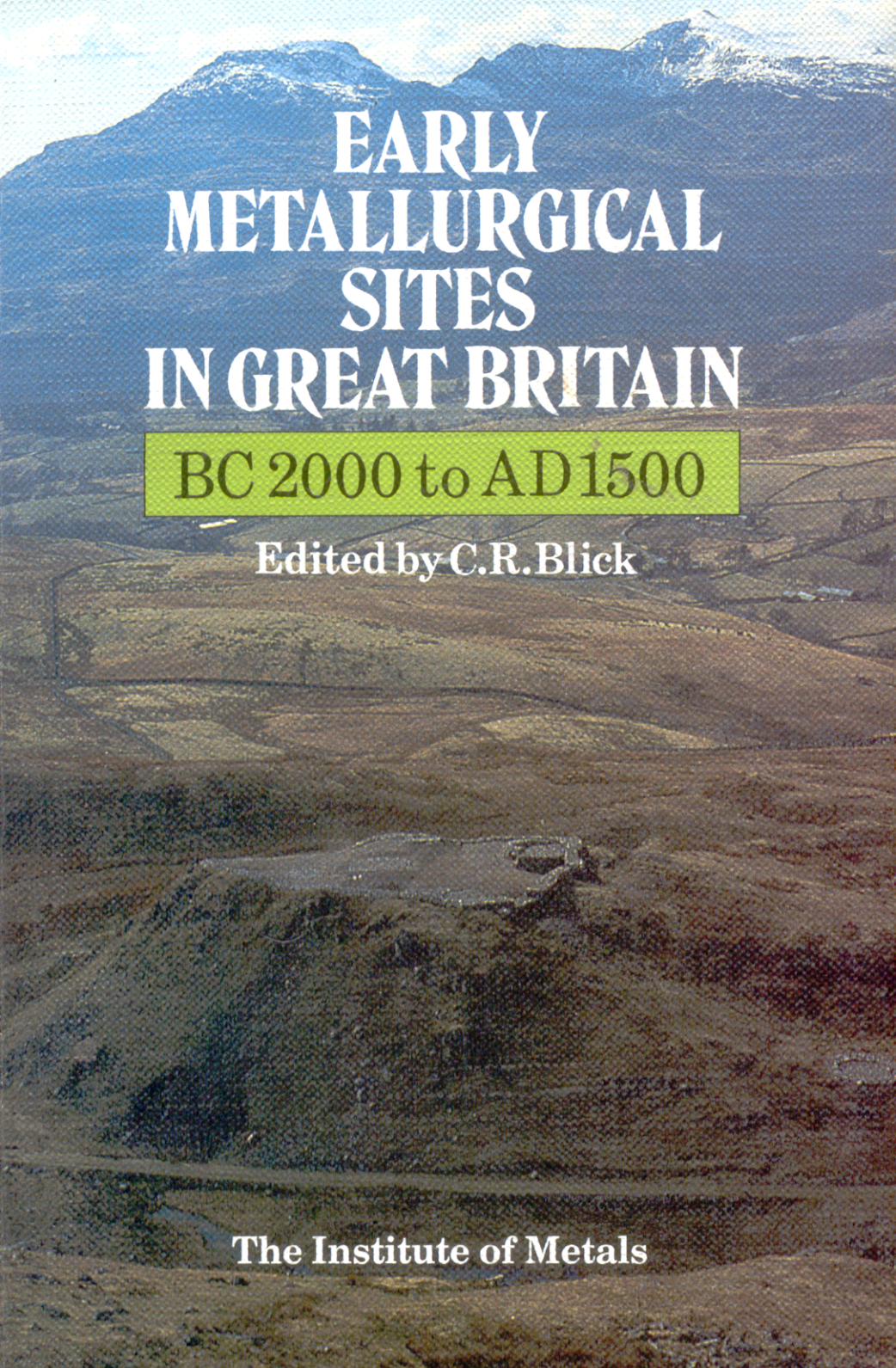
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BC 2000 to AD 1500
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The Institute of Metals

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Preface

In 1986 The Historical Metallurgy Society established an Archaeology Committee with the aim of providing a forum for the learned discussion of archaeometallurgical problems. Early in the life of the committee a request was received from the American Society for Metals for a list of sites of importance in the history of metallurgical development in Britain. Sadly it was realised that no such list existed, and if such a list were produced it would be a mammoth task taking some years to complete.

