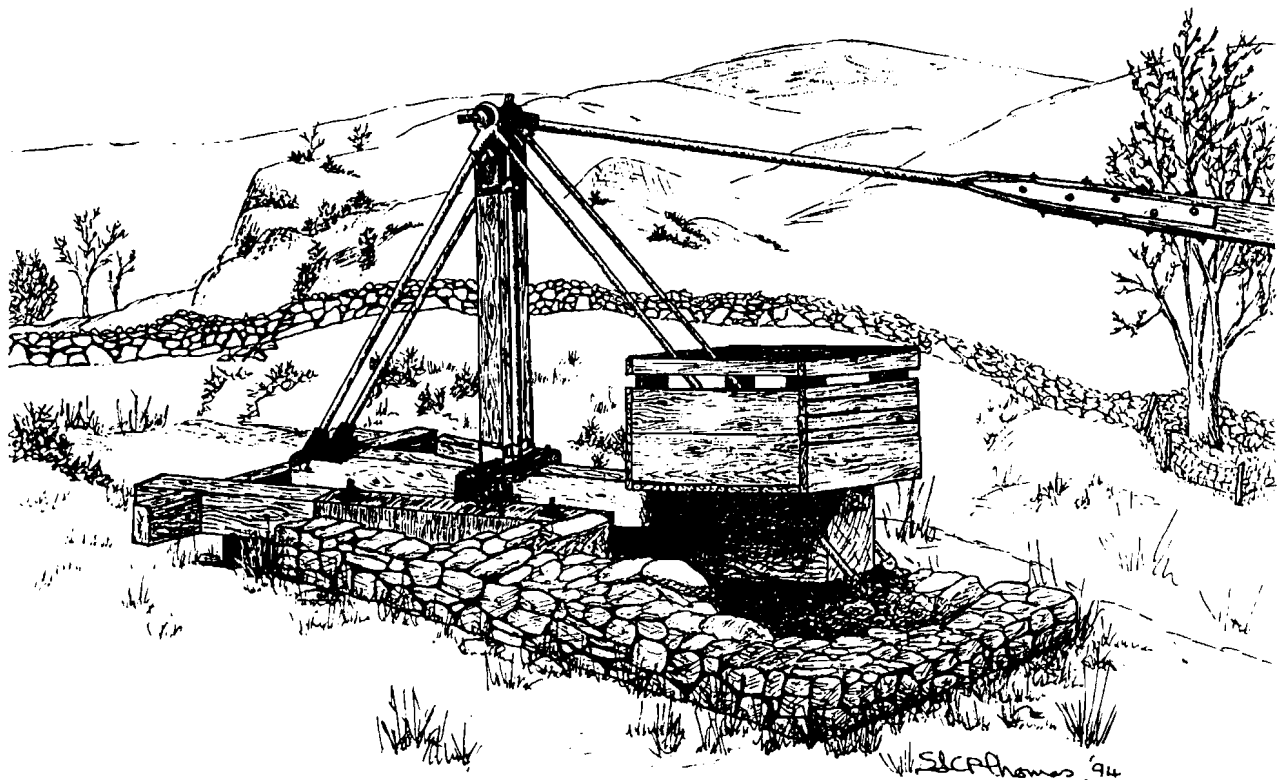




No 39

JULY 1994



The Newsletter of
the Cumbria Amenity Trust Mining History Society

FRONT COVER

The Balance Bob at Cwm Ciprwth Mine - North Wales

Another drawing from the pen of Sheila C.D. Thomas
who also produced the drawing on Page 3

Contents

Page	1	Diary Dates - New Members	
	2	Details of NAMHO 94 Field Meet	
	3	Society Notes	
	5	North Wales Meet	15th - 18th April
	9	Ingleton Quarry	22nd May
	14	Ingleton Coalfield	22nd May
	17	Hudgill Nenthead	11th - 12th June
	17	Mines of Grassington Moor	18th June
	19	Gavel Mine Buckden	19th June
	20	Mine Forum Meeting	15th June
	21	IRIS Index Record for Industrial Sites	
	22	Dr Descender	'J.K.'
	23	A Visit to Wet Earth Colliery -	Peter Hay.
	25	Plynlimon Mine	David Blundell.
	30	The Great Lindal Rail Disaster	John Helme.
	31a	News	
	31b	Photographic Copy for Newsletters.	

Contributors of articles on Floppy Disc :- Please use a Read Me file saved in ASCII (*.ASC) with the following information :-

A list of files for the newsletter and their format e.g MS.Works, Wordstar, Word 6, etc. Most formats import O.K but it helps to know what one is dealing with before starting. (M.S. Works preferred - *.WPS).

For Sale :- IBM Compatible P.C's 640k ram only, standard AT keyboard

3.5"FDD, Hercules Graphics, serial mouse, standard serial and parallel ports. Supplied with mono monitor Dos 3.3 and M.S. Works v1 with manuals. All machines sold as seen . Contact the Editor if interested. A.S.A.P.

Diary Dates -

July -- September

July	17th	Coniston Exploration
	27th	Lindal Tramway Bridge (Evening Meet)
	31st	Red Dell Conservation Coniston
August	5th-8th	NAMHO Field Meet (See below)
	17th	Red Dell Coniston (Evening Walk)
	21st	Roanhead (Survey & Recording Meet)
September	4th	Yarlside Furness (Survey & Record)
	5th	MEETS MEETING 7.30 BMSC Cottage Coniston
	17th-18th	Hudgill Dig (Nenthead)
October	2nd	Dufton Fell (U/g exploration)

Note !! As has been said before Meet Leaders put a lot of effort into the meets that they lead and if you do nothing else in the society please make an effort to attend. I am thinking in particular of the Newlands Furnace meet where John Helme put in much time and, apart from the FMA only Jon Knowles turned up. At the last count I believe we had about 90 members and if only one or two turn up then fewer meets will be organised, so remember, the MEETS MEETING is open to all, or, if you cannot come let a committee member know, there are such things as telephones.

NAMHO 94

Royal Forest of Dean Field Meet 5th-8th August

This field meet has on offer a good selection of venues, catering for all abilities including children. The base for the events will be the Clearwell Caves. The Saturday evening event will be a Social/Pig Roast.

See the next two pages for the trips on offer.

Old Millclose Mine, Wensley, Derbyshire.

For those of you who missed our meet to this interesting place or, for, any one who would like a repeat trip, PDMHS is opening Old Millclose Mine to visitors one weekend in September. Two alternative trips are being offered, the first will be a basic tour on a first come, first served basis. The second will be a more difficult trip for experienced people only.

For further information contact Dave Warriner (0623 661127 or John Peel (0335 25448).

New Society Members

Mr M.Forsdyke Egremont
 Mr R.Rutherford Darlington
 Mr & Mrs K.Geddes Clitheroe
 Mr B.Stevens Coniston
 Mr J.Davies Langdale
 The Westmorland & Furness Bat Group

N.A.M.H.O 1994 Forest of Dean.

Underground Trips

Friday Evening

1 Clearwell Caves Complex - A large complex of disused iron mines with multiple entrances and last worked in 1945. The lower levels of this mine are polluted and may not be accessible although it is hoped that the situation may have been improved by August.

A) Self guided trip round show mine (Easy , 1 Hour)

B) Guided trip to deeper workings (Moderate, 3 Hours)

2 Wigpool Iron Mine - last worked in 1918, extensive levels with several entrances, steep in places .Guided through trip (Moderate , 3hours)

Saturday

1 Clearwell Caves Complex - see above but with several extra different trips.

2 Wigpool Iron Mine - see above

3 Morse's Level Coal Mine - A working Free Mine Surface and u/g trip (Easy 3 hours)

4 Bixhead Quarries Stone Mine- An area worked for pennant sandstone.- Surface and u/g trip (Easy, 3 hours)

5 Noxon Park Area - An extensive area of disused iron mines. two trips- A) Crater and Jetty entrances (Easy 3 hours)

B) Oakwood Mill Deep (Moderate , 3hours)

6 Westbury Brook Iron Mine- A large steeply descending mine, last worked in 1893. Recently extended and with numerous artifacts found.- Trip to Sprag Level(Moderate/hard, 3-5hours)

Sunday

1 Westbury Brook Iron Mine - As above- Trip to new extensions (Hard, 6-8hours)

2 Wigpool Iron Mine - Trips as above.

3 Beech pit/ Trow Ditch level - A recently opened through trip. Beech Pit was a separate mine that became part of the Westbury Brook Mine. The connection to Westbury Brook from Beech Pit is below water table and so rather wet. A guided through trip -(SRT required, damp exit, Mod 3hours).

4 Devil's Chapel- An extensive area of disused iron mines.Guided through trips (Easy, 3hours).

5 Brincomb Limestone level- A level worked in the lower Lst Shales.

Perseverance Iron Mine Last worked in the 1890's, very steep muddy artifacts etc. Trips to both sites (hard, 6-8hours)

Surface Trips

1) Bixlade Valley Walk

Starts at GR 608099(Forest of Dean Stone Firm) and the route will include Coal mining sites, a working Free mine, Pennant sandstone quarries & Birch hill iron mine.

2) Howlers Slade & Wimberry Slade Walk

Starts at GR 604114 and will travers sections of 2 tramroads which served Coal & Iron mines as well as the stone quarries. Mushet's Old Furnace Level and Cannop Drift (mine).

3)Clearwell Area Walk

Starts from Lambsquay Hotel GR 581088 and takes in the iron ore outcrop at the western edge of the Forest ore field and includes the Old Bow, Lambsquay & Old Ham mines. The land pits of Stephens and Yew Tree mines plus the deep pit of the Easton Iron mine will be included.

4) Oakwood Valley Walk

Starts at layby at GR 601064 will follow part of the Oakwood Valley tramroad, which served collieries and iron mines, before traversing the iron outcrop in Noxon Park. The site of Oakwood Mill deep level (Iron mine) and Oakwood land level will be seen as well as the Princess Louise Iron Mine shaft and the China Engine Iron Mine.

5)Car Visit

Starts at Clearwell Caves site and will visit the Whitecliff & Darkhill coke blast furnaces, the Titanic steel works, the Easter Iron Mine pithead buildings, Fairplay pit cornish 'bull' engine house, Findall Iron Mine ventilation furnace, Parkend beam engine house and Lightmoor colliery beam engine house.

Society Notes

Things have not changed much since Alistair's News-Sheet of May except that Chris Jones and Phil Merrin have commenced operations for the putting in of Batinox hangers to the through route in Coniston and the printing of the NewsLetter has changed. It is now carried by Jon Knowles who has this done by a firm in Leeds, the price of Printing, compiling, and stapling being similar to present costs. Many thanks to Peter and Margaret Fleming for their efforts over the years, they will now concentrate on smaller items e.g. minutes etc.

No-one has come up with a name for the Newsletter so for the time being it will stay as it is. The Journal, I believe, is shortly to see the light of day, the tying up of our resources on this project may concentrate minds on our publication policy, - any thoughts anyone?

Living memory - As some of you will know I have been over to Normandy with my father for the D. Day commemorations. It was an unusual experience to listen to the veterans, now mostly 70 years old and over talking about their experiences in the place where it all happened as, if it was yesterday. For one, who thankfully has never smelt powder, it was possible to perceive echoes of events past, better than any book, however skilful the prose.

The same applies when talking to people who have been miners, and there are one or two in the society. When they talk about what they did, events and situations come alive in a way difficult to achieve by other means. Each person's memory is unique even though they may have been working in similar places.

(It is not only what they say it is the way they say it)

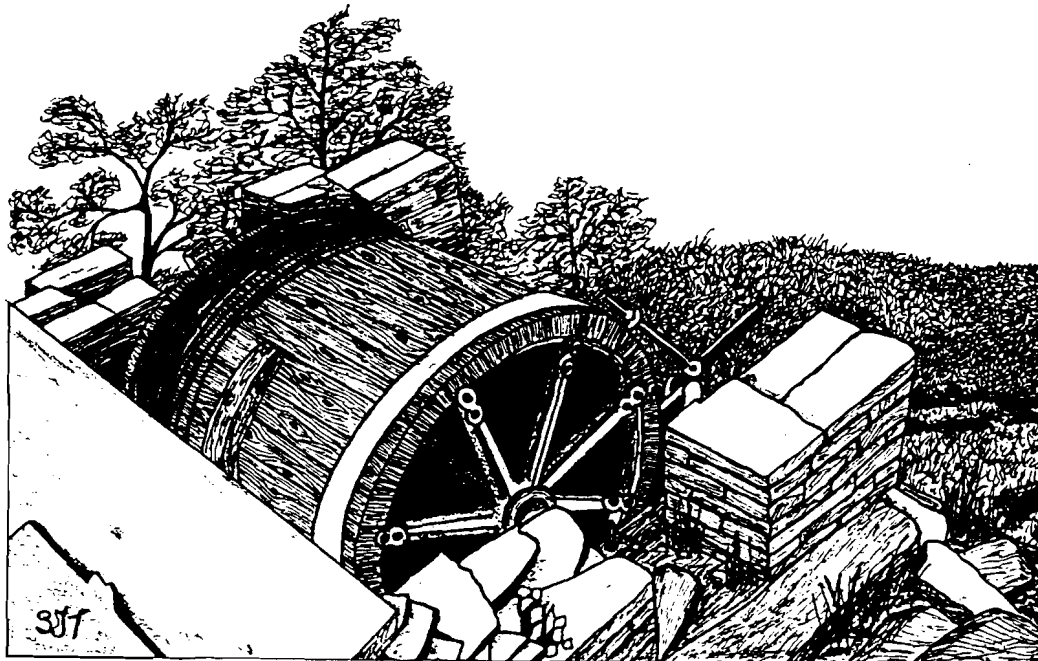
Miners like old soldiers are getting fewer, so it is important to record on tape their experiences, warts and all. Some members are doing this, it is not easy, and it is time consuming, and sadly for most of the metalliferous mining industry it is a generation too late.

The saddest thing is an unfinished memoir.

Note! some of the older members of mining history societies know a lot of interesting things that they have never recorded. I think we could all think of people who come into this category. SO GET RECORDING tomorrow may be too late.

Where is it ?

The owner of the first right answer will be named in the next newsletter



MEETS REPORTS

NORTH WALES MEET 15th - 18th APRIL

Friday 15th April

Thirteen members, including some new faces, turned up on time for a visit to the working Maenofferen Slate Mine at Blaenau Ffestiniog. The trip which had taken 4 months of correspondence to arrange took members into one of the last two remaining working slate mines in North Wales. The trip started at the Llechwedd Mine Office since J.W.Greaves, the Llechwedd owners, also own Maenofferen. After a brief introduction we were taken by minibus to Cookes level (Level B) and made our way along a shelf cut into the rock to the gated entrance. The level is named after William Fothergill Cooke who, together with George Hunter, invented a tunneling machine with which part of the level was driven. Our guide informed us that this locked entrance was the main emergency exit from the mine and that it was necessary to keep it locked due to persistent underground vandalism. Unfortunately the gate proved difficult to open and the key broke in the lock !. Plan B then went into action. This involved ferrying people up the steep road to the main mill level (Level 1) in a Landrover.

After viewing the incline winder and a rake of wagons containing large slate blocks being pulled into the mill we descended the incline to floor B. The incline is electrically powered and the D.C. motors are still controlled by the extremely crude variable resistors with which they were originally fitted. These motors require a variable resistor to start and this is provided by installing a barrel of brine in the circuit. One contact is a plate fixed in the bottom of the barrel and the other a second plate which can be lowered into the barrel, using a simple reel, to decrease the resistance. The only sop to progress is the use of plastic as opposed to wooden barrels. Whilst the system may seem Heath Robinson it is very safe since drawing too much current merely results in the boiling of the fluid and an increase in resistance thereby reducing the current. The incline was initially four track with the outer tracks being used for the

intermediate level (Level A) whilst the two central tracks were used for the "main" traffic to Level B.

On arrival at floor B, the second below mill level, we initially entered a worked out chamber now used as a compressor room where compressed air, to power the rock drills and winches, is produced. After walking along the level for 10 minutes we entered a chamber which had been worked until recently using a wire rope saw. Our guide explained that this had been used to enlarge the size of the holes in the pillars left between adjacent chambers to support the roof, but was definitely not pillar robbing !.

