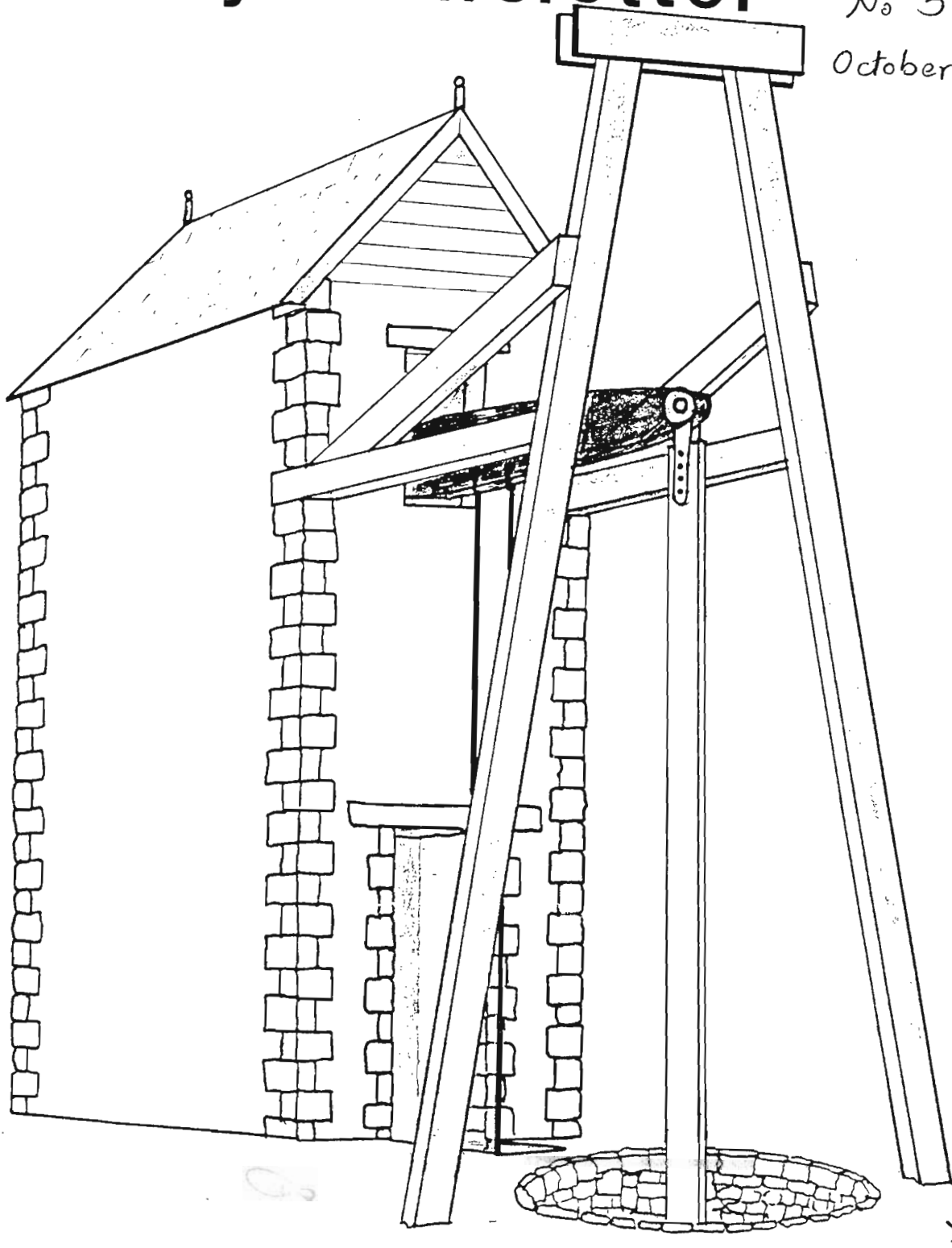


Great Orme Exploration



Society Newsletter

No 3
October 1988



**SIMS ENGINE HOUSE
TY GWYN**



Report of the activities of the Great Orme Exploration Society .

