

CYM BYCHAN OR NANTMOR MINE, NORTH WALES

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ABSTRACT

Cwm Bychan mine in Snowdonia has a partially preserved aerial cableway. The surface remains and underground workings are described. There are four groups of workings, but only one pocket of ore was stoped. The ore was quartz-sulphide breccia and was bounded by a planar hanging wall structure. No trace has been found of lead workings that were recorded in the past.

INTRODUCTION

Cwm Bychan or Nantmor mine [SH602472] lies approximately 1km to the east of Beddgelert in Snowdonia, North Wales, and consists of two main adits and a scattering of smaller workings near the upper end of Cwm Bychan (Fig.1). The first mining is reported to date from 1720 and activity continued with long periods of no activity until 1929 (Bick, 1982). The purpose of this paper is to describe the mine workings and the geology of the deposit. A detailed account of the geology, mineralogy and origin of the deposit will be the subject of a separate paper.

DESCRIPTION OF WORKINGS

The first remains of the mine are to be found at the foot of Cwm Bychan, a few metres upstream from the course of the former Welsh Highland railway where it passes the parking place a few hundred metres to the east of Pont Aber Glaslyn (Fig.2). This was the site of a small dressing plant, and nothing remains apart from various concrete bases and two large concrete buddle circles (Plate 1). An aerial cableway led up the valley for nearly a mile with the mine at its upper end, and at the site of the lower terminus there is a circular cage made of iron bars just over 1m in diameter and 2m long with a pulley at its upper end. It is partially filled with flat slabs of rock and in operation the cable would have passed through the pulley. The action of suspending the cage from the cable would have maintained the cableway under tension.

Proceeding up the valley, with the exception of a few pulleys and concrete bases, the cable itself and the remains of an occasional ore skip, the cableway has been largely obliterated. After approximately 1500m the first adit is reached on the west side of the valley (see Fig.3 for plans and selected sections of the mine workings).

ADIT A

Concrete foundations and the remains of ironwork indicate the former presence of an intermediate cableway terminus by the mouth of this adit, which has been removed for scrap. A drystone retaining wall on the edge of the tips shows where ore was loaded. The adit itself is a few metres to the west by the remains of a building. It runs virtually straight for nearly 200m through barren ground. With the exception of a few trial crosscuts the only working of any note is a short distance from the farthest end. Here a small amount of stoping up to daylight has taken place above a crosscut to the SW. The stope is very irregular and it is not possible to actually see to surface. It has a smooth hanging wall with nearly vertical striations and an irregular footwall. No mineralisation is visible and it was probably little more than a shaft for ventilation purposes. At the surface the shaft is rectangular, but within a few metres of the surface it becomes irregular and curves away out of sight. There is a small amount of waste by the collar so initially the shaft must have been sunk, but there is no trace of any headgear apart from a spike set into the rock which presumably acted as fixing for climbing chains or ropes, and the bulk of the work must have been by raising. Underground, beyond the crosscut

the level has been partially backfilled with deads for about 6m and ends in barren ground after a further 20m.

ADIT B

Up the valley from adit A the aerial cableway is largely complete. Four towers still remain, the cable is lying on the ground and the remains of numerous ore skips are scattered over the ground. The upper terminus is intact (Plate 2) with the exception of a small section of railing on one side which served to remove and introduce skips onto the moving cable. The rail on the NW side is intact, and at the time of surveying (April 1986) had a single skip in position on it.

Large tips to the NW of the upper terminus mark the position of adit B. This consists of a straight crosscut which runs NW for just under 70m and intersects a large stope at approximately right angles. Daylight can be seen above. To the SW the level rapidly closes down to normal dimensions and virtually all the way to the end the hanging wall of the vein is a remarkably continuous planar surface dipping to the east. Mineralization decreases rapidly from a few metres at the stope to a 10cm quartz-sulphide vein after 30m, and disappears completely a short way after. At 57m a small amount of drilling into the hanging wall has been done and there are small traces of sulphides, including bornite. At the end of the level the planar hanging wall is underlain by about 20cm of orange fault gouge. A very small amount of quartz and a thin sulphide vein are present in the footwall.