After a further short walk, during which we marvelled at the even roof of all the chambers, we arrived at the impressive head of the B to E incline. This incline descends the worked out chamber 31 and is powered in a similar method to the exit incline. Unfortunately the incline could not be seen in operation since a new hook was being fixed onto the end of the cable but even so this was an impressive place. The main winding gear is mounted on a staging and the wagons pass underneath. With the whole area lit and reverberating to the sound of another compressor cycling on an off load we could dimly discern the lights at the bottom of the incline 250' below. Due to safety considerations we were not able to visit the working chamber in E37.

After taking our fill we retraced our steps and returned to surface. Back at day we took the opportunity to look around the mill and watched with awe as the blocks were deftly squared up and then split before being trimmed to size. Joan Helme had a go at slate splitting and proved that it could be done but that doing it quickly was another matter. Whilst we watched a dresser squaring up blocks prior to dressing his mate come over to him and spoke to him in Welsh - they both laughed. It later transpired that the message was "I hope you hit your finger while they are all watching !". After leaving the mill we returned to Llechwedd in 20th century quarryman's transport. This consists of an old army lorry with canvas top and wooden bench seats arranged along either side.

As a token of appreciation we presented Llechwedd with a copy of **Beneath the Lakeland Fells** and we were advised that we were welcome to come back again at a later date if we wanted to.

After lunch we crossed Blaenau to the abandoned Diffwys Casson Mine where we walked up through the New Quarry before descending into the Twll Drum Bowydd. This large crater gives access to a run of chambers which show very little evidence of having been visited since closure. There are a number of interesting artifacts including an erect tripod crane, a box of gelignite and a set of spoon points. Spoon points are not like conventional tramway points, in that they do not move any part of the rails, but drop on top of them to enable a wagon to be added or removed.

Diffwys is a significant site in the history of Slate extraction since it was the first proper underground working in Wales. The credit for introducing Slate Mining (or underground quarrying to be strictly correct) is attributed to the Lakeland trio of William Turner and the brothers William and Thomas Casson who were all originally from Seathwaite.

Saturday 16th April

The meet leader turned up (late) to this meet to find a large number of cars and approx. 20 people. Cwm Pennant is even today a lonely and sparsely populated valley which has a number of abandoned mineral workings for Copper and Slate. None of the workings was very successful and it is doubtful if anybody other than share dealers made money from any of them. Fortunately the extant remains are very interesting.

The Gilfach Copper Mine (see map) was visited first. This consists of two levels and an open stope on the top of the hill. The lowest level which starts behind the remains of the processing mill gives access to the bottom of the single stope but there is much fallen timber and debris. The middle level gives access to the stope down which the meet leader had seen what he thought was the remains of a wooden windlass on a previous visit. A bolt was eventually put into some rather poor rock, upon completion of which one member, who will remain nameless, helpfully inquired as to why we were not using the bolt already there, which nobody had seen till then. The stope was descended

for approx. 50' where the windlass turned out to be the remains of a ladder !. The stope descended further though poor timbering and clearly connects with the lower level since it was draughting strongly. There is clear evidence of a ladderway down through the stope.

After a short walk the Cwm Ciprwrth working was reached. According to David Bick (The Old Copper Mine of Snowdonia) Industrial Archeologists have a rule that the more isolated the site the more likely it has escaped the cutters torch. This is certainly true here where a water wheel complete with winding drum, and flat rod drive to an angle bobremain. The whole site has recently been restored by the Snowdonia National Park who should be congratulated on the high standard of work achieved. The remote location of this site, with no vehicular access, should ensure its long term survival.

Note that these workings are on private property. The owner who lives at Gilfach Farm gives permission freely when asked.

After lunch we drove to the head of the valley and walked up the remains of the Gorseddau Tramway to the Prince of Wales Slate Quarry. This site is probably a better example than any other of ill conceived development since it has all desirable features of a good slate quarry bar one - good rock. Suffice to say a tramway to Portmadoc, water powered mill, barracks and extensive tipping space could never make up for omission of this pre-requisite for successful operation.

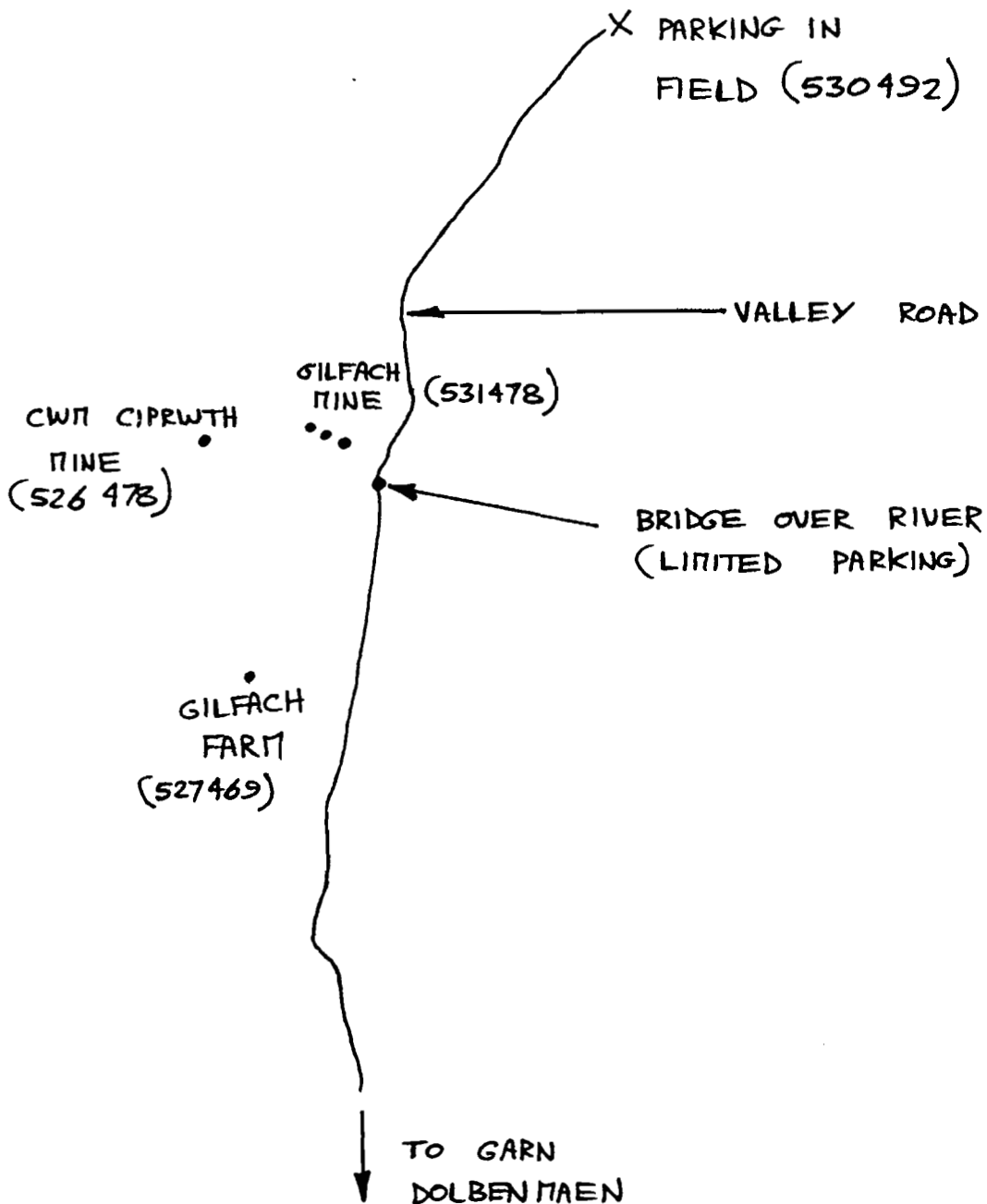
The plan had been to descend an open chamber into an un-explored part of the workings. Unfortunately a large grill had recently been placed over the hole. Fortunately the grill, which was 20' x 20' was not fixed down and was manhandled out of the way. After descending it was slightly disappointing to find that very little new ground could be entered. However all was not lost since one of our younger members demonstrated a new SRT rig made by his father. This rig known as "The Cameron" is lighter than the more common frog rig. Weight reduction is apparently achieved by dispensing with redundant components such as the leg loop ascender to harness tie in rope

The afternoon was rounded off with a walk round to the Cwm Dwyfor copper mine

CWM PENNANT

SEE OUTDOOR LEISURE MAP (SNOWDON &
CONWY VALLEY AREAS FOR) FULL DETAILS

- PRINCE OF WALES QUARRY (549499)



where a previously unknown shaft was located to which a return visit will be required in due course.

Sunday 17th April

After the crowds of the preceding days a more select group consisting of messers Bridge, Geddes, Hay, Knowles and Simpson assembled at Tan-y-grisiau, on another glorious day, before driving round to Croesor and up to the mine.

"Are you stark raving mad ?" was how the tackle master had greeted the request for a 450' rope. Suffice to say that after some banter he duly came up with the goods in the shape of a 600' piece. The problem with a rope this long is carrying it, and for the 600' ascent to the shaft collar it was split between two tackle sacks and moved "mule train style" by Mark and Dave - readers should judge for themselves the aptness of this arrangement. It is surprising that in this safety conscious age that a 450' shaft can be completely open and unprotected but this proved to be the case with the 8' x 8' opening. Much time was spent in getting a good hang and even the final arrangement was not ideal since the only good belay points were two large sheave wheels lying on the ground nearby. Once all was fixed the meet leader muttered "I suppose I've got to go first", nobody disagreed. Once the edge had been cleared, which was not easy due to the weight of rope below, the decent turned out to be very pleasant.

The shaft descends initially through poor or made up ground where it is lined in slate, until approximately 30' from surface where a level is cut. This is the remains of tunnel through which spoil from the shaft sinking was removed. This was presumably necessitated by the mounting of the winding sheaves at ground level, presumably to render a headframe unnecessary. This tunnel, which does not extend into the hillside beyond the shaft, is run in at its mouth. A timber beam with lifting hook indicates that a trap door, or similar, once spanned the shaft to enable material to be removed. Below this level the shaft descends through very solid ground of no remark. Occasionally there are the remains of iron pegs etc. in the walls but these are insignificant and small.

Approximately 50' from the bottom two levels join the shaft. The one to the East is soon cut

by chamber A1E but the level can be seen continuing on in the pillar between chambers 1E and 2E. The other level leaves the shaft in a Southerly direction before curving round and dropping down slightly (it leaves the shaft a few feet higher) to give access to the working bench at the top of chambers 1W and 2W only. The lower part of the shaft is extensively coated with soot confirming its use as a flue.

Exploration of the side levels did not prove very eventful until coming back out of the level onto the rope, where the large amount of stretch proved impossible to remove completely. The net result of this is a very rapid descent of approximately 15' when stepping out of the level as the stretch is suddenly taken up. Note dark coloured underwear recommended. Technically this sudden loading of the rope is insignificant since with 400' of rope above the fall factor is negligible.

Peter Hay receives the "mad man of the trip" award for this descent which was his first descent with a Petzl Stop.

In the late afternoon a brief visit was made to Rhosydd to have a look at the 3 to 6 incline.

Monday 18th April

Following last years successful Croesor - Rhosydd through trip it was hoped to have a re-run but with many people having other commitments this was not possible. However this enabled a detailed exploration of Croesor floor A, immediately east of the fall, to take place. A detailed description of the results of this, and last years exploration, will follow in a later newsletter.

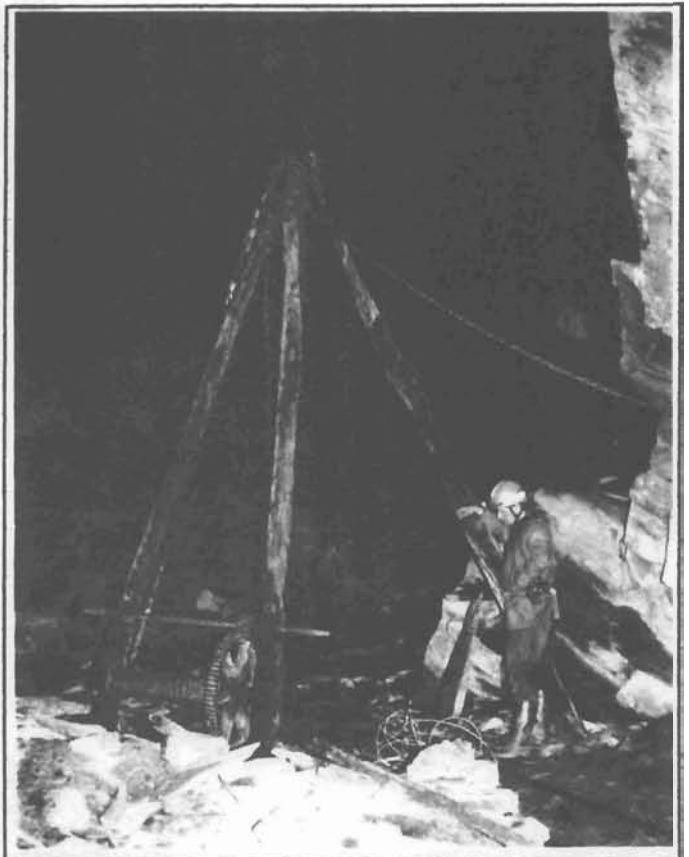
Further Reading

For more information on the sites visited the following books are worth reading :-

- 1) "The Old Copper Mines of Snowdonia" by D.Bick. Information on Cwm Ciprwth, Gilfach and Cwm Dwyfor.
- 2) "Slate from Blaenau Ffestiniog" by Graham Isherwood. Drawing of Hunter tunneling machine and photographs inside Cookes Level.
- 3) "Pioneers of Ffestiniog Slate" by Michael Lewis and Merfyn Williams gives the early history of Diffwys.



Splitting Slate -- Maenofferen



Tripod Crane --



Cwm Ciprwth Mine

ARC Northern Ingleton Quarry

Sunday May 22nd

A good turn-out of 12 people turned up for the visit at the arranged venue, and at about 10.45 we made our way up to the quarry office. Mr Carl Lis the Manager (with Ms Rachel Stone his assistant) gave us a very interesting introductory talk on the history of the works to date and what the ARC proposals were for the future, the including landscaping scheme for when the quarry is finished. The quarrying methods used were then explained - laser profiling of the face, blasting patterns and methods etc.

After that it was safety helmets on and to the quarry minibus for a ride down to the quarry, a very big hole when you are in the bottom of it.

After a good look round with a brief explanation of the geology, it was back in the vehicle and back up to the primary crusher house, and a guided walk through the

processing plant, via the control room, and lorry loading hoppers, to the quarry office. The control of all the plant was by standard P.C's where at a press of a key plant status could be shown and process's stopped or started, this type of facility not being possible with the older plant. Last stop was the dispatch office. Where we were shown how when a load of stone is required a smart card is programmed, with the information about

what is required, the driver takes his waggon down to the loading bay, shows his card to a reader and the correct load is given to him. Loaded up the driver takes his vehicle up to the weighbridge office, hands his card back in, the load is booked and he departs on his way.

The tour finished here and after thanking Mr Lis we departed our various ways for lunch.

It makes a very nice change to see a working quarry, instead of our more usual business of picking over the dry bones of previous extractive enterprise.

Mark Simpson June 1994

QUARRYWOMAN Rachel Stone acknowledges her suitable surname with a smile.

The trainee assistant manager at ARC's Ingleton Quarry is moving on to take up a post as quarry manager at Gwalchmai on Anglesey.

Truly a woman in a male-dominated world, Rachel's promotion makes her possibly only the second female to manage a UK quarry.

She said: "I know of at least one woman who is a quarry manager. There aren't a great deal of women in the industry."

On Anglesey Rachel is in charge of a relatively small granite quarry and coating plant with 12 employees. She reports to a unit manager at a quarry about 40 miles away and she is looking forward to the challenge of being in charge.

For her first few weeks Rachel will be finding her feet. After that the company will apply for her to be licensed as a quarry manager.

The 23-year-old, who is originally from East Sussex, was inspired by quarrying from an early age, when her father worked for British Gypsum at a site which was important to the village's economy.

Later Rachel was recommended for a three day introduction for a mining degree course in London, and she was hooked.



On the move: Rachel Stone takes on a quarry manager's job on Anglesey

"My parents were very worried that I would not get a job after graduating, but I convinced them it was what I wanted to do, and exactly what I was looking for in a career."