To reduce the effort to manageable proportions, and after discussion with American friends, it was decided to produce a list of important archaeologically authenticated sites pre-dating the time that Columbus crossed the Atlantic. David Cranstone produced an initial list and then prospective authors with detailed knowledge of the sites were approached for their views.

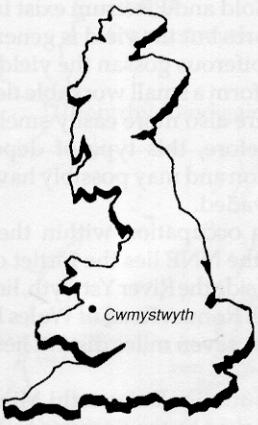
At this stage Charles Blick, the Conservation Officer of the Historical Metallurgy Society, was co-opted on to the committee and given the task of commissioning the articles on the individual sites which are presented in this volume. With characteristic vigour, Charles Blick produced guidance notes for the authors, edited the manuscripts and obtained much of the illustrative material and in all these tasks he was ably assisted by Peter Crew and David Cranstone, whilst Chris Salter prepared the material in a form suitable for publication. Professor R.F. Tylecote was a founder member of the Archaeology Committee and took an active part in the initial discussions leading to the preparation of this volume. It is sad that he is no longer with us to see the task completed. We are grateful to these gentlemen and the individual authors for their efforts.

I hope that the volume which has been produced will be of interest to all those who wish to see the visible remains of the work of the early metallurgists who did so much to advance the materials base of our civilisation.

Professor Jack Nutting

Chairman of The Archaeology Committee

SITE No. 6
Cwmystwyth



1 Name of site:

Cwmystwyth, Copa Hill, Comet Lode Opencast, Dyfed. Scheduled Ancient Monument, under the protection of Cadw Welsh Historic Monuments. N.B. 'COPA' means Upper in Welsh. So Copa Hill is Upper Hill not Copper Hill. There is no association with copper although the site is now referred to in literature as 'Copper Hill'.

2 Metal:

Copper in antiquity: lead/zinc from medieval times.

3 General history of area:

The early history of Cwmystwyth Mine is a period of great speculation on very little information. The first traces of man in Ceredigion, formerly Cardiganshire, appear during the Neolithic or New Stone Age and there has been a total absence of the remains of this era in the vicinity of the Upper Ystwyth valley. Until recently this has largely been true of the later periods of prehistory - and there is an apparent deficiency of archaeological sites in the immediate area. However, the lack of visible and identifiable remains is perhaps not surprising in view of the thick blanket cover of peat present on the hills and the lack of any systematic field walking coverage in the region. Of the 200 mines of any consequence in mid Wales, the

majority are pre 1800 in origin though later activity has destroyed much of the evidence.

It is also worth noting that many of the more ancient mines have an above average gold content in the waste rock, it would not be presumptious therefore to assume that the grades which were mined yielded a small quantity of that metal. Gold and Electrum exist in tiny grains (50 microns or less) in the sulphide ores but the yield is generally in the region of half a gram per tonne. In cupiferous gossan the yield could be increased by a factor of 20 or more and form a small workable deposit; secondary copper minerals in the gossan are also more easily smelted than the unoxidized chalcopyrite. It is, therefore, this type of deposit which would have attracted early exploitation and may possibly have been all worked out by the time the Romans invaded.

