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JOURNAL OF THE GREAT ORME EXPLORATION SOCIETY

1992 (1)

LLANDUDNO

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Front Cover: Phil Smith in Higher Shaft. The block in the photograph is a small example of the blocks which now obstruct the shaft at about 100 foot in this faulted area of the Old Mine. Photo Don Smith, November 1991.

NEWS ROUNDUP

Higher Shaft: Congratulations to Phil & Mat on finding Higher Shaft. When surveyed, the shaft's position was the same as that projected from the survey of the Penmorfa level onto surface, ie exactly where we thought it was all along; SH 77048319, just south of the road. En route to the shaft an area of very old working was noted with ample charcoal to be sampled in the future for C^{14} dating. On brief examination of this site there was an absence of stone or bone tools, in contrast to the Vivian's workings.

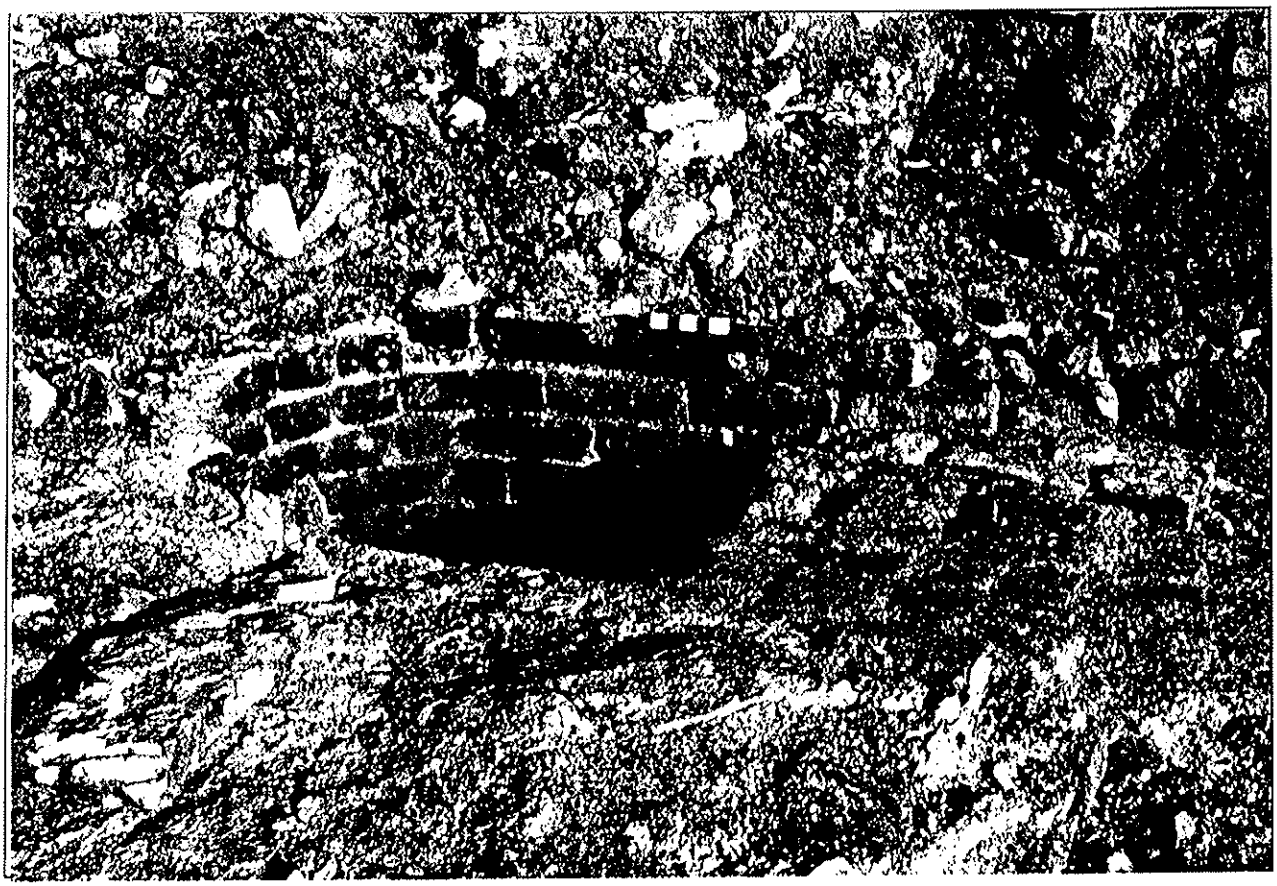
Coniston: The Society had a successful trip to Coniston in late October 91 which was attended by Bob Bainbridge, John Bowen, Geoff David, Tony Davies, Ian Norman, Edric Roberts, Steve Lea and Erik the Viking. They lodged at the 'Black Bull' and were met there by Peter Flemming from CATMHS who told the group of the itinerary arranged for the following day. On Saturday morning Peter took the gladiators (Tony, Ian, Bob, Erik and Steve) on a through trip while Edric, Geoff and John followed Alistair Cameron on a less arduous route into Blue Passage and Pool, Avalanche slope and Hospital level. The two groups did the ascent to Levers Water in company before going their respective ways and the gladiators were not seen for some hours afterwards. On the Sunday morning, near the Levers Water site, Edric and Geoff discovered three mortar stones which have not previously been described in the area. In which period they were used is impossible to say. The Mines Royal Society were active in this area from the Elizabethan period onwards so they might be 'modern'. However, further investigation might reveal evidence of an older period of mining activity.