Being taken seriously was a hurdle she came across on site visits in her first year at the Royal School of Mining — with only three other women on the course.

"Initially during my first year of my mining degree I felt the

greatest hostility towards being female. By the time I went on visits in my third year it was OK — I convinced them I was not just playing around and I was serious about it.

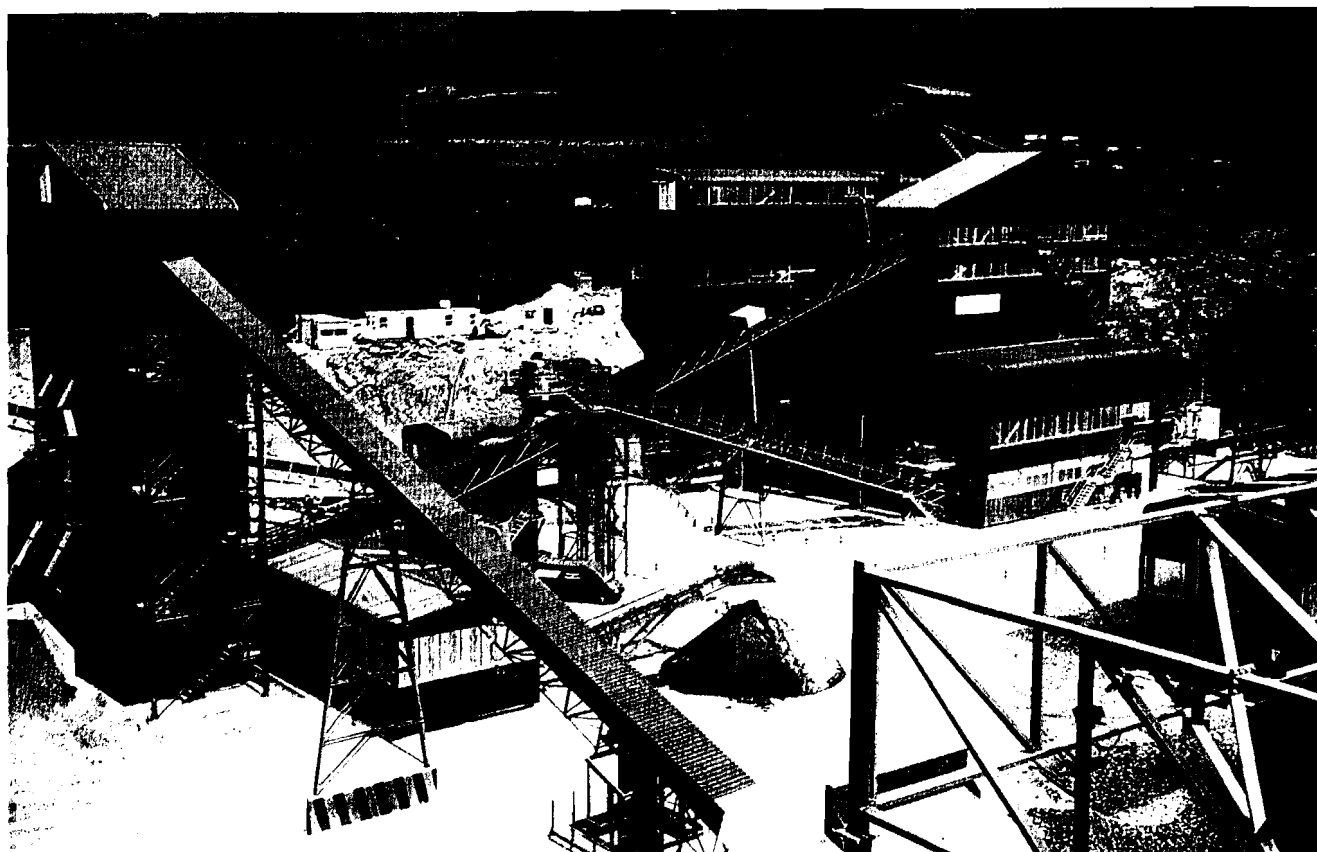
"I think it is a bit of a surprise at first, having a woman in charge, but I hope in the main I am judged on my capabilities and not on what sex I am."

After her degree Rachel was offered a place on ARC Northern's graduate manage-

ment training scheme and came to Ingleton as trainee assistant manager working as deputy to Carl Lis in January 1993.

During her time at Ingleton Rachel has played a part in the commissioning of a new £6.95 million plant, which included £1 million worth of environmental and health and safety investment.

Picture by Craven Herald photographer Stephen Garnett. 231294.



A general view of the new quarry plant at Ingleton

INGLETON QUARRY GETS A NEW LEASE OF LIFE

ARC Northern commission state-of-the-art plant

Ordovician greywacke, known locally as green 'granite,' has been worked close to the village of Ingleton, in the Yorkshire Dales National Park, near the North Yorkshire/Lancashire border, for over 50 years. Much respected as a roadstone aggregate, with a polished stone value in excess of 60, the gritstone commands a wider-than-usual market area and is regularly supplied into the Leeds/Bradford conurbation some 50 miles distant. With the existing excavation limited in depth by its lateral extent, ARC Northern, the operators of the quarry, have just spent £7 million on a new crushing, screening and washing plant which releases reserves under the old processing area. Based on the results of an exploratory drilling programme, it is estimated that the quarry will be able to increase in depth by some 60m, extending its life by 18-20 years.

The new 500,000 tonnes/year plant, designed by ARC Northern's engineering staff in conjunction with the operational management team, has been constructed by Butterley Engineering Ltd of Ripley, Derbyshire, and entered its commissioning period at the end of July. The state-of-the-art plant contains a number of interesting features designed to improve operational control and maintenance, and minimize environmental intrusion. One such feature is the new

sand and sludge handling facility which produces a new grade of material and clarifies water for return to local watercourses. It is estimated that, in all, £1 million has been spent on environmental improvements at Ingleton Quarry.

QUARRYING OPERATIONS

The greywacke is largely massive in formation, with no uniform bedding and no tendency to fissuring or other irregularities.

Blasthole drilling is undertaken using a Halco 400C down-the-hole rig which drills 4in holes angled at 12.5°. The standard face height is 15m and holes are drilled 1m subgrade to a pattern of 3.5m x 3.5m. Water is commonly present and Powergel slurries are used in conjunction with ANFO. The column charge is split by a single deck and initiation is by Magnadet at the deck and at the bottom of the hole.

A Michigan L320 wheeled loading shovel operates at the face with a fleet of Terex dumptrucks (one 3307 and two 3305s). At present the trucks are feeding the old plant which has been in operation since 1955. As the new system comes on stream, the old structures will be demolished, serviceable equipment will be salvaged for resale and the site will be prepared for future quarrying operations.

Part of the working quarry which will be extended into the area covered by the old plant



THE NEW PLANT

The new system has been designed with a knowledge of the material and its behaviour in the old processing plant, together with experience gained at other ARC operations. This has led to a revision of the crushing equipment at both the primary and tertiary stages.

In the old system, the single-toggle jaw primary had a tendency to produce slabby material which gave rise to difficulty in subsequent processing stages. Furthermore, crusher provision stretched the reduction ratio to the limit, leading to poor shape and the need to install a vertical-shaft impact crusher in the mid-1980s to correct this in the final stage of crushing. These lessons have led to the selection of gyratory primary and secondary crushers, with five cones and a versatile control system forming the tertiary stage.

After careful evaluation, an Allis 36-55 Superior, with an open-side setting of 127mm and throw of 32mm, was selected for the primary installation. This had the additional benefit of being identical to ARC's Penmaenmawr Quarry primary, which presented the opportunity for trials on Ingleton material. Driven by a 225kW Brook Crompton motor, the primary is

capable of crushing 660 tonnes/h and in operation handles 465 tonnes/h, precisely the amount calculated after the Penmaenmawr trials.

Situated at the highest point of the site, the primary can receive run-of-quarry stone in 50-ton dumptrucks which may be introduced as replacements for the existing fleet. Beneath the crusher is a 100-tonne live capacity crash-box equipped with Milltronics level control. The crusher is constructed within a 24m high all-steel inner structure, with the crash-box and ancillaries on a separate outer structure, so reducing vibration. The primary is operated from a pressurized control room from where the operator monitors the feed and discharge through a CEGELEC Gem controller and can activate the Viper hydraulic arm as necessary.

A Locker feeder (one of a total of 21 supplied by Locker to comply with the latest European directive on interference-free operation) controls the flow of -300mm crushed product on to the 1,200mm conveyor belt which supplies the covered 4,500-tonne live capacity surgepile. The unusual canopy, which eliminates dust and keeps the surge pile dry, was designed by ARC to tone in with the plant structures. Indeed, the whole plant, coloured Van Dyke brown with heavier brown steelwork to comply with the planning permission, has the appearance of a pleasingly integrated 'architect-designed' unit, with machinery guarding and some five miles of hand-railing picked out in ARC yellow as a safety feature.

The new control room



Secondary crushing

From the surge pile, stone is fed to an Allis 6ft x 16ft double-deck screen. Oversize passes through a bunker to the Allis S 4000C Superior secondary crusher, while undersize is discharged to a wet triple-deck screen for separation into sizes below 8mm. Undersize from the latter is fed to the washed fines plant which incorporates a Finlay Hydrasander for the production of -3mm 'sand'. This new product complements Ingleton's chippings products which are widely used in surfacing preparations for sections of roadway where superior skid resistance is a necessity. The -75µm

fraction passes through a second Hydrasander which, with the aid of flocculant, discharges the sludge into concrete bays, while the clarified water is pumped to a lagoon system which regulates the flow of clean water back to the process plant or discharges to a watercourse.

Throughout the plant, Allis encapsulated dry sceens are in use and dust collection from the crushing and screening houses is accomplished by Torver wet suppression and dry extraction systems — the latter utilizing a 48,000ft³/min fan and 640 filter bags. The screen decks are polyurethane Isenmann modular systems which provide accurate screening and reduce noise levels and abrasive wear.

Tertiary crushing

At the tertiary crushing station, where four of the five cone crushers are Allis H3000 Hydrocones (the other is a Pegson Automax 900), two 7ft x 16ft selector screens split the incoming -100mm from the secondary crusher into four sizes, ranging from +50mm to -6mm, which are stored in bunkers from which material can be drawn for stockpiling or is discharged by Locker variable-speed feeders to the tertiaries. The +50mm material is fed to a H3000C Hydrocone which is in a closed loop with the selector screens. In this way good shape is virtually guaranteed by keeping the reduction ratio within bounds. Ground-stockpiled material can also be fed into this circuit by wheeled loading shovel via a reception hopper, as can material drawn from the final product bunkers. A Volvo L160 wheel loader is used for stock handling and two Volvo 861 articulated dumptrucks are used for stocking-out.

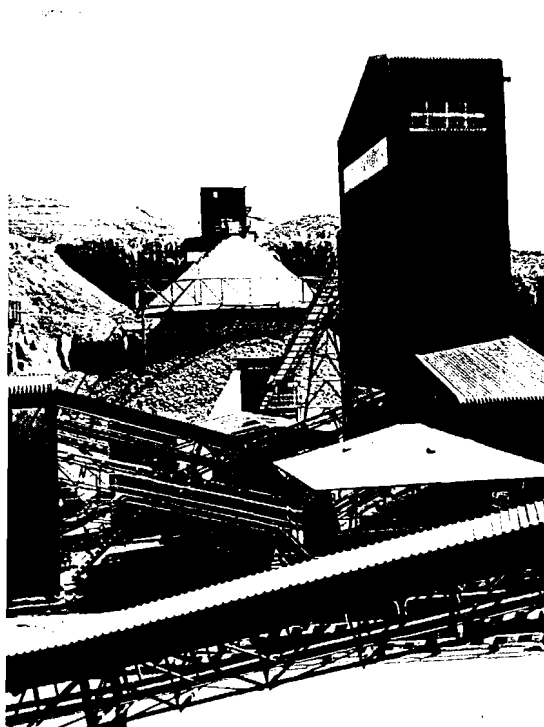
The tertiary crushers, all started by soft-start systems, have a control system that permits a combination of four out of five machines to be deployed to meet supply, storage and maintenance conditions. An overhead remote crane is fitted above the row of five crushers and feeders are fitted on slides so that they can be rolled out of the way to give more headroom when required for crusher repair work.

From the tertiaries, -20mm crushed product is fed to a 800mm wide belt for delivery at 310 tonnes/h to a free-standing 120-tonne surge bin for transfer by conveyor belt to the tall final-screen house. The designers considered using a special steeply angled conveying system in this application but finally settled for a conventional solution. The surge bin is controlled through high- and low-level limits to give a constant feed to the final screens.

Screening and dispatch

Preceding the one 8ft x 24ft and two 8ft x 20ft screens is a Mogensen sizer which serves as a de-dusting screen and by so doing allows a reduction in the size of the final screens. Ingleton dust is used in the company's coating operations elsewhere in the region. This can either be drawn from the bunker by belt feeder on to the conveyor supplying the lorry load-out or is taken by three screw conveyors to the enclosed dust shed for stockpiling on the concrete floor. All dust collected by the Torver system from the tertiary crushing stage and from the final screening plant is returned to the dust bunker, but only when material is being fed to the screens, thus ensuring consistent end-product.

From the nine final storage bins a computer-controlled Checkmark lorry loading and blending system controls the discharge of each grade on to the 500 tonnes/h 1,000mm conveyor system which supplies the lorry load-out point. Checkmark blending doors



The primary crushing station followed by its covered surge pile. The central control room is in the foreground

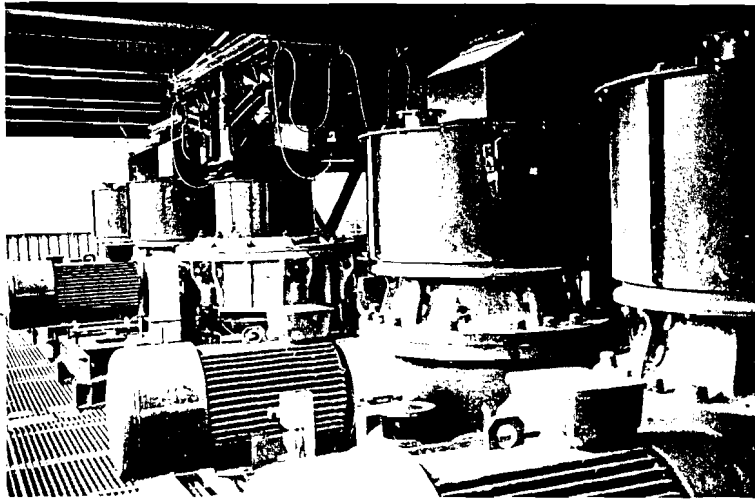
are used for the coarse aggregate sizes and a variable-speed feeder for the dust grade. The installation is totally enclosed and the dust suppression system minimizes emissions to atmosphere.

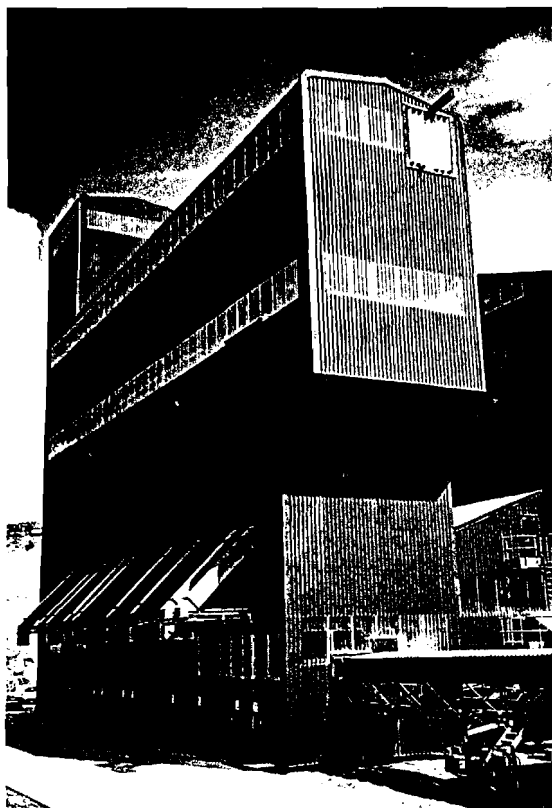
Final products are selected by the weighbridge operator and dispatched from the plant by the driver using a card-reader computer system; material can be loaded either via a dry-leg or over a rinsing screen. The electronic card is issued at the weighbridge and is of the non-contact variety, permitting the driver simply to wave the card at the reader from his cab to activate the loading process. A traffic-light system helps to control trucks at the load-out and drivers are sent on their way with an overhead electronic dot-matrix exhortation to sheet their load and drive carefully through Ingleton.