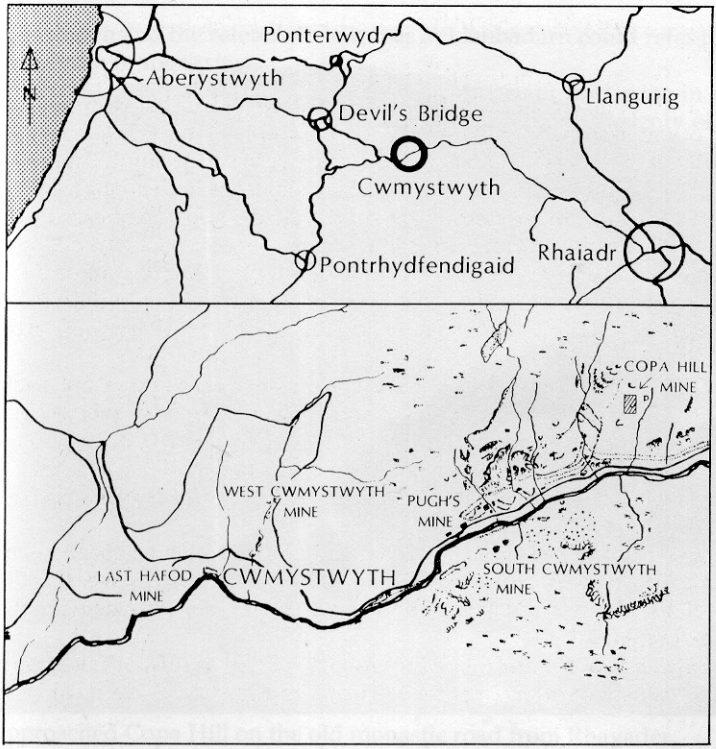
Traces of the Roman occupation within the general area are more common. Four miles to the NNE lies the fortlet of Cae Gear, whilst eight miles downstream, alongside the River Ystwyth, lies the fortlet of Trawscoed and the main north-south Roman Road of Wales known as Sarn Helen. To the west of Cwmystwyth, seven miles distant lies the fortlet of Esgairperfedd.

Thirty miles to the south lies Dolaucothi Mine which has been established as having been worked by the Romans, but this only proves that the technology of organized mining and complex ore dressing existed in the area before AD 100.

A large area of old dumps on the west face of Copa Hill associated with quite rudimentary workings for lead on the Kingside Lode have been referred to as the 'Roman Dumps' although there is no evidence at all of surface remains of such antiquity. Many hand-dressing mortars, or 'bucking' stones, are associated with collapsed drystone wall shelters on these tips but crushing was more likely effected with iron hammers. Indeed many of the structures are built from mine waste that exhibit the occasional gunpowder shot holes and, therefore, an eighteenth-century or even nineteeth-century date is probable for some of the workings, although there may well be evidence here for mining earlier than this.

On the southwest slope of Copa Hill over 60 acres of topsoil have been removed by hushing, a practice used greatly by the Romans at their Spanish gold mines and also on a smaller scale at Dolaucothi. But this provides no terminus ante quem and written records show this type of hydraulic mining was being used on the site as late as 1785 (S.J. Hughes). The majority of hushing channels on this part of the hill appear to radiate out from a dam of probable eighteenth-century date and, more than likely, had a prospecting function.

In conclusion, the possibility remains of Roman workings for lead at Cwmystwyth, and on Copa Hill, but it must be borne in mind that the lead here was notably silver-poor in comparison with much of the mid Wales area and one might well consider a rather more favourable choice elsewhere, given the extent of their occupation and interests in metals. However, it is the opinion of Hughes (1981) that of the estimated 250000



Cwmystwyth. General plan of area.

tons of development rock and gangue on Copa Hill (presumably the Kingside Dumps) at least 90000 tons may have been produced during the Roman period.

It would seem unlikely that any exploitation of the mines took place immediately after the withdrawal of the Romans from Wales and none of the contemporary writings before the 11th century suggest otherwise.

It would seem likely that the next lead miners, or probably the first, were the Cistercian monks from the Abbey of Strata Florida, or else persons appointed by them as miners.