A Coniston mortar stone. Photo Edric Roberts

Penmorfa trip: On December 30th last year the winze below the Ice Bridge was surveyed. The rim of the winze appears to be 5.9 metres east and 37.4 metres south of the break-through, elevation 15.4 metres. It is filled 9.3 metres below the

rim and in view of its zig-zag nature is probably an ore shute.

The Old Mine Engine House: Recent excavations on the high ground north-east of Vivian's shaft have unearthed the base of the boiler house chimney, its flue and some of the foundations of a building which could be either the engine house or the boiler house. Much of this site is still covered by soil, cinders and dressed stone and as yet no artifacts of interest have been found. In the next few months this site will be excavated and surveyed.



The chimney flue, scale = 6 inches Photo, Don Smith

A little lower down the slope a stone lined duct has been exposed by the JCB. It may have directed water down to the Ty Gwyn engines but it too will be excavated in due course. At the bottom of the slope south of the chimney an old retaining wall has been exposed which for many years has been completely buried by 10 feet or more of mine spoil.

Cave Rescue: On January 19th Nick Jowett, Tony Davies and Don Smith attended a North Wales Cave Rescue training session at Ogof Hesp Alyn. The problems of extricating a casualty from underground are considerable and I would encourage members to attend a future training session if they get the opportunity. The plan for this year is as follows: April; First Aid, date to be set, Acrefair: June 14, Techniques & BBQ, Llangollen SJ 235433: October 18, Underground practice,

Snowdonia, RV to be announced.

Captain William Vivian: No sooner was 'On the trail of William Vivian' in print (J.GOES 91(2);8-9) than I heard good news from those returning triumphant from their trip to Coniston. In Eric Holland's book, 'Coniston Copper', a Captain Vivian (first name not specified) was said to be working for the Taylors at the West Caradon Mine, Cornwall, in 1865 and had written a report for one of the Coniston mines. Tony has written to the author to get more details and manuscript references so we can expect a progress report at some stage.

New **Authors:** I am glad to see contributions from new authors, well done. In addition to articles, suitable letters to the editor will be published, so let's hear from some more of you.

Republication: 'The Industrial Revolution in North Wales' and 'A History of Caernarvonshire' by A.H. Dodd, having been out of print for some time, have been republished by Bridge Books of Wrexham at £14.95 each. Clwyd Books have some copies and can order more at about two weeks notice. Pennant's Tours has also been republished by Bridge Books as a limited edition, price unknown.

LETTERS TO THE EDITOR

NORTH WEST PASSAGE

They seek it here, they seek it there, they seek that passage everywhere,
Is it above or below Marine Drive, H.T. could tell whilst still alive.
But Mostyn claims and other's greed, ensures that he will not concede:
The tunnel leads from north to west, but to find it requires patience and zest.
H.T. is aware of the doubts that exist, of the claims, he's a "Lyre" on many a list,
But sceptics cause him no loss of sleep, he wishes he was fit for another peep,
The passage, the lake, the chest are all there, for others to find and the truth to bare.

Huw Tudno Williams

THE UMPIRE STRIKES BACK

The persistent wisecrack by Donald the quack,
Is now getting boring and stale,
Perhaps it is time that some Canada Dry,
Be mixed in to weaken his ale.
Sour grapes are a flaw in the make up of a man,
A character trait of a poor also ran,
There are persons still living who recall my spree,
So, go find the route and stop taking the "P".

The Prof, Between Asda Carpark and the Lighthouse, Floating postcode

the shaft was obstructed by a boulder choke. The shaft is perpendicular and has a square section, approximately 4m*4m.

