Welsh Mines Society

(Member of the National Association of Mining History Organisations)

NEWSLETTER 50 **Spring 2004**

WMS Members on a field meet.
8th June 2002 – Bontddu, Dolgellau Gold Belt.
Photo credit; Alison Wilkinson

Editorial Thoughts

1. No. 50, and a bumper edition indeed !

My request for cover photos has been met with a number of responses – creating a bit of a dilemma, in that I can't do more than one at a time ! So I've placed a few within these pages, and others will appear on, or within, future Newsletters in the fullness of time. Many thanks as always for all contributions – please keep them coming… WMS field meet reports would be especially welcome !

Inside this Issue:

Honorary President: DAVID BICK, The Pound House, Newent, Gloucester, GL18 1PS.
Secretary/Treasurer: DAVID ROE, 20 Lutterburn Street, Ugborough, Ivybridge, Devon, PL21 0NG.
Editor: MIKE MUNRO, 64 Bron Awelon, Garden Suburb, Barry, South Glamorgan, CF62 6PS.

In addition to the extra pages contained within this Newsletter, there will also be a supplementary publication, (under separate cover), compiled by member Robert Ireland, detailing a snapshot in time of Pwll Roman Mine, near Talybont.

Mike Munro & BD

Events – Dates for Your Diary

(Note that details of forthcoming WMS meets, complete with links to maps indicating meeting points etc., are always posted on the WMS web pages as soon as they are confirmed – URL on front page.)

2. WMSoc. 2004 Programme

Summer Field Meet – Weekend 19th-20th June 2004. Location: Gwynedd (Slate) and North Cardiganshire (Metal). Organisers: Alan Holmes (Tel. 01785 812820) and George Hall (Tel./Fax. 01584 877521). Headquarters for Saturday evening meal and accommodation: **Corbett Arms Hotel**, Tywyn, Gwynedd, LL36 9DG. Tel. 01654 710264 & Fax. 01654 710359. Located in Tywyn High Street near the cinema. B&B, £28 single, £56 double.

Book accommodation directly with the hotel, stating that you are with the Welsh Mines Society.

Other accommodation nearby:

Hendy Farm, Tel. 01654 710457; Sunningdale, Tel. 01654 710248;
Monfa, Tel. 01654710858; Tredegar Arms (budget - no en suites) Tel. 01654 710368

Camping:

Ynysmaengwyn, Tel. 01654 710684; Tynllwyn Farm, Tel. 01654 710370;
Vaenol, Tel. 01654 710232

Saturday 19th June Leader Alan Holmes – **Meet at 11:00 a.m. – Note change of meeting place** – Since the Winter edition of the Newsletter we have received permission from the Forestry Commission to take our cars onto the forest roads, saving the hike up from the village. Directions : From Abergynolwyn village, drive westwards along B4405 and at about 350 yards from the village centre, at NGR SH 674 068, turn left and past Hendre Farmhouse. The road bends sharp right and rises to meet the railway line at NGR SH 673 066 (take care as trains will be running). Cross the track and continue to a junction, turn left, and reach the meeting point (a parking area) at **NGR SH 679 068.**

There may be opportunities for underground trips. Bring a packed lunch – there is no longer a village shop, only a pub !

(Field notes on the quarry & geology available for download on the WMS web pages – click on 'Field Meets : Current').

Saturday Evening – Dinner **6.30 for 7.00 p.m.** at the **Corbett Arms Hotel.** Menu enclosed with this Newsletter, copy also available for download from the WMS website. Please return a menu with your selections marked to Alan Holmes, 132 Newcastle Road, Stone, Staffordshire, ST15 8LG, to reach Alan at least a week before the event. Please do not send any money, but have it ready on the night.

After dinner there will be the usual informal meeting, and a projector and screen will be available if anyone wishes to show some slides – assuming time permits !

Sunday 20th June Leader George W.Hall – Brynarian and Bryn Dyfi Mines. Meet at **10:30 a.m.** at **Gwar-cwm-isaf farm, NGR SN 6685 9140**, for Brynarian Mine. G.W.H. recommends that you turn off the A487 Machynlleth to Aberystwyth road, immediately after passing the Talybont '30' sign, by St. Peter's Church, and carry on up to the top of the hill, turn left at the 'T' junction, past Pensarn wheel-pit, through the farm gate, then, by courtesy of Alan, the farmer, park anywhere by the road, which is unfenced, before the farmyard.

Please take care here, and on the way to Bryn Dyfi, as these by-roads are narrow, with some steep, sharp bends. Please also make sure that all gates are left closed.

Afternoon at **Bryn Dyfi**, by courtesy of Mr. Stephen Evans. Mill site is located **at NGR SN 683 934**. Return to the A487 from Brynarian, turn right towards Machynlleth, then turn off right up the forest track just beyond Penrhyn-gerwin, at **NGR SN 6720 9405**, and continue (there are no significant side turnings) to Llwyn-gwyn, **NGR SN 6830 9405**, where there is space to park. From here it is a short walk to the mine along the Council road, which is gated and grass grown ! If the situation at the farm permits, this approach and meeting place may be changed. If this is done the new locations will be announced at the dinner and at Brynarian. There will be opportunities to go underground, but only if you don't mind getting wet.

Pub and cafe lunches are available at Talybont and Tre'r-ddôl, but there are good picnic spots, with fine views, at Brynarian, as elsewhere in the vicinity.

Autumn Field Meet – Weekend 18th-19th September 2004.

Location; **Penrhyndeudraeth** *(Pant-y-wrach copper mine, Catherine and Jane and Bwlch-y-plwm lead mines, plus an ancient bole site)* and Clynnog Fawr areas, Gwynedd, North Wales. Organiser : **Harold Morris** (Tel. 01766 512 903)

Headquarters for Saturday evening meal and accommodation; **The Marine Hotel**, Castle Street, Criccieth, Gwynedd, LL52 0EA, Tel. 01766 522946 : NGR SH 499 378.

B&B, Double or Twin Bedded Room £22.50 / £25.00 per person, per night. Family Rooms from £60 per night. (The above prices are based on two persons sharing a room.) Book your accommodation directly with the hotel, mentioning that you are with the ***Welsh Mines Society***.

For details of other accommodation in the locality, B&B, camp-sites etc., contact Harold as above or by e-mail : **JohnHarold.Morris@Virgin.Net**

Saturday 18th September – The Penrhyndeudraeth mines. Meet at **11:00 a.m.** in the lay-by on the A485 road, between Penrhyndeudraeth and Garreg, at **NGR SH 614 400**.

The walk is in the order of 4 miles, taking in the Pant-y-wrach mine; a recently re-discovered bole site on the ridge above, then on east to Penrallt or Catherine & Jane mine, finally north across the spine of the ridge to Bwlch-y-plwm mine. From here a return to the cars is made along a minor road, distance about 1 mile. If anyone has any doubts regarding the length of the walk, options are available; for details get in touch with the organiser beforehand.

Saturday Evening – Dinner at **7.00 for 7.30p.m.** at **The Marine Hotel**, Criccieth, five miles west of Porthmadog on the A497. The hotel is located between the east and west promenades about 100 yards west of the castle entrance at NGR SH 499 378 The sea is very close, time maybe for a paddle before you dine ! A projector and screen will be provided, and hopefully we will have time to show some slides.

If dining with the Society, please return a copy of the menu (enclosed with this Newsletter) to the organiser, who would appreciate an early return of the booking form, and certainly no later than August 31st.

Sunday 19th September – Meet at **10:30 a.m.** at a very small lay-by or passing place close to a very prominent radio station at **NGR SH 437 478**, for a visit to the manganese mine of Seler Ddu on the slopes of Bwlch Mawr, a mountain with its summit at NGR SH 426 478. The meeting place is reached by turning off the A487(T) road between Porthmadog and Caernarfon at a small village called Pant Glas. It is a complicated approach, hence further information will be available at the dinner on Saturday evening. Due to the fact that parking is extremely limited, and the roads very narrow, it is essential that people share cars otherwise we will be grid-locked.

The mine is located on the south east side of the mountain, at NGR SH 431 471. The Seler Ddu mine is fairly small but very interesting underground, being, I feel, quite unique in the means adopted for the support of the worked areas. At several places, large stones of a different nature to the country rock have been carried in from the mountainside and used to construct support pillars. The whole working appears to have been excavated using picks only, as no shot-holes are to be seen.

Other mines in the area may be visited depending on available time, or we can possibly continue to the summit of the mountain, a very pleasant viewpoint in good weather.

Other Societies & Organisations

If you're aware of events or trips which other organisations are holding or making to/into Welsh mines, please let me know and I'll include them in the next Newsletter.

3. NAMHO Conference 2004 – This is to be held in the old mining village of Coniston, in the heart of the English Lake District 23rd - 25th July 2004, and has been organised by the Cumbria Amenity Trust Mining History Society. There is a full and varied programme of field trips, both surface and underground, plus a series of lectures with the theme of 'The Extractive Industries of Cumbria'.

Conference booking forms are available from CATMHS Hon. Sec., Sheila Barker, The Rise, Alston, Cumbria CA9 3DB: please enclose an sae. **sheila.barker@cybermoor.org** or alternatively access the CATMHS web site at **http://www.catmhs.co.uk**

4. Geologists' Association Reunion – 6th November (Sat), National Museum of Wales, Cardiff. The day is being termed a 'Festival of Geology', and is open to the public, with 30 to 40 groups from around the country putting on their displays. The south Wales branch of the Geologists Association and the Russell Society each hope to put on their own stand, emphasising the Welsh dimension.

Lynda Garfield

If there are any members prepared to support a ***Welsh Mines Society*** display stand, please contact your Editor.

Important Announcements

5. Insurance Update – Although your secretary is heartily sick of insurance and serial mail shots, he is pleased to see – much to the surprise of many – that the BCA insurance scheme has not only been a success, but is looking to be continued next year.

It has to be said that herding cats is probably a more relaxing job than trying to get 250 WMS 'members' to decide on one of three options, correctly calculate the payment and then send their cheques by a deadline of 25th March 2004. Could those of you who have been relaxed in their interpretation of 'not later than 25th March 2004', please try harder next year as it is causing your secretary and the BCA needless extra work – particularly as we know that you are not insured until your name is entered onto the list by the BCA – which is several days after you posted your late letter !

From the secretary's perspective the BCA have done a superb job of co-ordinating so many disparate societies and individuals and they have provided the WMS with a first class service. Inevitably some things are behind schedule – one of these is to issue cards to all insured members. The BCA hope to set up a system to do this in the next few weeks.

Until then please keep your envelope label ! On this you will find a box that tells you when your subscription to the Newsletter runs out. If this is still 'paid up to Dec 2003' then you must pay £4 immediately to bring this up to date. I have been very liberal over the last 20 years with late payment – I can no longer do so as it causes problems with your status as a member. **PLEASE PAY UP TO DECEMBER 2004** – or you will not receive any further Newsletters.

If you are insured for Overground or Underground through the WMS then this appears in a second box. *Unfortunately my Access Database skills on the computer are not able to indicate if you have BCA insurance via another club.*

Please also note that the BCA or affiliated clubs are the only insurance that is valid for members of the WMS on field trips. Any other insurance is NOT valid, as it does not cover the WMS officers.

David Roe

6. Welsh Mines Society sweatshirts – John & Daveleen Alder would like members to know that there are a few Sweatshirts and T-shirts left over from NAMHO 2002 – Aberystwyth (white logo on black) : Sweatshirts – £16.00 ; T-shirts – £12.00, inc. p+p.

Also, W.M.Soc. Sweatshirts (gold logo on navy blue), £16.00, inc. p+p.

Please place orders with Daveleen Alder, 43 Rowlands Crescent, Solihull, West Midlands, B91 2JE, Tel. (0121) 711 1049, or by e-mail to **aggie@1ststoponline.co.uk**

Field Reports

7. Snailbeach Underground – WMS Autumn Meet, 20th September 2003.

In support of the excellent report Ivor Brown submitted for the last Newsletter, the following notes detail the trip four intrepid members of the WMS made into the depths of Snailbeach Mine…

WMS members John Alder, Roy Quilliam, Dave Seabourne (and yours truly) were ably led and assisted by members of the Shropshire Mines and Caving Society, including Mike Worsfold & Eileen Bowen, amongst others, who took us up to the entrance of Perkins Level

(NGR SJ 380 023) where rails leading out of the adit can still be found. We made our way along the level, taking a heading off to the right and passing through some 'Armco' type lining to see some of the stopes where baryte had been extracted, an area now used for the practice of Single Rope Techniques in an underground environment. We returned to the main level and proceeded (through a few more sections of 'Armco') to its termination in a couple of larger 'chambers', which apparently broke to surface, and were used as a way in by earlier mine explorers, some years back, prior to the re-opening of the adit entrance to this level.

Our steps were retraced a very short distance to a steel 'bridge', from which we climbed down a short steel ladder to the top of our first pitch. One by one, we abseiled our way down a less than vertical pitch, to a slightly awkward re-belay, which if it went wrong, would result in disappearing down the stopes, hundreds of feet deep – it being made quite clear that no one had been to the bottom of these particular workings due to their increasing instability the deeper one got, so a visit, particularly without a rope, was not recommended ! We proceeded along a short level to the head of a second pitch – recently belayed, a few artefacts being noted on the way down. A final relatively gentle pitch down took us to the '40 Yard Level' – (some 55 yards beneath Perkins Level !)

Remains of wooden bodied tipping ore trucks on the '40 Yard Level'

Here a bite to eat was taken, near where a few ore trucks remain on the rails. The level, which originally headed out to day, was partly explored, but deepening water levels prevented further progress. The level was followed in the opposite direction to take a look at Chapel shaft prior to making our way back up (the hard bit !) a partly different route and ropes back to Perkins Level.