Background information

In 1985 a group of local Archaeologists , Historians and Cavers , who had been investigating the old copper mines for many years , formed the Great Orme Exploration Society and since then it has grown in size and capability . In addition to a comprehensive range of caving equipment we have recently been given a winch by Ashton Mining of Colwyn Bay and we anticipate that this will be very useful in handling heavy equipment and materials . A short book is nearing completion and is designed to be of interest to local people , visitors as well as those with a special interest . We have a number of well qualified members in the Society without whom we would be severely handicapped :

Civil Engineer	3	Geologist	3
Archaeologist	4	Historian	2
Doctor	1	Ambulance Man	1
Cliff Rescue Pers.	3	Outward Bound Instr.	1
Draughts'n/Cartog.	1	Mine surveyers	2
Comms. Engineers	2	Lifeboat Crew (ILB)	1

We have developed mutually helpful relationships with the undermentioned and hope to develop this cooperation further in the future :

Dept.of Archaeology , Bangor University
Gwynedd Archaeological Trust
Nature Conservancy Council
Llandudno Historical Society
British Museum
Ashton Mining

Ty Gwyn Mine Feasibility Study : Phase 1

It had long been known that the Ty Gwyn Mine occupied an area between the Happy Valley and Upper Mostyn Street . Local knowledge and a chance finding of the main trammig adit (MTA) during construction work near the pier gates some years ago made it possible to make an entrance via a shaft sunk 15 feet through the lawn close to the pier gates . The ginging lining the adit was breached and the shaft secured with concrete liners and a locking manhole cover .

CHAIRMAN	L. SMITH
SECRETARY	E.R.D ROBERTS
ASSISTANT SECRETARY	G.C. DAVID B.A
TREASURER	C.A. LEWIS B.Sc

The council will be aware of the report submitted by James Williamson, Consultant Engineers, but I shall summarise the findings so far. A sound main tramming adit leads into the mountain towards Tyn y Fron and is ginged for the first forty yards. Fifty yards from the entrance another adit crosses from the pier pavilion heading westward before returning to the main tramming adit 100 yards further on. This tunnel has been of vital importance as the main tramming adit is blocked between these two points.

The side tunnel leads past one of the 'Engine Shafts' formerly used for pumping and now called the Ty Gwyn Shaft. It is in a good condition with what appears to be a sound capping and still contains the pump rod with associated fend-offs underwater. In all probability the pumps remain intact but at an unknown depth.

The main tramming adit continues for a further 225 yards past the blockage but fails to reach Tyn y Fron because of an accumulation of glutinous clay. Continuity of the adit to Tyn y Fron has been confirmed and crosscut tunnels discovered but further investigation and surveys of this area are needed as they may lead into workings. The mine is dry and the air, when subjected to analysis, contained no explosive or noxious gases and the oxygen content was normal.

Costs

Survey	£ 681 81	Total	£ 881 98
Sand cement etc	£ 18 81	Less :	
Manhole & liners	£ 94 82	Grant from L.T.C.	£ 500 00
Miscellaneous	£ 51 43	Society funds	£ 381 98
Public Liab. Ins.	£ 35 00		

The Society is grateful for the generous support given by the Town Council and also to the many generous individuals and organisations (listed below) in the town who donated funds and essential building materials worth approximately £ 350 which were used during this phase of the project.

Hotel and Restaurateurs	Capt & Mrs Ough
Derek James	Llandudno Pheonix Club
Women's Institute	International Friends'p League
Town's Women's Guild	Mr W Roberts , Builder
John Vale , Church Walks	David Roberts
W T Roberts , Cottage Loaf	Nogel Roberts , Newsagent
H B H Lewis	W Salisbury
Robin Gubay	Management , King's Arm's
J L Davies	Mrs Elliot
Dr W D F Smith	R A Poynton
Welsh Water Authority	

Phase 2

In the coming year the Society proposes to continue clearance , safety and survey work but will also continue searching for as yet undiscovered parts of the mine system which could be of major importance in developing a show mine .

We intend to pursue the following main projects :

1 Clear a passage through to the Tyn y Fron shaft to establish easy access , good ventilation , and investigate the possibility of mine workings here .

2 Conduct a close inspection of the capping of the Ty Gwyn Shaft , internally and externally .

3 Clear the first blockage in the main tramming adit when circumstances allow . As this can be bypassed it is not a high priority .

4 Manuscripts detail additional entrances and it may be possible by close study , local knowledge and dowsing to locate adits and incline levels leading into neighbouring mine working within the Ty Gwyn system .