I knew that on return to surface a certain individual would be miffed, all the more so because of the plaster-of-paris cast which prevented him verifying the find. Two weeks later a larger group, consisting of Dave Jenkins, Tony Davies, Danny Dutton, Mat Richardson, Don and Phil Smith, returned and surveyed the route from Higher Shaft back to Owen's shaft. Feeling somewhat mischievous I brought the party along the scenic, indirect route, as we progressed towards Higher Shaft. Dave Jenkins was well impressed with the flat, which he thought was very old, the windlass and the abundance of splendid azurite crystals and nodules we found on the way to the shaft. All were convinced that Higher shaft had indeed been found.

Having demonstrated the discoveries I, with Mat and Danny, headed for surface, leaving the remainder to survey the system on their way out. Being devious and fleet of foot I was tackled up and half way up the rope before Mat and Danny reached Owen's shaft. This, you might think, is it for now, until I stumble across something new and unexplored. But I don't stumble, everything is strategically planned in our office at the King's Head, where many a great plan has been hatched. This was just to whet your appetite, for following a recent office meeting I have a plan, 'An Incredible Plan'.

Phil Smith

The windlass 33m west, 48m north of Higher shaft. Photo Don Smith

SUBSCRIBERS TO MINERALOGIA CORNUBIENSIS

Mineralogia Cornubiensis written by William Pryce of Redruth, Cornwall, was published in 1778, and, like many books of its time, most of the copies printed were subscribed for prior to publication. Its full title is: **MINERALOGIA CORNUBIENSIS;** A TREATISE ON MINERALS, MINES AND MINING: Containing the theory and natural history of strata, fissures, and lodes, with the methods of discovering and working of Tin, Copper, and Lead mines, and of cleansing and metalizing their products; shewing each particular process for dressing, assaying, and smelting of ores. To which is added, an explanation of the terms and idioms of miners. Printed London MDCCLXXVIII. It is a landmark work and often quoted.

The majority of the subscribers are from Cornwall and Devon, but among the list there are the notables of the day, James Watt, Matthew Boulton, James Smeaton, Sir Herbert Mackworth as well as the big companies such as the Mines Royal Society and the English Copper Company. A number came from Ireland and there was even one from the Empire of Russia. Perhaps what is more interesting to the society are the subscribers from North Wales. The majority are from Flintshire and some are already known to us 'tourists' or shareholders in the Llandudno Mines.

Thomas Pennant of Downing, Flintshire, is known to have come our way on at least one occasion and mentions the mines in his Tours. He was an avid bookworm and spent a great deal of time burrowing, and borrowing, in the libraries of the local gentry. He also wrote quite a number of books in addition to his famous tours. I understand the Downing library was quite substantial was not broken up for some time after his death.

His associate, Paul Panton junior of Plas Gwyn, Anglesey, was also a subscriber but to our knowledge he did not visit the mine with Thomas Pennant at any time. Thomas Pennant had interests in the lead and coal mines of Flintshire so Paul Panton may have had similar interests. In the mid-nineteenth century the Swansea Vivians married into the Plas Gwyn house, however this was the military side of the family rather than the smelting firm.

Francis Smedley of Bagillt Hall, and Henry Steeple of Holywell subscribed for a copy each, though not the third partner, Anthony Steeple, with whom they leased the New Mine in 1761 (21 years), some 17 years before the book was published. Francis Smedley had other mineral interests in Flintshire with lead and eventually went bankrupt. It is possible the bankruptcy was a factor in the viability of their Llandudno venture though at present its data is not known.

Among the others from Flintshire are John Denman of Holywell and Richard Hill Waring of Leeswood (Mold?). In Caernarvonshire are listed Joseph Williams Esq of Glanravon and the Reverend Rayle of Gwedir (Gwydir?), and in Beaumaris, Anglesey, John Flemming. Curiously, there was no subscriber from Denbighshire.

Don Smith, November 1991

MERIONETH GOLD

The Prince Edward Gold Mine near Trawsfynedd is the most northerly in the Merioneth gold belt and was visited during a recent field trip. Previously known as the Welcome Hill, it is said to have opened in 1891 and exploited auriferous quartz veins that occur in the Harlech Dome.

Gold was found but in common with other mines, occurred in small but highly productive pockets, and sometimes assayed at 100 oz to the tonne. Experience in other mines, and no doubt the Prince Edward Mine, showed these small gold pockets sometime occurred where the quartz veins cut the black Cambrian shale beds. If the mechanism of the gold genesis in the area could be fully understood then this might lead to pinpointing productive ground.