The level to the NE of the large stope is of unusually large dimensions, averaging 2m in width and swelling to 4m in places. The vein is very well-displayed in the walls and roof of the level. It consists of a quartz breccia with irregularly developed sulphides bordered by the planar hangingwall. There is no well-defined footwall. Away from the hanging wall the ratio of quartz-sulphide to wallrock decreases until mineralisation is absent. This can be two metres or more away from the hanging wall. The mineralisation consists of quartz, pyrite and chalcopyrite. Pyrite is more abundant than chalcopyrite, although occasional ribs of massive chalcopyrite occur. The sulphides have crystallized preferentially within the clasts of wallrock, and in places complete replacement has taken place, leading to a quartz supported sulphide breccia. Near the end of the level the quartz contains well-developed comb textures - fine fibrous structures oriented perpendicular to the walls of dilatant zones - up to 7cm wide.

A higher level 20m above the main adit gives access to the upper part of the stope. Along most of this level the vein has been removed as far as the surface. The NE end of the level is not accessible as the floor has been removed by stoping, but it probably does not continue more than a few metres beyond the end of the survey. From this level the irregular nature of the stope can be appreciated. It shows some pinch and swell between levels. Unstopped sections of the vein near the surface show it to contain a network of fractures arranged sub-parallel to the vein margins. The wallrocks on the surface, and particularly those of the footwall, have been intensely silicified for a few metres adjacent to the vein and contain numerous irregular veinlets and hexagonal crystal sections of quartz.

Bick (1982) states 'according to Dawson Ware, the levels at Nantmor [Cwm Bychan] intersected a rich pocket of arsenical copper-sulphide (copper-pyrites?) with concentrates assaying 1 - 3 dwt of gold per ton.' The stopes of adit B must presumably be those referred to in this account. It is interesting, however, that wallrocks samples contain only slightly enhanced levels of arsenic (approximately 70ppm).

ADITS C

NE from the top of the stope accessed by adit B several small pits mark on-strike trials for extensions of the vein across the hillside. These continue down into the valley, and a small tip marks the site of these two adits. They were no more than trials. The more southerly of the two ends in a small chamber in which a few minute traces of sulphide are visible along with an irregular network of tiny quartz veins.

Fig. 2. Map of surface arrangement of Cwm Bychan Mine. Letters next to individual workings are referred to in the text and on Fig. 3. Ornamented areas indicate waste tips.