Thanks are extended to those members of the Shropshire Caving and Mining Club who kindly gave their time to give us an underground taste of this interesting and extensive mine.

8. WMS Winter Meet – 14th March 2004

A fine turnout of members ensured that there was plenty to talk about at this welcome opportunity for a bit of socialising ahead of the weekend field meets.

An open discussion (a bit lively at times !) was held on various subjects including that of insurance for the Society and its members – you are now of course aware of the outcome – until the next change at least !

Finally, as a bit of a taster for the June meet, slides were shown of Bryneglwys Slate Quarry by Alan Holmes, some of which depicted structures and buildings, sadly long since demolished by the then Forestry Commission.

Our thanks are offered to George and Nheng Hall for kindly making their home (along with ample quantities of tea and coffee) available to the Society for this social meet.

Bronwen Dog 🐾

News & Developments

9. Ball Mills & Rod Mills – with balls in them… ! – In response to my (incorrect !) caption to the photograph on the front cover of the last N/L, George Hall puts us in the picture so to speak !

'Your cover photograph is not of a Ball Mill, and I ought to know. It's a Rod Mill. In other words it was designed to contain rods, not balls, to do the grinding. It's true that at one stage we took the rods out, and loaded it with balls, in the hope of increasing the rate of throughput, which was much too low. This change had no perceptible effect, so we reverted to rods. We then discovered, rather late in the day, that the entry throat contained a very coarse thread, which, while it moved the pulp into the mill, severely restricted the rate. Had we persevered we would have removed this thread.

Ball mills of that period were usually tapered at both ends. *[In my experience they still are – on larger mills the balls are fed in with the material to be crushed. Although not too clear in photograph, in my defence it was the pile of spent balls and crushed material next to the mill which encouraged me to make my erroneous statement ! – Ed.]*

The supposed advantage of rods is that they should produce a more closely sized pulp, as the coarser particles will protect the finer ones while themselves being ground up. The Esgairmwyn plant, in its final, simple form, did an excellent job up to a point, with good recovery of a satisfactory grade of concentrate, but it was unreliable, and had too small a throughput.

It may interest you to know that this mill was taken from Graigwen to Esgairmwyn on a flat-bed trailer hauled by two Land Rovers in tandem, a day I remember well. This operation was admirably organised by John Bate, of the Talyllyn Railway, who then manoeuvred it smoothly into position with the aid of ropes attached to a Land Rover capstan.

George W. Hall

10. Environment Agency – Metal Mine Strategy for Wales. With reference to Item 23, last N/L, Peter Claughton reports on the meeting held at Cwm Rheidol 18th March 2004

Cwm Rheidol in this instance encompasses a group of mines on the high ground to the north of the Afon Rheidol around Ystumtuen, including the following mines, from west to

east – Ystumtuen, Penrhiw, Bwlchgwyn, Llwynteifi and Temple. All these mines contribute, or have the potential to contribute, to the mine waters discharging from the two adits, No. 6 (Aldersons) and No. 9, at Cwm Rheidol. Although Cwm Rheidol was rated relatively low in the listing of mines for priority action, compiled for the Environment Agency in Wales Metal Mine Strategy, a number of factors have combined to bring it to the point where remedial action is being planned. Amongst the mines in the Agency's group 3A, with diverging issues but the potential for these to be resolved through negotiation, it had the greatest environmental impact, contributing significantly to the heavy metal loading on the river. It was planned to remove the existing filter beds at Cwm Rheidol anyway, as they were regarded as largely ineffective in treating the water discharged from the adits, and it would be politically expedient to counter this with positive moves to improve the situation. Added to this, an earlier plan provided much of the information required to assess the impact of remediation on the mines concerned.

SRK Consulting, Cardiff, were appointed in May 2003 to undertake site investigation with the aim of providing detailed remedial designs. In January of this year SRK circulated their draft project description for a Proposed Minewater Treatment Scheme, to which I responded on behalf of the Welsh Mines Society with Graham Levins endorsing the response on behalf of the Welsh Mines Preservation Trust.

The scheme proposed reducing the amount of water discharged from the adits at Cwm Rheidol and using either passive or active treatment of the discharged water to improve its quality, reducing both the acidity and the heavy metal content. Major contributors to the water being discharged at Cwm Rheidol were identified as 1) surface water entering the workings from waterlogged ground north of the Llwynteifi reservoir via a collapsed shaft, and 2) water sinking through the bed of the Nant Bwlchgwyn between the reservoir and the road at Bwlchgwyn. Both of which were highlighted and stakeholders notified early in the investigations, allowing us to carry out the necessary fieldwork to assess the potential impact of any remedial work in those areas.

In the draft project proposals of January 2004 SRK proposed improving the channel of the stream flowing into the Llwynteifi reservoir from the north thus draining the waterlogged area north of the old boundary hedge. This proposal does not appear to present any problems in respect of the archaeology of mining and ore preparation, and could be very effective in curtailing the flow of water into the collapsed shaft, provided that assessment was carried out prior to the work and the access route for heavy machinery was similarly assessed. However, the proposal to cut an intervention ditch from north to south immediately east of the collapsed shaft would appear unnecessary and could compromise the archaeology of a sensitive area where mining and ore preparation may date from the mid-18th century.

Two proposals were put forward for rectifying the loss of water into old workings below the Nant Bwlchgwyn. The first was a simple sealing of the bed of the stream between the reservoir and the road. The second involved using the bed of the old Bwlchgwyn leat to channel the water from the reservoir around the hillside to the north of the Nant Bwlchgwyn and then down the hillside to the culvert under the road, thus bypassing the existing stream bed. Objections were raised to this second proposal as it would involve raising the level of the water in the reservoir, increasing the risk of water entering the old workings to the north, or forcing a flow in the leat at a lower level, thereby destroying the surviving surface features.

Also in the draft were proposals to address the leaching of heavy metals into the Afon Tuen from the waste dumped in association with ore preparation processes formerly carried out

adjacent to the road at Bwlchgwyn. These involved either stabilising the waste or removing it for encapsulation on an adjoining section of the mine. Objections were raised to the prospect of the waste being removed as this would a) be a major undertaking, as the existing road ran over the waste dumps, and b) removing it to another part of the mine would involve disturbing two areas both with potential archaeological features.

At a stakeholder meeting held at Cwm Rheidol on 18th March the proposals along with stakeholder responses were discussed and SRK presented their preferred options for a design plan for the remedial work. SRK made it clear that they were confining the design plan to those factors which had the potential for maximum improvement in water quality with minimum intervention; addressing the problem of surface water entering the workings and treating the flow from the adits using the limited amount of land available in the valley at Cwm Rheidol.

Temple Mine would not be included in the project design as there were no issues with acid mine discharge (AMD) from that site. There remained the possibility that water from Temple does flow west into the workings at Llwynteifi/Bwlchgwyn, although a direct connection has apparently not been proved, but any such water would be dealt with at Cwm Rheidol. At Ystumtuen action would be confined to monitoring the existing intervention ditches around the workings. Action would be taken to prevent surface water entering the collapsed shaft north of the Llwynteifi reservoir, as outlined in the draft proposals. Further objections were raised regarding the need for an intervention ditch to the east of the shaft. The idea of using the old Bwlchgwyn leat was scrapped. Action to prevent water entering the old workings from the Nant Bwlchgwyn would be confined to sealing the stream bed. It was not intended to grout or in any way fill the old workings under the stream. As was pointed out, filling those workings could compromise not only the underground archaeology but also any flow of water underground from Temple or Lwynteifi west towards the outflow at Cwm Rheidol. SRK also made the point that they would not be recommending the sealing of the No.9 adit at Cwm Rheidol, as proposed in an earlier remediation plan, as the impact on underground water flow could not be determined and could be detrimental to further treatment of AMD.

At Bwlchgwyn the leaching of heavy metal bearing wastes into the Afon Tuen would be monitored to determine what, if any action, would be appropriate for the waste dumps. A geophysical survey would also be carried out to determine the extent of the workings below the bed of the Nant Bwlchgwyn and the Afon Tuen.

Given the limited availability of suitable land at Cwm Rheidol, and the potential visual impact of treatment plant, the preferred treatment option for the discharge waters was passive, using a reducing and alkalinity producing system (RAPS). The major pollutant is the discharge from the lower, No.9, adit which contributes by far the largest proportion of heavy metals entering the river from the mine. It is proposed that the water from No.9 would be settled in a lagoon to capture the ochre and treat by the RAPS, constructed on the old dumps north of the road, before being discharged via new filters, on the site of the old filter beds between the road and the river. Water from the upper, Aldersons or No.6, adit would be captured by re-engineering the existing line of the culvert along the top of the spoil heaps and then fed by a large diameter pipe down the western edge of the dumps to flow over limestone gabions. It would then be treated in the new filters between the road and the river, bypassing the RAPS. Limestone would be introduced into the beds of the discharge channels with a view to reducing the acidity. It was explained that the rapid flow of the water over the limestone would prevent the ochre sealing the surface of the limestone, with a resulting loss

of effect, as happened in the old filter beds. The whole to be concealed at ground level using spoil removed during the installation of the RAPS. However, as pointed out to SPK, that would not conceal the systems from the majority of tourists who would be looking down on the site from the Vale of Rheidol Railway.

Overall costs of the project were expected to be as follows —

Site works, at Bwlchgwyn / Llwynteifi, £ 60,000; at Cwm Rheidol, £ 400,000.

Investigation, at Bwlchgwyn / Llwynteifi, £ 20,000; at Cwm Rheidol, £ 40,000.

The intention is to put the project forward, through the local authority, for part funding by the European Union under Objective One. An early bid is therefore expected which, if successful, would require the work to be completed, i.e. the money spent, by 2007.

In discussion a number of points were raised by local residents. It was clear on questioning that people locally do not regard the mines as hazardous. Their concerns were more towards the increased traffic that the project would generate on the road in the valley, the only access to the Cwm Rheidol site, which is considered inadequate. In response to a question a representative of the local authority, Ceredigion County Council, stated that road improvement could be included in the Objective One bid if it was necessary for the project. Concerns were also raised on the exclusion of Ty'n-y-fron Mine, to the west, but with the Environment Agency's action being driven by water quality issues, and with that mine not being a major contributor to pollution, it did not justify investigation at present. Also, in relation to the lack of local concern regarding the hazards presented by the mines, it was pointed out from the floor of the meeting that some activities not connected to water quality were far more hazardous. A speaker from the floor highlighted the problems associated with the disturbance of mining spoil, particularly tailings, where the inhalation of cadmium dust was a major problem. The use of sites like Frongoch for 4x4 trials is already known to us but he cited at least one site near Cwm Rheidol understood to have been given planning permission for use by trial bikes.

More details on the project as they become available. However, in the meantime, I would comment that the trouble taken by the Environment Agency in Wales to engage with stakeholders is encouraging; and the project proposals to-date appear to be designed for maximum results with the minimum of intervention.

Peter Claughton

11. Metal Mine Strategy for Wales – Simon J.S. Hughes states; 'The Environment Agency remediation proposals became too demanding upon my time, and with no remuneration being offered for commercial work, I have now withdrawn as a stakeholder.'

12. An index to the *Mining Journal* – An offer has been received from a member to transfer the contents of George Hall's index to the *MJ* into machine-readable text for those mines within Wales. Are there any members who would be interested in doing likewise for mines in other regions of the UK ?

13. Small Mines of the South Wales Coalfield – During 14th-15th May 2004 a series of visits were made with Michael Poulter, Katrin Sauer (15th) & B. Dog, to five of the last six working (underground) coal mines in the south Wales coalfield (Tower being the sixth), four of which are privately owned and worked by a handful of miners.

Gleison, nr. Pontardawe, only just restarting production, and now conveyor worked.

Nant Hir No.2, nr. Seven Sisters, working the Red Vein and still using drams on a haulage incline – the winch being driven by a particularly smoky diesel engine !

Aberpergwm, nr Blaengwrach, operated by Anthracite Mining Ltd.
Blaentillery No.2, on the hillside above Big Pit.
Black Barn, currently under care and maintenance.

They all looked fairly prosperous, but mines such as these are still known to disappear overnight – catch them while you still can !

Bronwen Dog 🐾

14. Frongoch News

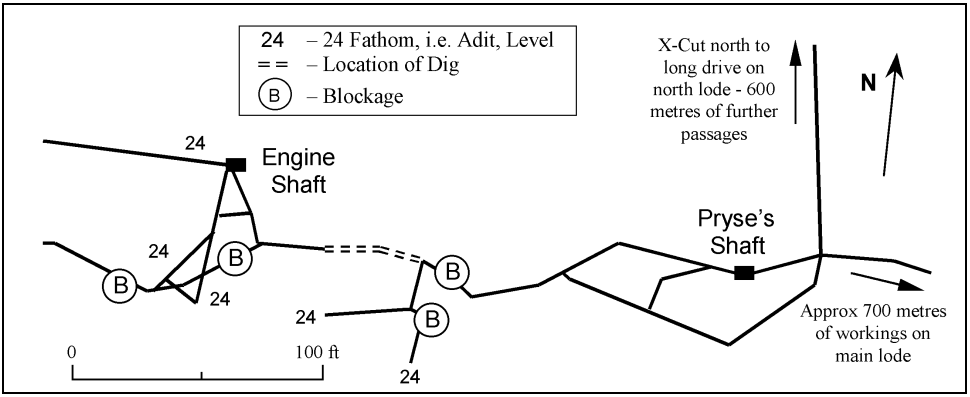
Most members will remember the Frongoch situation from NAMHO 2002. The adit shaft had been cleared and fitted with fixed ladders. Later work has resulted in the whole shaft being capped. There is a large manhole cover with a drain on either side. A length of scaffold pole has been concreted in just below the drain on the footwall side. This is to provide a suitable belay point in the event the first ladder is removed. (This is up to Dave Seabourne, whose ladder it is !) The length is 18 feet down the footwall to a timber solar I have fitted. After a short ladder, a rubble slope leads to the final ladder down; this is 15 feet to the adit. I have to express my sincere gratitude to Dave for the help he willingly gave in this work. At times we were labouring in nearly 90-degree heat, mixing concrete in a barrow down by the adit portal and carrying it up the hillside in buckets – Not to mention the concrete sleepers. He never complained, except for the fact that the "RF" inscription in the concrete is actually about half an inch bigger than the "DS" if carefully measured !