Some recent work might just explain some aspects of the occurrence of gold in Merioneth[1]. Hot aqueous fluids circulated in the area due to underlying hot igneous rocks. The quartz veins seen now are the pathways along which the fluid circulated and deposited the quartz and minerals containing copper, iron, lead and zinc. It is known that these metals are transported and deposited under certain chemical and physical conditions, but gold has always presented difficulty in finding a transport model.

Sulphide complexes are now thought to be responsible for transporting the usually insoluble and inert gold. Deposition of metallic gold could occur if organic material in the surrounding rocks reacted with the sulphide to liberate methane. This mechanism could explain the occurrence of the gold in the areas where the vein cuts the shales which are known to contain organic material.

The unpredictable nature of the gold occurrence has been responsible for the boom and bust character of many Merioneth gold mines. The discovery of rich bunches of ore would lead to a boom, but unfortunately, this all too often proved to be short lived as the spectacularly rich ore quickly ran out.

The Prince Edward mine was small in comparison to Gwynfynedd and Clogau, and closed in 1931 as it proved difficult to remove the gold due to an excess of iron pyrites.

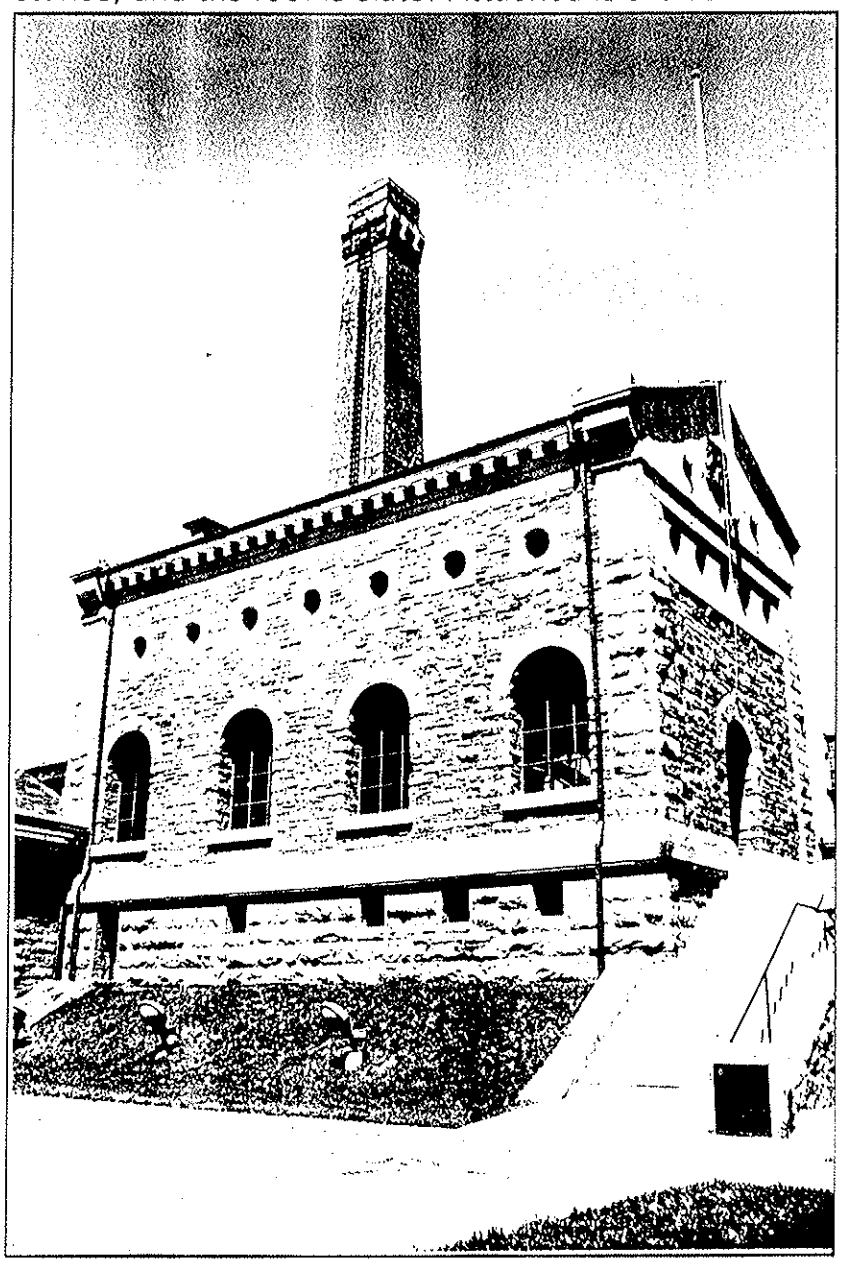
1 New Scientist No 1781 Mud and the Midas Touch

