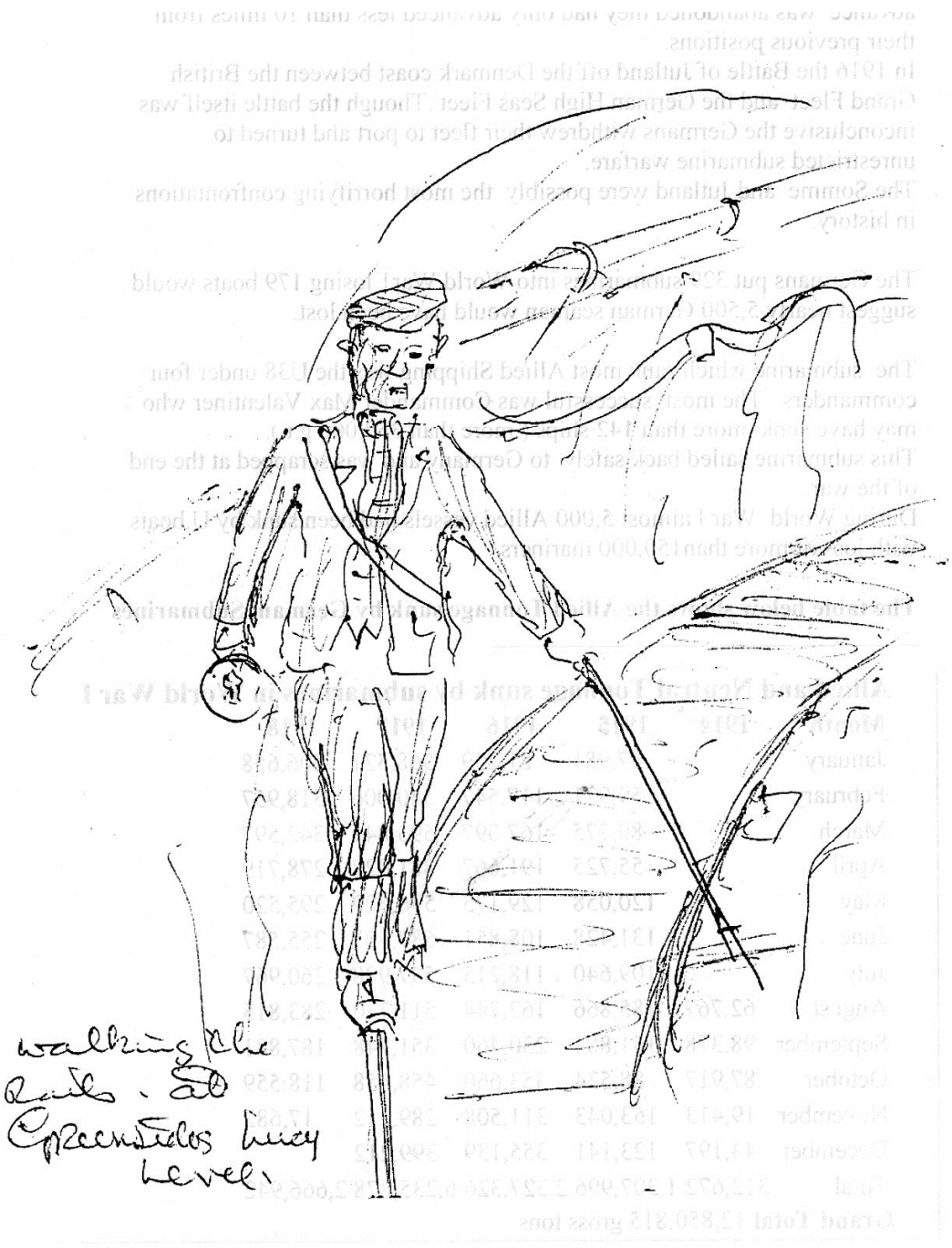
GREENSIDE MINES GLENRIDDING 1759 – 1961.

SOME HISTORICAL NOTES.

Lead was mined around Hartsop and Patterdale since the 16th Century – I believe records had been kept of mining at Greenside since 1759 and the Greenside Mining Company was formed in the early 19th ~Century. Miners were then paid every six months – at Penrith 15 miles away. Owing to a tragedy in which a young farmer named Robert Grisedale was stabbed to death by two Alston miners who had mistaken him for one of the local men with whom they had been quarrelling with in the White Lion. The directors paid out monthly, and this remained the practice until the 1930's, when men were paid fortnightly and weekly subs of £2 were also paid. There had been various things – which had brought the Greenside Mines to a poor state, one being the bursting of the Kepple Cove dam when the Company had to pay out a great deal in compensation to people whose property had suffered from the flood.