Dumptrucks on stocking duty also operate the same system with paper print-outs and copies for hard disk.

The whole plant includes eight Miltronics belt scales, the last of which is on the final delivery conveyor and is very accurate. In addition, the wheel loader on

The tertiary crushing station





The fully sheeted final screen house

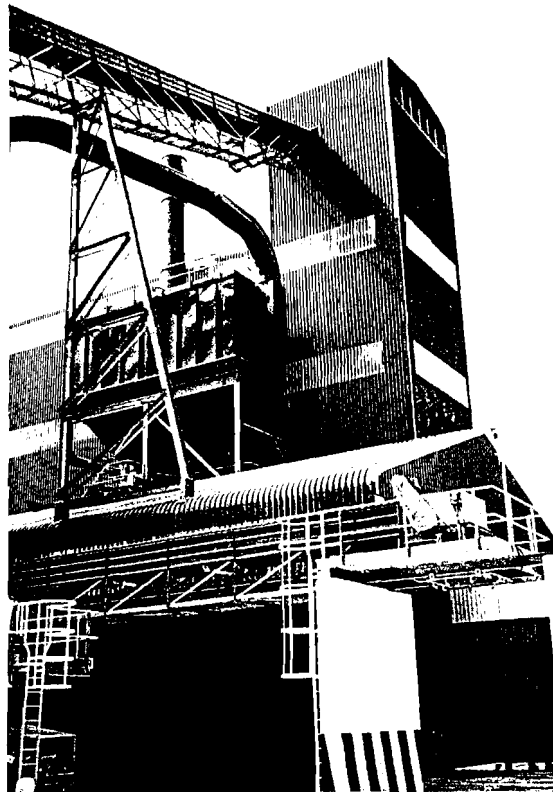
stockyard duty is equipped with a load-sensing device to ensure accurate loading. The Avery weighbridge is located away from the plant area, close to the site exit, but is linked to it by a newly surfaced tarmacadam haul road.

Control of the plant

The main control room, already affectionately known as the 'Pizza Hut' because of its design, houses the Gem control and monitoring equipment, installed by Ortech MCS as subcontractors to Butterley Engineering. From here one operator, with the aid of CCTV, can control both the processing plant and the primary crushing equipment, with the single exception of the hydraulic arm.

The control system includes Milltronics AirRanger

The lorry load-out point



Dust control equipment for the screen house

XPL and MultiRanger Plus ultrasonic level-measurement devices and 20 Milltronics motion-failure alarms which monitor against machinery failure.

In addition, Metal Detection detectors and Boxmag magnets guard against tramp metal.

Beneath the control point is the electrical switch room, the terminal for a new 11,000V supply system of 2MW. Throughout the site, it is estimated that the electricity supply has made use of some 37km of electrical cable.

CONCLUSION

ARC Northern's new plant at Ingleton is a credit to both planners and operators in that it demonstrates that, with forethought backed by experience, this medium-sized quarrying and processing operation can exist in harmony with rural surroundings.

Although the site is only visible from a minor road approximately half a mile distant, attention to detail has ensured a visually attractive installation. In addition, noise and dust control measures, which include the top-to-bottom sheeting of crushing and screening and storage areas, and a concrete roadway around the site, help to minimize potential sources of complaint.

Earthworks, including extensive screen bunding, have been hydraseeded and some 12,000 trees have been planted, while a viewing point is planned with explanatory diagrams for National Park visitors and local residents using a footpath overlooking the site. This type of facility, which is all too often lacking at working sites, can help to foster goodwill based on better understanding.

ACKNOWLEDGEMENTS

The editor is grateful to the management of ARC Northern for permission to visit Ingleton Quarry and to Roland Whiting (regional engineer), Gary Oxley (regional project engineer) and Carl Lis (quarry manager) for their help in the preparation of this article.

Ingleton Coalfield

Sunday May 22nd

This walk was put on as a bit of an afterthought when it was realised that the quarry tour was only going to last half a day. The inspiration for this came from a Northern Mines meet that I went on some years ago led by a B.Bond, who has collected much information on the subject.

As Andy observed on the day "there is not much to see", and, indeed, it was several years after I moved to the village that I found out that the area to the south of Ingleton had been the scene of a flourishing coalfield with coal mines, a brickworks and several potteries. Still, it was a sunny afternoon, so the walk itself was pleasant enough, and if members managed to acquire an idea of what went on, so much the better.

To explain the route taken by the party, a brief outline of the peculiar geology and a history of the area is necessary. I believe several people are preparing detailed monographs on the subject but so far as I know nothing recent has been published.

A look at the geological section of the area will show that the North and South Craven Faults are the main geological features of the area. To the North, Limestone, to the South, coal measures, a displacement being indicated of several thousand feet. The coal dips initially to the North, outcropping between ParkFoot and Burton in Lonsdale. The coal bearing strata being roughly bound by Leck beck to the west, Burton in the south, Ingleton in the East and the Craven Faults to the North.

As usual the coal was first worked on outcrop, the workings spreading eastward as far as Moorgarth. It is now realised that the area suffers from complex faulting and the geology has been only recently become more understandable. The bore holes put down at about 1900 revealed the imperfect state of this knowledge at the time.

For a full appraisal of the area see:- Mining in the Ingleton Coalfield by T.Ford in the Colliery Guardian September 18 1958.

History:- First references to coal mines occur in documents in the early 1600's and are concerned with disputes about who owned what, at one stage seriously holding up the production of coal.

In 1732 Seargentson acquired an interest in these colliery's through marriage.

Next, there are references to a disputation between the above, who was on the North side of the river and, a Mr Hodgson who controlled mines on the South side. (The river being the manorial boundary).

During this period and into the early 19th cent attempts were made to alleviate drainage problems, there is on record details of several of these schemes. The first mentions a leat coming from a place near the Ingleton Mill contouring round to what is known as Gin Pit (see plan). The second is of a drainage adit from opposite Clifford Gill (just west of Burton) to Wilson Wood Pit, this was done by the method of sinking shafts and digging out from the bottom. Apparently the course is somewhat erratic and at its Burton end near the surface (20-30ft), this was ascertained when not so long ago water main was being laid and the JCB fell into a shaft (there not being any known records).

This adit was rendered useless when either coal workings or the level itself holed through into river bed.

From 1843 Sergeantson managed to get control of Hodgsons Collieries. By the mid 1830's the ground between Park Foot had been fairly well exploited both sides of the river, and a lot of pits had been worked out. Moorgarth and Winning Pit were working at this time, although the later ceased production in 1855 and closed in 1876.

In 1842 the Wilson Wood colliery was sunk to 130 yds, but in 1866 was drowned out until a William Bracewell in 1872 brought it and managed to reopen the mine. Production did not last long for in 1887 it was closed down, putting about 130 men out of work, and the all the assets were put up for sale. A Mr J. Barker bought the Ingleton Royalty and started the Newfield and Grove pits, the later closing in 1914.

By the 1890's a lot of pits had been abandoned and the prospects were not good. This was not helped when, about 1900, the Greenwoods put out an injunction to stop Barker from using a tram way from Ingleton Collieries to the Midland railway. The case ended in the High Court and Barker lost despite his best efforts, and he had to sell up to pay for costs of it all.

About this time boreholes were sunk, but there was little evidence for optimism. So it is to be wondered at why the Ingleton New Colliery shafts were sunk in 1911. They did find coal and more than they expected, production being started in 1914 (A model

colliery village was built nearby). Work stopped in 1935, the mine seems to have been only formally abandoned in 1946. Quite why production ceased is a bit of a mystery, there were reserves but geological conditions were difficult, plus the war years and nationalisation may have had their effect.

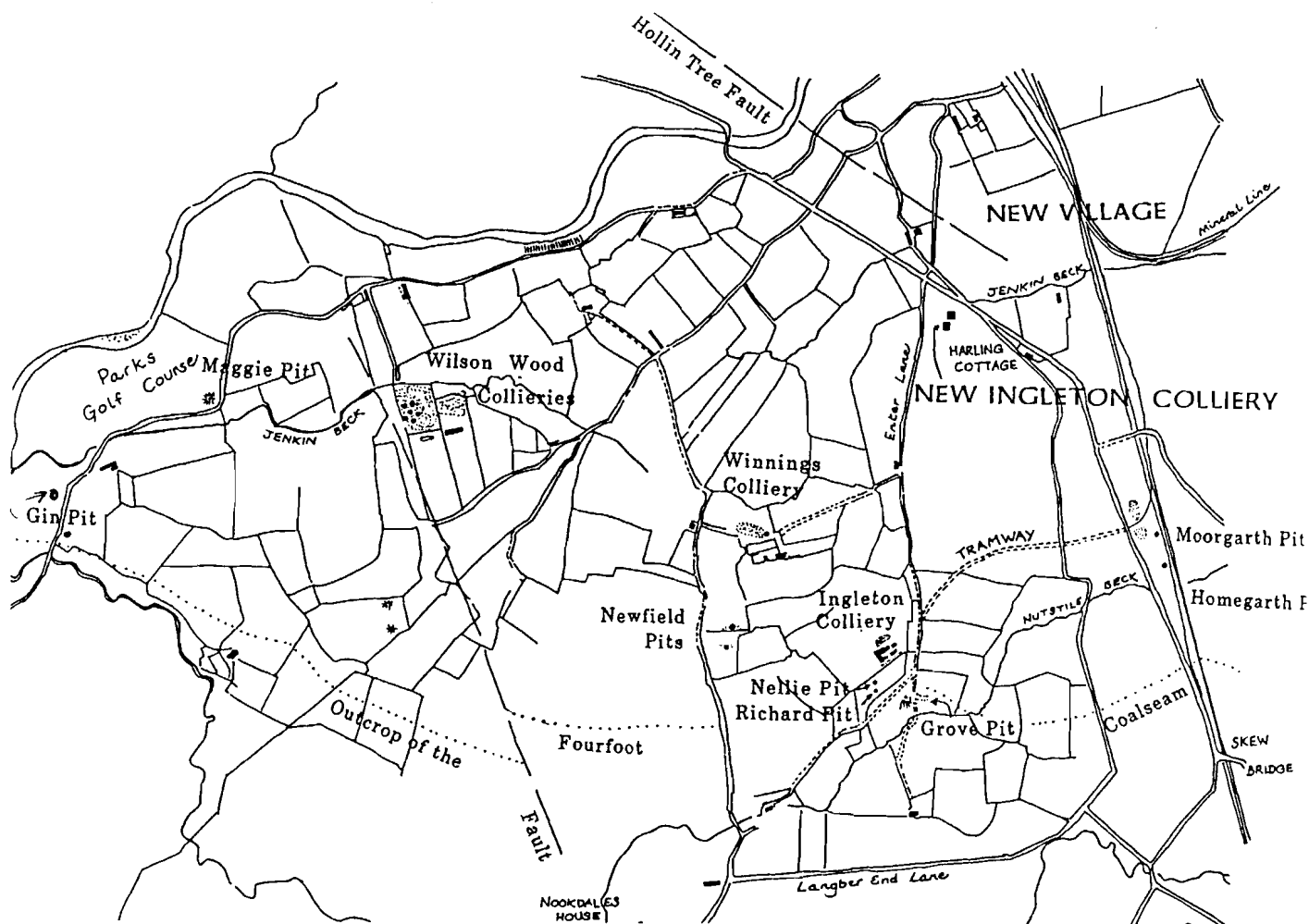
The route the party took was as follows:- We commenced at Facon Farm situated in the middle of the early workings, and then we proceeded eastwards looking at the rock exposed by the river. We then walked up the south side of Aspland Beck until Raygill House when we crossed over heading north east passing by Wilson Wood to the west on the way to Winnings colliery where only what looks to be the managers house remains. From there it was to the site of the Old Ingleton Collieries where the tram way

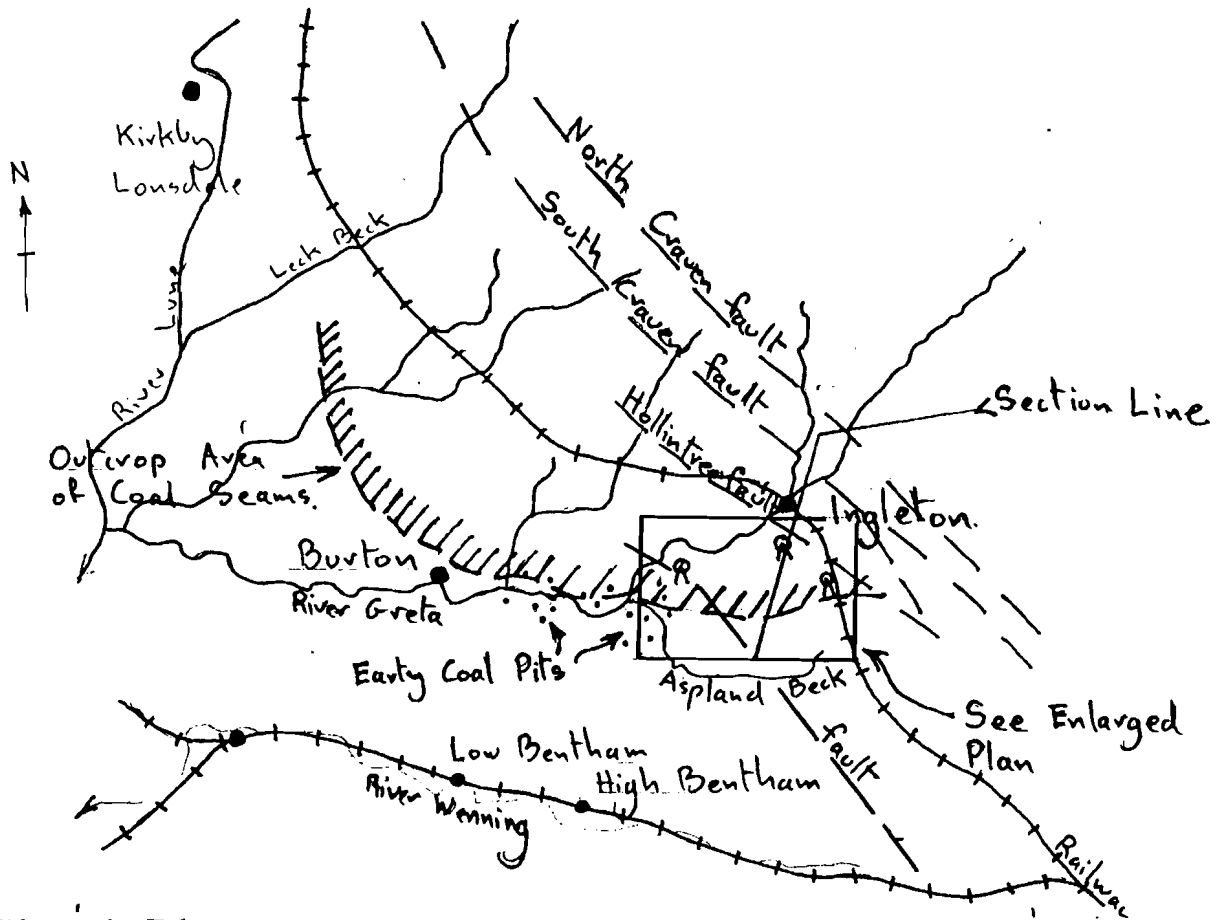
embankment and the shaft site were seen, plus a lot of Barkers bricks. The absence of any data about the site made interpretation of the surface features (of which there were many) difficult. So it was back along to village past the site of the New Ingleton Colliery of which no sign remains except for the scrap yard which still has some of the colliery ancillary buildings in it, also the pit heap across the road.

Debriefing was carried out in the Curlew Crafts tea room.

My thanks to Alan King Warden of Ingleborough Community Centre, Mrs M. Humphries, M/s B. Capstick and Mr Stan Lawrence for their help in providing background information.

Mark Simpson June 1994.