Dave Smith, November 1991

WOOLF BEAM ENGINES IN ONTARIO

My curiosity was aroused when I read in the Toronto Star of a steam museum in Hamilton, on the shores of Lake Ontario. I turned to the Ontario Tourist Guide which confirmed there were two Gartshore engines in the old water pumping station, installed in 1859, but told me little more. Ontario was still in the grip of winter, but, when warmer days arrived, I paid Hamilton a visit.

The engine house is an imposing building with arched windows. The lower walls are of well dressed local limestone, topped with sandstone and limestone corner stones, and the roof is slate. Attached is the boiler house, now the exhibition hall, built in the same style, and across the yard is the large open shed, previously used to store the hard wood blocks and coal for the boilers.



The engine house

While I was waiting for the museum to open I began talking to the curator, Ian Kerr-Wilson, who told me the two engines were Woolf compound rotative engines, designed by Thomas Keefer, a much celebrated local engineer. He had modelled them on an engine working at the Thames Ditton water works, built by a James Simpson and Company of Pimlico. This company were well known for their steam engines which I believe they continued to produce into the beginning of this century.

The history behind the waterworks goes back to the 1850s when Hamilton was a rapidly growing Great Lakes

into reserve use. They last pumped water in 1938 and only escaped destruction because the construction had been so solid that the cost of demolition would have been too high. In addition, the waterworks remains on the same site and as the engineers had a soft spot for the engines they did some limited maintenance periodically.

The engines remain in public ownership (Corporation of the City of Hamilton) and have been opened to the public as the Museum of Steam and Technology. The engines and house were built to the highest specifications, are kept well and all the brightwork gleams, begging inspection. A good deal of restoration work was performed circa 1980 by volunteers, museum staff and power engineers but only one engine has been run on compressed air in recent years. At present, the museum staff are bringing both engines to demonstration standard, hopefully by later this year, and with the help of relevant professionals are tackling rising ground water which threatens the basement.

VITAL STATISTICS:

Engine type:	Woolf compound rotative engines
Power output:	100 HP at 30 psi and 15 spm; 200 HP at 70 psi and 15 spm.
Cylinders:	High pressure 24" diam & 72" stroke; Low pressure 42" diam & 96" stroke.
Boilers:	Four Cornish boilers each with 80 4" diam firetubes
Flywheel:	24′ diam, 22 tons.
Valve gear:	Cam operated double beat valves.
Linkage:	Watts parallel motion gear air and main pump rod.
Beams:	Twin plate cast iron, 30′ long, 14 tons.
Condenser:	Jet condenser immersed in a water tank.
Water pump:	30" diam, 48" stroke, bi-directional 2.6 million gallons each per day.
Duty:	Not known.

Don Smith

Published previously as the Hamilton Museum of Steam and Technology by the Trevithick Society 1990.

THE TY GWYN TRAMMING ADIT: BLOCKAGE No 1.

The following article is a brief account of the problems encountered and the solutions involved in clearing the first blockage in the Ty Gwyn adit. This blockage was situated 100 meters beyond the manhole through which entrance is gained. Both sides of the blockage could be reached and it was estimated to extend at roof level for about 10 feet and anything up to 30 feet at its base. It consisted of rocks the size of footballs down to golf ball sizes, mixed with a large quantity of fines and mud.

It was obvious upon inspection that there was a lot of loose rubble above roof level, and at the north west end, that the side of the shaft had collapsed outwards. As there was a theory that this was the bottom of a ventilation shaft extending up to surface, this rubble would have to be supported and a passage dug below it.