The Basinghall Mining Syndicate took the mine over and I did hear their intention was to clean it out in a short time and close it. Some say six months or a year. It carried on over a quarter of a century before finally closing and was deepened by many hundreds of feet. When I went there in 1937 just after Easter over 200 men were employed there in three shifts, men from other parts of country – Geordies, West Cumberland coal miners, Cornishmen, Scotsmen, mostly from Wanlockhead, Welsh men and others. The old stables were made into a fine and substantial hostel, many miners were took in lodges and one house it was said that one shift of men rose out of bed to let in men who had just come off work and that the beds were never cold.

I started work at Greenside mines on the morning shift. I was given an acetylene lamp and a tin with enough carbide to charge my lamp for the ensuing week. Men in those days walked in the mine on the rails, for pump and drainage water flowed between the rails. Each man had a walking stick and walked in the mine in perfect step, often singing. The speed of some of these men walking in was fantastic often walking the mile in about 12 minutes perhaps some went faster than that. New-comers stumbled along as best they could. It didn't take long to learn to walk with the best of them. You had to watch your head as overhead there were live electric wires on which the trolleys on the loco ran. If you touched them you got a very nasty shock. I never knew anyone killed by it. I think it was 500 volts DC. Had it been A/C it would have been lethal.



Once at the end of the level you turned right and came to the Smith Shaft top. Smith shaft

Was 90 fathoms deep, 540 feet. A little higher than Blackpool Tower – or should I say – longer. I was sent to The Murrays Shaft top where the foreman Bill Richards put me tramming “deads” up 90 south, with a lad called Joe Bell Park- we got on fine. This was the beginning of a new life for me. I was to join in the life of the village. Get married and

bring up my family. Abroad Hitler and Musoline were causing anxiety – in Glenridding all was at peace – There was work for all, prosperity had come to the dale and we were more or less happy. The men had money to spend – they could afford to go to Penrith for a bit of pleasure or to the Jerry or Fishys or White Lion. There was the church and chapel with their various movements, Girls friendly Society, The choir and dramatic societies, there was the village silver band in which some of the miners became proficient players, men fished or hunted with the Ulswater fox hounds, some had their gardens which not only gave them healthy recreation but flowers and fresh vegetables. There were worse places than Glenridding to live and work.

I married Violet Scott in 1938, our first home was at Gillside Cottage and we were very happy.

HOW THE HEAD WAS WROUGHT.

The old miners, before the invention of explosives broke his ground by various methods, all of which were labourious and slow. He could light a fire at the face then when the rock was hot enough, throw cold water on it which made it crack easily. The rock could be barred out with pinch bars. Another method was by stope and feather – it was still used occasionally at Greenside when I was there, consisting of a specially designed wedge which was driven in a crack of the rock and as this wedge was a split one the feather was hammered in and this widened the crack making it easier to put a bar in to lever the rock out. Some time miners made a “hush” on the fellside. Damming up a large quantity of water and releasing it in order to wash away the top soil and expose the lode. Later gunpowder was brought into use. Miners used a “jumper” a kind of hand drill or chisel which was driven into the rock by hammer blows. It took a long time to drill a “round” of holes and even so the miners could not make very deep holes. I have seen the marks of these drills in Greenside mine made by the “old men” only two or three feet long. These men made their own fuses, if you can call them that, from Straws, later the safety fuse was invented by a Cornish miner which made the business of firing less hazardous. Later the hammer and jumper was superseded with the drilling machine. The early ones were dry borers and rather macarbley refered to by the miners as “merry Widows” because these drills made dust which being full of silica caused miners to get the disease silicosis. Later still drills were made which had a hole right down the centre through which water was forced thus keeping down the deadly dust. Many miners died in their early forties and the luckier ones perhaps until their fifties. When I went to Greenside all miners had to have regular x-Ray examinations and miners were by then living longer. There were about four types of drills in use. There was a drifter which was used in driving and bored holes in the face. The miners put a pillar of iron which had a jack to tighten it up to the roof and sole (floor), he also drove wedges to make it more secure against vibration. On this pillar he put a saddle which could be raised or lowered according to where he wished to drill. The drill was securely bolted to this saddle, the miner then connected his air and water pipes which at Greenside were referred to as 2air or water crags”. He put a drill in the chuck and he was ready to commence drilling.