The Old and New Mines

While assisting with the preliminary survey work for the Great Orme land reclamation and car park scheme , the Society has discovered prehistoric workings as well as the expected 19 th century workings . These areas have been undisturbed since the mines were sealed and therefore hopefully contain many artefacts and other important features . This area show considerable potential as a study area , but it is also the subject of intense archaeological interest within the Society , Bangor University Department of Archaeology and the Gwynedd Archaeological Trust . It will be some time before a full assessment of the finds is known but we anticipate that the Great Orme will rank high in importance among prehistoric mines sites anywhere in Europe .

W.D.F. Smith M.R.C.P.

07.03.38

Appendix 1

Skeleton history of copper mining in Llandudno

Bronze age Presence confirmed by radio-carbon dating

Roman presence Roman coins found in the mines & area

Norse presence Orme Norse for serpent

1403 Mines Royal Act (Inhibited mining enterprise)

1688 Repeal of Mines Royal Act 1403

1692 First recorded lease to Sir Thomas Mostyn

1748 Mines reported abandoned

1761 Mines working

1807 Mine at Pyllau becomes 'The New Mine'

1812 Pumps installed on Pyllau level, New Mine

1824 Expansion of Old Mine by Samuel Worthington

1829 Trial at Pen y Fridd

1830 Trial at Tyn y Coed

1831 Bronze and stag horn artefacts; Old Mine

1834 Work begins on the Penmorfa adit

1835 Ty Gwyn Mine opens

1836 18" Steam engine installed in Old Mine

1836 50" steam engine installed on Ty Gwyn Shaft

1841 50"/90" Sims steam engine installed at Ty Gwyn

1841 22" portable steam engine installed at Ty Gwyn

1842 Sims engine broken

1842 Penmorfa adit completed

1842 Mines and Collieries Act

1844 Ty Gwyn Mine flooded

1846 Ty Gwyn Mine becomes Tyn y Fron Mine

1848 Import tariffs on copper ore lifted

1849 Welsh California on Bryniau Poethion

1849 Miners find prehistoric chamber & artefacts

1850 Ty Gwyn Mine flooded

1853 Strike at the Old Mine

1853 Ty Gwyn Mine closes

1855 Old Mine extends the Penmorfa level

1855 Ty Gwyn Mine sells engines and plant

1860 Old Mine plant sold: lease to Capt. D Lloyd

1864 New Mine closes

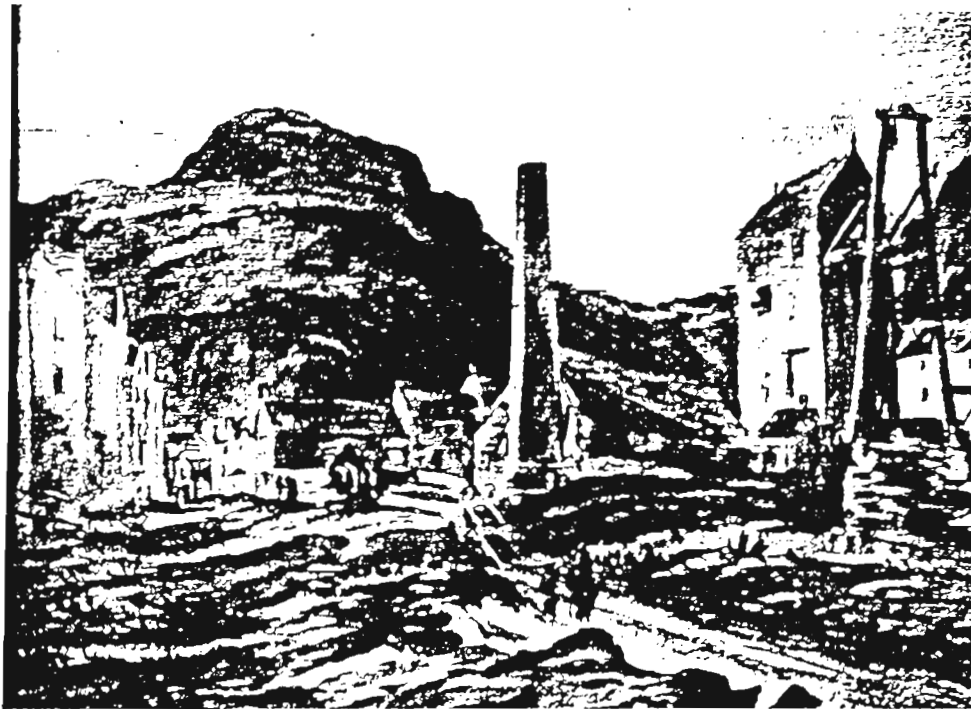
1872 & 1875 Metaliferous Mines Acts

1881 Old Mine closes

1911 Mr C Horsefield prospects the New Mine



A HISTORY OF THE TY-GWYN MINE



The Great Orme Copper Mines were mined in prehistoric times as the discovery of stone and bone implements during 1849 in the vicinity of Bryniau Poethion a well known local landmark near the summit of the Great Orme proved. Recent finds as well as those of 1976 further substantiated the fact. It is also widely but not unanimously accepted that the Romans also worked the mines; the workings concerned would have involved the Old mine and to some extent of what became known as the New mine.

However this article concerns some of the brief history of the Ty-Gwyn mine which was a much later development and enterprise, but which generally produced a better quality ore than the other two and which during its comparative short life produced more more than 100,000 worth of copper ore - 93,000 worth being produced in its first twelve years between 1835 - 47.