The reason for carrying out all this work is to secure the shaft against material falling in from surface, with the attendant risk of the adit becoming blocked, and to provide a more 'sociable' method of entry. Up to the time of the work on the shaft, the only method of entry was a flat out crawl in running water from the adit portal.

The next lot of work involved the digging of a fall on the adit adjacent to the Engine Shaft. This is a terrible job and has been going on since about October 2002. So what is it all about ? Well, examination of the plans shows about 50 metres of passage between the Engine Shaft and the next shaft on the lode, Pryse's Shaft. Before Pryse's Shaft there is a 'bypass level' similar to the levels that bypass Boundary Shaft and Williams'. If this can be gained, the level will bypass the inevitable blockage at Pryse's Shaft to rejoin the main adit level at a point that I have christened 'Four Ways'. One way here is the way the explorer would have come, another will lead back to the likely blockage at Pryse's Shaft, another will continue along the main lode, (probably blocked by falls), and the last is a crosscut to a long (about 600 metres) drive on the North Lode. The North Lode is the vein that the adit is driven on from portal, and is only slightly stoped. To make the whole proposition even more exciting, there is another crosscut further on between the Main Lode and the North Lode, this would probably bypass any falls on the Main Lode. Also, there is 140 feet of ground in this area between adit and grass, with the possibility of rises/ladderways up to higher workings. David Bick comments in his book that the mine probably has 3 miles of adit workings, examination of the plans show this to be very likely.

I have been working on the dig almost every Sunday, with the exception of the bank holidays when it is my habit to spend a few days down in Cornwall. In November 2003 the dig broke through to a right hand side passage shown on the plan. This is a crosscut to a drive on the lode that has been thrown to the south of the adit drive. As a point of interest the whole mine is a geological anomaly. Although there are only two faults shown on the plan, the main lode is all over the place, the footwall becoming the hanging wall and vice versa. I

only recently noticed this ! Shame on me. The side passage crosscut leads to a junction at the (thrown) vein. Left is blocked, right leads past a dangerous hanging shale block to a blocked rise that strongly draughts. There is no stoping.



Frongoch *– Workings in the vicinity of the dig*

Unfortunately, at the breakthrough, the way on ahead is blocked by more fall. The plan is to tidy up the work done to date, and then start a new dig onward. Obviously, there is plenty of room to dump the spoil, and working conditions are quite good here. In the event that there is no breakthrough within about 12 feet, it is likely the project will be terminated, as its 16 meters to the Pryse's Shaft bypass.

The prospect of abandoning the project fills me with dismay, however one has to be realistic. The length of dug 'passage' is ten metres, yes, metres NOT feet. Pushing this has been a feat of endurance at times lying flat out with water coming down on me from above. However, in dry weather it is a reasonable, if somewhat long, crawl. The passage itself leading up to the dig was of very dubious condition, being all in timber of uncertain condition. The dig provided much solid rock that was used to build a packwall on the footwall side of the dodgy passage. Also, I have put in quite a bit of extra timbering here. An old wooden wheelbarrow that NAMHO visitors may remember has been relocated. Out of the dig I recovered a curious artefact. It is a timber sleeve about a foot long and a foot inside diameter. It is made up in the same way as a wooden barrel of timber strips and two iron bands. However, unlike a barrel it is straight. Anyone have any ideas ? My guess is that it was probably part of some timber lagging for a steam pipe from the pumping engine that must have been thrown into the engine shaft when the engine was removed. It then probably found its way down through the stopes.

In the event that the dig has to be abandoned, no doubt the dig itself may be come a source of curiosity to future explorers, possible earning itself the name 'Fellows' Folly'.

Both the adit portal and the access shaft are on private ground belonging to Cwm Newidion Uchaf. Although the landowner, Mr Arthur Edwards, has not imposed any access restrictions, it should be remembered that the land is used for grazing purposes (no dogs), and would visitors please use the stile at the corner of the field to avoid damage to the boundary fence. It would also be a good idea for anyone wishing a visit to contact Roy on Tel. 01922 406713 or email **roy@iriscom.co.uk** for the reason that work is still ongoing.

Roy Fellows

15. Cornel Ogofau

Following up information supplied by an archaeologist studying at UCW Lampeter, I recently looked at a small trial working at Cornel Farm in the parish of Llanllwni, on the left bank of the Teifi 2.5 km south-west of Llanybydder, at NGR SN 494 429. The workings, referred locally to as Ogofau, are on a spur of high ground within a bend in the river opposite the southern end of the grounds associated with Highmead House. There is a shaft, more a drift, sunk at about 45 degrees decline in a southerly direction but curving to the east as it goes down – now largely filled with rubbish. Below this is a short adit driven from river level – although the two do not connect. The decline appears to be hand cut on a show of quartz in a fold in the strata. The adit has at least been extended in the modern period as there are shot holes in the forehead.

Peter Claughton

16. Eaglebrook – Our Aberystwyth Correspondent advises of the recent discovery of a possible adit, part of which is cut and cover, at Eaglebrook mine. It runs under the dumps, and it's not impossible that it may be part of the tailrace from the wheel pit – further investigation will be required to determine its true function.

17. 'Slate Inclined' – Reports based on field observations, April 2004 – except first two !

Cwt-y-Bugail Slate Quarry (this is the old quarry of this name and not the renamed Bwlch y Slaters) – The boiler of the winding engine on the tip tramway has been removed from the quarry. The engine's 'new' owner is to attend to off-site conservation.

Oakeley Slate Quarry – Arrangements are apparently well advanced for the removal of vast quantities of crushed slate for building purposes. The crushing plant has yet to be built though.

Aberllefenni Slate Quarry – Sadly the 9th December 2003 saw the last extraction of slate from underground at the quarry. Slate is now being bought in, see last WMS newsletter, although the Chinese product is not now listed. The Company are now working slate block from the tips, part of the tip has been leased to a subcontractor to crush slate and over 15,000 tons have been crushed recently. Full planning permission to open the mine as a tourist attraction has been received and a feasibility study is underway.

Maenofferen Slate Quarry – The mill door has been repaired preventing entry to unwanted visitors but I understand that the locomotives have been moved on to other locations.

Votty & Bowydd Slate Quarry – The former Tuxford chambers have now disappeared as this area is being worked on. Two digging machines were in evidence. Very disappointingly all buildings on 'C' Level have been destroyed, including the diamond saw shed, the only survivor is the wheelpit of the mill. Also the old office level is like a bombsite with every structure gone.

Graig Ddu Slate Quarry – The open workings are somewhat larger than previously seen and the former underground chamber tops are clearly visible.

Bwlch y Slaters Slate Quarry (now Cwt y Bugail) – The waste on the tips looks of very good quality and it is difficult to understand why so much has been thrown away when it is obviously very useable.

Ffridd Slate Quarry – Sited very close to the new Rhyd Ddu Railway Station on the Welsh Highland Railway and the circular powder magazine is well worth a visit; it stands to the left of the Miner's track up to Snowdon.

Rhiwgoch Slate Quarry – The road-widening scheme on the A496 Betws to Blaenau is affecting the quarry remains and much of the slate waste has been used for hardcore: the lorries were passing very close to the mill and damage seems inevitable.

John A. Knight

18. Quicklime – *[Ref. Item 29, last N/L]* As the explosives regulations grew tighter and tighter during the late 1980s and early '90s a number of firms started manufacturing 'Swelling agents' which needed no permit and were not subject to storage regulations. These are largely made from calcium oxide or quicklime. You may find that your local builder's yard keeps it in stock or can order it from Feb Products. Silent Demolition Agent is almost certainly the same stuff. One manufacturer made two varieties – quick and slow, but was forced to withdraw the quick variety as it was prone to spitting out of the hole. I have never used any of these products but I believe that they have their place and are adequate, provided that the burden is not excessive. These agents appear to be ideal for stone working, but as far as I know, they have not been used in any of the Welsh slate quarries.

Around 1977, in Abraham's adit on Copper Hill at Cwmystwyth, I found a larger than usual borehole (about $1^1/_2$" or 35mm diameter) which had neatly cleaved the rock and was absolutely full of whitish clayey mud – slaked quicklime possibly ? With hindsight, I should have put a sample in a bag for further analysis, as I'll never get up there again. Stone dust stemming, if tamped very tightly above the powder, will remain in the hole, often entrapping a fragment of fuze, but always leaves a cavity at the innermost end which once contained the powder. Stone dust is far more effective than flucan / flookan for stemming powder in a shot-hole as it can be tamped harder. Clayey material can be too pliant or extrudable in which case it is given a coating of stone dust, to dry it, before placing it in the hole. I understand that quicklime must, likewise, be tamped as hard as the rock itself, by hammering an iron bar into the shot-hole, before it is slaked, a wooden plug is believed to improve its action and may prevent the slaking water from spitting out.

I have an engraving of St. George's Hall, cut in The Rock of Gibraltar and was delighted by Tony Brewis's account of Sergeant Ince's novel methods. I have heard one account of the Dolaucothi Miners who went to work on extending these tunnels through The Rock between 1939 and 1945. Can anyone enlighten us ?

Simon J.S. Hughes

19. Clement Le Neve Foster – Discussion Continues (Ref. Item 17, last N/L)

It is sad to note that a person of George Hall's undoubted eminence in the world of mining history hasn't read the inscription on the Clement Le Neve Foster (CLNF) plaque with more care than is evident from his semantic and pedantic outburst against my use of the word 'appalling'. The quote, *[Ref. N/L 48 Item 26]* which is clearly and correctly punctuated, is taken from an obituary by Bennett H. Brough. I hope that George will at least accept him as a worthy and capable obituarist. I take full responsibility for my use of the word, which has apparently raised George's hackles, and I defend it to the hilt. I wonder if he has ever tried to compress the professional life of someone of the stature of CLNF into c. 50 words and do him justice in the process ?

However, regarding the main thrust of George's apparent apoplexy, I won't enter into statistical foreplay with him here: there are other, more appropriate, channels available for that course of action if needs must. CLNF noted that comparing the mortality and accident statistics of coal and metal miners was an exercise fraught with problems and it could prove

to be a particularly arid discussion with, perhaps, as much to interest the general reader as attempts to estimate the total gold output from the Welsh goldfield !

Suffice it to say, CLNF gave very careful thought and consideration to the very question that George appears to be addressing: to summarise his conclusion, he was startled by the result of his inquiry, in which he concluded that, despite the immunity from fire-damp &c., the occupation of metal miners in his inspection district (Cornwall) was almost as dangerous as that of a collier. Indeed, he wrote, 'a shade more dangerous'. He was, at this time, yet to move to Wales and the inspection of the Merioneth slate mines !

I accept George's comment regarding the health hazards arising as a consequence of the introduction of machine rock-drilling; CLNF was amongst the first to recognise the inherent problems and to seek amelioration of the deleterious effects on the health of the miners who used them.

Simon Hughes adds several interesting points to the various reviews of 'Victorian Slate Mining', (Ref. Item 34, last N/L), including my own, which suffered some truncation in the last Newsletter. *[In the name of avoiding repetition – Ed.]* His suggestion that 'adequate biographies of Sir Clement Le Neve Foster and G. J. Williams are long overdue' has, unless he would contend otherwise, been met in the case of Le Neve Foster in so far as my thesis on his professional life is in the public domain; at their request, a copy was deposited in the BGS Library, Keyworth.

Peter Challis

20. Sygun Copper Mine – Ref. Item 13, last N/L, David Bick advises – 'I understand the new owner is Mr David Ward, and presumably the museum will re-open in the spring.'

21. Darren Mine – The demolition of the cap over Francis's Shaft at the north end of Darren Mine has not blocked Oliver's Adit and the gate has now rotted so badly as to be ineffective.

22. Cwmbrwyno – Following the reclamation scheme during which the dumps were re-profiled, an agricultural road has now been constructed across the top of the lower dumps and into the woods about half a kilometre to the west. In the garden of Cwmbrwyno House, a large sheep shed has been erected and is a blot on the landscape. Following heavy rain, the old reservoir discharges into the dump as no one had the wit to replace the spillway. As far as I can see, the only person to benefit from the expenditure of £ 750,000 of taxpayers money, was the farmer, and the consultants. An absolute disgrace !

23. Clogau Gold – *[Ref. Last N/L Item 16]* It is true that Sir Mark Weinburg presented the Queen with a one kilogramme bar of fine gold from Gwynfynydd but I understand that it remains intact and there is no intention of defacing this ingot by cutting off a piece for ones son. Cambrian Goldfields did indeed produce the gold for the recent royal wedding from Prince Edward mine. I am told on a regular basis that the royal rings 'always come from Clogau', but I cannot substantiate that this is true or even find any element of truth in this claim. However, Clogau Gold plc., who own the trade name 'Clogau', heavily emphasise this royal ring claim in their brochures and I'm sure that this must be right – mustn't it ! They also state that the metal is now so scarce that they can only put a small 'pinch' in each ring. Note that Clogau Gold plc. have no rights whatsoever over Clogau Mine and these are currently granted to Cambrian Goldfields Ltd.

Simon J.S. Hughes – Above three items

24. Welsh Industrial Archaeology Panel – Peter Claughton provides an update…

On Thursday 20th May I attended the Welsh Industrial Archaeology Panel where a number of issues related to mining were discussed.