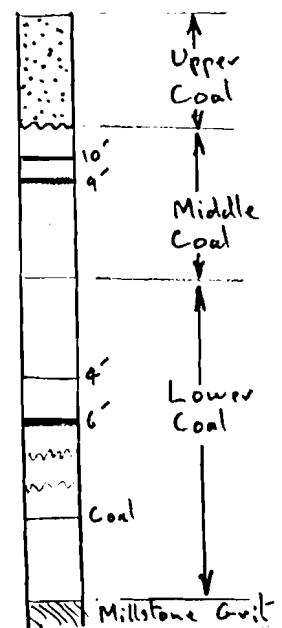
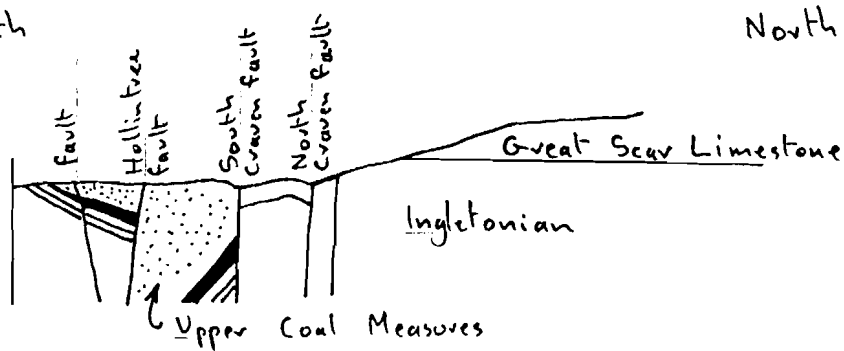




Sketch Plan

South

North East.



Section Through Coalfield

Hudgill June 11th./12

The dig goes on

The area around the dig site was properly fenced off on the Saturday, a very necessary thing, to stop animals falling into the excavation.

The Sunday was occupied by digging out down to the adit floor in the stone arched section, some 25ft in from the entrance. It was a bucket brigade job with none to many of us to do it, if I remember rightly there was me, Jon, Angela, Pete and Ann, Sheila Barker being busy down in Nenthead with the NPHT. So it was someone in the arched section digging and filling the buckets, two people passing the buckets to the out side world, and two on the wheel barrow. And that, with alterations in positions was our day. The 'mud' in the arched section being just over welly depth. The pump was tried but it was

unable to do much with this 'liquid'. I have to say that I was impressed when Pete got right in it and started starting scooping the mud out two bucketfuls at a time carrying them out to the next man, making the job look like a mere nothing. I was next in line and having problems with one bucket.

At 4.45 a halt was called, as there was a lot of cleaning up to do, but we had dug out half way to the collapse, and the next meet will see us at this next obstacle. Hopefully by then several of us will have been and adjusted the entrance so that one can barrow the muck out straight from the arched section.

There is only one problem, the barrows are Pete and Ann's

The CATMHS barrow is, I think in Top Level in Coniston, its retrieval would be useful.

Mark Simpson June 1994

The mines of Grassington Moor - Surface Walk

18 June 1994

Originally there was only going to be a Sunday only meet at Gavel Mine Buckden, but it was thought that to make it more worth while for people to come, the option of an activity on the Saturday was included. This incentive appears not to have worked as only Sheila Barker and Don Borthwick turned up.

So it was an elite group that set off on a cloudy windy day with included bits of dampness. The first item on the itinerary was the Yarnbury Mining Field, New Rake and other shafts close by were inspected (both had a rather notional means of a shaft cap). Sheila pointing out the gin circles adjacent to the shafts. From there we made our way to Davis Shaft and thence via the mill tailings heaps and the Beavor Dam to Union (Beavor) Shaft. This is a large shaft and has been properly grilled over and there are several interesting things to look at in this area viz, the bouse team and the crushing plant nearby. Next stop was the Beavor Mine Powder

House restored by Earby Mines Group. From here we headed South across some very hummocky ground that was not far from Mitchells Shaft, the whole of this area has been well turned over by mining. Having descended into New Pasture Beck we passed by the Bottle Level Adit Portal and on over the Bolton Gill Dressing Floors. An interesting site and well worth closer inspection. The Dukes Level Portal is impressive, and inside more so. (The portal opens in the Hebden Mining Liberty while the mines and mills it was to serve were all to the North in the Grassington Liberty). Next it was up Bolton Gill to the Engine Shaft with its unusual angle bob tunnel at the top. Apparently the water wheel powering the pumps in this shaft was built some distance away, the connection being by a endless rope system and/ or iron pump rods.

We would have like to have given this site more attention but time was pressing and we were not even on the main mining field yet. Several fields away to the North was the the Cupola Smelt Mill chimney to which we now headed. On the way to it we passed over the Low level Water Course and then, the flue system complex, in a good state of preservation. The wind did not encourage

staying in the open, so lunch was partaken in the lee of the spoil heaps of the Engine/Brunt Shaft, facing the reservoir once fed by the Dukes High Level Water Course. The view North covered most of the Grassington Mining Field and the problem was where to go next as there were a lot of sites to look at. The wind precluded any casual wander, so, our repast over we made for the area of the Moss or Coalgravehead shaft. The shaft site is surrounded by an agglomerate of heaps, and is evidenced by a large crater with a stone angle bob lobby to one side. This structure looked strange surrounded by so much desolation.

From here a track was followed North to the site of the New Peru Mine, the ground round here has been so moved about that it was difficult to see which were spoil heaps and what were shaft mounds. At this point the weather became decidedly unfriendly and precluded further detailed investigation, though we did manage to notice a gin circle enclosed by a stone wall (a definite necessity in an area exposed as this).

A quick change into waterproof gear and out into the driving rain heading west to the valley of the New Pasture beck. A compass and care is required, when visibility is reduced and not all shafts are covered over or visible. Anyway, after a rugged half hour we gained the shelter of the valley, the rain ceased and one could again take an interest in what was about. The way on was now south, the first thing of note being the Dukes Water course that took water to the Yarnbury Mines.

Eventually the Dukes New Road was reached after several small diversions, and, before turning west to the cars a look at the Cupolar Smelt Mill remains was carried out. The notice board outside being less than helpful about what went on there. We did not linger long and it was soon up the New Road and back to the vehicles. However, before we left a look was had of the Barratt Incline, but found that it was blocked just 20 feet or so in.

Despite the paucity of CATMHS members we had a worthwhile day, and, can say that the extent of the remains are such that it will take several more visits and background reading to arrive at a good appreciation of the area.

Grassington, as some of you will know has a direct link with Coniston Copper Mines in the

names of **John Taylor** and **John Barratt**. Taylor came to Grassington in 1818 from Consolidated Mines in Gwennap, to act as the Duke of Devonshire's Mineral Agent. It was he who carried out the systematic exploitation of the mines and brought up Barratt from Wheal Friendship to help him do this. (Barratt married the daughter of the local Barmaster Joseph Mason). In 1824 Taylor leased a mine at Coniston and appointed Barratt as manager. By 1834 the lease was in the name of Taylor and Barratt, Taylor subsequently withdrew, (this may be due to the fact that Taylor had many other interests in other parts of the world). Around this time Barratt moved to Coniston and stayed there and died in 1866. Stephen Eddy from Mold Mine in Flint took over the running of the Grassington Mines. (Sheila mentioned on the walk round that a Stephen Eddy had something to do with some mining in Furness, anyone know more?).

Apart from the major reorganisation of the Mines in the 1820's Barratt's other main contribution was the introduction and invention in 1830 of sophisticated ore dressing techniques, to the Low and High Grinding Mills at Grassington.

Mark Simpson June 1994

Anyone wishing to visit the area should carry out some background reading and some references are given below.

British Mining No 13 The Mines of Grassington and Wharfedale M.C.Gill
Published by Northern Mines Research Society

British Mining No 49 The Wharfedale Mines M.C.Gill

Published by Northern Mine Research Society
Mines and t'Miners A History of Lead Mining in Airedale, Wharfedale and Nidderdale J.M.Dickinson

Lead Mining in the Mid-Pennines

A. Raistrick

Buckden Gavel Mine Sunday 19th June

Five members turned up plus myself and my daughter, Anton came somewhat later.

An early start was called for and all that were coming had arrived by 10.00 or thereabouts. The weather was slow drizzle, and did not encourage loitering so the party set off at about 10.40 for the strenuous but picturesque walk up to the mine, which is situated at about 1700ft AOD.

The first sign of an end to the walk is the Buckden High Smelt Mill with the mine heaps behind. After a brief look round it was up the heaps, along to the level portal and a breather, plus a bit of a discussion about what we were going to see.

The mine is unusual in that most of the ore came from pipes and flats instead of true veins, and were worked on 3 horizons above adit level. Some below adit sumps were driven but prospects did not warrant further development. The main trend of the workings being North/South.

The party having recovered, we made our way in, the first few yards of the adit (Flank Level) containing just under welly depth water. By the time the No 1 South Level was passed the water had been left behind, and apart from a few muddy bits, was not encountered again. The party turned north at Wiseman's West Level North when it was reached and after some easy walking passing Boudens Xcut on the right, (where the ore was originally brought out of) we arrived at the Old mans Xcut also on the right (going east). It was then a hands and knees job, and, a sump that had to be traversed on some flexible strip rails. The Main Pipe was soon reached but we were now some 15ft or so higher than the level floor, the descent to which presented no problems. This being the main haulage route of the mine, strip rail was encountered, (apparently the fall in Boudens Xcut prevented the scrap men from extricating this rail).

All safely down we made our way north, the level being in good condition, (although it was noticeable that specimen collectors had been about), except for a notable place just beyond Smelters Xcut. A collapse had been dug through some years ago by Earby Mines Group and the timbering left just enough room for careful progress. After a bit of muttering Mike Mitchell led off through, all following without difficulty. Beyond, the level went on for some distance, the first things being encountered were a walled sump with blue water in, and a wooden water tank set into the level side. The party explored most of what was accessible on that horizon, although there were numerous rises and several sumps. It was noted that the pick marks looked very new and that the air had a freshness indicating access from another entrance to the mine.

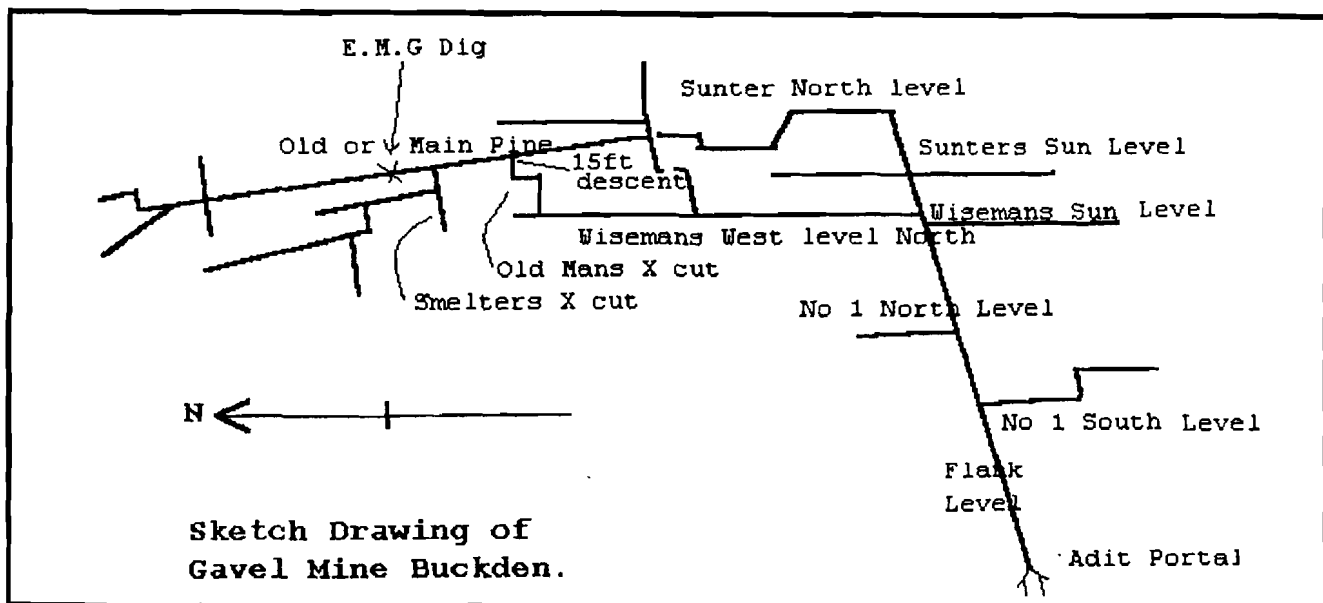
Lunch was had in Smelters Xcut after which it was back down the Main Pipe to Boudens Xcut and a look round the levels in that area, especially with a view to getting into Sumter North Level, which it was recently possible to do. No luck, if the route still existed it was somewhere in the workings at a higher level.

We retraced our steps back via the Old Mans Xcut and Wisemans West Level, to Flank Level. There, two of our number went out and rest of us made our way to Sumter North Level to the collapse near Boudens Xcut where it was easy to ascend to the workings at the next level. Here I regrettably had to leave them and made my way out to where Dave Blundell was contemplating the view.

The remainder of the party, Paul, Jon and Mike, were intent on a good look round the flats, and they spent a happy hour or so exploring this area, Mike especially said he felt a lot better for it. They also came to the conclusion that there was a lot more to the mine than they had originally thought.

All in all an interesting day for everyone concerned and my thanks to all those who turned up.

Mark Simpson June 1994



Mine Forum Meeting -- 15th June 1994

Present:

Andrew Lowe	LDSPB
John Hodgson	LDSPB
Robert Cartwright	LDSPB
Peter Davies	LDSPB
Mark Bowden	RCHME
Robert Maxwell	National Trust
Brian Young	BGS/Russell Soc.
Mike Mitchell	COMRU
Sheila Barker	CATMHS
Warren Allison	MOLES
Ian Hartland	LMQT
John Greasley	LMQT

The mining forum meeting was held on 15th June 1994 at Threlkeld Quarry Mining Museum. Industrial Archaeology projects in the National Park were discussed.

RCHME

Mark Bowden told the meeting that due to difficulties in obtaining an aerial transmission the survey of the Coniston mines would have to be postponed till next spring. This meant the survey of the early iron Industries and associated woodland industries of Furness could be brought forward (Good news for the Furness Adventurer's). RCHME expect to be involved in the Furness area for the next two to three years. They had already contacted CATMHS asking for information.

Nation Park Authority

Andrew Lowe and John Hodgson reported on the progress of projects on the NPA list of current initiatives:

A) Backbarrow Iron Works has been surveyed by RCHME and the site cleared of rubbish. Trees have been removed which has revealed in full the extent of the deterioration of this important site. The Park management hopes to reach agreement with the landowner concerning the conservation and management of the site.

B) Hawk bobbin mill is to be surveyed and consolidation work carried out.

C) Greenside mine, SMC (Scheduled Monument Consent) has been applied for to remove the old ore tub from Swart beck and other small jobs discussed at the previous meeting.

D) Coniston coppermines. The LDSPB are taking no further action here till the outcome

of the 12th August deadline is known. As yet no date has been set for the Inquiry into the appeal by P. Johnston regarding the change of use of his study centre.

The proposed consolidation work at Red Dell was discussed. CATMHS had decided the condition of the launder tower had deteriorated drastically in the two years it had taken to arrange the insurance cover to the specification required by Rydal Estate (still not achieved). They had decided they could not carry out the work without help from the NPA and advise from English Heritage.

F) Honister Quarry The NPA are to re-roof Dubs Hut which will remain as an unlocked shelter. Wider management of the whole site is under review.

G) Lancaster University Archaeology Unit has carried out a survey of Torver High Common.

H) Stony Hazel Forge is to be surveyed by RCHME and consolidation work to be carried out.

National Trust

Robert Maxwell informed the meeting that the NT have applied for SMC to carry out consolidation work at Hoggett Gill Smelter. Brian Young reminded the meeting of the importance of leaving the slag undisturbed and not to remove any of the materials as it is of geological importance.

Several members of the group asked questions regarding the trust's intentions at Force Crag mine. Warren Alison reported vandalism and theft from the mine.

Monument Protection Programme

David Cranstone's review of the Lake Districts copper mining sites has been delayed till the autumn.

Progress Reports From The Mining History Groups

MOLES

MOLES had obtained timber at a reasonable price to increase the amount of support in No. 1 level. At Greenside they had reached the last fall, there is deep water behind it but a good flow of air, work has stopped for the summer. They are continuing their surveying and exploration at Hay Gill and Bray Fell mines.