Within the confines of the old hamlet of Llandudno were twelve farms some of which for centuries had provided the isolated village with its means of existence, mining and fishing also being important factors in the economy of the locality. One of the farms was known as Ty-Gwyn and was situated at the top end of the present promenade in the North Parade - it comprised 25 acres and 21 perches parts of which included land in "Y Fach" now known as the Happy Valley, and was the property of Edward Jones. He used to allow a local inhabitant Benjamin Edwards to graze cows on his pasture at "Y Fach". One wet day a cow slipped displacing a lump of turf showing traces of copper ore. This lead to Edward Jones successfully applying for permission from the landowners to prospect the area. Lacking capital he sold out to a syndicate which sold 126 shares in the venture, Edward Jones retaining two. William Jones of Bodhyfryd, Llandudno became the major holder with 23, the Douglas family, Holywell cotton spinners having the second largest holding with other individuals from the Holywell area also being shareholders.

During the mid to late 1830's a tramming adit was driven 534 yards from the direction of the North beach to join a large shaft of almost 300ft. named Tyn-y-fron situated in a field slightly below the present ski slope at Wyddfyd. Historical records indicated that the shaft had failed to connect with the promenade adit by a few yards, but the Great Orme Exploration Society carrying out a survey and feasibility study of the workings in 1986 proved that the connection had been made. Another drainage level had also been driven but this had been covered and blocked by the construction of the pier pavilion in 1884-85.

The Ty-Gwyn mine offices, workings and engines as well as two shafts were located in the vicinity of the Empire Hotel running down towards the beach and upwards in the direction of the Great Orme Victoria Tram Station in Church Walks. The company had leased 25 acres from the Old mine Company at the top of the Orme. They had dug a ditch down the present tramline route from the summit which ran into a reservoir in Ty-Coch Road known as Llyn Mawr and was piped to supply a 50 inch steam engine which had three boilers and a 15 ton beam operating at 15 strokes a minute. The system also operated a 15 foot water wheel on the current site of the Min-y-Don Hotel and an ore crusher where is now sited the Belmont Hotel. A wonderful historical watercolour by Felicia Simpson painted in 1853 accurately records the mining area around the now Empire Hotel, Church Walks and Ty-Coch area.

In 1957 an old shaft which earlier had been used as a well collapsed near the Victoria Tram Station. it was over 12 foot in diameter and at least 130 feet deep. Council workmen digging down 6 foot found a dome of masonry, after digging down a further six feet it was established that the dome was intact, but some masonry below had collapsed leaving a four foot gap which had caused the subsidence. One of the popular chestnut trees had to be removed and it was seen that interwoven with the roots were bricks of the same firing as those used in the construction of the dome. In all probability placed over the old shaft when Church Walks was constructed.

The Ty-Gwyn mine Company following a court battle over a boundary dispute had a management reshuffle and William Jones and directors held a party in the Kings Head, and a fireworks display in 1846 and changed the name to Tyn-y-Fron Company. However continuous flooding which had plagued the mine from the outset finally closed it in 1853. The copper below sea level now awaits perhaps an era in the future when it might be commercially viable to mine it once more.

The lifting of restrictions on imported copper plus the transformation of the old hamlet into a popular seaside resort proved the death knell to the industry, but optimists perservered unsuccessfully until Sarah Lloyds lease was finally surrendered in 1881 one month after her death during December 1880.