Cwm Erch (Lliwedd) copper mine, Snowdonia – The National Trust have been assessing this site for some time now and are progressing towards a detailed survey. John Latham, one of the Trust's archaeologists, would appreciate informed comments on the remains (see David Bick's latest edn. of 'The Copper Mines of Snowdonia', pp. 93-95) and this could be a suitable venue for a future WMS meet.

Cefn Coch gold mine, Merioneth – Consolidation work is being carried out on the barracks ruins.

Navigation Colliery (Caerphilly Borough Council) – Although four or five studies have already been made on possible future uses for the buildings, yet another study is underway.

Clwyd Powys Archaeological Trust are carrying out a detailed survey of the Llanymynech limestone quarry although it is not clear if that will include the mine workings cut into by quarrying activity. The Clwyd Powys Archaeological Trust are to publish their survey / report on the Metal Mines of North and Mid Wales. The information now on the Internet will appear as hard copy.

As a side issue, in discussion on early mining within the RCAHMW's upland archaeology survey, Stephen Briggs once again queried the dating evidence for prehistoric mining – perhaps there is a case for further study / discussion on the secure dating of early mining sites to settle the argument once and for all ?

25. The Plynlimon Mine, Ceredigion

Although primarily intended to inform, encourage and attract shareholders, reports in the Mining Journal are potentially important sources of geological information. Obviously not all mine captains or agents were equally interested or competent in this respect but if the generalisation has validity then it should be tested.

We have thus restudied the Plynlimon Mine from new and detailed surface geological mapping (DMDJ) and from the abundant accounts in the *Mining Journal* (GWH). Results have recently been published, see below. Although no plans are known to exist we have been able to extend significantly the account by O.T. Jones and establish a northerly dip for the main lode in conflict with his conclusions. The ore body displays a strong geometrical control by the form of an anticline in massive gritstones, the fracturing of which seems to have localised ore precipitation in the immediately overlying mudstones. Several enigmatic and archaic descriptions in the *Mining Journal* have proved interpretable in the context of modern knowledge.

The success of this joint approach is encouraging and we plan to extend similar analyses to the south and east, notably to Esgair Llee and the Wye Valley Mines.

Reference : James, D.M.D. and Hall, G.W. 2004. 'The Plynlimon Mines, Ceredigion, Wales, U.K: an integrated evaluation from new surface geological mapping and contemporary subsurface documentation.' In Dominy, S.C. (ed.), *Mine and Resource Geology*: EGRU-NQ AusIMM Symposium. James Cook University, North Queensland, Australia, 72-86.

David James and George Hall

26. 'Plans on track to bring goldmines back to life on National Trust site'

A project is underway to transfer 450 metres of narrow gauge track, locomotives and rolling stock from the now closed Bettws Colliery in Ammanford to the Dolaucothi goldmine site in Pumsaint. Funding has been received from the Objective One Rural Services and Thematic program, Carmarthenshire Tourist Association and Bettws Colliery. It is intended to relay 80 metres of track inside one of the adits enabling visitors to experience 'a much richer experience of the mines'.

Cambrian News, 29.04.04 – Brian Evans

Query Corner

Please reply direct to the correspondent. Any follow-up info will however be gratefully received by your editor to allow a suitable response to be placed in the next newsletter for the benefit of all.

27. A bit of a Puzzle – I'm not aware that any members managed to break the code presented by Harold Morris in the last N/L (Item 27) – the answer being nine ! How's that then ?

Letters of the alphabet having curves in their form should be considered as having a value of 0, while letters made up only of straight lines should be given the value 1. Applying these values to the word LODE we get the binary identity 1001 which has a decimal value of 9. Thus lode = 9. *[Don't blame me, blame Harold !]*

28. Where is the East Dyliffe lead mine of 1863 ?

Several reports under the names of East Dylif(f)e and Dyliffe Consols appeared in the *Mining Journal*, at intervals, between 1862 and 1870. About half of these clearly referred to Bryn Moel (GR: 868 942), tried in 1851-52 by the Dyfngwm Company. However, the 1863 reports don't fit Bryn Moel, and must describe some other mine, as correspondents to the M.J., who enquired as to its whereabouts, claimed.

Reports by Joseph Evans in 1863 under the name of East Dyliffe refer to a shallow adit, a middle level, apparently 10 fms. below shallow adit, a deep adit, and a new engine-shaft, sinking below the last, down 7 fms. (or 47 fms. from surface) at the date of the last report in August. Stoping was carried on from all three levels, and 25 tons of PbS were sold in July. The company also built a reservoir, to collect the water from the mine for dressing, and installed buddles and other dressing machinery. Mr. Evans' first report had called it the 'Drummond property.' Former workers had raised, so he said, several thousand pounds worth of lead.

In 1864 notices of the winding-up of the East Dyliffe Lead and Copper Mng. Co. and the East Dyliffe Silver-Lead Mining Co., apparently the same company, appeared in the *M.J.*. They seem to have been associated with the Snowbrook SilverLead Mng. Co., identical winding-up notices for which were printed adjacently.

A shallow adit, an intermediate level, with a deep adit below and forty fathoms from surface can't be Bryn Moel. But where are they ? Perhaps someone else can work it out ?

George W. Hall

29. E. M. Richards and the exploitation of Welsh zinc ores.

Between 1868 and 1874 Evan Matthew Richards was an MP for Cardiganshire. He was also the managing partner in Dillwyn and Co., the specialist silver smelters in Swansea. His

election as MP came at a time when Dillwyns were expanding their processing of zinc ores with the opening of a new smelter at their Llansamlet works. In the run up to, and after, the election the Mining Journal reported on the 'representation of mineral interests' amongst the candidates. In an article subsequently reprinted in the Cambrian (Swansea) newspaper, 11/12/1868 p. 6, it is reported that Dillwyns had 'tried extensive experiments with the blende ores of Cardiganshire, which up to a few months past were considered useless. Success having attended the experiments made, large works are now being erected at Landore(sic) for the smelting and manipulation of these ores..' Since the late 1850s Dillwyn's had been treating imported zinc ores, from Brittany, Sardinia and other Mediterranian ports, and profitably extracting silver from those ores.

Has anyone any information on Richards and possibly his association with mines in Cardiganshire ? Were there silver (argentite) inclusions in any of the sphalerite (blende) ores mined there ? A glance at the mineral statistics doesn't provide evidence of the predicted benefits for Cardiganshire – zinc production through the 1860s and 70s was particularly low with only an isolated peak of 1604 tons in 1872. Any comments would be appreciated.

Peter Claughton

30. Van Mining Co. Ltd. - On the subject of Van Mining Co. Ltd. (Ref. Item 40, WMS N/L 49), Thomas Clement Mundey, company Chairman was also involved in the East Van Mining Co. as Chairman in 1871. He also served as Chairman of the New North Van Mining Co. in 1873.

Robert Oldrey served as a Director of the Van Mining Co. until his death in March 1881. In the mid 1870's he was Vice Chairman of the East Van Mining Co.

William Page was a director of the Van Mining Co. into the 1880's, serving as Chairman of the company in later years.

Julius Alington of St. Neot's, Huntingdon in 1869. He was to Chair meetings of the company in the 1870s.

F. L. Slous was described as late Chairman of the Stock Exchange in 1869.

However the most interesting was Mr. William John Lavington, the company secretary. He appears to have made a living as a company secretary, holding this post for the Van Mining Co. and the Van Railway Co. for many years. He held a similar post for the Pateley Bridge Lead Mining and Smelting Co. in Yorkshire, The West Esgair Lle Mining Co. in 1874, The South Caradon Mine in at least 1884 and was Company Sec. to the Weardale Lead Co. in 1885. During 1870 he held this post for the Worthing Mining Co. He developed foreign tastes in 1873, serving as Company Secretary to the Utah Silver lead Mining Co. with George Batters as Chairman.

The man missing from the plaque is George Batters, who was Vice-Chairman of the Van Co. in 1869. He seems to have been involved in most lead mining companies, claiming in 1869 to have 'sent tens of thousands of pounds into the Principality for the support of mining – sometimes with success, sometimes with a want of success.'

I am sure this list is far from complete, so can others add to the list ?

Nigel A. Chapman

31. More on Mine Directors – Ref. Item 40, last N/L

I believe that the common factor of the Van, Nantiago, and Castell Mines in the first quarter of the last century was Mr. Onslow, of Mount Severn, Llanidloes, who I understood to be the principal partner in these three mines at that time. I met him sixty years ago, when he told me

that when given up they had four solid ribs of blende in the sole of the bottom level at Castell, that every deeper level at Nantiago had proved better than the one above, and that they had plenty of ore ground opened there.

What put a stop to these mines, and almost every other in mid-Wales, was the action of the Government in destroying the zinc market in 1921. Overcome by panic during the Kaiser's war, the British Government signed a contract with the Australian producers at Broken Hill to buy their entire output of sphalerite until 1929, at £ 6 per ton. When demand fell after the war, they dumped this onto the market at whatever price it would fetch, while refusing to buy the relatively small output of the British mines for the same price that they were paying the Australians.

Mr. Onslow told me that they were offered 12s. 6d. per ton for zinc concentrates that cost them 15s. to cart from Nantiago to Llanidloes station, never mind the cost of mining. They hoped and expected to go back to Nantiago when market conditions improved sufficiently, and therefore left the entire plant in situ, where I saw it during Hitler's War.

George W. Hall

32. Mining Plaques – *[Ref. Item 40, last N/L]* As well as the memorial plaques from Van and Goginan, the National Museum inherited one from the private museum at Tre'r-ddôl (see photo right) commemorating the Thomas United Mines under which T.P. Thomas ran the South Darren Mine in 1855 until 1857. Has this gone to S^{t}. Fagans rather than Nantgarw ?

Simon J.S. Hughes

33. Waller's 'Description of the Mines in Cardiganshire', 1704 (See also Item No. 46)

Trying to make sense of the more obscure of Waller's plans is an intriguing business, which I hope the book will encourage. In this context I was interested in Robert Protheroe Jones's note in the last N/L, Item No. 43, concerning the provenance of the Blue Level. But where was Waller's 'New Work' at Cwmystwyth, which his 'Description' states was 300 yards from his 'Great Lead Mines', which presumably were near Bonsall's level and his stamp mill in Nant yr Onnen ? (The Blue level is 600 yards away). Any suggestions would be very welcome.

34. Death Rates and Metal Miners

In Item 17, last N/L, George Hall challenges the suggestion that the death rate for metal miners in the last century was 'appalling'. But the fact is, that metal miners were described as 'middle aged' at 25 or 26 years old, and as Captain Richard Ridge said to the 1863 Government Commission, 'When a miner gets up above 40 years of age he is not worth the snap of a finger'. This he attributed to lack of ventilation; 'a smell that will almost knock you back, a nasty filthy bad smell; that is what kills the miners'. In contrast, coal mines were much better ventilated; not out of concern for the miners health, but to reduce the ever-present risk of catastrophic explosion, disastrous for profits. How did the average life-span, as opposed to that relating purely to accidents, for miners in the two industries compare – it would be interesting to know.

David Bick – Above two items.

35.

EARLY DAYS AT DYLIFE

'Tramlines, slagheaps, pieces of machinery,
These were, and are, my ideal scenery'.
W.H. Auden

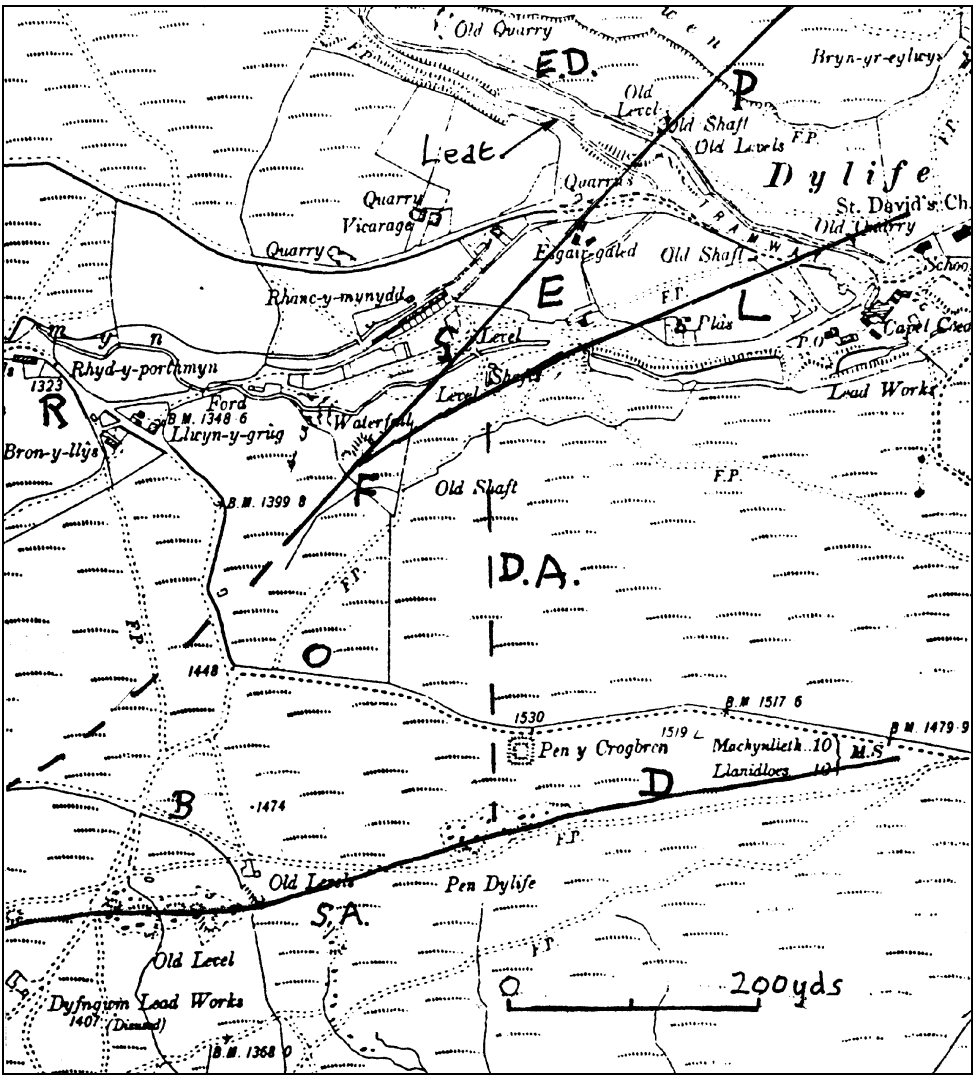
In 1975 I wrote a booklet, 'Dylife', now long out of print, which mainly dealt with the 19th century when, before eclipsed by Van, it was the glory of the Montgomeryshire mines. And since our society first met there, I thought it fitting to say more about its origins, when still just a scatter of workings on several different lodes. In those early days, the district around Plynlimmon was a waste of mountain and moor, much as now, but with scarcely any roads or vehicles to go upon them, and cargo too heavy for sledge or packhorse could not move at all. Even so, many trials and re-openings took place of which few records remain, so that to compile an account is like trying to assemble a jigsaw when most of the pieces are missing. But something can be gathered all the same.