Brian Young asked if a copy of any mine surveys could be sent to the BGS.

CATMHS

CATMHS have started re-bolting the Paddy End through trip and the Old Engine shaft pump rods are to be secured. Consolidation work at Red Dell to be carried out. The Furness survey is progressing. Work has commenced to re-open Hudgill Burn Mine.

LMQT

LMQT have removed 15,000 tons of material whilst landscaping the their Threlkeld Quarry

site. The buildings have been renovated, a small museum has been made in the former canteen building. There is a good collection earth moving machinery and locomotives. They hope to open the site to the public during the summer.

Next meeting scheduled for January 1995.

After the meeting Ian Hartland showed forum members around the site, pointing out its features and outlining their future plans.

Sheila Barker

IRIS

Index Record for Industrial Sites

Association for Industrial Archeology

Index Record for Industrial Sites (IRIS)

The Association for Industrial Archeology has created the IRIS form to record the existence and nature of industrial period buildings, monuments and landscapes in England. It is designed for use by volunteers, particularly of the Associations's affiliated societies. Complete forms will be passed to local Sites and Monuments records (SMRs) and ultimately become part of the National Monument Record (NMR), where industrial archeology is, currently, significantly under-represented. A copy will also be held by the AIA

Background

The AIA has defined industrial archeology as a period study embracing the tangible evidence of social, economic and technological development from the onset of industrialisation to the recent past.

The NMR is the national register for information on historic structures, monuments and landscapes, including those relevant to industrial archeology. SMRs provide more detailed local registers for research and planning purposes. The importance of the latter has been stressed by the DoE in its *PPG 16 Planning Policy Guidance : Archeology and Planning*. Due to the limited number of industrial archeological sites currently in the

SMRs and NMR, the system outlined in PP16 is failing to protect many sites. It is therefore essential that the imbalance is quickly redressed.

Several moves are currently being made which will rectify the situation. In 1990 the RCHME announced its intention to enhance the National Archeological Record (part of the NMR) by including sites up to 1945 - the previous cut-off date was 1714. Within its Monuments Protection Programme (MPP), English Heritage is also in the early stages of reviewing the country's stock of sites relating to industry for the purposes of selection of monuments for statutory protection under existing legislation.

The AIA initiative.

The AIA Sites and Monuments Initiative for England is aimed at contributing to this enhancement for national and county registers by making use of the knowledge and expertise of volunteer groups and local societies. With funding from the Department of National Heritage and the Lyndhurst Trust, the AIA is employing a Sites and Monuments Officer to encourage links between local societies and SMR's and to provide a standard form for passing information about industrial sites to the SMRs and the NMR.

The IRIS form has been designed for this purpose. The intention is that the form be completed by volunteers ready for input into

the relevant SMR computer system. A handbook has been written as a guide to the manual completion of the form. This includes a list of site terms based on the RCHME's own thesaurus that allow structured interrogation of the information held on computer.

The AIA also intends to create a central index of the IRIS data, allowing the AIA to monitor progress, to comment on the nature of the stock of industrial remains, to assess research and conservation priorities, and to provide a more reasoned response to listed building applications.

DNH funding is available until March 1995. This is being provided to allow the AIA to establish contact with local societies and SMRs to initiate the use of IRIS, and to collate the results. Anyone wishing to take part in the IRIS project should contact the AIA Sites and Monuments Officer at the address below.

Anticipated Procedure

Initial contact with the local societies and county SMRs will be through mailings and attendance by the AIA Sites and Monuments Officer at events such as the CBA industrial archeology panel meetings and regional

industrial archeology conferences.

Subsequently, for each society, it is then hoped that an initial meeting can be set up with the their county SMR officer and the AIA Sites and Monuments Officer. This meeting should aim to cover items such as appointing a society coordinator, identifying individual compilers, establishing the current content of the SMR and agreeing a course of action.

Individual compilers will then complete the IRIS forms, referring to the handbook for guidance, and a Summary form to record progress. At intervals to be agreed upon by each society and SMR, it is anticipated that the society and SMR officer will hold regular liaison meetings, at which society members will be able to check each others forms and pass these across to the SMR. The AIA Sites and Monuments Officer would expect to receive copies of the IRIS and Summary forms within four weeks of these meetings. Computerisation of the forms is being discussed with the SMRs and the RCHME.

For further information contact Sheila Barker who has a copy of the handbook and sample forms etc.

DR DESCENDER

by 'J.K.'

Dear Doctor Although I am a School master I have developed a tendency to bully small children. I find that that whenever I am in competition with them I must win at all costs, even when doing such unimportant things as playing snowballs. Unfortunately I end up over doing it and tears from the child are usually the result. Anon.

Dear Teacher I find it a little surprising if not somewhat odd that a grown man in his mid thirties (never let it be said that the good Dr. is unfair) spends his free time playing snowballs with young girls. Whilst it is not for me to comment on a Gentleman's spare time pursuits I much recommend caution since having met the parents of the child it is clear to me that they would not be adverse to settling their differences in a street brawl. Doc

Dear Doctor I feel I am all alone in the world and nobody loves me. I sit here all alone on some old land, although some people think it new land, getting older and more decrepit. Although some people come down every month to see me there are not many of them and there is much to do. All I need is a few more friends and a bit of attention and I am sure I will be very popular and everybody will come and see me, but when will this be ? Blast - The Furnace

Dear Blast I can see your problem but things can't be that bad. Remember that your friends are very kind particularly Mr Shiny Head who has all the money and the bloke who tickles inside your tummy with the sparkler. Doc

Dear Doctor I have recently been up to the North Pennines where I saw a Gentleman struggling with his hose. When I asked him if he was going to suck on it. He was lost for words and gave me a very strange look. Why should this be, after all if he was not going to suck his hose I would have sucked it for him. Anon. Preston.

Dear Sucker Whilst you might not think your question unusual an assortment of normal people questioned at a local asylum thought it highly unusual if not somewhat risque. I feel I can only helpfully respond as I did some time ago to a gentleman who was caught in the public toilets, i.e., we don't need your sort here. In summary I suggest you go back to hammering your post. Doc

Baffled ?, confused ?, completely lost ?, if Dr Descender makes no sense you've missed a few meets.

A Visit to Wet Earth Colliery Clifton, Greater Manchester

Ever since I first saw a picture of the entrances of the canal to the collieries at Worsley near Manchester I have wished to get inside, though gas now prevents access, I am told. There were rumours of canals underground at Wet Earth colliery in nearby Salford, but my enquiries led to finding out that the rumours were untrue. At last year's NAMHO conference however I discovered that there was a body called the Wet Earth Colliery Exploration Group and I got a contact name and phone number. This February an opportunity to be in the Manchester area pointed to trying to arrange a visit, and so, with two like-minded enthusiasts I found myself one Sunday morning recently at the Clifton Country Park.

Our guide was Mark Wright who is delighted to conduct visitors around underground, his phone no is 061 773 6250.

First we visited the upcast shaft of Brindley's inverted siphon under the Irwell and were shown a small tunnel which leads off it, at right angles to the leat (feeder stream) which is parallel to the Irwell. The purpose and destination of this small tunnel is not completely certain but suggests that the water from the siphon might once have gone to an earlier pit than the one now known as Wet Earth. When the old pit closed, did its name get transferred to the new one? We walked along the feeder stream and looked at its bywash wiers which prevented surge from reaching the waterwheel at the colliery. Mark also showed us two entrances in the river bank, one of which was certainly of boat level dimensions, and which heads for an old shaft. Was this the origin of the reports of underground canals at the site? After inspecting the partly buried 1867 turbine pump by the side of the river we went underground along one of several tunnels which Mark's group are clearing, and which are connected with the waterwheel installation. Lacking waders we did not penetrate the full length of the tailrace tunnel to the wheelpit but retraced our steps to the riverbank entrance. The next site visited was the wheelpit which has now been excavated down to the tailrace level, where one of the turbines which replaced the waterwheel is visible, waiting to be revealed when the debris round it is removed. After visiting the colliery fanhouse where parts of the fan

remain, we went last to the 207 yard deep upcast shaft. The surrounding brickwork had been broken through and we used a powerful floodlight to look down the shaft.

An ultimate aim of the group is to descend the shaft and try to gain access to the colliery workings, abandoned since 1928. The Group is continuing to clear further watercourse tunnels and excavate/consolidate important surface remains. They have already done a vast amount of work and welcome pre-arranged visits, especially from those interested in mining history. They provided us with accompanying resume of the story of Wet Earth and there is also available from the Visitor Centre in the Country Park a small booklet which sets it out in more detail. This however does not yet include the results of the Group's explorations. Regarding the underground canal, it seems there might just have been one at Wet earth after all, but about 90 yards deep in the mine. The large arched entrance at the inner end of the loading basin is of boat level size, but served only to carry away spoil from the nineteenth century shaft sinking.

Peter Hay March 1994

WET EARTH COLLIERY THE HIDDEN TREASURE OF SALFORD.

Wet Earth Colliery is of national and international importance primarily due to the activities of James Brindley, the eminent engineer. Brindley's solution to the water problems at the colliery remains unique in the annals of coalmining history and provides us with an insight into the genius with which he was to approach other, better documented projects.

Poorly illustrated by contemporary historians, the rise and fall of Wet Earth Colliery is described in the following notes:-

The Irwell Valley Fault follows the course of the river Irwell in the north-east to south-west direction. In the Carboniferous era it displaced seams of coal by up to 3000ft. Thus on the Clifton side of the river we find coal outcropping close to the surface but on the Ringley side of the river those same seams of

coal are 3000ft below the surface.

It is conceivable that at an early date the coal outcropping to surface would have been discovered and mined on a small scale, possible via bell-pits or even drift mines. Quickly worked out, these crude attempts were of no use commercially and it was not until 1740 when John Heathcote, a gentleman landowner, sank the first 'deep' mine on site, that major efforts were made to win the coals.

Having employed an engineer, Matthew Fletcher, to direct the shaft sinking, Heathcote looked forward to prosperity. His expectations were unfortunately thwarted by water which flooded the mine soon after completion. Traditional pumping methods failed to control the problem and, after some time, the engineer James Brindley was called upon to devise an alternative method of drainage.

In 1750-52 he constructed a weir at Ringley and took an underground passage from the north side of the weir pond to a point near Giants seat. Here he led the water into an inverted siphon discharging onto the southern bank of the Irwell. The flowing water was then channelled along a stream bed to the colliery which lay some 700ft away.

The water continued to a large chamber adjacent the pit shaft itself. Here it drove a wooden water wheel which in turn operated pumps that eventually drained the colliery. Both drive water and pumped water were led away from the wheel pit along a passage (tailrace tunnel) which eventually discharged into the Irwell.

Granted a new lease of life the colliery prospered. Further expansion took place above and below ground until, after 180 years of production, economic reasons finally brought the closure of Wet Earth Colliery in February, 1928.

In the 1950s two engineers, A.G.Banks and R.B.Schofield, were drawn to the now derelict site of Wet Earth colliery. with an interest in industrial history and an expertise in hydraulics they began to survey the few remains that were visible on the surface. By the late 1960's their 'interest' had become a passion, and in 1968 the book *Brindley at wet Earth Colliery: an engineering study* was published.

The surveys had been completed just in time. by 1970 the colliery site had been levelled and landscaped. The water wheel pit had been filled in and little remained for the archeologist to discover. For 22 years Brindley at Wet Earth Colliery remained the definitive work. Over succeeding years, visitors were drawn to the

site and it was gradually realised that not everything was as clear cut as previously thought. By 1990 it was obvious that Banks & Schofield had neglected the underground aspects of the pumping scheme. Their surveys had been confined to surface with thoughts of venturing below ground quickly dismissed as dangerous.

Hoping to rectify this situation a group of interested parties were brought together by Alan Davies, Museum Officer at Salford Mining Museum and on June 16th 1990, the group carried out an investigation of certain tunnels thought to relate directly to the work of James Brindley. Covering a divers range of specialities; archeology, geology, engineering and mining, the group concluded that a detailed underground study would add another dimension to the interpretation of coal mining history in Salford. Several members of the original team stayed together forming the nucleus of the Wet Earth Colliery Exploration Group.

Solely interested in the work of Brindley, the group began a search for the tailrace tunnel. Vividly describe by Banks and Schofield, what should have been an easy task proved to be a fruitless search. The wrong tunnel had been identified in 1968 and in an attempt to correct the error, the Wet earth Colliery Exploration Group (WECEG) were thrown into a project which redefined the meaning of 'Industrial Archeologist'.

Work to locate the tailrace lasted 18 months and entailed the excavation of approximately 800ft of fully silted passage.

During 1992, voluntary work below ground coincided with an excavation by a branch of the Greater Manchester Archaeological Unit to reveal the original wheel pit. Unfortunately the excavation ran into problems when the unit ignored the fact that interpretation of the wheel pit would be useless without showing the tailrace portal and attempted to seal the infill 'floor' at an unrealistic depth. Not wanting to see many months of funding go waste, the WECWG continued their own investigation and eventually emerged through the tailrace portals, facets of Brindleys work which would otherwise have been lost forever below the infill that still remained on the true base of the wheel chamber.

In March 1993 the installation of a spiral staircase was funded by the City of Salford, thus allowing supervised visits to extend into the wheel chamber. Visitors are able to follow the water course from its entry on the banks of

the Irwell; along the feeder stream bed to the colliery and finally into the wheel chamber itself. Inside the chamber, visitors are able to see evidence of the original wooden water wheel, huge scour marks cut when the wheel moved on its bearings, and also the turbine which replaced the wheel as technological advances were made.

Wet Earth Colliery Exploration Group

(The fan chamber has now been excavated to a depth of 8 feet to reveal stone engine beds, air tight chambers, a semi-circular air inlet and the remains of a Walker Bros Indestructible Fan. Little had been known about the engineering practice at the colliery but finally armed with the identity of the company which constructed the fan, group members were able to search archives and locate details of the very equipment which had been purchased by the mine owners in 1898).

Plynlimon Mine Mid Wales

Plynlimon Mine (various spellings) lies in the heart of Mid-Wales (Grid Ref SN 797 857), at a height of 1800 feet, less than 1 mile from, and only 700 feet below the summit of the highest hill in the area, the 2476 feet high Plynlimon (Pumlumon Fawr). The mine is in the county of Dyfed (formerly Cardiganshire) and is less than 1/4 mile from the boundary with the adjoining county (formerly Montgomeryshire).

Despite the strong winds, and high rainfall which occur at this altitude, shortage of water often brought pumping at the mine to a halt. Due to the elevation, the catchment area for the stream through the site, the Afon Tarennig, is negligible, with the source of the stream occurring less than 1/2 mile above the mine. The lack of a nearby public house was another disincentive in the ability to recruit and retain working miners.

In spite of these difficulties, Plynlimon mine went on to produce 3270 tons of lead ore, and an estimated 12,280 ozs of silver, during the period 1866, to its abandonment in 1897. No production figures survive covering the period from the mine's discovery in 1854 to 1866. Returns for silver production were only made for 4 years.

GEOLOGY/DESCRIPTION OF THE WORKINGS

The vein at this mine strikes East-North-East through the rocks of the Van formation. The

vein dips to the South, and is probably the western continuation of the vein mined at Nantiago (Powys) Ref. SN 826863, some two miles to the East-South-East. The Plynlimon vein is marked on the current Geological Survey map as Pb/Zn, although no Zinc concentrates were ever produced at this mine, fairly good specimens of Sphalerite (ZnS) can be found on the tips. The booklet "Welsh Minerals" credits Pyromorphite $Pb_5(PO_4)_3Cl$, a secondary lead phosphate, as being found at this location.

The adit level is driven North-East on the vein from the Eastern side of the Afon Tarennig, at a height of 1750 feet Above Ordnance Datum. A short section of the roof of the adit immediately inbye of the portal has been stoped out to day.

There are two shafts on the mine, both sited on steeply rising ground on the Eastern side of the stream. The Western shaft was sunk to the 36 fathom level below adit, and is located 230 yards North-East of the adit portal. The Eastern (or Engine) shaft, used for pumping, was sunk to the 48 fathom level, and is sited a further 230 yards to the North-East of the Western shaft. There are levels off the shafts at 12, 24, 36 and 48 fathoms. The 36 fathom level is reported as being the most extensive level in the mine, with a winze sunk to the 48 fathom level, near to the Western shaft. The winze was sunk on a rib of Galena 4 - 7" wide, but values in the vein died out towards the Eastern shaft, and the vein pinched out in depth, on entering the harder grit beds.