The first monks to arrive in the area settled about 8 miles to the south-west of the mine at an Abbey known as Hen Fynachlog. The generally accepted date for the completion of this first Abbey is 1164 with a monk named David being appointed as the first Abbot. Due to philanthropy and, possibly, a natural disaster, a second Abbey was built and completed in 1202. This Abbey was one of, if not the grandest in Wales. It retained the

Looking north towards ancient opencast at the top of the Coment Lode. The lode here cuts the brow of the hill and is visible on the skyline.

name of Strata Florida and had as its first abbot Sissilus, who was the abbot of Hen Fynachlog when it was visited by Giraldus Cambrensia and Archbishop Baldwin in the year 1188.

It is in the remains of the new Abbey that the links with mining become evident. The monks were obviously capable engineers in that they built a leat system for their corn mill and used part of the tailrace to flush their underground sewers. Their fresh water was brought to the Abbey by means of a 4in diameter lead pipe. Stephen Williams, in his account of the Abbey, relates how part of a smelting furnace was found close by, and since smelting slag was strewn about the grounds, and on the strength of an assay done on one of the finds from the 1887 excavation, concluded that the monks practised cupellation due to the low silver content of the metallic lead.

During the 13th and 14th centuries the boundaries of the mine fell within three divisions: (i) the Parish or Lordship of Llanbadarn Fawr; (ii) the Grange of Cwmystwyth; (iii) the Tenement of Briwnant. Categories (ii) and (iii) at this date can make reference to no site other than Cwmystwyth; the Lordship of Llanbadarn Fawr however covers the northern half of

Ceredigion and the references to mines at Llanbadarn could refer to any of a dozen or more sites.

There is one reference to a single, but important lead mine in Llanbadarn in 1282, and to a mine in West Wales, 1301, with 'plenty of ore'. There were two Inspectors of Silver at Cardigan in 1340. The 14th century is poorly represented and only a single reference in 1485 can be found that would encompass the Cwmystwyth Mines as well as the other north Ceredigion mines.

Summing up the evidence for mining before 1500, it is seen that there are no contemporary reports or accounts of mining at Cwmystwyth alone.

Whatever work - if any - was done between 1300 and 1500 amounted to very little. Probably less than 200 tons of ore as a maximum were raised between these dates. It would certainly have been advantageous for the first Cistercians to work the mines if only to supply some of the lead used in roofing the abbey and the fabrication of pipes and the latticework around the windows. As the dimensions of the abbey are known, it can be reasoned that the weight of lead needed to roof the structure with $^{3}/_{16}$ths of an inch sheet gives a figure of 70 tons.

As regards specific documentary evidence for mining at Cwmystwyth there is nothing until the beginning of the 16th century at which point a lease was issued for Cwmystwyth Mine to Rhys and David ab Ievan ab Hywel from Abbot Richard Talley of Strata Florida. There is some uncertainty about the exact date but it would appear to be around 1535. Of interest also is the account of the visit of Leland, King Henry VIII's antiquary, about this period and his journey down the valley as he approached Copa Hill on the old monastic road from Rhayader:

> 'About the middle of this Wstwith valley that I ride in being as I guess three miles in length I saw on the right hand of the hillside Cloth Moyne [Anglice: Cloth or Clodd = Mine : Moyne or Mwyn = lead ore] where hath been a great digging for Leade, the smelting whereof hath destroid the woodes that sometimes grew plentifully thereabout.
>
> I heard a marvellous tale of a crow fed by a digger there that took away his feeder's purse and while the digger followed the crow for his purse the residue of his fellows were oppressed in the pit with a ruin.'

These comments of Leland are the best circumstantial evidence for lead mining having been established here prior to 1500.

Of probable greatest antiquity on the site (Copa Hill) is a primitive opencast working situated at the top of the Comet Lode where it outcrops on the brow of the hill overlooking the valley. The lode here carries (relatively) appreciable amounts of chalcopyrite ($CuFeS_2$) ore, it being the only obvious occurrence of copper at surface in an otherwise lead-rich area. For up to 100m downslope of the infilled opencast are several eroded and since overgrown tips of shattered rock containing numerous bruised and split pebble hammers.

The occurrence of stone tools here was first noted as long ago as 1848 and in the mid-1930s the site was examined by Oliver Davies as part of the investigations of the British Association Committee set up to examine the evidence for early mining in Wales. Three of the tips were partially sectioned by Davies, who concluded:

'We cannot do more at present than guess at the date of the Comet Lode opencast. I am inclined to think that the hammer querns are old Celtic, approximately contemporary with the Roman period, though surviving after it'.