As long ago as the Bronze Age the minerals of Plynlimmon were attracting prospectors, and at least one mine with copper and lead ores (Nantyreira) has been attributed by Carbon 14 dating to that period, though with the lack of smelting evidence, whether for metals or pigments etc has never been settled beyond all doubt. As for the Dylife area, its mineral wealth must have been clear in pre-historic times. In the Clywedog gorge the Dylife lode is exposed like a castle wall, and there can be little doubt that most of the workings date from antiquity. At Pen y Crogben (SN 856 935) is a Roman Road and fortlet within a stone's throw of the Dylife lode outcrop, and in this vicinity it may well have been revealed in building the road which cuts across it a little to the east. There are also remnants of hushes and ponds, perhaps Roman, and stone mortars at Esgairgaled.[1]

In 1856 a visitor, David Davies, was shown the remains of a lead-smelting furnace on the north side of the hill where 'bricks of Roman make are found among the debris', and a level, presumed to be Roman, 'about 150 fathoms in length, only 10 inches at the bottom, then bulging out in the shape of a coffin... the rock had all been cut with small chisels...'. The site of the furnace has been lost, but in 1971 Jon Savage and Tony Jarratt encountered such a level some 75ft down a shaft near Pen y Crogben. It had been later widened by blasting. Several years ago we re-opened a shallow adit which led to ancient workings, but falls prevented much progress. Early written evidence of mining is a lease of Dylife taken up about 1641 by a disciple of Sir Francis Bacon, Thomas Bushell, who had re-opened the silver-lead mines of Cardiganshire with great success. But whether he did much is unlikely, not least because of the low silver content in the ores.

During the 18th century the mineral deposits attracted growing attention from lead and copper smelters to feed their works, which were mainly located around the coast of Wales with coal available nearby. This interest in so remote a district is curious, but it probably reflected a measure of desperation arising from drainage problems in the local mines. Among those involved were the Bagot Reades of Chester, father and son, Daniel Peck also of Chester who was also mineral agent to the Mostyn estates, and the Smedleys of Bagillt near Flint; their names will appear again. Such men were able to call upon considerable capital, but smaller ventures were often run by a handful of adventurers risking their own pockets. Yet we are bound to feel a certain sympathy when their dreams turned to ashes as they often

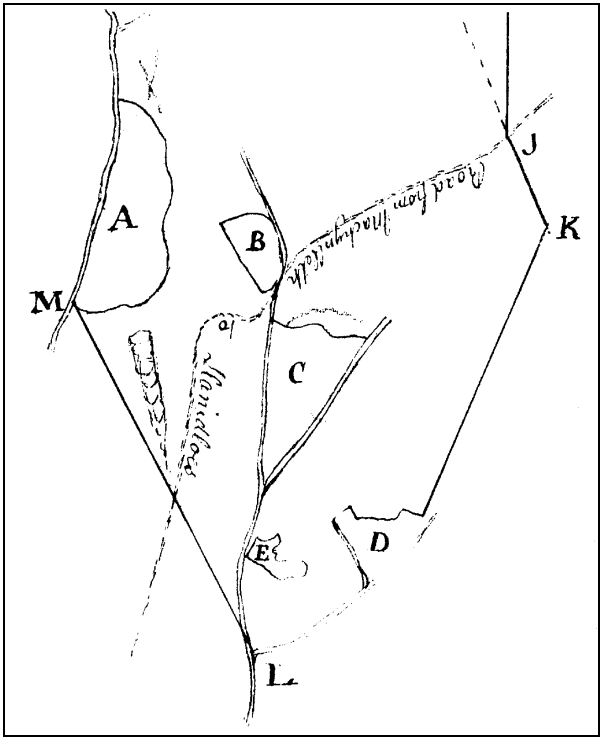
did, more indeed than for those roguish later promoters who plundered shareholders by stock exchange swindles which finally brought the industry to ruin.



Dylife on the 6 inch O.S. map, 1903

From top to bottom :

E D = Engine Dingle, P = Pencerig, E = Esgairgaled lode, L = Llechwedd Du lode,
G = Gwaith Gwyn, R = Rhyd-y-porthmyn where the benighted travellers stayed,
F = Where the lodes divide, DA = Dylife deep adit, O = Old coach road, D = Dylife lode,
B = Dyfngwm boundary ditch, SA = Shallow adit to Dylife lode.



Part of the Fern lease of 1786, with the Clywedog Gorge on the left.

A = Dyfngwm; B = Rhyd y Porthman; C = Esgairgaled, bounded by the Twymyn river and Engine Dingle.
Note the opencut workings between M and C on the Dylife lode. The old coach road is shown cutting across the sett. The present road through Dylife dates from the 1860s.

The chief landowner was Sir Watkin Williams Wynn, who owned so much of Wales that he could ride from his home near Wrexham all the way to Machynlleth on his own ground.[2] However, the accompanying plan from a lease of 1786 to Josiah Fern of Mold shows several tenements in the Dylife area standing out like islands in a sea of waste. These farmsteads belonged to others, and two in particular concern us. The mines were often worked by separate partnerships or companies. Their names were Gwaithgwyn, Esgairgaled, Pencerig, Llechwedd Du, Dylife and Dyfngwm, with endless variations in spelling. Being on one of the 'islands', the latter mine just west of Dylife was independent and deserves a study to itself, and one day I might attempt it. A few words of explanation are needed concerning the first five. As regards mining, until the 19th Century the name Dylife referred solely to workings on the Dylife lode on Pen Dylife; but when the mines were later united, Dylife became their collective title with the old names still applying to the various sections. However, before this arose, if the 18th century workings never lasted very long, neither were they long abandoned. For although the perennial factors of pumping, unpredictable lodes, fluctuating prices and the burden of pack-horse transport were ever present, greater than all these was the unbounded optimism of the mineral adventurer.

The Dylife Lode

The first detailed news comes from a fact-finding tour in 1691 by William Waller, a mining engineer. Of particular interest are his recollections of 'a mine called Delivia belonging to William Pugh Esq., and there they had shafts as I remember, 50 or 60 yards deep'. These few words graphically sum up how much had been done there, even before the days of gunpowder.

By 1693 Waller had become manager of Esgair Hir and together with Sir Humphrey Mackworth, an industrialist from Neath, promoted the Company of Mine Adventurers to work it.[3] But the output proved disappointing, and in more or less desperation they leased

large tracts of land to the east belonging to Edward Vaughan of Denbighshire. A number of old workings were revived, and some with such success as to yield profits of 200 per week- a vast sum in those days.[4] About this time, samples of ores from the Mid-Wales mines were being assembled by the mineralogist Dr John Woodward. His collection resurrects wonderfully the scene in those distant hills nearly three centuries ago.[5] Many specimens came from the Dylife district but of great interest are his notes relating to certain specimens. One reads – 'Potters lead ore. Mr Peck's mine. Delivy'. And another – 'White flaky Lead-ore about 14 fathom deep; in a mine of Mr Edward Harley's at Eskergallid in Montgomeryshire.' This is our first reference to Esgairgaled. The next evidence comes from a shocking story, beginning in 1719 when a blacksmith, John Jones, or Sion y Gof, left Cardiganshire and his children and their mother in search of work at Dylife. He succeeded not only in this, but also found another woman, a maid at Llwyn y Gog a mile or two away, whom he soon married.

But when his family turned up unexpectedly he took the fatal measure of pushing them down an old shaft at Dyfngwm, (the first mention of this mine). His crime came to light a few months later when three men working at Dylife, managed by a Colonel Ward, were sent to recover some timbers there.[6] Jones was caught, sentenced for murder in 1720 and reputedly hanged from a gibbet at Pen y Crogben, where in 1938 the gruesome remains of a skull in an iron cage were unearthed by Will Richards an ex-miner, and the landowner. Whether Dylife had been working ever since Waller's description 12 years before is unclear, but it seems likely even with the burden of pumping, which suggests that the lode was a rich one. As for Dyfngwm, it was leased for a term of 31 years in 1771, and some years later a number of shares in the venture were on sale as part of the huge industrial complex belonging to the Smedleys, which like Daniel Peck's many years before, had gone bankrupt. Soon afterwards, Dyfngwm was advertised as 'now in profit', and came up for auction at the Spread Eagles, Machynlleth; you could see it by applying to George Painter at the mine.[7] (There is a little more on Dyfngwm later)

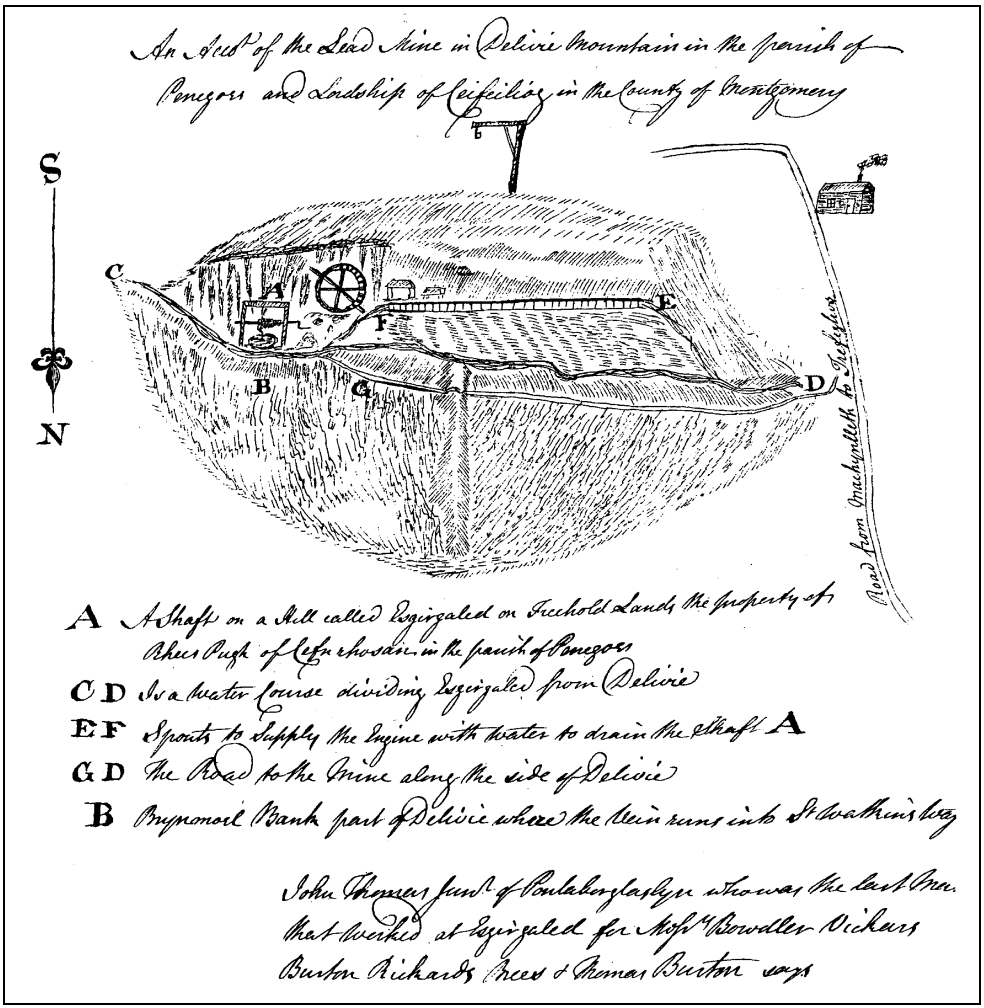
The Esgairgaled lode (Gwaith Gwyn, Esgairgaled and Pencerig)

In 1849 Matthew Francis reported that the Esgairgaled lode was up to 30ft wide, and had yielded immense quantities of ore.[8] Waller's letter to Mackworth, dated 25th March 1707, shows how much had already been done nearly three centuries ago :

'As to Mr Harley's Lead Mine, (Esgairgaled) it is above 20 yards under water and no Level can be had to it; ... I am told that Mr Peck will throw up Mr Pugh's Liberty (Dylife), for work is now 30 yards that they draw Water under Level, and the Water Charge goes with the Profit of both Mr Harley's and his. We had Mr Harley's ore at 3/10/0 per ton delivered at the mill, and it cost him above 6 per ton; these things will not do ... and a Level to each must be brought...'[9] But soon afterwards, the Mine Adventurers became lumbered with the problem when they acquired a rambling complex of smelting works and mines operated by Peck, one of which was Dylife. Esgairgaled continued under Harley into the 1720s,[10] but as the lode has been mined all across most of the sett, it is difficult to know just where he was working. (Francis relates that the western end was known as Gwaith Gwyn or White Works, perhaps from the presence of lead carbonate.) By 1728, new adventurers had taken over, including Malachi Swaine and Robert Morris, a copper smelter from Swansea. The mine was leased from a Mr Nicholas and also involved was Abraham Blackmore of London. But the parties fell out, and encouraged by Blackmore, Swaine preferred a Bill of no less than 117 sheets

against Morris. The last we hear is Morris responding with the words 'rather than be at the expense and trouble of answering ... I would give him 117 such mines if I had them'.[11]

The scene now changes again, with some hard facts about Esgairgaled in the form of a document and plan in the National Library of Wales dated 1774. The plan is reproduced here, but is better viewed upside down as the points of the compass are inverted. The parish boundary identifies the stream and makes it clear that the workings were on the west side of



The plan of 'the Lead Mine in Delivie Mountain', dated 1774, with its watercourse and 'Shaft on a Hill called Esgirgaled'. Note the gibbet on Pen Dylife.