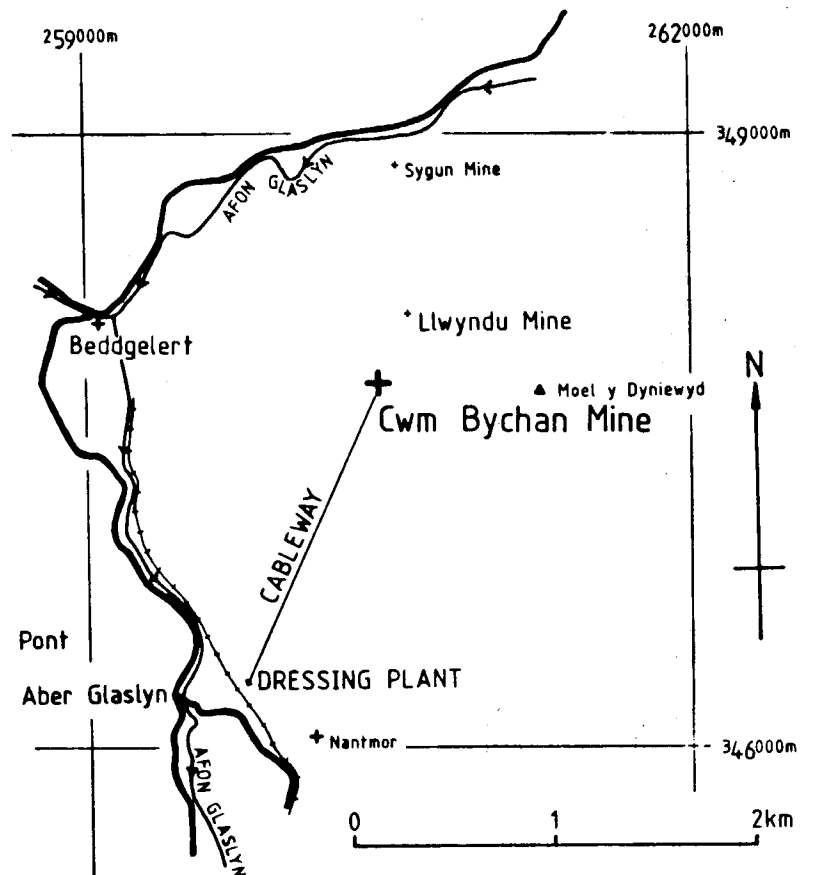
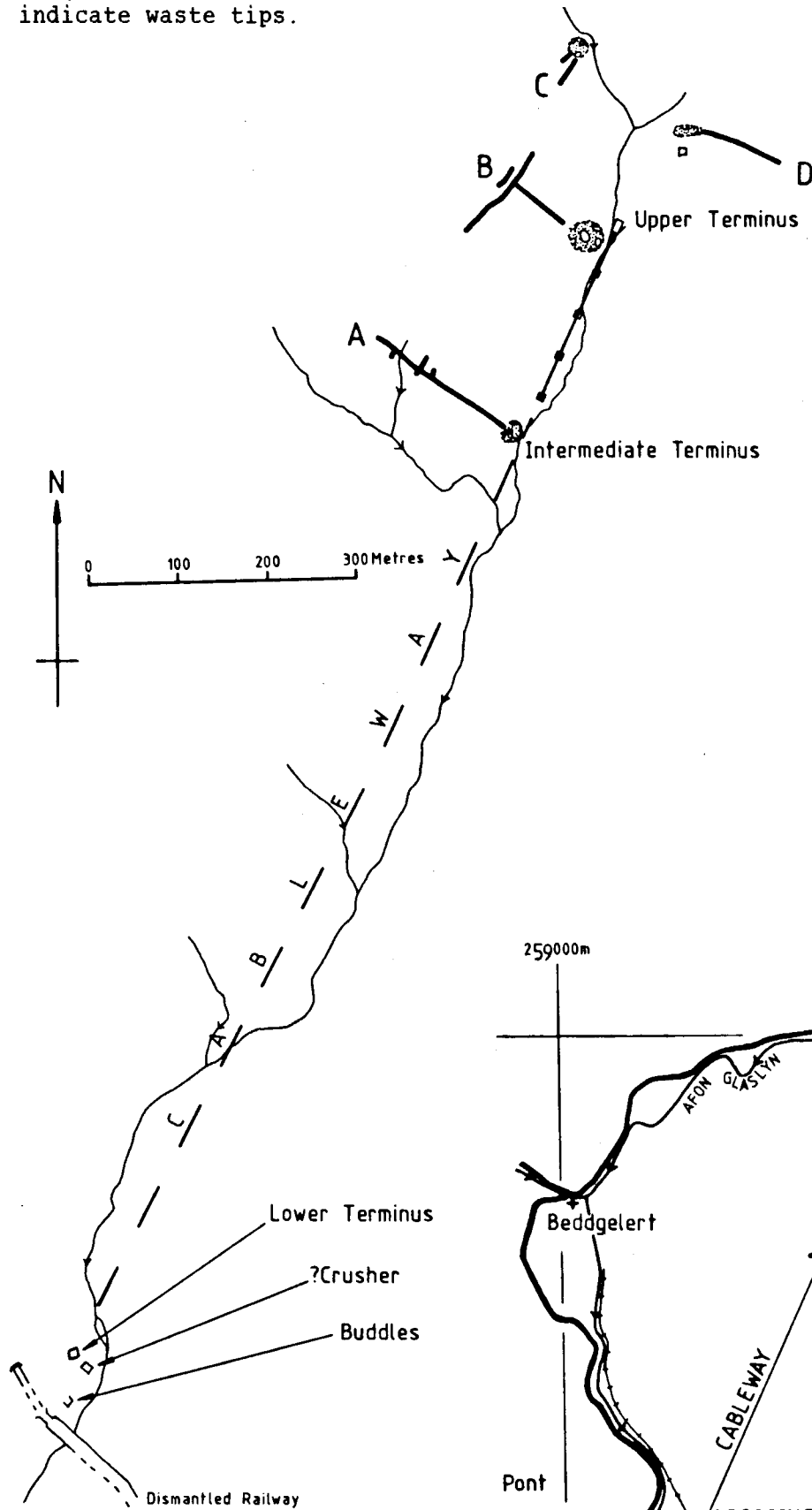