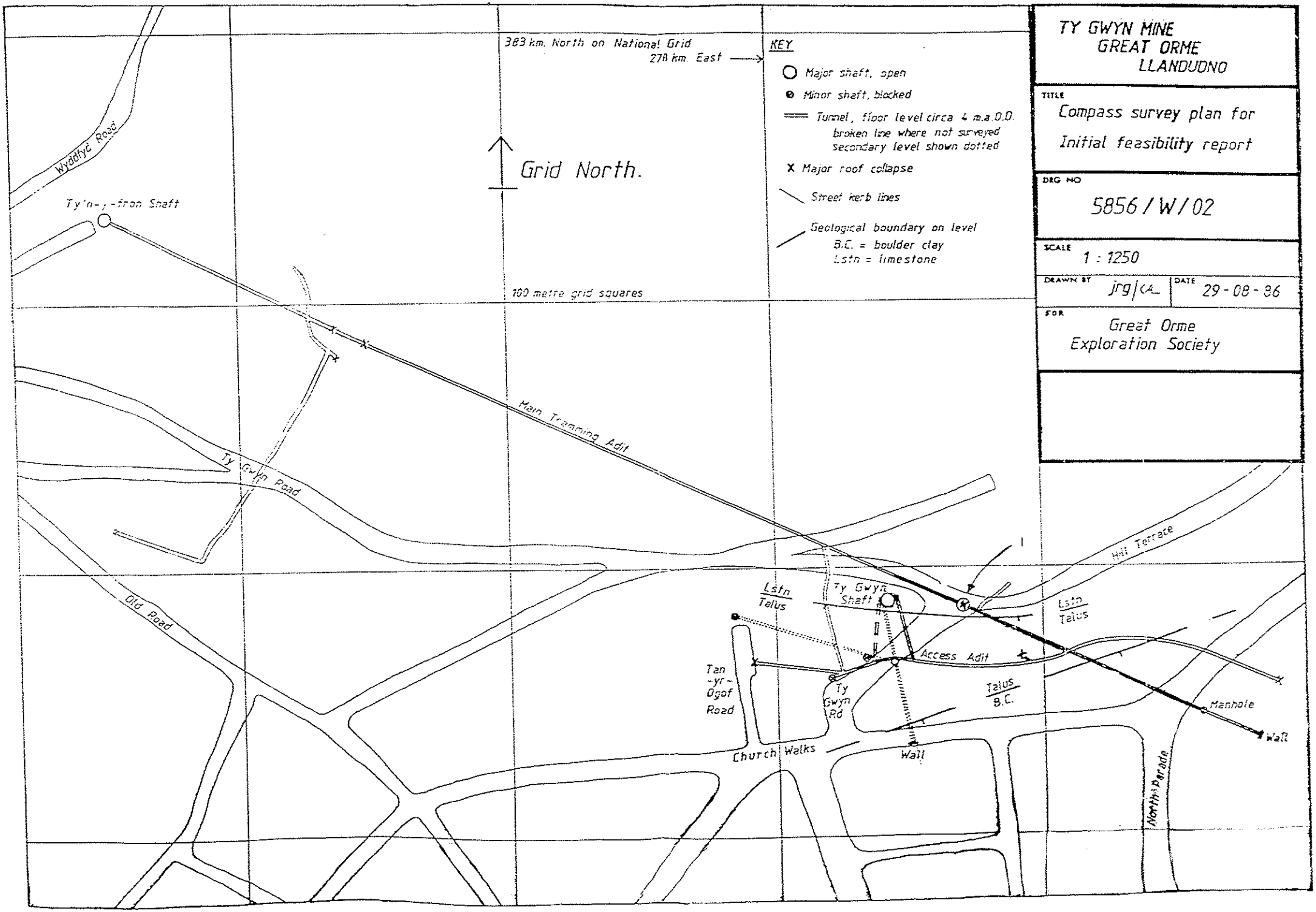
After some lengthy discussions it was decided to drive 1 inch solid steel bars through the blockage at as high a level as could be managed, and then, as long as the other ends could be found these would be supported on acrows to allow the dig to proceed underneath. So the dig started in earnest, and hard work it was too hammering those bars through, as quite often they would hit a large boulder and either stop or veer off to one side or the other.

Finally, after many weeks work, all the bars were hammered home with about a foot left protruding to allow the supports to be positioned. We then had the problem of finding the other ends so that the north-west side of the blockage could be supported before digging commenced. After scratching about for a while the ends of four out of the seven bars were found and steel scaffolding poles were slipped over them to bring the supports out into the adit and away from the collapse.

Digging now commenced and proceeded at a good pace over many weekends, all the spoil removed was bagged and stored in the blind passage just before the blockage with the larger boulders being built into a wall of deads. The spoil was bagged in order that it could then be easily transferred to another location at a later date for use as walling or to lay on the floor to allow access across the "muddy bits".

The digging progressed and extra acrows were used to support the roof as it was exposed, until finally one day a small hole appeared in the top right hand corner of the spoil, this was it, we had finally broken through. Not much else was done that day as celebrations were in order. So, tired, wet and dirty, yet jubilant, we all retired to the nearest pub for refreshments and discussions.