Nant Rhydwen, also known, inter alia, as Cwm yr Engine or Engine Dingle. (This became a centre of developments, and eventually huge waste dumps, long since removed, filled the valley.) The waterwheel for pumping was probably the first in the district, and the first of many more; Brynmoel Bank (B) on Sir Watkin's land was the site of Pencerig mine. Note also the old coach road and the gibbet at Pen y Crogben.

As regards the Esgairgaled engine shaft and wheelpit, their position is not altogether clear, but from a section of 1866;[12] the former appears to have been partly up the western slope of the dingle, with a footway shaft near the stream, the site of which could be made out quite recently, and perhaps still can. Over the stream was Pencerig where its pumping shaft (see photograph) was later the centre of much development. It is unfortunate that the Pencerig part of the 1866 section is missing.

Egairgaled Shaft on Pencerig land in 1969, showing a wrought iron cage and pump-rods. Both have long since vanished and little shows there now. (David Bick)

The 1774 document also informs us that the last man employed in the venture was John Thomas junior of Aberglaslyn near Beddgelert, and his testimony is full of interest, though a lack of punctuation renders names a muddle. His employers were 'Messrs Bowdler Vickers Burton Rickards Brees & Thomas Burton, and they worked under the Brooke and altered the course thereof three or four yards towards Delivie and raised by five men in a month about 12 Ton of ore the greatest part of which came from under the Brooke.' The ore sold for nine pounds a ton. It lay about 12 or 15 yards below surface, and the vein or lode under the brook was about a yard wide of which one foot was solid, the rest being ore mixed with spar and stone. They sank 10 yards more in ore and 'found no bottom or difference.' But the shaft was now full of water, with 'no possibility of seeing the vein'. Why or when such apparently rich ground was abandoned is not clear, but the general tone suggests it was some time previously.

We now turn to a bundle of letters about Sir Watkin's mineral properties which shed a broad, and at times intense but flickering light on the mines in general between 1785 to 1799. The source of these papers was John Barff of Oswestry, one of Wyrm's agents who also dabbled in mining himself, and I have endeavoured to turn the material into a coherent narrative elsewhere.[13] We learn that Bagot Reade, the son, was tired of his investment in Dylife and wanted to get out. Another shareholder was John Gibbons, a coal-owner and

entrepreneur.[14] As regards Pencerig and Esgairgaled, these were under separate management with workings abutting below the stream and pumped by the wheel on the latter property. This led to endless trouble, with the Pencerig people wanting to acquire Esgairgaled to make use of its pumps and work the two as one. In desperation, John Gibbons wrote to Barff with the idea of cutting off their water, though he did not think they could use it themselves because 'if we were to build a water engine on the waste and their Freehold lands may be injured by the stream being taken out of its usual course'. Whatever he meant, the alternative of putting a wheel downstream to use the waste water from the Esgairgaled wheel does not seem to have occurred. However, Pencerig made a profit at times, and extensive stopes to surface bear testimony to the ore removed. Its shaft, confusingly known as the Esgairgaled Shaft, was finally deepened to about 40 fathoms, but the effort was largely wasted since the lode became very hard and turned increasingly into blende (zinc ore), which was not worth extracting.[15]

Barff was something of an industrial chemist, making trials with china clay and glazing, and one of the Pencerig shareholders was William Evetts Sheffield (1752-1821), whose address was Worcester College, Oxford. But he seems different to William Sheffield of the same

Ancient workings

Looking north-east about 1970 from F on the 6 inch map along the lode outcrop to Pencerig, beyond the white buildings. (This was Esgairgaled cottage). Gwaith Gwyn is behind the white spot marking the protruding pump rods at the Llechwedd Du Engine Shaft. The opencuts on the right are on the Llechwedd Du lode with the Star Inn, extreme top right. (David Bick)

place who was keeper of the Ashmolean Museum from 1772 to 1795. W.E. was well versed in geology, mineralogy and smelting, and in 1805 surveyed mineral estates in the North of

Underground – Pencerig deep adit workings. Looking vertically down on the top of a wooden rising main in a flooded winze. Note outside diameter of pipe ~10". (M. Munro)

England.[16] In 1786 he took out a lease on land including old trials at Hafod Feddgar, west of Llanidloes.

The lode through the Esgairgaled sett was worked extensively, and at Gwaith Gwyn a cross-cut adit still emerges opposite the great Dylife level, which itself probably dates from the mid-18th century. According to an advertisement in 1810 announcing the sale of their unexpired leases, Esgairgaled was still producing well, and Dyfngwm had fully recovered. It was claimed that the weekly profits of the mines were very great, with expensive machinery and ore of a very superior quality. The early 1800s were a time of unusually high lead prices and prospects were rosy. The prospects of working Dylife from Dyfngwm were mooted, but it never happened.[17]

The Llechwedd Du Lode

This was the foundation of Dylife's glory in the mid-19th Century, but its history is very obscure. Surface evidence suggests early beginnings, and there is a leat system, hitherto unrecorded, running eastwards above the opencuts and ending in a hush. Much more research is needed.

Opposite Gwaith Gwyn, an unusual feature of the Engine Shaft (date uncertain) with its well-known protruding pump-rod, is graffiti on the side of the shaft, consisting of the nicely carved initials 'HT', and 'WW'. In particular, the latter two are interwoven (see photograph), and according to C.J. Williams who first noticed them, the style implies the 17th Century. Could it stand for William Waller ? The very improbability renders the dream all the more intriguing, yet there is just a chance – he had an impish sense of humour, he was involved in the area, and the 1864 Commission records a 'Waller's Shaft', (Boundary Shaft), on the Dylife lode. As for 'HT', I have no ideas at all.

Mystery Graffiti. The initials carved in Llechwedd Du Engine Shaft. (David Bick)

Travellers Tales

Around 1800, we are indebted to several benighted gentlemen on the old coach road from Llanidloes to Machynlleth for more light on the area, and a taste of its conditions. With men and horses exhausted and in torrential rain, they were forced to stay at nearby Rhyd Porthmaen (Porthmyn), 'a miserable hovel, called a public house, with its disgusting ensemble, a dwelling of wretchedness'. What the locals thought of them was not recorded. But next morning they had revived enough to visit the mines, where the Dylife deep adit or 60 fathom level was said to be no longer in use. No doubt all the ore above had gone, with the deeper workings drowned out.

Across the stream, 'Isgar Gallid' belonging to Mr Salter of Machynlleth, was in full work with shafts 15 yards deep and a level about 50 yards long. The steel-grained fetched 14*l*. to 16*l*. per ton, and the potter's ore, 18*l*. to 20*l*.. 'Dymfyngum' (Dyfngwm) was said to belong to a Griffith Jones, but then believed to be nearly exhausted. 'Nine shafts about 14 yards deep have been sunk, and a level drove five hundred yards from the river'. Zinc blende, formerly used for mending roads, was being sold for thirty shillings a ton.[18]

In short, long before the great days to come, these little mines were hard at work with little intermission for generations, but all those times of industry and endeavour, of hopes raised and dashed, are now a distant memory. As for the hovel beside the old coach road, it has somehow survived and is now a respectable country retreat. If the ghosts of those rowdy miners still haunt the place, what stories could they tell ?

David Bick – 26.03.2004

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1 Timberlake, S. 'An Archaeological Examination of early Leats and Hushes in Upland Wales', *Archaeology in Wales*, 43. See also David Bick. 'Observations on Early Mining in Wales', *Early Mining in the British Isles*, 1989, 75-77.

2 Much of the following is based on the Wynnstay archives in Ruthin Record Office and the National Library of Wales.

3 For more on the Mine Adventure, see William Rees,[4] David Bick. 'Waller's Description of the Mines in Cardiganshire', 2004.

4 Rees, William. 'Industry before the Industrial Revolution', 1968. This is a scarce and valuable book, but rather diminished by errors and dearth of source notes.

5 The collection is in the Sedgwick Museum, Cambridge.

6 I am indebted to Simon Hughes for the details.

7 Chester Chronicle, 4th Feb 1780.

8 Report on the Dylife mines, March 1849. Druid Inn papers, NLW.

9 Mackworth, H. 'Second Part of the Book of Vouchers', 1711.

10 W.J. Lewis, 'Lead Mining in Wales', 1967, 94

11 I have mislaid the reference – probably the Morris Papers, Swansea Library.

12 Powys Record Office, M7MQ/7/5, Dylife plans, 15603. It does not appear that the Gwaith Gwyn adit ever reached the eastern boundary.

13 David Bick, 'The Old Metal Mines of Mid-Wales', Part 6, 1991, 30-31.

14 See also John Goodchild, 'John Gibbons of Oswestry', *British Mining*, 43, 1991, 63-76 NMRS. For a time, Gibbons was Mayor of Oswestry.

15 For more on the history and archaeology, see 'Dylife', and 'Old Metal Mines of Mid-Wales' Parts 4 and 6. For the mid-19th Century, see C.J. Williams, 'Cobden and Bright and the Dylife Lead Mines', 2002, *Welsh History Review*, 21, 1

16 I am obliged to Hugh Torrens for these details.
17 North Wales Gazette, 6th Dec 1810
18 J. Evans 'Beauties of England and Wales', 1812, 848-849

General Articles

36. Cwmystwyth – more on the Blue Level (Ref. Last N/L, Item 43)

Whilst the approximate position of the Blue Level marked on W.W. Smyth's 1847 plan would seem at first to correspond well with that of the Penguelan East Level, a little closer examination of this begins to sow some doubts. The heading direction and distance seem comparable, yet the intersection with the Comet (Copper) Lode on Smyth's plan lies some distance to the west of the Comet Lode Opencast, whilst the position of the adit portal shown also appears to lie at a lower altitude and closer to the main area of workings on this south-facing slope of Copa Hill, as well as to the eastern field boundary of the old Penguelan smallholding. If Smyth had been equating the Blue Level with what we now refer to as Penguelan East, it is surprising that he doesn't show the Nant Stwc alongside, for on his plan most of the other surface features are marked. Furthermore, our own fieldwork has revealed the remains of another, and I think, older adit which lies beneath the Penguelan East just above the 300 m contour. However, the latter is further east still, and even closer to the Nant Stwc. As Jones points out, the wide section, straight alignment, and common use of blasting seen in the Penguelan East shows no similarities at all with 1700's method and technology – short of the whole level having been completely altered along its 220 m length, I would have thought this more akin to a late 19th / early 20th century work.

It is interesting to speculate whether the area of old spoil tips referred to above (centring on SN 8110 7490), some of these still with the remains of small hand-dressing floors, the occasional anvil stone, plus a number of shallow square stone-lined buddles (in many respects similar to those found associated with the vast acreage of successive tips upon the Kingside Lode workings which lie some 500 m to the north) represent the lodes referred to as 'Silver Hill' by Rob Jones and worked by Waller in the 1700's. I tend to agree with Jones that the figure of 189 fathoms may well just be the aggregate of the various drivages – though clearly a fair amount of rock, and one would also presume ore (gauged by the volume of mineral dressed) was extracted. Most of these workings clearly pre-date 1847, whilst some may credibly be early 18th century. Our 1990 survey has identified at least 10 adits within this general area, an area which extends over several hectares of slope lying in between the 250 and 325 m contours, one since cut by two much later 19th century mining leats.

Smyth's plan also shows what may be the original Penguelan Adit entrance on the north side of the valley road (SN 80957485). This can now be equated with a hollow in the bank immediately to the right of the present lay-by. The present path up Copa Hill passes immediately above its collapsed entrance. The recently timbered adit dug out some years back by the Aberystwyth Caving Club was presumably therefore a post-1847 short crosscut driven to meet the earlier level, perhaps after the original portal had collapsed. I agree that it would be interesting to know the origins of the Penguelan Mine – indeed whether this also began as an 18th century or still earlier work.

37. Comet Lode Opencast – the earliest prehistoric dates.

A small re-investigation of work previously carried out here in 1994 and 1999 was undertaken by the Early Mines Research Group in March 2003. This focussed on the dating

of what appeared to be the first part of the Early Bronze Age mine to be worked – a number of clearly weathered spoil horizons found lying beneath the very base of the grassed-over Lateral Spoil Tip adjacent to the south side of the opencut. Charcoal recovered from these had previously supplied some strange and rather anomalous radiocarbon dates well in excess of 4000 years old with which the remains of burnt rock, small hammer-stone spalls, decayed antler and crushed copper and lead ores seemed to be intimately associated.