HISTORY.

Documented production of lead ore from this site began with the establishment in 1866 of the Royal Plynlimon Mining Company, under Chief Agent John Paull. In the first year, 60 tons of ore were produced.

Other writers, for example, Absalom Francis, and Liscombe & Co, quote the story of how a working miner found a vein of solid Galena, quoted variously as 3 inches and 6 inches, and how he obtained a take (or tack) note from the mineral lord, which he then sold on to the Royal Plynlimon Mining Company. The date of the discovery varies between 1864, and 1867.

Foster-Smith (The Mines of Cardiganshire) quotes dates of reports in the Mining Journal, of the mine at works in October 1854, and again in 1860. The mine was at work during the period 1860 - 1866, as at the latter date, the then owner, (George Williams, the probable original finder of the vein) sold out to the Royal Plynlimon Mining Company. This ushered in the development of Company (as opposed to private mining, which was to last until 1878.

Production of lead ore increase up to 350 tons per annum. In 1869, a company re-organisation took place, along with a slight change in name, to the Plynlimon Mining Company. John Paull stayed on as Manager, rather than Chief Agent as previous. Up to now, the majority of the ore produced (around 1,000 tons), had come from stopes up to 20 fathoms high, above the 155 fathom long adit level. Messrs Liscombe and co, Share Dealers of Liverpool, produced a glowing report, full of glorious expectations for the future, with 1 foot of galena showing in the 12 fathoms below adit.

The new company proceeded to sink the Eastern Engine shaft, whilst erecting a 50 foot diameter waterwheel for pumping, which commenced work on the 26th October 1870. Production continued at around 350 tons per annum. In 1871, due to a shortage of water for the wheel, a 18" horizontal steam engine was purchased, for #700, and connected by gearing to the pumping wheel, to operate the flat rods to the Eastern shaft.

In 1874, the highest annual production in the life of the mine, 404 tons of ore, was achieved. The mine was then 24 fathoms below adit, and sinking was proceeding very slowly, Absalom Francis, in his "History of the Cardiganshire Mines", dated 1874, believed that very little, if any, profits had been made to date, recommended that if the

"Cornish" system of working was adopted, of sinking the shaft 10 fathoms per annum, and opening out stopes in advance, then excellent profits could be made from this mine.

The following year, the first silver return was declared, of 1200 ozs, but at the 1875 Annual General Meeting, Manager John Garland, who had held the post for under two years, had to admit that the steam engine was useless, and worse, had almost shaken the 50ft diameter pumping wheel to pieces. In October, they suffered a breakage in the pumping rods to the Engine shaft, followed by a balance bob breaking in two. Shortage of water for the wheel was leading to flooding in the bottoms of the mine. Despite all these setbacks, production for the year remained at over 300 tons of ore.

In 1876, ore production fell to 142 tons, with 532 ozs of silver. The dam of the mine reservoir burst in December, and was not repaired. The price received for the ore fell from over 14 a ton, to a little over 10. due to competition from foreign ores. The 36 fathom level was turning out to be poorer than expected, and, as a result mining came to a halt at the end of 1878, although the Plynlimon Mining Company Ltd retained ownership of the mine until 1882. 57 men (31 Underground & 26 surface) were thrown out of work, the only person left on the company's books was the Company Secretary, J.H. Murchison.

This would seem a appropriate point to introduce a few notes on John Henry Murchison, the son of Sir Roderick I. Murchison, the famous Geologist/Minerologist, author of "The Silurian System", published in 1839. John Henry was known as a formidable Company Secretary, and promoter of lead mines. He appeared to have inherited his fathers knowledge of geology, and himself possessed an unrivalled knowledge of company law, such that he could intimidate Solicitors, Directors, and Shareholders alike. An avid follower of fashion, he was known as "Beau Brummel of Secretaries". He was Company Secretary of Plynlimon mine from 1871, through to its sale in 1882, with Captain John Paull as his Mine Manager, from 1866 to 1873. Just over the county boundary, in Montgomeryshire, at the Wye Valley Mines, J.H. Murchison established the Wye Valley Lead Mines in 1868, again with Captain John Paull as Manager. This venture lasted until 1872, when it collapsed. There is no doubt that this was just an example of a large number of companies that were promoted and managed, by a fairly small group of people during this period.

Returning to Plynlimon, in 1883, William Thomas bought the mine. For the first two years, William Branwell was employed to supervise the workforce, initially of 14 on the surface, later 7 employed underground. No production of ore resulted from these efforts, and the workforce remained at 3 or 4, managed by the owner, until 1887, when production of ore recommenced, to continue until 1891. During this period, the shafts were sunk from 36 to 48 fathoms levels, and a total of 195 tons of ore produced. The price received for this ore had not improved on that in force at the last closure in 1878. During the period 1887 - 1891, the price of lead ore fell from a little over 10 per ton, down to 7.20. Given that the workforce in 1887 started off at 30, and never dropped below 12, one can only assume that this was a low cost operation, with no capital investment, and minimal overheads, which was unlikely to have been profitable. The venture ended with the death of William Thomas in 1892.

In 1895, Elizabeth, widow of William Thomas, employed a total of 5 men, (3 underground, and 2 on surface) who produced a total of 10 tons of ore, but with lead ore fetching 6.50 per ton, this could not cover costs. On the 18th September 1895, Captain John Roberts, of Nantgawr Mine Rhayader inspected the mine, to prepare the report for the formal mine abandonment, 2 men were employed on the surface during 1896, recovering saleable items of equipment, and the mine was formally abandoned in 1897.

The site has remained derelict since then.

THE SITE TODAY.

The track leading to the mine is accessed from the A44(T) Aberystwyth to Llanidloes road, 18 mile East of Aberystwyth, at Eisteddfa Gurig (Ref SN 798841. This is a popular starting point for walks up Plynlimon, and cars can be parked on the unsurfaced car park in front of the new farmhouse, at 1 each.. The footpath to the mine passes between the farm buildings on the North side of the road, but before leaving, attention should be drawn to the range of buildings at the Western end of the farm. This consists of two facing rows of miners cottages (9 in total) gable end on to the main road, which have recently been roofed over so as to form 1 building. These cottages were built in this remote spot between 1850 and 1853, not for Plynlimon mine, but for Esgairlle mine, which lies 1 mile to the South-West of here (SN 792828). To date, no

explanation has come forward as to why cottages of Esgairlle, where built in close proximity to Plynlimon Mine.

The path passes between the buildings until the Afon Tarennig is reached, when the South bank is followed for 1/4 mile, until a tributary Nant Y Nod, comes in from the West, at a ford. some 400 yards up the Nant Y Nod, on the South bank, can be seen the tips of the Nant y Nod of Eisteddfa Fach Lead Mine, driven South at 1500 feet AOD. This mine produced 324 tons of lead ore between 1853 and 1856, and then, under the name of South Plynlimon, went on to produce 20 tons of Zinc concentrates in 1876, after which date it was abandoned.

Crossing the ford, the rough cart track keeps to the West bank of the Afon Tarennig for the next mile, within 200 yards of the stream. Soon, the dumps can be seen across the valley, pointing South towards the A44.

The features on the mine are described from South to North. Below the track, can be seen the pit for the 50 foot diameter pumping waterwheel, built in 1870, pointing across the valley to the Eastern shaft, on the rising ground beyond. 100 feet above the track, can be seen a trial level, driven West.

Near the stream, on the edge of the dressing floors, lies a sheet steel kibble, in fair condition, apart from the plate rusting away on one side, where it has been in contact with the ground.

Continuing upstream, the pit for the 40 foot diameter waterwheel used for drawing and crushing is passed, en rout for the ford across the Afon Tarennig at the North end of the site. Above the ford can be seen the earth dam and reservoir breached during December 1876. An 8 foot diameter sheave wheel from the Western shaft headgear lies adjacent to the ford. Across the ford, some 230 yards steeply uphill lies the Western shaft, with the Eastern shaft a further 230 yards on. This shaft is very close to the Dyfed/Powys county boundary.

Returning to the stream, the end of the deads heap is passed. This extends around 200 yards down the valley, in a long narrow shape. A considerable area of the Eastern side of the dumps has been removed in recent years for roadstone.

Below the dumps, adjoining the stream, is the adit level, driven North-East on the vein, with a small stope to day, just inbye of the portal.

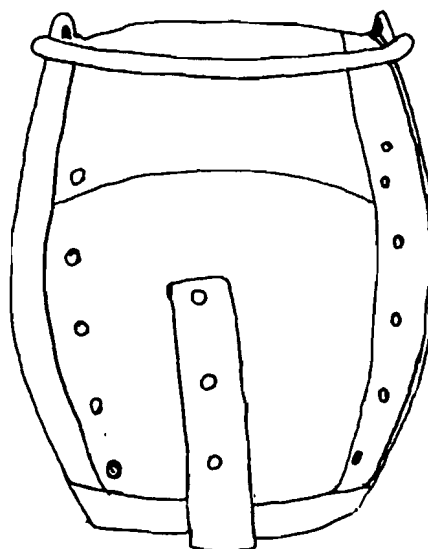
These notes were produced following a visit to site made in Mid-September 1993.

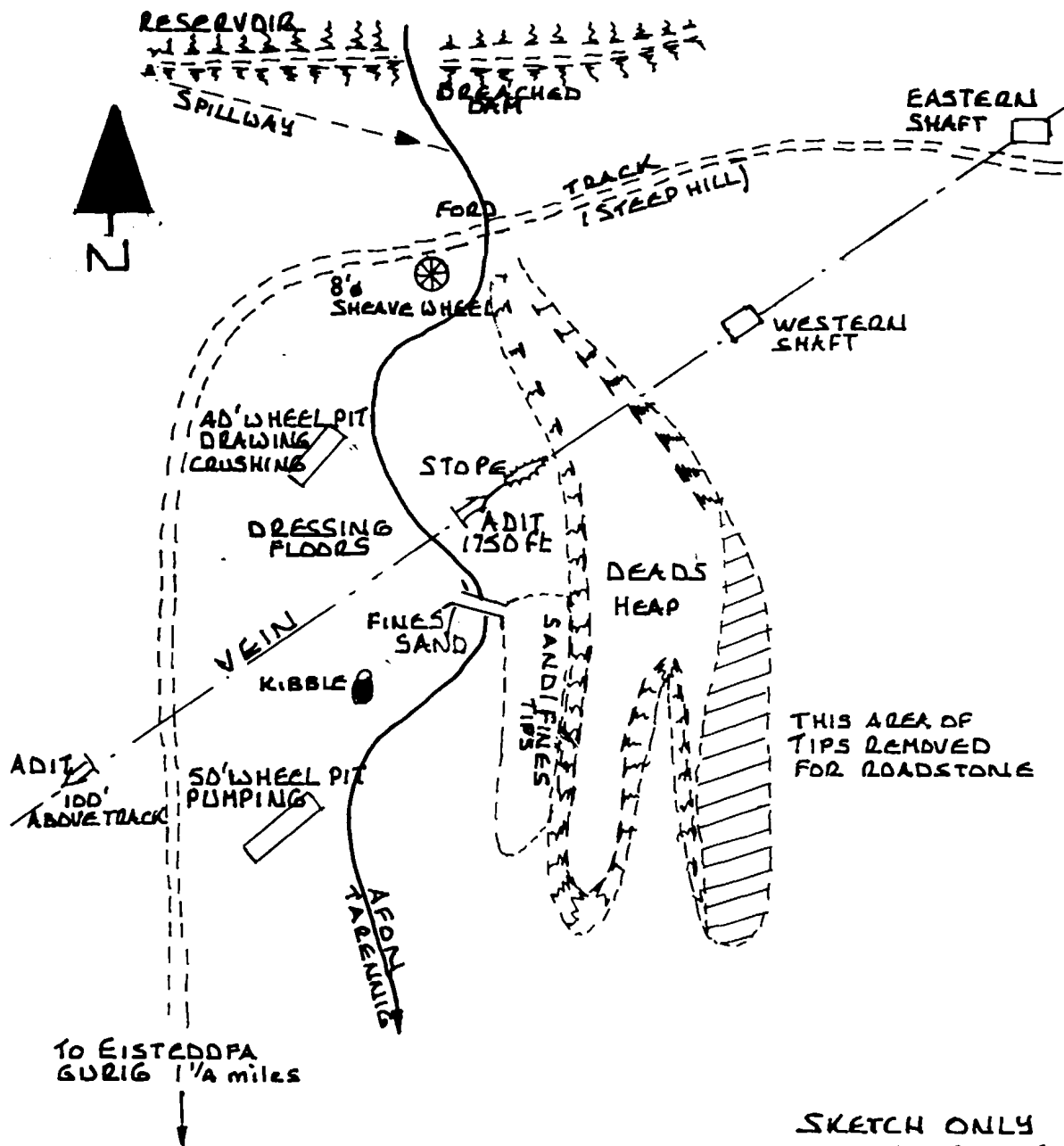
REFERENCES

- Bevins RE&T Welsh Minerals, National Museum of Wales, Sharpe Cardiff 1982, Nos 15 & 16.
- Bick David The Old Metal Mines of Mid- Wales Combined Edition, Pound Ho 1993, Pt 2 P.6, 50, 51.
- Burt R, Waite P. The Mines of Cardiganshire. Metalliferous Burnley R. and Associated Minerals 1845 - 1913, Department of Economic History, University of Exeter, in association with Northern Mines Research Society, 1985. P,76,77.
- Carr T & Pigs and Ingots, The Lead/Silver Mines of Schone AM Cardiganshire y Lolfa, Talybont, 1993 P,76,77. Photograph of site.
- Foster-Smith JR The Mines of Cardiganshire. British Mining No 12. Northern Mines Research Society
- Francis Absalom The History of the Cardiganshire Mines from the earliest ages, and authenticated history to AD 1874. Goginan, Aberystwyth. 1874. reprinted by Mining Facsimiles, Sheffield 1987. P.15
- Jones O T. Memoirs of the Geological Survey. Special Reports on the Mineral Resources of Great Britain. Volume XX. Lead & Zinc. The Mining District of North Cardiganshire, and West Montgomeryshire. HMSO 1922, Reprint by Mining Facsimiles, Sheffield 1986. P.91,92
- Liscombe & Co. The Mines of Cardiganshire, Montgomeryshire & Shopshire, 1869/70 reprint by SJS Hughes, Mining Services, Talybont, Dyfed. Sept 1989. P.24
- British Geological Survey 1:50 000 Series Aberystwyth Sheet. 163. Solid Ed 1984
- Ordnance Survey 1:50 000 Landranger Series Aberystwyth Sheet. 135. 1986
- Ordnance Survey 1:25 000 Pathfinder Series. Talybont & Ponterwyd. Sheet 927 SN 68/78. 1987

David J Blundell 08/01/94

Sketch (from photograph) of
Whim Kibble at Plynlimon Mine
24 ins high, 18 ins dia,
Capacity approx 5cwt



PLYNLIMON MINEEISTEDDPA GURIG DYFED SN 197857

SKETCH ONLY
NOT TO SCALE

The Great Lindal Railway Disaster

September 22nd 1892

Most readers, particularly those who live locally, will have heard of the above event when locomotive 0-6-0, class DI, number 115 disappeared into a mining subsidence crater near Lindal on Thursday September 22nd 1892.

Since then a number of "hoax" articles have been written about this event, perhaps the most famous and plausible being that in the "Journal of the Stephenson Locomotive Society" in February 1955. It was later repeated in the "Cumbria Railway Circular" of May 1987. A copy of this later magazine is available in the Records office at Barrow.

This article, by George Taylor, commences with a factual account of the events but goes on to describe how, in 1950, the son of the engine driver succeeded in locating and removing the buried locomotive. The article, it is claimed, was reprinted from the "Dalton Advertiser" of the 1st. April 1951. The only clues that the reader gets that the conclusion of the article is a hoax is that there never was a "Dalton Advertiser" and, of course, the supposed date of the issue.

The second hoax article to which I would refer is much more recent, and occurred in the "Evening Mail" on, 1st April 1993. This article claims to describe, with a photograph, the location and removal of the buried locomotive during excavation work connected with the Dalton By Pass.