The work proceeded apace now that we saw light at the end of the tunnel so to speak (no apologies for the pun), and it was not long after this that there was room enough for, yes you've guessed, Billy to clamber through. From this point the actual clearance work was soon nearly complete and our thoughts could be turned toward how to affect a permanent solution and free the acrows for future use.



TY GWYN MINE
GREAT ORME
LLANDUDNO

TITLE
Compass survey plan for
Initial feasibility report

DRG NO
5856 / W / 02

SCALE
1 : 1250

DRAWN BY jrg/CA | DATE 29-08-86

FOR
Great Orme
Exploration Society

Above; Jacking up the roof supports. Below; the work nearing completion

By this time it was decided that the support structure we had built and underneath of which we walked would need to be strengthened and if possible raised as close as we could get it to the roof line before more permanent supports were installed.

A number of 9 inch wide steel channels were donated to the club and using the only two remaining acrows the first of these was raised up against the steel bars and tightened into place so releasing two more acrows to repeat the process. Eventually all the old wooden cross supports were removed and the project was beginning to take shape and look more presentable.

We still had the problem of how to raise the height and after trying to screw it higher using the acrows with no great success a portable 10 ton hydraulic jack was borrowed and little by little the channels were jacked up with the acrows being tightened up behind them. After a lot of hard work everything was as high as it was possible to get. Four lengths of heavy duty 5 inch by 3 inch "I" beam were purchased to be installed longitudinally as close to the side walls as possible. The borrowed hydraulic jack was again brought into use, this time to support a temporary "I" beam placed a foot out from the wall. This allowed the acrows to be lowered away from the channels and another section of beam to be lifted into place close in to the side and then re-supported with just two acrows.

This process was repeated until all four longitudinal beams were in position when the jack was utilised to level them as best as could be achieved. During this process we finally reached the limit of the jack, which gives an indication of the weight of rubble now being supported by the channels we had installed.

Due to this weight it was decided that eight uprights made from the same heavy duty "I" beam should be used as the final supports, each was measured individually and after purchase they were cut and plated top and bottom to the required lengths ready for installation. The final job was the placing of these uprights and that was achieved without too much difficulty by again using the jack to relieve the pressure on the acrows so they could be removed and replaced by the permanent supports. Until finally the project was complete!

This record of the progress of the clubs first major blockage clearance is as factual as it is possible to get without becoming too long winded. Credit must be given to all the club members who gave up their free time to get wet, dirty and tired during the project and they are to be congratulated on the effort put in and in the final appearance of the Ty Gwyn adit which is now passable all the way to the Tyn y Fron blockage a total distance of 465 metres.

Discussions will begin soon on what should be the next project to tackle, should it be the final Ty Gwyn blockage into the Tyn y Fron side of the mine, the Penmorfa ginging and mud slide or something else? I am open to suggestions but I am sure volunteers will soon be needed to get extremely wet, muddy and tired.

Tony Davies

A FAIR DAY'S WORK

During the first half of the nineteenth century conditions of employment were hard and ruthless. Wages were low, hours excessive, women and children were employed in mines, factories and sweatshops, and industrial accidents were commonplace. Yet, at this time, many metalliferous miners worked six hour shifts.

John Taylor and Sons, the mining engineers who had taken over management of the Old Mine expressed horror and disbelief when confronted with this practice at Llandudno in 1854. The Mine report reads:

".....that the miners had been allowed to start and leave work at any time they pleased, and to devote as little as six hours a day to their bargains in the mine.

So contrary was this system to any known to us (John Taylor and Sons) in any copper mine in Great Britain, or in any mine whatever where we are concerned, either as partners or as managers, that we decided at once to take decided stance against it, and to insist upon a full eight hours work 'per diem' which is customary in all well-regulated mines throughout the United Kingdom....."

As a result of this "stance", a year long strike resulted before the men were eventually 'prevailed upon' to accept eight hour shifts. The tone of the Taylor report seems to suggest that the practice was peculiar to the mines at Llandudno. This was not so. Similar strikes occurred at Mold lead mines in 1826, and at Holywell in 1850 when the Cornish mine-captains attempted to introduce eight hour shifts.

In 1891 the Welsh writer, Daniel Owen, refers to the practice in Flintshire. In his novel, 'Enoc Huws' he describes, in less than flattering terms, a common underground scene:

".....When the miners congregated for a smoke, something they often did, for they did not believe in overworking, and were all well aware of the verse, (which loses a great deal in translation)

"Six hours a day are enough,
For every dear miner,
To be between difficult rocks,
In smoky hazardous places."