LIST OF ARTEFACTS AND EQUIPMENT

TY-GWYN MINE

DESCRIPTION	LOCATION
3 No. bottles	M
3 No. rock drills	M
Shovel	M
Clay pipes, 1 No. complete, various fragments	C, M
Wagon coupling	C
2 No. wagon wheels	C, M
Wagon wheel bearing	C
Assorted iron rods, plates and bolts	M
Fragments of pottery, glassware and bone	M
Wooden pump rod with iron joining plates	M
Pump rod fend off linkage	M
Victorian chamber pot	C

M - Retained within the mine

C - Retained at "Gwynedd", Tyn-y-coed Road, Llandudno.
(Items removed for detailed examination and photographic record).

Recent Discoveries on the Great Orme

During November-December last year members of the Great Orme Exploration Society teamed up with two local mining engineers to conduct a survey of all the underground workings within 20m of the surface in the mining areas known as Pyllau and Bryniau Poethion on the Great Orme. This survey was initiated in order to determine if there were any major workings in or around the proposed car park planned here; which is part of a reclamation scheme to improve the site; capping off all existing shafts, retaining access for authorised persons and bats.

In order to produce a comprehensive survey of the area it became necessary to gain access to the three existing shafts in the Pyllau area, notably Vivians, square walled and round walled shafts. None of which had been previously been entered this century. Surveys of the two grated shafts on Bryniau Poethion were also to be completed.

The method of gaining entry into the three shafts varied in each case, with techniques on how and how not to "break in" noted for any future work. The individual shafts were dealt with as follows.

1. Round Walled Shaft

Other names - Pyllau, Gwaith Newydd or possibly Afnant.

This shaft was the first to be dealt with. Before any excavation work commenced a scaffold gantry was erected over the shaft cap, to which workers attached themselves. This was done as a safety check as we had know idea what condition the capping was in or of the shaft diameter and depth. As it turned out the capping was quite solid and so we decided to try and gain access by excavating under it. To do this a section of the surrounding wall was demolished, we then continued by tunnelling from the side into the lining just below the capping; this consisted of an iron lattice work covered by limestone slabs.

The dry stone lining was in very good condition being 1.7m in diameter and continuing to 3.8m where it met with the rockhead. Short blocked and blind levels were encountered at respective depths of 10.5 and 33m, with a major level at 39m. This trended north-south along the vein to medium sized stopes and a remarkable "flat" chamber 1.5m high 30m across. The workings generally appeared to be limited in extent. However certain areas do suggest extensions are possible with careful digging.

From the described workings the shaft continued to about 70m where it had become blocked by a major collapse through a thick bed of shale. This may be the "Great Shale Band" as mentioned in the John Taylor Company reports of 1855-1857.

2. Vivians Shaft.

Other names - Engine or Pump shaft and Copper Ddu

Up to the early 1950's this shaft had been surrounded by a tower like circular wall. Connected into this was the overflow pipe from a nearby reservoir. It is thought that water discharged from this pipe was responsible for undercutting of the wall foundation resulting in collapse and subsequent blockage of the shaft mouth. Up until recent the fenced off circular depression marking this feature was recognisable in this area. This has now substantially altered.

Access into Vivians was gained by using a back-hoe excavator creating a cutting from the lower area of spoil on the south side. The blockage itself was only about 2m thick and opened into a rock cut shaft, no stone lining being present. The exposed rock surfaces were in a highly weathered condition, coloured in places by secondary copper mineralisation. An estimate of the shaft depth was obtained by dropping stones while positioned in the excavator bucket within the shaft mouth. It was difficult to hear clearly when the stones hit bottom due to the sound of rushing water in this deep recess. A conservative on site estimate was of at least 140m.

Explorations revealed a major system of northward trending workings about 10m below the surface cutting. These appeared to have been exclusively mined using picks, with only a few drill holes noticeable suggesting a pre 1750's working (i.e. before the general usage of gunpowder). The smooth weathered featuring to the rock surfaces here tends to reinforce the idea that these are relatively early workings. Further progress down the shaft was prevented by precariously placed surrounding areas of spoil. Plans to clear this are at hand. There was however a narrow tunnel that lead downward through a series of inclines and stemmed shaftways. This ended in a stope that reconnected with the main shaft at 30m depth, from which workings with extensive stoping upto 20m high continued northwards in the direction of Higher shaft. A link through in this area will hopefully be proved. At least three major veins have been identified at this depth with many possibilities for future explorations.