The careful re-excavation and micro-sampling of this site has since showed clear evidence for at least two earlier phases of small-scale prospection at the beginnings of the exploitation of this up-standing ankerite/quartz lode outcrop. At the base of these thin spoil horizons lay a several centimetre thick layer of tree root-holes and charcoal; the latter representing perhaps a still earlier vegetation clearance of the hillside. The depth of oxidation and weathering of these basal spoil layers, plus the evidence for shallow turf formation in between, suggested several significant periods of abandonment of the site in between the first tentative surface prospection(s) or mining of the lode. Well contextualized charcoal fragments from each of these individual horizons are to be submitted for AMS C14 dating. It is to be hoped that some meaningful and potentially more accurate dates for the very earliest mining levels will soon be forthcoming.

38. Roman (1st-2nd century AD) and Early Medieval lead smelting boles on Banc Tynddol, near Penguelan, Cwmysywyth.

The most recent dating evidence from the site(s) of the lead bole hearths reported on in Newsletter No. 48 have, in true form, proved to be something of a revelation.

The type (i), a now completely destroyed dry-stone walled surround hearth constructed above the former turf-line, did as anticipated return an Early Medieval C14 date associated with a small lead runnel channel immediately beneath, yet this was still much earlier than expected (1060+/- 40 BP; Cal AD 880 to 1020), and clearly pre-Cistercian in age. The lower hearth site referred to (type (ii) a primitive clay-lined and stone bonded pit bole scooped out of the side of one of the exposed ridges facing the prevailing westerly winds) was in many ways the most interesting and best preserved of the two. In March 2004 the line of a 'channel' extending some 8 metres downslope of the entrance of this hearth was excavated to reveal a network of braided 'runnels' which appeared to be the routes followed by molten metal overspilling from the base of the hearth. Lead had clearly been collected and removed from these, though no casting pit was visible below; suggesting that the thin metal had simply frozen and then been plucked from the turf and rolled-up. Some fragments of lead remained, in one place sealed under a bed of wood charcoal. A sample of this has since returned the early Roman or Romano-British date (1920+/-70 BP; Cal BC 55 to AD 245). The difference in the date between the two examples of bole hearth excavated makes considerably more sense given their completely different design, location and presumably mode of operation. Both represent small-scale, perhaps even experimental operations, perhaps related to assaying the quality of the metal, or perhaps even for further examination of its silver content. Perhaps only a few tons of ore were ever smelted at this spot. Further smelting does seem to have been carried out at the beginning of the Cistercian period (12th-13th century AD), as attested by the earlier archaeological sampling and dating of a charcoal bed associated with a hearth site which lay some 10-15 m to the west.

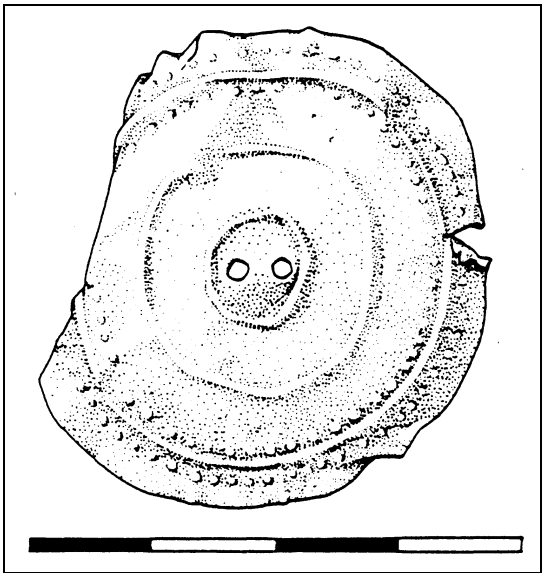
The evidence for Roman lead smelting here is particularly interesting in respect of the conjectured Roman mining activity on Copa Hill (Hughes 1981) and the suggested

provenance of Roman lead artefacts found at Trawscoed Roman Fort (S.J.S. Hughes 1981 MA Thesis, and subsequent reference in J. Davies in the Cardiganshire County History). Recent geochemical analysis of peat cores taken from the top of Copa Hill also show a significant local lead peak during the Roman period which would seem to support the suggestion that lead ores were being mined as well as smelted somewhere within the vicinity.

The account of the above excavations (2002-2003) has just been published in *Archaeology in Wales 42.*

39. The Banc Tynddol gold disc

Though not necessarily related to the early evidence for mining at Cwmystwyth, the discovery in October 2002 of this Copper Age / Early Bronze age gold 'sun disc' within a Beaker period grave lying beneath one of the Medieval bole hearths was a piece of serendipity – given the rarity and importance of these artefacts. Only a handful of such objects have ever been found in Britain, and this is the first such find in Wales. Made sometime between 2500-2100 BC, this is probably amongst the earliest of gold or metal objects manufactured. Beaten from cold-annealed gold to the thickness of a foil, this was then cut and impressed with a repoussé ornament of concentric circles and punched dots, then perforated for attachment to a garment, perhaps a tunic, cloak or burial shroud. The composition of the metal is approx. 94% gold and 7% silver (natural 'electrum'), purer than most later Bronze Age/Iron Age gold objects, though the origin of the metal itself is unknown. Future investigations will no doubt focus on this question – Ireland is most likely, but of course Wales, Scotland or even the continent are a possibility.



Banc Tynddol Gold Disc – Scale in cm

The declaration of the find as Treasure under the new Portable Antiquities legislation proved to be a long drawn-out process, involving two court hearings and a considerable amount of national press and media coverage. However, following the decision of the Coroner in Aberystwyth on 17th December the object has been returned to the National Museum in Cardiff to await final valuation at the British Museum. The landowner, Mrs. Mary Raw, will receive up to 50% of the declared value of the disc – but as archaeologists, we will have to forfeit our half to the Crown. Still, it did help us to get a grant to go back and do some more archaeology – and we know a little more about lead smelting as a result !

The results of the above investigation into the earliest mining dates on the Comet Lode may yet provide us with a further link to this disc. If the dates for the grave and the mine really are comparable, then the location of this Beaker burial at the very foot of Copa Hill, within

sight of the mine, and within a valley largely devoid of other associated burial monuments, seems a coincidence indeed ! We await developments.

Simon Timberlake – Above four articles

40. Flotation – In response to George Hall's comments in the last N/L, Item 12…

I'm rather wary of using the term 'invention' in respect of flotation. The first documented discovery of the property of oils in the separation of minerals was in the 1880s – Carrie Everson patented the process in the USA in 1885 but financial constraints prevented her from developing the process commercially. Certainly the Elmores made significant developments at Glasdir but it was the experimentation by various people in Australia, in Melbourne and Broken Hill, later combined with American-led management, which brought flotation to the point where it was a commercially effective process. I doubt whether marginal copper deposits in North Wales would ever have provided the incentive to fully develop the process. It took the ever-growing 'mountains' of zinc rich tailings at Broken Hill and the prospect of commercial failure for the world's largest / richest known lead/zinc/silver deposit to provide that incentive. And the process changed the face of mining, probably the most important development of the modern period, allowing the exploitation of massive low-grade deposits. In the process, of course, it also spelt the end of non-ferrous metal mining in Wales.

For those interested, the best account of flotation is an article by Jeremy Mouat, 'The Development of the flotation process: technological change and the genesis of modern mining, 1898-1911', in the Australian Economic History Review, XXXVI, 1 (March 1996), 3-31. Not surprisingly, given the rapid development of the Broken Hill deposits during the 20th century, little survives of the early flotation plants in Australia – just the Broken Hill South Mine's mill from 1908/20, of which only the ore hoppers are original, on what is now Consolidated Broken Hill's consolidated lease and in an area where there are prospects of reworking to access new deposits in the near future. A complete mill, the Shenandoah-Dives (Mayflower) Mill originally constructed in 1929, has been preserved at Silverton in Colorado but the surviving features at Glasdir and Sygun provide us with possibly the best physical evidence for the early work on flotation.

Peter Claughton

41. Yet more on Flotation – Simon J.S. Hughes advises…

Whilst the Elmore's plant at Glasdir was a most important development, as George rightly points out, it was in fact the Mineral Separation Company who brought the process to fruition by incorporating many improvements and modifications which were developed to treat rebellious Australian ores. The Mineral Separation Company were drawn to the vast tailings heaps at Van Mine, probably in some sort of joint venture with Captain W.H. Paull (late of Goginan) and the name of E.A. Sulman as manager of Van Mines in 1902 is easily overlooked. At Van, the Mine Tailings Co. (a division of the Mineral Separation Co.) experimented with hot-brine leach-vats – the Delprat Process, but their costs exceeded the value of the product.

Just after the Great War, The Mineral Separation Company sold several of their 'Sub A' flotation cells to Bwlchglas Mine, but they provided no salvation to the dilemma of falling ore prices. I have often wondered if the cells supplied to Bwlchglas were scrapped by Thomas Ward or if they were moved to Penrhyngerwin Mine which only closed in 1940. The two MS Sub A cells which were installed in the 1947 mill at Frongoch by M.M.

Dandrick and survived until about 1970, may have been salvaged from the Penrhyngerwin Mill.

A précis of the Delprat process used at Van Mine is available in my article in *UK Journal of Mines & Minerals*, No.9, 1991, pages 16 to 26.

42. The battle of Lluest-y-carn

Queen Victoria's Golden Jubilee in 1887 gave rise to spontaneous public celebrations across the entire nation, commonly accompanied by the lighting of bonfires and beacons around which master and servant shared a hearty feast and imbibed copious volumes of alcoholic beverages.

At the Plynlimon Mine it was decided that the appropriate venue for a beacon and associated convivialities would be the summit of Pen Pumlumon-fawr. Not to be outdone, the staff of the Nantiago Mine decided on a rival happening on the summit of Pumlumon Arwystli, just over two kilometres to the east and in full view of the former. Peats were cut and wood was carted.

On the big night both events began well. Eventually the consumption of ale turned matters ribald and the idea was mooted in the Nantiago camp that bladder relief might be most usefully directed towards sousing the rival beacon on the skyline. Human nature being what it is, this stroke of genius also occurred in the Plynlimon camp. The bands of pre-emptive piddlers met about halfway between the fires, on Lluest-y-carn. A right royal punch-up ensued, honours roughly even, but many sore heads and bruised butts in the morning. Today they would go to a football match for similar sport.

David James – with thanks to the Bennett-Evans family at Sweet Lamb, below Nantiago.

43. Remember this ?

WMS Meet – Cwmystwyth, Sept. 1985. Photo credit; Mary Hyde

44. Cwm Mawr lead mine

A 'newly discovered' view of the Cwm Mawr lead mine,
thought to have been taken around 1912.
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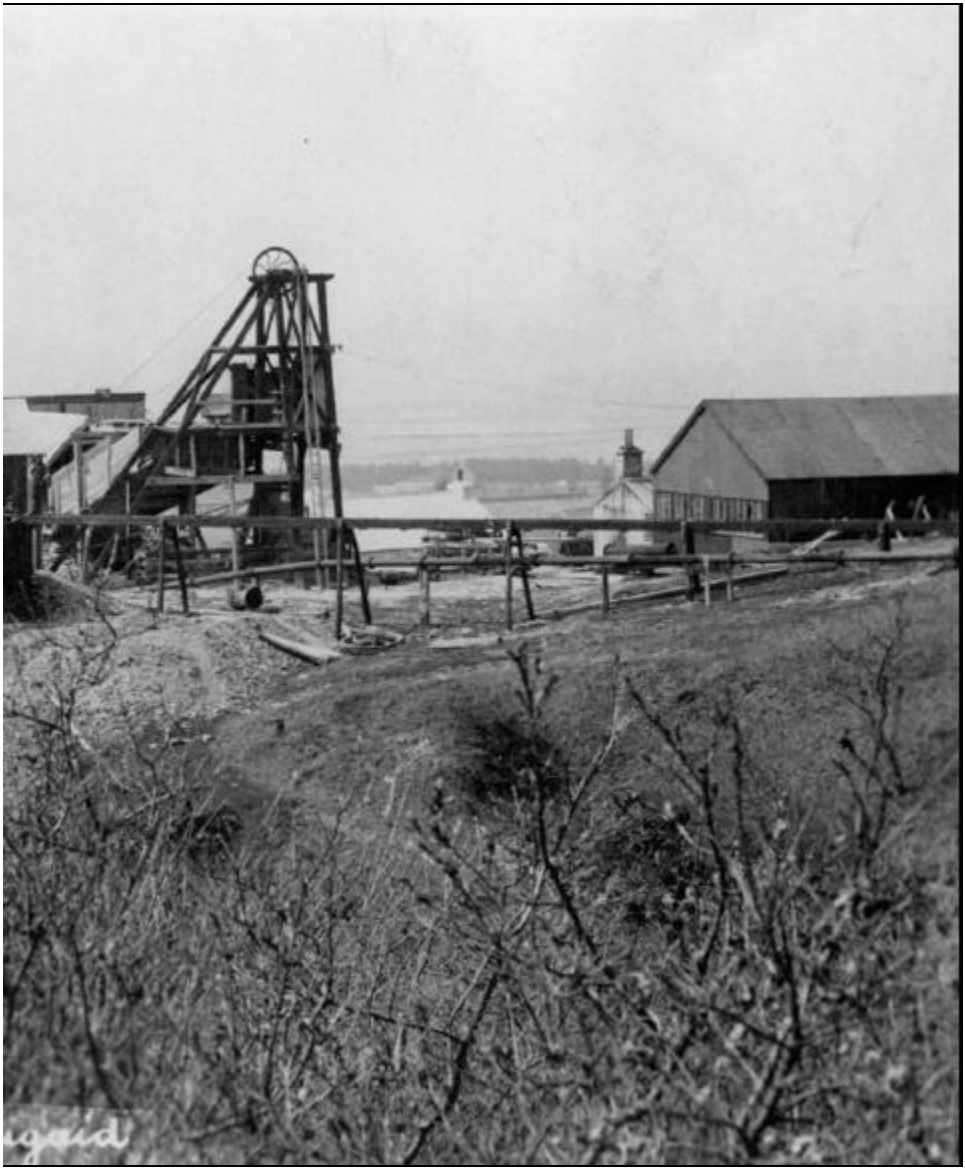
The above photograph, provided by Dennis Parkhouse, was originally published in *Archive* No.41, copies of which can be obtained direct from the publisher, £ 6.00 ea., post free. Write to; W.J.D. Parkhouse, 36 Bells Place, Coleford, GL16 8BX.