The opencast area and tips have since been the scene of recent survey work and archaeological excavations carried out by Simon Timberlake and the Early Mines Research Group in 1986 and 1989.

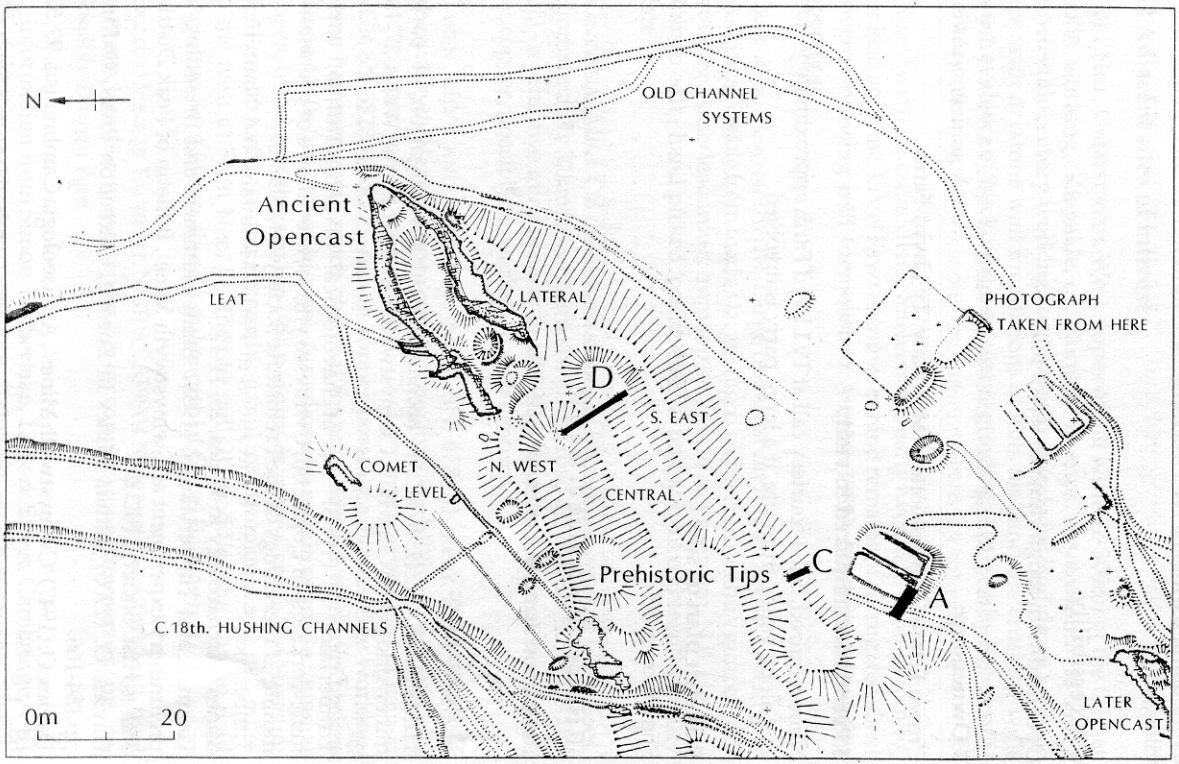
4 Remains and dating:

(1)Opencast and tips with stone tools. A section through one of these tips cut in 1986 provided burnt wood from fire setting activities from which three carbon-14 dates have since been obtained. These calibrated suggest a date of c.1500 BC indicating mining for copper here in the Early Middle Bronze Age. A channel of likely artificial origin buried beneath one of the tips (possibly with an ore washing or hushing function) is probably of the same period.