3. Square Walled Shaft.

Other name - Owens shaft.

This was accessed by surfacing trenching up to and under the surrounding wall, then through the shaft lining below the capping of limestone blocks. Here again the lining was in good condition being 1.2m in diameter and extending to 5.1m. Five separate levels were surveyed to a depth of 40m where the shaft obviously continued but was flooded. The first and third levels from the surface proved limited in extent. The fourth level was more extensive but showed few signs of any real ore production. Remaining levels indicated that some mineral had been produced here, although it is only small scale when compared to stoping in Vivians shaft.

Future visits to the lowest level may prove worthwhile in locating a connection to Treweeks shaft as there is a marked airflow towards the north. Again historical records mention that Treweeks and Owen shaft did work the same vein called String Cefn.

At present all access to these shafts is restricted being controlled by the Council. This will remain so until the shaft capping and car park scheme is complete.

C.A.Lewis 16.3.88

References

Williams, C.J. The Llandudno Copper Mines
Bick, D. The Old Copper Mines of Snowdonia

Ogof Bryn y Mor ? Gwaith Bryn y Mor ?

In the basement of this Hotel is a passage leading 12' into fractured dolomite to the rear of the hotel under Hill Terrace . It was proposed to excavate the rubble to establish if this was an adit or incline or if it led into mine workings . The current owner was moving out in a months time therefore the time was ripe for a dig dig on weekend of March 12th & 13th . . A dedicated group of personnel was required and it was of utmost importance that the work was done safely and the hotel was left as it was found , clean and tidy .

The team and equipment arrived slowly on saturday 12th of March . While waiting for the skip to arrive the situation was reassessed and the tourist trip into the Ty Gwyn was firm footed .

A shaft from the surface was filled with mined rubble ? and was slowly but surely undermined and supported but the end result was disappointing . Beyond the shaft was a small recess but there was no continuation as an adit or as an incline as judged by appearance and probing . Headroom didnt allow probing through the floor but it is possible the shaft continued down a little further .

The area was fractured weathered dolomite and showed no evidence of blasted but as it was easily drilled by hand during the dig (holes for supports) this does not rule out the possibility of a mine trial . There was little evidence of mineralisation and the only artefacts worthy of note were a piece of pelvis from a small animal eg dog and an abraded stone consistant with that of a maul .

The weekend was a useful exercise and I am sure it will be valuable experience for future digs . Another ghost has been laid to rest but there are plenty more to go so carry on grovelling .

EARLY MINING ON THE GREAT ORME

Throughout the historical record for the Great Orme mines there are various accounts to the discovery of ancient workings attributed to the "celtic miners" or "old man". One such happening occurred in 1849 when miners broke into a large cavern which was decorated with stalagmites that hung from the ceiling like "tree branches"; obviously suggesting this was a working of considerable age. Contained within this chamber were a number of hard rounded stones weighing between 5-50 lbs., having worn ends indicating they had been used for hammering the rock. Other artefacts included chisels of bone and antler and also two small wedge like tools of bronze. A similar working encountered earlier in 1831 again contained stone and bone implements, implying that early man had exploited the valuable copper ores over a wide area of the Pyllau valley.

Victorian archaeologists conjectured that the Romans were responsible for these early workings, with their arguments backed by the occurrence of two hoards containing Roman coins of low denominations unearthed on the Little Orme in the early 1900's; also a carved stone oil lamp from the Great Orme and a broken cake of smelted copper from Llandrillo-yn-Rhos. It is recognised that the Romans did possess metal tools, so why the need for stone hammers? Surely they suggest an earlier origin when the availability of metal was limited. The absence of any pottery indicative of the Roman period is also lacking. However we can not totally discount a Roman exploitation of copper ores here as it is accepted that they inhabited the North Wales area for many decades, and did mine for gold at Dolaucothi in South Wales.