The headframe is over a shaft approximately 40 fathoms deep. The drainage adit, down the hillside, in the left background, (just above the village), was apparently used as the means of access into the mine by the miners.

45. Mining Rhymes

I enjoyed Neil Dickinson's poem (Item 39., last N/L) and it put me wonderfully in mind of one of W.H. Auden's. He was never more at home than exploring lead mines in his beloved Pennines, and wrote this when still a schoolboy. The mine was probably Rookhope :

> This is the place where man has laid his hand
> To tear from these dark hills his gold
> He found it not, they say, but left his brand
> Of greed upon the spot for all men to behold.
> I peered a moment down the open shaft
> Gloomy and black; I dropped a stone;
> A distant splash, a whispering, a laugh
> The icy hand of fear weighed heavy on the bone.
> I turned and travelled quickly down the track
> Which grass will cover by and by
> Down the lonely valley; once I looked back
> And saw a waste of stones against an angry sky. *– W.H. Auden*

It expresses sensations of foreboding, which I am sure most of us have had at one time or another. In his youth Auden wanted to be a mining engineer, and throughout his life returned to those windswept hills. Many more such poems came from his hand, and what a pity they have never been brought together and published.

David Bick

['W. H. Auden – Pennine Poet', by Alan Myers & Robert Forsythe, published by the North Pennines Heritage Trust, contains extracts from some of his poems which relate to mining. The book provides information on the places which Auden actually names, and those he is known to have visited. – Ed.]

Book Reviews & Bibliographical References to Welsh Mines & Mining

Due for Publication

46. Waller's *'Description of the Mines in Cardiganshire'*, 1704 (See also Item No. 33)

This book contains ten or a dozen, and sometimes more, plans of the mines, smelting mills etc, worked by the Mine Adventurers. It is now very rare, and I am hard at work on a facsimile edition to coincide with its tercentenary. Also will be added more scarcely known maps and plans, and other documentary material of the period, with ideas on interpretation and correlating the records with evidence still on the ground. The book will run to some 60 pages in large format (8" x 10") to do justice to the original drawings. With any luck, it will be published in the summer or autumn, and I shall be suggesting that the WMPT/WMS have a meeting at Esgairhir before long, where it all began over 300 years ago.

David Bick

Book Reviews

47. 'The Old Copper Mines of Snowdonia' – I was grateful to Simon Hughes for his kind remarks about the third edition, (Item 32, last N/L), and somewhat amused to learn that one reviewer has complained there was no mention of Parys Mountain. Since when has Parys Mountain been in Snowdonia ?

In another review, it appears I have not said enough about the geology; but the book is about the mines, not the geology. When will these people understand that you can only criticize a man for what he has said, not for what he never intended to say in the first place.

David Bick

48. 'Pembrokeshire - The Forgotten Coalfield', M.R. Connop-Price, 256pp. & 64pl., SB, £ 17.95 Landmark Publishing, ISBN 1 84306 094 9 **www.landmarkpublishing.co.uk**

This scholarly work admirably achieves its intention to 'provide an overview of the long history of coalmining in Pembrokeshire' yet remains highly readable. It is very well referenced, (and lists a thorough bibliography) paving the way for further studies. As would be expected, much content covers the infrastructure and economics rather than history of any specific colliery or group of workings.

I personally welcomed this publication, having lived within the area of the coalfield for six years, and hence spent quite some time exploring the surface remains (with occasional underground excursions) mainly in the Freystrop & Hook area. Prior to this publication there has been no attempt to produce a comprehensive review of the history of the entire coalfield.

After describing the geological complexities and how they affect the occurrence of coal in the County, it provides an overview of the development of the coalfield since early times, namely the 13th century until the last colliery (Hook) closed in 1951. (Although I've heard of locals extracting coal in the 1980's !)

Much information (particularly on working methods and social aspects) has been obtained 'first hand' from those who previously worked in the coalfield – I learnt that the Timber Vein, which ran through the back garden of my cottage, where it had been worked from surface, was apparently so called because of the poor roof above the seam and hence large amounts of timber needed to support it.

The book covers transport in great depth, indicating one of the Author's other passions – railways.

Despite several photographs of remains of colliery buildings and the likes (although not a single underground shot – I have not seen a contemporary one, but some workings are still accessible), the book leaves much of the I.A. unrecorded, which like in many areas is slowly being removed, leaving it wide open for much further detailed study.

There are a few typos & odd 'anomalies' such as Fig. 35 being located between Fig. 37 & Fig. 38, a few pages away from the text which refers to it, similarly, Figs 18 & 19 are stated as being on pages 66 & 67 respectively, when in fact they're on 65 & 66 ! These minor issues detract little from the general readability of the work, as this book is a must if you've even the slightest interest in this little known 'corner' of the south Wales coalfied.

49. 'The Archaeology of the Welsh Uplands' edited by David Browne & Stephen Hughes. Published by RCAHMW, ISBN 1-871184-26-6, soft covers with thermal binding, 149 pages & approx. 150 photographs. £ 15.00

A delightful volume, although flimsily bound, of high quality photographs from the Royal Commission's own collection. The aerial views of Copper Hill, Craig y Mwyn and Esgair Mwyn are quite breathtaking and there is a broad portfolio of more traditional archaeology as well as that of recent slate, coal and ironstone working. Unfortunately parts of the text reads like a rather badly written school geography book and continually quotes banal statistics, like '80% of all mines lie at an altitude of over 200 metres', or that '80% of the mines produced less than 100 tons of concentrate'. It is quite obvious that they have a new database in which

the RCAHMW claim to have logged every mine and trial in the country, this is not so. Whilst it would have been better if it was written in plain English, the photographs more than compensate for the text. I looked for details of the photographers, film type and which cameras were used but none were included, I'm sure that other readers would have appreciated some technical notes. The seven page bibliography and eight page index are well constructed *[unlike the binding ! – Ed.]* and are useful additions. The binding is a seriously bad flaw and my copy actually fell to bits in the shop, it was evidently not the first time that this had happened ! *[Mine has just begun to do the same, after only a handful of glances through its visually rich content. – Ed.]*

50. 'Excavations of Copa Hill, Cwmystwyth' (1986 – 1999) by Simon Timberlake et al., published by Archaeopress as BAR #348, ISBN 1-84171-486-0. 127 pages, 101 figures and five plates, soft covers with thermal binding. £ 29.00

If you have an archaeology degree than this is probably the best account that you will find about the Early Bronze Age mine on Copper Hill but this report is so technical and academically orientated that most people will barely recognise it as English. A Latin dictionary will help in many instances. There has even been correspondence in this journal regarding the misuse of prospection instead of prospecting, and I fear that there is a danger of this spreading – we will end up with prospectors being 'mineral prospection operatives' !

The publishers are not the distributors, this is left to Hadrian Books who refuse to give a proper trade discount resulting in this volume not being stocked by most bookshops. Whilst the quality of the drawings is very good, most of the photographs are well below standard for a volume at this price, the colour plates have a yellow tinge and are well below what could have been achieved with an old colour copier. It also carries a rather steep price tag which will be a great impediment to general 'over the counter' sales but is unlikely to influence the University Librarians which is where the greatest demand will lie. A guide to all the ancient mines of Wales written in a more popular style would fill a current void in the market.

Simon J.S. Hughes – Above two reviews

Bibliographical References to Mining in Wales

51. 'Below' – Quarterly Journal of the Shropshire Caving & Mining Club, No. 2003.4

p. 9 'Dinas Mawddwy 28th September 2003', Ian Cooper.

p.13 'Cwt-y-Bugail slate quarry Traction engine remains', Ian Cooper. Details the history of the engine and the recent removal of its remains for restoration. (See also Item 30, last N/L.)

52. 'Gathering the Jewels' – Deepjoy ! This web site **www.gtj.org.uk** *['The website for Welsh Cultural History']* is full of interesting old photographs, wonderful aerial views of lead mines, slate quarries etc. and much, much more. You MUST have a look. *J.A. Knight*

Miscellaneous

53. The WMS Newsletter & Website – Trials, Tribulations and Statistics….

(or 'Your Editor & Webmaster Rambles'…!)

Well, English was my weakest subject at school. I proudly achieved an 'Unclassified', (i.e. less than 12%), in English Literature – I am a qualified Engineer after all, so it's not impossible that I managed to spell my name incorrectly ! So why do I do it ? Well, it's never too late to learn, and the best way of learning is by doing, so with dictionary, 'English Made

Simple' to hand and a strong pot of fresh coffee to get me into the wee small hours, one sets to on yet another 'Newsletter'.

It typically takes me 40 to 60 hours to pull together, unbelievable I know, but articles and information received for submission usually has me rummaging through maps to check NGRs and other reference material to ensure information is fairly close to the truth. Graphics are particularly time consuming, especially when I'm supplied with a dog-eared photocopy which can take many hours to make legible and presentable.

Over half of the written material is received in hard-copy, which is then scanned, OCR'd, and checked through. All text is converted to a 'standard' format, and items juggled around to keep graphics and titles etc. with the relevant text. An electronic copy of the document is proof read by David Roe, (but errors have still been known to creep through !), and finally a hardcopy 'master' is printed which I mail through to David which he takes direct to the local copy shop for reproduction. After which he laboriously inserts the printed Newsletters into hundreds of envelopes, sorts out the labels, postage etc., before putting then into the hands of the Royal Mail for distribution.

So, what does Bronwen Dog think about all this ? Well, not a lot ! Walks are executed at double speed for several evenings on the trot, (or worse still postponed !) papers become strewn about the floor – through which B.Dog is instructed to tip toe, lest she leaves so much as a paw print on material sent in – and I become increasingly tired and in need of a break !

So, I took this task on nearly five years ago, and in the ten Newsletters I've edited and issued 267 pages of material – the previous forty Newsletters (twenty years' worth) produced only 244 pages – (of course quantity is no indicator of quality !) so quite where we'll be after the next ten issues is anybody's guess !

Keeping the web site up to date isn't particularly onerous, as I've the relevant info to hand – if you've not yet visited it take a look : **www.welshmines.org** Here you'll find details of future (and previous) WMS meets, including field notes and evening meal menus for download, which tend to be posted here long before they arrive on your doorstep !

As the Newsletter only seems to get bigger – not smaller ! – if there are any members our there who would be interested in helping out with editorial duties, (access to e-mail would be required) please do drop me a line : **editor@welshmines.org**

54. Feffryn Chwarelwr (Quarryman's Favourite) – A recipe for a quarryman's dessert. Many traditional dishes evolve from workpeople's need for portable food to eat at their workplace. Cornish pasties are one example. This was apparently popular with the slate quarrymen of North Wales :

1 lb. / 450g flour	1/2 lb. / 225g lard
1/2 lb. / 225g currants	1/4 lb. / 125g sugar
Pinch of salt	Few dabs of butter

Make pastry with the flour, lard and salt. Divide into two, roll out fairly thinly and cover a large oven plate with one half. Spread the currants evenly over the pastry, dot with butter and sprinkle with sugar. Cover with the rest of the pastry, seal the edges, cut air holes in the top and brush with milk and egg. Cook to a golden brown (425 F, Gas 7, 220 C). Mmmmm !

Bronwen Dog (From Barnardo's 'West Wales Recipe Book', 1989)

'Tailings'

WMS e-mail Discussion Group – This has been set up for the exclusive use of WMS members, mainly for the communication of WMS matters outside of the Newsletter – you'll hear it first there ! Details of how to signup can be found on the WMS website :

http://www.welshmines.org

Acknowledgements – Many thanks to all those who have provided me with contributions and feedback for the newsletter. Note that all items are credited to the contributor, unless submitted by your editor or his dog !

All contributions welcome – see note (below) about format. Absolutely 'any' field reports/ notes, or news item from the local paper, T.V., radio or 'heard down the pub' are sought. Without these the Newsletter would cease to exist, so please don't stop sending them in !

Mike Munro & Bronwen Dog 🐾

***Welsh Mines Society* Membership** – Annual membership:

Due to the increasing expense of insurance the following options are now available :

'Newsletter Subscription' only : £ 4.00 per year (or to ease administration, £ 8.00 for two years). For this princely sum, you will receive two Newsletters per year, packed with current information on mining history, predominantly in Wales. You will also be entitled to attend any **indoor** social meets held by the Society.

'Overground WMS Membership' only : £ 10.00 per year. In addition to the above you will be insured to participate in the weekend field meets organised by the Society, but will be restricted to surface activities unless covered by BCA Insurance via another club.

'Underground WMS Membership' : £ 22.00 per year. In addition to the above you will be entitled to participate in any underground activities organised by the Society.

For full details of the British Caving Association insurance cover provided within the above two levels of WMS Membership visit the BCA web site at :

www.british-caving.org.uk/bca/insurance/insurance.htm

The paid-up date of your subscription is shown on your address label – on the envelope you've just thrown in the bin !! If you are 'paid up to DEC 2003' or earlier, then the date will **be highlighted in red** indicating your subs are now due, and your Treasurer, David Roe (address on front page), would be most grateful if you could pay promptly. Failure to do so will result in cancellation of your Membership / Newsletter subscription.

Copydate for the Winter Newsletter, **15th September 2004**, publication due October-ish ! (Please be prompt – the sooner I get the material, the sooner I can 'go to press' !) Articles, preferably typewritten, and ideally in electronic form, (MS Word 97 or Plain Text format) should be sent (on a 3.5" disk) to Mike Munro (address on front page) or by e-mail to **editor@welshmines.org**

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