Fortunately we are not dependent on these articles for the true facts. The "News" of September 24th 1892, preserved on micro film, in Barrow Library contains a full account of the events and it is from this source that I draw my references.

The subsidence occurred on September 22nd 1892 at about 08.30 at Lindal Bank Top about one mile on the Ulverston side of Lindal station. Locomotive 115 left Barrow about seven a.m. with a goods train intending to pick up extra loads on its way to Carnforth. It had reached Lindal sidings when the incident occurred

"Fortunately there was only the driver, Thomas Postlethwaite, on the engine at the time, the fireman having just got off to get some breakfast. The driver noticed that the ground seemed to be cracking, and feeling a tremor, he instantly knocked off steam,

reversed the engine and jumped off".

The locomotive then fell into a crater, at this time estimated to be about 30 ft. across and 30 ft deep.

"The engine fell in front first, the funnel and front part being completely embedded with only a part of the tender being visible above the surface."

Preparations were then made to extract the locomotive from the crater, described as follows:

"The tender was very easily hauled out and was soon uncoupled from the engine and removed. With the locomotive itself, however, weighing about 35 tons it was seen at once that to get it out of the awkward position into which it had fallen would be a task of very great difficulty requiring both care and patience."

The Locomotive fire was then extinguished, with water, and the task of removing it was begun:

"It was decided that the only way to get the engine out would be to slope one side of the chasm and lay down temporary rails in order to drag it up the incline. A large gang of men was therefore set to work to remove the ballast and make the necessary incline."

The article then goes on to describe the arrangements made for passenger traffic. This involved, at first, passengers getting off the train on one side of the crater and walking round the hole to join the train on the other side, the train being driven slowly on one of the lines at the side of the crater. Railway traffic was heavy because it was Ulverston Market Day.

"Much time was lost in this operation and train delays occurred. Indeed so eager were the passengers to see the hole that they crowded round the place, which had been roped off, in order to get a good view and the officials had some difficulty in hurrying them to the train."

The article then returns to describe the work of constructing the incline out of the crater:

"The men had been called off the work about half past two, to partake of much needed refreshments, and they had not been clear of the place long before a further and much more serious subsidence took place. The hole suddenly deepened to about 60ft., the ponderous engine falling with it, but it did not stop there, for it slipped further and gradually

the earth closed over it, although it could be heard falling down and down after all sight had been lost."

The new subsidence now measured about 60 ft. diameter and 75 ft deep with as described above, an unstable bottom. this crater now made it impossible to recover the locomotive and also impossible for trains to cross any of the ten sets of lines.

"The large number of passengers, returning from Ulverston Market, were considerably surprised when the train stopped and they were directed to take the highway and walk on to Lindal station where another train would be waiting to convey them to their destination."

By late afternoon train loads of ballast, sleepers and rails were arriving to commence the work of filling in the crater and relaying the lines.

The article then describes the arrangements made for passenger travel and the re-routing of goods traffic from Carnforth via Penrith and Whitehaven. The most important of this goods traffic was coke for the Iron Works at Barrow, Askam and Millom. There then follows details of the work of infilling:-

"Gangs of men were kept at work all night, on Thursday, tipping ballast into the hole, and although by five o'clock on Friday some 300 wagon loads had been thrown in, not much progress could be seen to result. Yesterday morning (Friday) saw a further development of the mischief that is being worked underneath . A field adjoining the highway showed signs of subsiding and, before noon, an area in the middle of the field about 70 ft. by 30 ft. slowly subsided."

There then follows an account of the visit to the scene by local dignitaries and railway officials including the Duke of Devonshire, Sir James Ramsden, Lord Muncaster and Mr. Victor Cavendish M.P.

"It was stated yesterday that two mining engineers had been and examined the workings below, but found nothing out of the ordinary. The top level of the Parkside workings are about 500ft. down at this point."

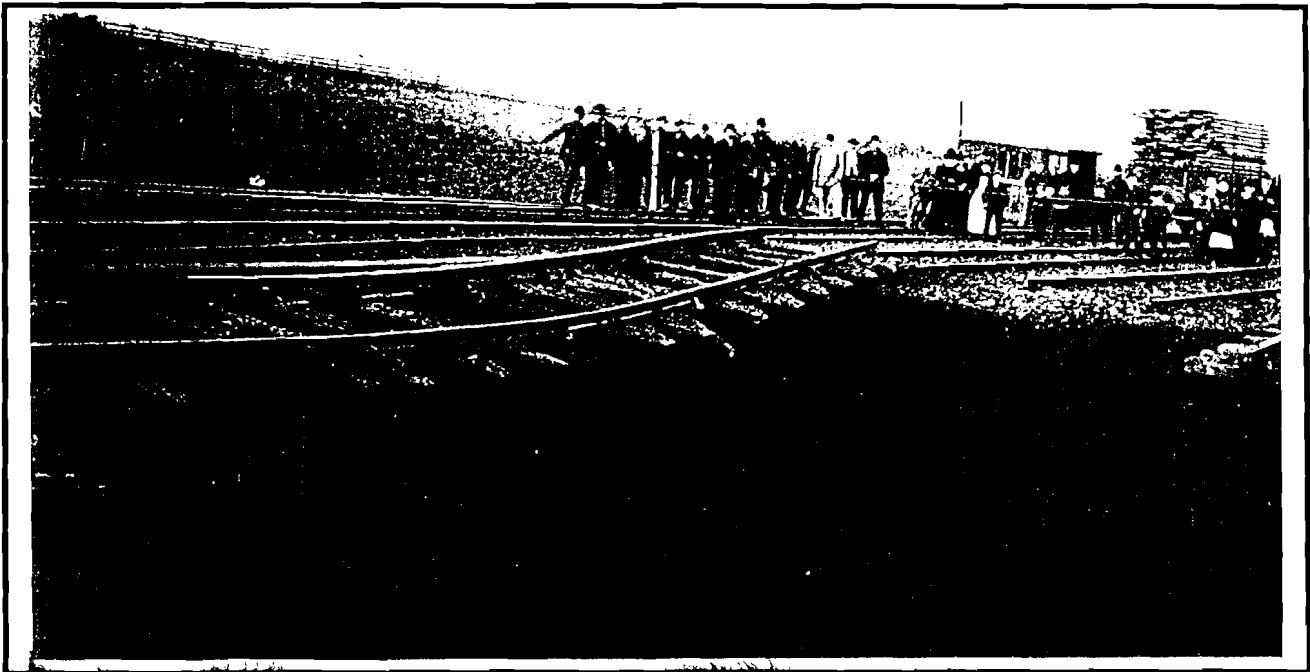
"We understand that late yesterday afternoon three engines were taken across one of the sidings without the ground giving way a subsequently a goods train for the Belfast boat was brought over the bad ground."

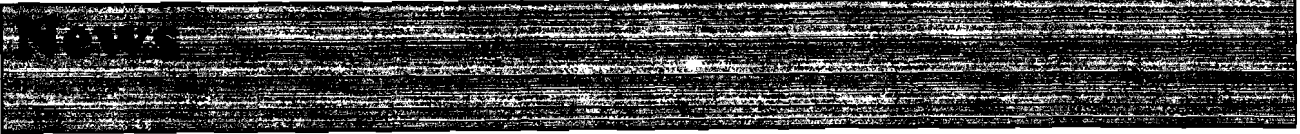
So gradually the hole was filled and normal rail services were resumed. The only visible evidence now to this event are the extra concrete reinforcements built into Lowfield bridge and nearer to the collapse site the remains of an inspection tunnel built into the embankment. A relative of mine, now over 90, recalls that a retired miner was re-employed to walk this tunnel daily to inspect for signs of earthmovement.

A second cavity , about 30 ft. across and 30 ft. deep appeared on 11th. November 1893, but without causing the havoc and damage of the 1892 collapse.

I would recommend any one interested in this event to read the full article in the Barrow Library as described above. It really is an extraordinary detailed account of the events of 1892, and contains many insights into life at that time

John Helme 25 - 03 - 94





Bursting Stones Quarry, Coniston Old Man

I was both interested and saddened to hear early stalwarts of the Friends of the Lake District talking on a recent radio programme. How lucky Lakeland has been in the past to have had committed friends who were able to take a long term overall view on Lakeland development for the benefit of the whole area. whilst early planning board policies may have been justifiable to identify with the aspirations of the roofing slate mining companies, conditions have now changed completely.

The slate industry is no longer labour intensive with small underground mining operations in each valley for a roofing material for which there was no substitute.

Instead it is a capital intensive exercise with a handful of operatives. the main product is cladding material which is cheerfully sold to any foreign bank or supermarket which can afford the product, irrespective of the fact that cheaper substitutes can be used.

Lakeland planners have themselves to blame for the huge visual eyesore at Bursting Stones Quarry, situated 1,500 feet up the face of Coniston Old Man.

The time has come to stop the insidious extension of planning applications for slate quarries which are creeping like an untreatable cancer over the face of one of Lakeland's most beautiful mountains.

Never has South Lakeland needed good friends more than now.

Letter from A Westall
Oxford Street Barrow to the
Barrow Evening Mail Thursday 16 June 1994

Wanlockhead -- Glencreiff Leadmine

An attempt is being made to rescue an 1833 hydraulic pumping engine, by Messrs J Landless, Gilmour Harris, and Charlie Smart. Initially discovered in 1983, attempts to reach the engine were stopped by a fall blocking the

main level to the pump room. The project has been estimated that it will take about 4 years to reach the engine.

The engine which is unique, was abandoned in the 1920's, and was built before 1833 by "Mr Dean of Hexham". It is a double acting engine with a large cylinder filled alternatively with water from one end and then from the other. The water was fed under pressure from a tank that was located 136 feet above the engine.

(NAMHO Newsletter 25)

Midland Collieries Saved

It has been announced that Trantham Colliery (Stoke on Trent and Coventry Colliery are to re-open as private mines. About 150 men will be employed at each of the mines, about half the number as were employed when they were operated by BC (SCMC).

Operable Collieries

The Mining Journal reported on the 15th April 1994 that British Coal still owned 32 "operable" collieries. There were 17 collieries worked by British Coal, 4 under licence, 6 of them were mothballed and a further 5 had licences pending (SCMC).

Last of the Pit Ponies

The last of the ponies to work in a British Coal mine were "retired" at the end of February 1994. The last mine where pit ponies were used was at Ellington Colliery in Northumberland and, whilst there were about 80 ponies used in the heyday of the mine, the last four were brought to the surface some two weeks after the mine ceased to produce coal. The hours a pony could work were laid down by law - 48 hours being the maximum but very often it was a good deal less. They work a single shift a day and a five day week. Offers from people prepared to give retirement homes to the ponies (who will not be allowed to work again) are being

evaluated. (Mining Journal).

Chatterley Whitfield Mining Museum.

The major structures on the site - including the winding engine house and the winder have been declared Ancient Monuments and cannot be destroyed. The rest of the assets have recently been sold off on the instruction of the receiver. This auction was hindered by the fact that many artifacts belonged to private individuals/organisations and could not be sold off. The sale did not help much to meet the museums depts. (NAMHO Newsletter 25)



Technical Information

Mine workings survey system

Analysis Geotech Ltd of Northampton has delivered its first Caveman cavern surveying system to BLM Mincom of Canada, and the second is shortly due for delivery to a Chilean company. The system is a laser based 'total station' which can be deployed into active or abandoned mine workings either through a bore hole of over 120mm diameter or by means of a boom extended into the stope. The system can then survey areas to 1cm accuracy in design. Volumes, tonnages, sections and 3-d views can be generated by computer. As well as stope dilution, other uses include ore pass wear surveys, verticle retreat stope and face advance volumetric calculations as well as shaft deformation surveys. (Surveyor 9th January)

Photographic Copy for the Newsletter – Half Tone Printing

A photographic image consists of infinitely varying shades and hues which, in all but the most exceptional of cases, a photocopier will have difficulty in reproducing faithfully.

Bromide screening produces a pixelated copy of the photo and comprises of an image of alternate black and white dots, similar to that of newspaper graphics, where, differing shades are simulated by varying proportions black and white dot densities.

Two grades of bromide are available; Fine for proper printwork, and course for photocopy work. Newsletter contributors should beware of the distinction for, photocopiers are optically too insensitive to "read" a fine bromide, and only discriminate coarser images.

Anton C.P.Thomas June 1994 Appended to Jon Knowles's van in Buckden Car Park.

To enlarge upon Antons information:- A photograph with too great a contrast will not print satisfactorily.

A process called 'flashing'(brief exposure to light) may do some good but should not be relied upon to remedy a deficient print.

To help matters you should use either colour or 400 ASA HP5 black and white film. The end print should have 'lustre'.

The quality of the paper the photo is going to end up on also matters i.e. fine quality paper, a 80 to 100 dpi screen, but if a finer screen is used than the quality of paper will stand then you get 'clogging' the holes bleed into one another and the definition goes. Conversely, a more porous paper 50 to 80 dpi screen.

Photographers will either use a screen or a special film which will create the same effect.

Thus:- A soft grey course image e.g. the cover picture of Newsletter No 37 has reproduced well, whereas a photograph with high contrast and fine graining as in Newsletter No 38 has reproduced less well.

Your biggest problem is finding a photographer who is familiar with the above process's, has the right screen for the job and is keen enough to help. If you do find one let me know so that members can be notified.

This information has been produced in an effort to encourage more people to submit photographs for the newsletter with confidence that publication will do justice to their efforts.

[Editor].

The final day of production at Barrow Ironworks



THIS photograph depicts the end of an era at Barrow Ironworks on the day the factory closed in 1963.

At its peak the Barrow Iron and Steelworks were the largest in the world with a workforce of more than 5,000.

Depletion of local iron ore deposits, technical advancements, falling markets and increasing competition combined to close the furnace doors forever.

The six workers who completed the final shift are

Stan Howarth, Bill O'Neill, Bill White, George Coward, George Tyson and George Governor.

Many thanks to Mr Howarth, from Osbourne Street, Barrow, for sending in the photograph.

from the Evening Mail 3rd March 1994

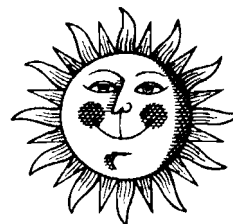
My thanks to all of you who have contributed, no letters have been received and apparently no one is spreading the word leastways no-one has let me know that they have. No books have been reviewed. So in the hope for better things **copy should be in by mid-September.**

Mark Simpson -- Editor.

Stop press --

Jon Knowles and Alastair Cameron, sometime during the back end of June, visited Cwmorthin Slate Mine, and have found their way into alot more new ground, if you wish to know more you will have to come on the next Wales Weekend.

Meets Meeting September 5th



CUMBRIA AMENITY TRUST MINING HISTORY SOCIETY

Officers for 1994

HONORARY PRESIDENT	Lord Egremont
CHAIRMAN	Dave Bridge, 28 Abbey Vale, St. Bees, 0946 822484
SECRETARY	Sheila Barker, 411 West Shore Park, Barrow in Furness, 0229 472296
TREASURER	John Helme, 3 Town View Road, Ulverston, 0229 584895
MEMBERSHIP SECRETARY	Andrew Sibbald, 46 St. Lukes Street, Barrow in Furness
MEETS SECRETARY	Jon Knowles, 6 Ferncroft, Hightown, Liversedge, W.Yorks. 0274 871012
NEWSLETTER EDITOR	Mark Simpson. Station Gates, Ingleton, via Carnforth, Lancashire, 0524 241920
JOURNAL EDITOR	Don Borthwick, 38 Salcombe Gardens, Tyne & Wear, NE9 6X2, 091 482 2873
TACKLE MASTER	Chris Jones, 3 Bell Hill, Cottages, Lindal, 0229 63892
LIBRARIAN/ARCHIVIST	Anton C.P.Thomas, 189 Greengate Street, Barrow in Furness, 0229 835951
PUBLICITY OFFICER	Alistair Cameron, Linden Lea, Pass Street, Eckington, Nr Pershore, Worcestershire, WR10 3AX, 0386 750494

Committee Members

**Peter Fleming
Jon Knowles
Ian Matheson
Mike Mitchell**

**Mark Simpson
Anton C.P.Thomas
Jeff Wilkinson
Angela Wilson**

Honorary Members

John Marshall

Mike Mitchell

Peter Fleming