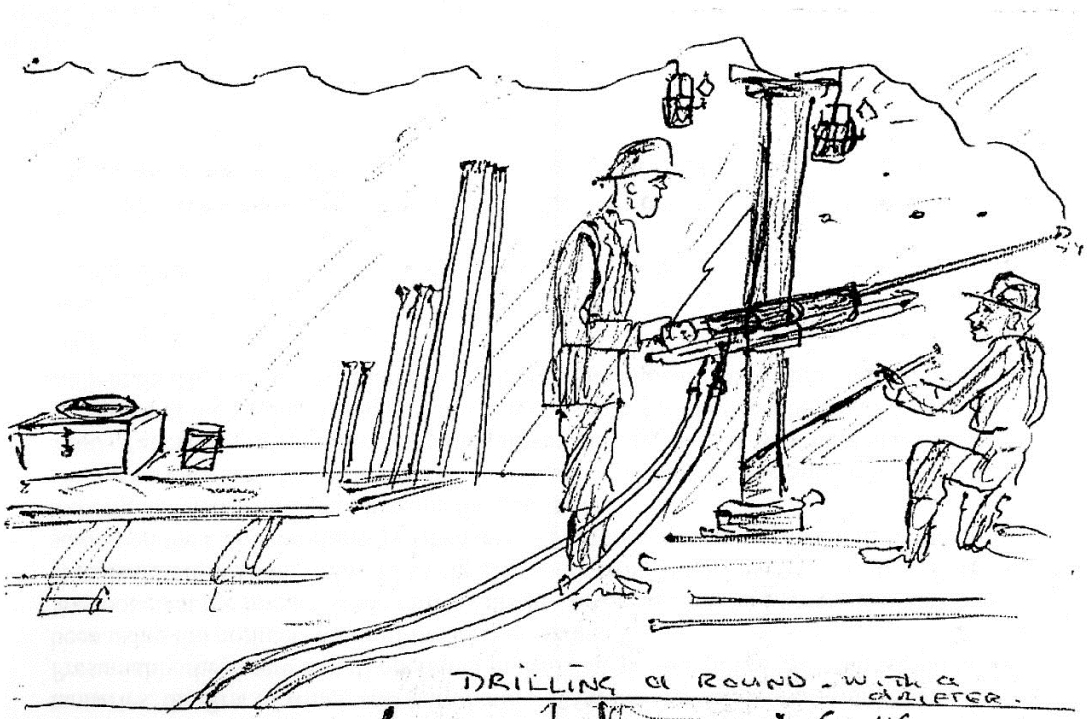
Turning on his air and water his assistant known as a “spannerman” pitched the drill and they then began to drill. The noise was terrific, anyone who has heard a road drill at work should imagine the noise one or more of these could make in an enclosed space of about 6ft x 6ft.

There was also a stoper used to drill holes in the roof when making a “rise”. A wet dirty job. The water and grit continually falling on the head, face and shoulders of the driller who had constantly be looking up to see where his drill was going. The stoper drill did not use a pillar but had a pack leg which lengthened as the drilled in the rock. In later years they invented a drill which drilled horizontally and used a jack leg instead of a pillar. Using Tungsten Steel tipped drills. These drilling machines could drill a full round with only two drills. The old machines could use upwards of thirty, forty or more drills a day especially in hard ground. A round could be 6ft or 6ft 6ins made by perhaps 25 drill holes. These were charged with Gelignite and either fused by fuses which had detonators on the end or by electric detonators. The former were lit by a special lighter like a firework which burned with an intense blue flame. The second with a plunger type of exploder. Great care had to be taken with electric detonators shots. They were tested to see if the circuit was connected and this way the miners could go a long way out of danger before he fired. The other type depended on the length of safety fuse and once lit up the miner had to get away pretty quick to a safe place. Once he had got there he would count his shots as a miss fire could always be dangerous.

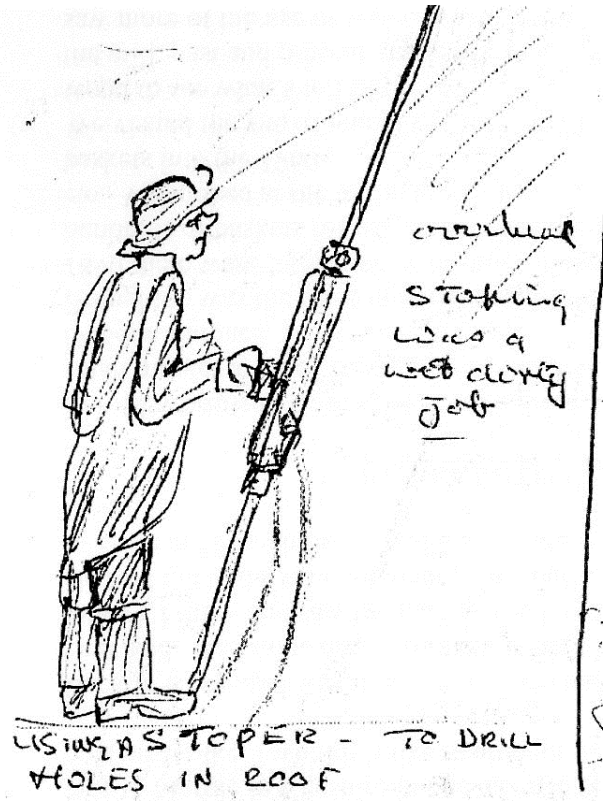
The electric fired ones went very fast and I don’t think the miners could count his shots. Men had to be very careful not to drill into old cartridges of Gelignite which may have been left from a former firing. When he had fired his round, the resulting debris was either shovelled directly into waggons, usually the next shift did this. Or if he was stoping the debris was blown down into hoppers and taken out from them as needed.