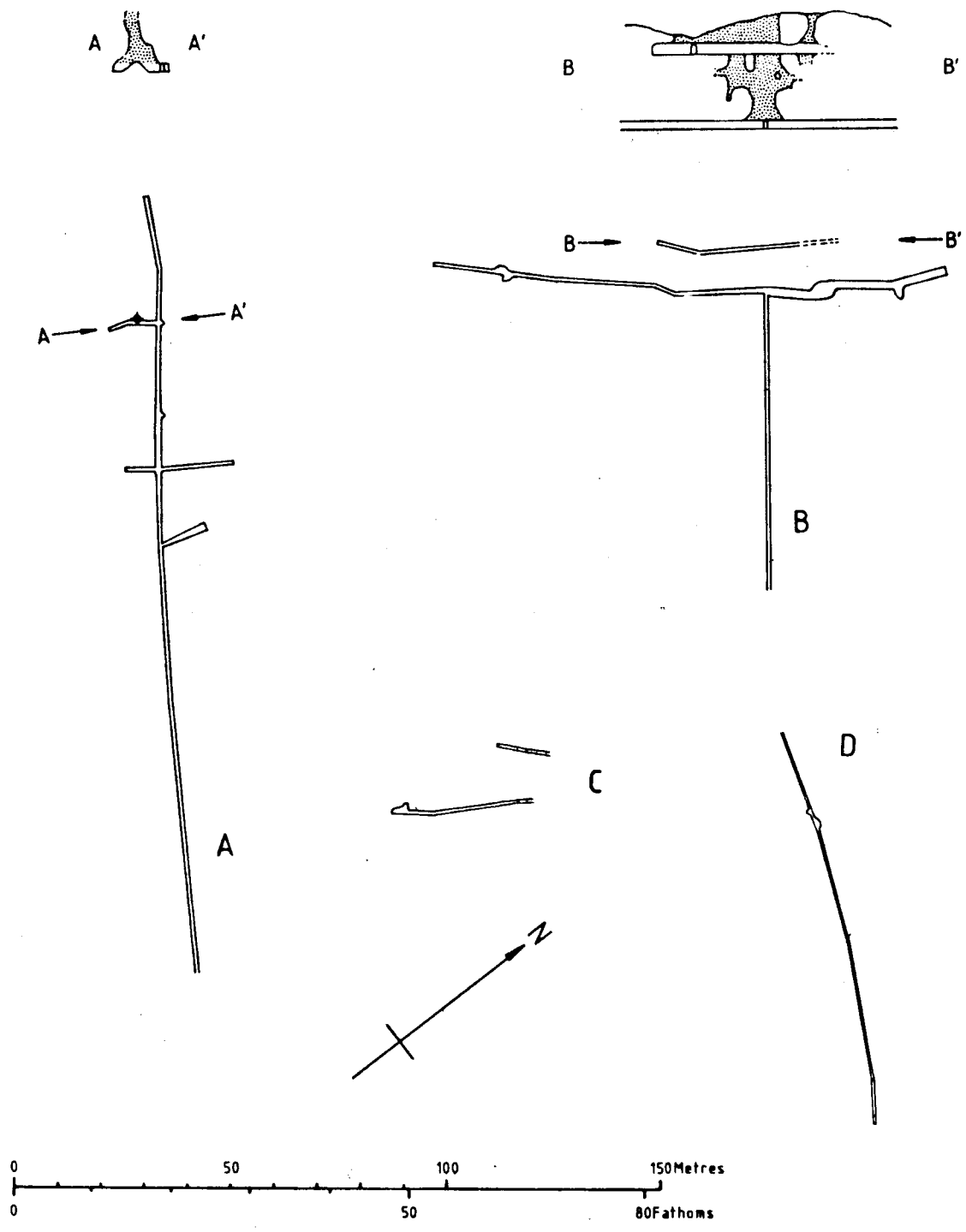