Deep excavations within the opencast area during the summer of 1989 revealed a great overburden of later deposits sealing the early tip and sides of the quarry, including natural silt and peat accumulation, remains of a water hushing dam and reservoir and spoil from an eighteenth century shaft. Against the north wall of the opencast at depth was discovered a fire-set gallery with stone tool marks in the roof, of likely prehistoric age. Above and leading into the opencast is the outline of an early leat of uncertain age and function but possibly connected with a later hushing use of the quarry. The outlines of rectangular structures downslope along the 400m contour appear to be much later features unconnected with any mining activity.

(2)Tools. The numerous pebble hammers are not grooved although some are slightly notched - they were probably hafted. (N.B. The cobble hammers are similar in appearance to mining tools found associated with Early Bronze Age copper mines in Ireland and many EBA and Chalcolithic sites on the Continent. Similarly there are close parallels with New World sites such as early Amerindian mining for native copper on the Keewanaw Peninsular in the Lake Superior Region, USA and pre-Columbian mining at Chuquicamata in Chile.)

A large ore dressing stone ('saddle quern' type) was found on site. Its use may have been contemporary with that of mining hammers. Remains of red deer antlers were also found within the tips (?possible tools). Examples of stone hammers may be seen on site. Other finds are within the National Museum of Wales.



Copa Hill. Comet Lode Opencast.

5 Location:

NGR SN 816 756 on western slopes of Copa Hill at an altitude of 400m OD, overlooking Cwmystwyth valley at a distance of 2km from Cwmystwyth village.

6 Accessibility:

Openland with tough climb to top of hill.

7 Ownership:

Crown Estate Commissioners Mr J. Raw, Ty Llwyd Farm.

8 Permission required to visit:

None required, but a courtesy call at Ty Llwyd Farm approximately 1km east along valley from site, if a large party is involved.

9 Sketch plan of site:

Shown on p. 57.

10 History of working at the site:

See section 3 and S. Timberlake (1987).

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12 Adjacent sites of interest:

COPA HILL, CWMYSTWYTH. West slopes of hill north (2-300m) of the Comet Lode working: Kingside or 'Roman' Dumps. Seventeenth to early nineteenth-century workings on a primitive scale for lead: large areas of tips with drystone wall foundations of huts for hand ore crushing with much evidence of 'bucking stones' for ore grinding. Also nearby eighteenth-century hushing dam.

CWMYSTWYTH KINGSIDE MINE. Nineteenth to early twentieth-century mining for lead and zinc. Level Fawr entrance behind remains of corrugated sheet covered dressing mill (demolished August 1989). Mechanized mining operation.

GRAIG FAWR, CWYMYSTWYTH. Large opencast on hilltop above Level Fawr workings. Visible from road as large crag: c. eighteenth-century gunpowder working. Adits lead into it from top of Nant Watcyn stream. N.B. Henry's Roman adit - hand picked 'coffin level' is probably of eighteenth century date.

NANTYREIRA MINE. On the eastern slopes of Plymlimon, west of Llanidloes, approximately 32km from Cwmystwyth by road at NGR SN 826874, 500m OD - a primitive mine of early Bronze Age date (two radiocarbon dates), for copper, possibly re-worked in 19th century.

DAREN MINE AND HILLFORT. NGR SN 678831 near Penrhyncoch, Aberystwyth. Very old open cut glancing Iron Age hillfort over top of hill: lead/copper vein of unknown age. Twll-y-mwym at one end of vein at NGR SN 682834 locally rich in copper possibly a Bronze Age working. Stone hammers with much charcoal found inside old workings broken into in 1740s (ref. Lewis Morris). A replica of a primitive spade found at Daren, in old workings in the 19th century, is in the Ceredigion Museum in Aberysthwyth. An ancient smelting mill for Daren lies some two miles to the west at Felin Hen, i.e. the old mill. It straddles the Roman road known as Sarn Helen about a mile north of Capel Bangor fort.

ERGLODD MINE AT TALYBONT. NGR SN 659904 Nineteenth-century lead mine with much earlier opencast possibly for copper: stone hammers on surface, possibly Bronze Age.

Information from Simon Timberlake, 12 York Street, Cambridge, CB1 2PY and Simon Hughes, Leri Mills, Talybont, nr Aberystwyth ,Dyfed, SY24 5ED.