Sinkings were often dangerous, wet and noisy. The miner would go down in his sinking fill the broken rock and send it to the top in a kibble, a sort of iron barrel. Often lumps, and even a small lump like a pea can cause damage when it drops down the shaft, and in a sinking there is little room to get out of the way. Water is continually dripping and even that can sting when it drops perhaps 30 to a 100 feet. Water accumulates in the sinking so waders are often needed. The rock itself is more difficult to shovel in the constricted space. Even when the debris is cleared out and drilling commences, water from the drilling machine begins to fill the bottom of the sump or sinking, usually an air pump is put in and they were very noisy making it impossible to hear any loose rock falling from above. The jack hammer was the drill used in sinking.

When miners were exploring a lode sometimes a diamond drill was used. This drill had a hollow tube, the bit had industrial diamonds set on its crown. The miners drilled a section and could drill hundreds of feet by screwing more sections on the drill. As the drill was hollow it cut a sample of the rock which would be taken out section by section. These would give an idea what the ground was like and if it would be worth working.

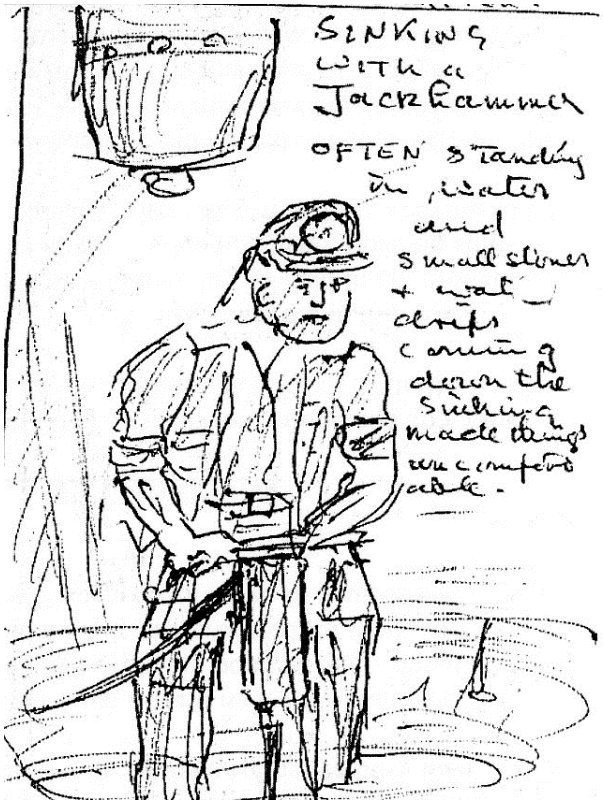


Miners were paid on contract by the fathom. When I first went there, contracts were made on a fortnightly basis and they had to pay for their own carbide, explosives and oil. Miners had to be able to turn their hand to anything – track laying, pipe fitting, timbering etc. Later men were employed to do these jobs for them.



The lode at Greenside ran roughly north – south. The old miners started high up on the fell. I believe it was a Dutchman who first drove into the fell to find metal. There was Kilgroves level, the high horse, low horse, Glencoyne level, Alma and Lucy level. The latter was driven in the mid 19th century and took 14 years to drive. This was the main level and way in when I was there. The old workings were not completely worked out and we used to go up to Alma level for metal. The metal was galena, plumbago sulphide and there was about 12oz of

silver to the ton of lead. Occasionally, at least from the early 18th century, ore was taken over the Slicks Pass to Keswick where it was smelted and later to Alston. By the time the Greenside mine had become a growing concern, the company built their own smelter and a chimney over a mile long like a brick tunnel was built up the fell to take away the fumes. This was swept and the soot treated and metal taken from that. It is of interest to know that the directors of Greenside mine gave a set of communion plate made from Helvellyn silver to Saint Patricks church at Patterdale, when the church was rebuilt over a century ago.



ABSTRACTS

REVISITING THE ICONIC: THE EXCAVATION OF THE REELFITZ PIT ENGINE AND THE NEWCOMEN STEAM ENGINE IN CUMBERLAND, UK. David George. Industrial archaeology review Vol. 36 No. 2 November 2014. Pp 128 – 140.

This is a further article to the one published in Cumbrian Industrialist Vol. 7. It places the Newcomen pumping engine at Reelfitz pit in relation to the other known pumping engines of the late 18th century that either exist or an archaeological excavation has been carried out on the site, especially Fairbottom Bob engine near Manchester.

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