Fig. 1. Location map of Cwm Bychan Mine.
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KEY

- ◆ Shaft
- Crosscut
- ▨ The Ground Stopped

Pecked lines denote uncertainty

NOTES

- 1) Surveyed by N. d'A. Laffoley and A. J. Rex, April 1986.
- 2) Surveyed with fibron tape ($\pm 5\text{cm}$) and Silva compass ($\pm 0.5^\circ$).
- 3) Drawn by N. d'A. Laffoley, August 1986.

Fig. 3. Plans and selected sections of workings at Cwm Bychan Mine.



Plate 1. Buddle circle at site of Cwm Bychan dressing plant.

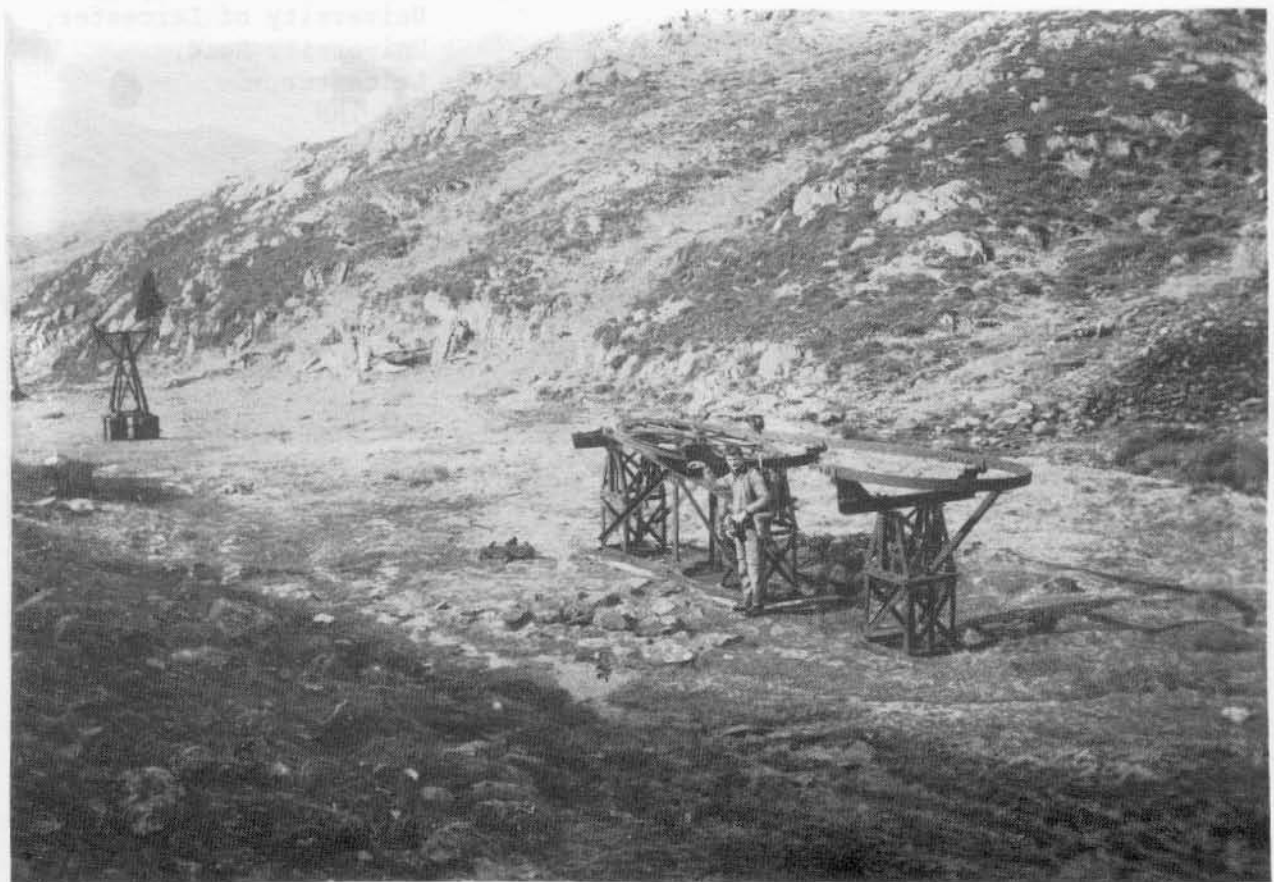


Plate 2. Upper cableway terminus, Cwm Bychan mine.

ADIT D

100m E of the upper cableway terminus the remains of a small building mark the site of adit D. The entrance is partly run in. The dimensions of this level are rather smaller than usual. It is oval in cross-section, averaging 1.7m in height, and is driven in highly cleaved rocks for nearly 100m. The only mineralisation occurs a short distance from the entrance, where chalcopyrite occurs in disseminated bands parallel to the cleavage, and in occasional cross-cutting patches.

OTHER WORKINGS

A north lode showing galena was worked at some stage (Bick, 1982). These workings have not been located by the present authors, and no traces of galena have been observed. Numerous small trials continue up the valley from the mine along strike from the adit B stope, and at the top of the mountain they meet the workings of Llwyndu or Crib Ddu mine [SH606483]. These will be described in detail in a future publication, but the main workings consist of a large stope at the end of an adit, which dips at an angle of 45 - 50 degrees SE and shows good pinch and swell. Whilst not necessarily on the same structure as Cwm Bychan mine the similarity between the stopes in both mines is noteworthy.

ACKNOWLEDGEMENTS

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REFERENCE

BICK, D. 1982. *The old copper mines of Snowdonia*. 129pp., figs., photos., refs., maps. (Newent: The Pound House.)