....."

At the Talargoch lead mine in Meliden an attempt to introduce eight hour 'Cornish Shifts' resulted in strikes in 1852 and 1856. During the 1856 dispute troops were sent from Chester to guard the mine machinery and outside labour was employed to restart the engines. Nevertheless, despite eventually accepting many of the company's new conditions the six hour 'stems' persisted until 1872.

Nor was the six hour shift confined to the Welsh metalliferous mines. The lead miners of Durham and Northumberland appear to have enjoyed similar conditions and to have reacted angrily when attempts were made to introduce compulsory eight hour shifts. In 'The history of lead mining in the North East of England', Les Turnbull describes almost identical situations and reactions.

"Until the mid-nineteenth century there was no restriction upon the hours of work and most men appear to have worked between six and eight hours. However, in the 1840s the bargains of the Blackett-Beaumont Company begin to include the phrase, "agree to work five eight hour shifts per week". The attempts of Thomas Sopwith to enforce these hours was a major cause of the strike at Allenheads in 1849, one of the few industrial disputes in the history of lead mining in the northern dales."

In many area where metalliferous mining took place the miners were usually obliged to engage in other activities to maintain themselves. Copper mining in the Great Orme was in one sense a part-time activity. The miners also farmed and fished. Mining was often temporarily abandoned at harvest time and other busy times on the land. Availability of fish stocks would also influence attendance at the mines. It was this need to have time for other occupations which accounted for the intense opposition of any change in working hours. It could be said that the miners were far too busy to mine for more than six hours a day!

In Llandudno the changes were introduced as the copper industry edged towards decline, and the tourist industry slowly developed. The census returns for 1851 show a population of 1,130, 191 of whom were miners. By 1861 an increased population of 2,318 had only 69 miners. A great deal more than hours of work has changed for the copper miners of Llandudno.

"That's mining, it comes and goes."
(Anon)

Tom Parry, December 1991

EVENTS

NAMHO Field Meeting 27-29 June 1992, Shropshire. The meeting will be hosted by the Shropshire Caving and Mining Club at the Ironbridge Gorge Museum and promises to be very good indeed. The programme will include; workshops, seminars, surface and underground field trips and a Saturday evening P.U. Registration fee £5.00. Further information and booking forms will be available February 1992; please send an A5 SAE to: Adrian Pearce, 72 Hopkins Heath, Shawbirch, Telford, Shropshire, TF5 0LZ. Tel: 0952 253310.

Victorian **Extravaganza**: The Victorian Extravaganza is under new management. It seems likely that we will once again have the opportunity to provide an exhibition in the market hall which will be a good forum to present our aims and activities to the public. Perhaps we should take stock of our exhibition material before too long

so we can plan and prepare this year's exhibition.

Coniston 1992: CATMHS are hoping to visit the Great Orme in early April 1992. If a return trip to Coniston is planned by GOES for 1992 CATHMS would like to book a date soon as their programme is filling up.

Alderley Edge 1992: The Alderley Edge group plan to visit us in late February or early March.

Mining in the Isle of Mann, Rio Tinto, France and Mitterberg: As Geoff said in the Journal a few weeks ago, the Great Orme is not the only very old mine in Europe. Of course, not all are Bronze Age mines, some without a doubt were worked by the Romans. However, if the Romans were there, was anyone there before them? With this in mind, a raid across the border into England to take a dispassionate look at Llanymynerch (with SC&MC blessing), or even a pilgrimage further afield to the IOM or mainland Europe, might be worthwhile.

Events: Although I will try to promulgate events in the journal I can cover only the pre-planned events. As most of the weekday/end trips are arranged on an ad hoc basis, at several days notice or less, members are encouraged to attend the weekly meetings or contact Tony Davies if they want to know what is going on.

Meetings: Thursday evening, King's Head, Llandudno. **Monthly exped:** weekend following the 1st Thursday of the month. **Events Information:** Tony Davies 877960.

VISITORS

Academic: Dr David Jenkins (UCNW & EMRG) accompanied a GOES trip down Owen's Shaft in search of Higher Shaft on 03.11.91. A contingent of undergraduate and PhD student's from Dr Barbara Ottaway's department at Sheffield visited the Great Orme on 09.11.91. Dr Ottaway was unable to come but we may be seeing more of her students as they return to complete research projects.