Recent studies now recognise the existence of probable prehistoric mining on the Great Orme. Detailed underground studies describe a set of features and artefacts that are considered to be typical of early working. These being the existence of stone, bone and antler tools, also rock surfaces that display a pattern of fracturing due to the combined effect of stone tools and fire-setting. Fire-setting being a process where a fire is allowed to burn against the required rock surface, with ducting of the flames where possible to attain the maximum heating affect. Dowsing of the heated surface with water would have also aided the process. Additional evidence for fire-setting is the occurrence of charcoal, which is found in certain of the more restricted parts of the mine. Collected charcoal has provided a radio carbon date of 900 BC for this location, corresponding to the late Bronze Age period.

Further study underground and on the surface is intended this year, with grants made available for the determination of further radio carbon dates. It is now quite possible that the Great Orme may become a site of national importance as one of the main producers of copper metal in Bronze Age Britain.



MINING FOLKLORE ON THE GREAT ORME

A rich vein of folklore runs through the history of metalliferous mining from its distant origins to the present day.

The familiar and much maligned garden gnome is said to be based on the legendary "kobbold", a malevolent dwarf like creature said to plague the cobalt mines of Germany. The Cornish tin mines were said to be inhabited by spriggans, evil spirits, and knockers a more friendly breed of little creatures who would assist the miners.

The knockers were no strangers to the metal mines of Wales. In 1754 Lewis Morris in a letter his brother William describing them as little creatures about eighteen inches tall, found in the Cardiganshire lead mines wrote of them :-

"Our old miners are no more concerned of hearing them blasting, boring holes, landing leads etc.; than if they were of their own people. and a single miner will stay in the work in the dead or night without any man near him and never think of any fear or any harm they will do to him. The miners have a notion that the knockers are of their own tribe and profession and are harmless people who mean well".

The miners in Llandudno were aware of the knockers and several interesting finds have been made in the old workings as evidence of their own belief. It was customary when the ore from a level or heading was exhausted to leave small offerings to the knockers in the hope that they would then direct the miners to other profitable veins.

Several such offerings have been discovered, usually clay pipes or clogs. In all instances it was obvious that the articles had been carefully placed and were in good condition.

Other more sinister finds have been made, indicative of superstitious beliefs, the significance of which is unclear. Several instances have been recorded of the discovery of cat corpses deliberately set out and surrounded by carefully placed stones. Black deposits found in regular patterns nearby were found on analysis to contain blackberry seeds! Why should dead cats be accorded this sort of treatment in the autumn? The mystery remains unsolved. Enquires with the National Museum of Wales failed to resolve the matter. A request that one of the corpses be forwarded to Cardiff was politely refused. None of the Society members would disturb the site.

Superstition is certainly an ongoing phenomena.

ARCHAEOLOGISTS VISIT THE GREAT ORME

The Great Orme Exploration Society was host recently to a distinguished group of archaeologists from the British Museum , Bangor University , Plas Tan y Bwlch and Gwynedd Archaeological Trust who came to see the mining sites on the Great Orme . Their particular interests and expertise lay in the field of ancient mining and it was upon this that most of our discussion was based as we toured the surface of the Old and New Mines .

The tour started at Vivian's shaft where recent excavation has revealed numerous strata within the spoil suggesting several stages of mining activity . Gwynedd Archaeological Trust have been excavating this site but their work is not yet complete though it seems the deepest layers may be over a thousand years old at least .

The tour continued to Pyllau and then over Bryniau Poethion where further surface and underground features were discussed at length . Having had a very stimulating morning the group left for Parys Mountain , Anglesey , where we had a similar tour over the mountain viewing the leaching pits , windmill , cornish engine house and vast open cast mining sites .

The mining activities of the 17th , 18th and 19th centuries are well known and documented but those covering earlier periods such as bronze age mining at these sites are very limited . The group felt that both sites had been neglected archaeologically and showed great potential and the Great Orme particularly may be the best early mining site in the British Isles .

Over dinner it was decided to form an 'Early Mining Group' to guide and encourage archaeological efforts , professional and amateur , in North Wales and Dr David Jenkins of Bangor University would act as coordinator .

The following day the group visited an ancient mining site at Cwm Ystwyth , near Aberystwyth , where Simon Timberlake has been conducting an excavation recently .

Those present were :

Dr Paul Craddock
Dr David Jenkins
Mr & Mrs Peter Crewe
Danny DUTTON...
JOHN... PICKEN...
Simon Timberlake
Andrew Lewis

British Museum
Bangor University
Plas Tan y Bwlch
Gwynedd Archaeological Trust
Sheffield Museum ?
Great Orme Exploration Society