

Mineralisation - Capel Curig and Betws-y-Coed. Description of 1:25 000 sheet SH 75

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Map: [Sheet SH 75 Capel Curig and Betws-y-Coed. 1:25 000 series - Classical areas of British geology](#)]

Under construction



Figure 25 Sketch of abandoned mine near Sarnau.

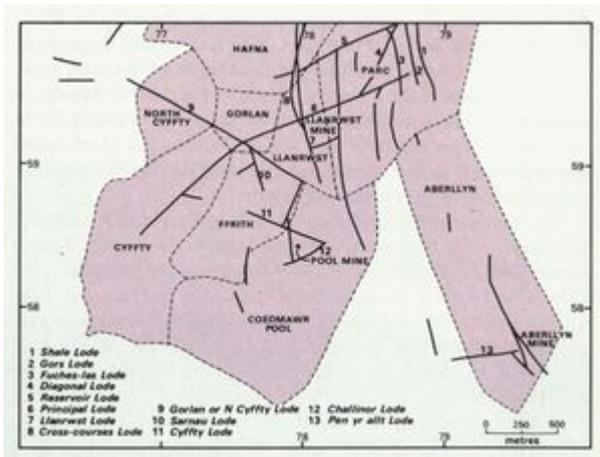


Figure 26 Sketch map showing lodes and properties of the southern part of the Llanrwst mining field.

Chapter 8 Mineralisation

The district includes the southern part of the Llanrwst mining field, which was once one of the most important sources of lead and zinc in the Lower Palaeozoic rocks of North Wales. The field is bounded to the east by the Llyn-y-Parc Fault, to the west by the outcrop of the Upper Crafnant Volcanic Formation around Llyn Bodgynydd, and to the south by the Mon Llugwy. It includes the properties of Aber-lynn, Coedmawr Pool, Ffrith, Gorlan, Cyffty, North Cyffty, Llanrwst and part of Parc and Hafna, the boundaries of which are shown, together with the principal lodes and mines of the district, in [\(Figure 26\)](#).

The mineral potential of the district was recognised as early as 1625 when Sir John Wynne of Gwydir

wrote to Sir Hugh Myddleton 'I have leade ore on my ground in great store, and, other minerals near my house, yf it please you to come hither' (Dewey *in* Dewey and Smith, 1922, p. 59). Mining activity was most intensive from 1848 to 1914 and was concentrated in the Sarnau area, near the centre of the field. Output during this period amounted to 11 357 tons of lead ore and 12 304 tons of zinc ore. Mining declined as cheaper sources were discovered elsewhere and from 1914 to 1938 the recorded output had dropped to 1501 tons of lead ore and 1424 tons of zinc ore ([Figure 25](#)). The Parc Mine lodes, associated in some instances with the Llyn-y-Parc Fault, were worked intermittently until the late nineteen-fifties (Dennison and Varvill, 1952; Archer, 1959).

The following summary is based mainly on publications by Dewey (in Dewey and Smith, 1922) and Archer (1959), supplemented by an unpublished report by T. Robertson in 1940, and research by Marengwa (1973).

The mineralisation is of lode type occupying steeply dipping normal faults which generally show little displacement. The lodes have three trends, the earliest east-north-easterly set being displaced by northerly lodes and both displaced by east-south-easterly lodes. The northerly lodes form mineralised belts, up to 80 ft wide, which 'merge insensibly into the country rock on one or both sides' (Dewey and Smith, 1922, p. 60), whereas the other lodes, up to 6 ft wide, have well-defined walls.

Substantial tonnages of ore have been gained from the northerly lodes at the Aber-llyn and Parc mines and from the east-south-easterly lodes in the Pool and Hafna mines. The east-north-easterly lodes were worked principally at Parc, Pool, Llanrwst and Cyffty mines. The nature and disposition of the lodes varies with differing lithologies of the host rock. The inclination of the Principal Lode at Parc Mine flattens to about 45° in black mudstone from the usual dip of about 75° in the more competent tuffs and tuffite. Within the black mudstones the lode is ill defined and can only be traced by poorly mineralised stringers and fault gouge.

The predominant ore minerals are galena and sphalerite, although pyrite and marcasite are locally common. Chalcopyrite and magnetite have also been recorded, but they are rare. The relative abundance of the main gangue minerals, quartz and calcite, is related to their mineral associations and to the wall-rock lithology: in general, breccias of slate are cemented by quartz, and breccias of tuff are cemented by calcite.

Over the mining field as a whole it has been estimated (Dewey and Smith, 1922) that the ratio of ore to gangue averages from 8 to 15 per cent of galena and 8 to 10 per cent of sphalerite. The proportion of galena to sphalerite varies in different lodes; at the Parc Mine the ratio is 2 to 1. Pool, Llanrwst and Cyffty mines produced lead almost exclusively, although zinc is not absent from the lodes. Parc Mine has produced more lead than zinc and Aber-llyn was almost entirely a zinc producer. These variations appear to be local rather than regional, for the distribution both of ores and gangue minerals shows no evidence of mineral zoning.

In virtually all the most important mines dolerite occurs in the vicinity of the lodes, sometimes forming the walls. The intrusions are clearly older than the lodes, but it is uncertain whether they have exerted any control on the mineralisation.

Hydrothermal alteration of the wall rock adjacent to the lodes is generally confined to narrow bleached zones, up to 1 m thick, and suggests temperatures of 200°-300°C during mineralisation (Marengwa, 1973). The dominant alteration is silicification, though sericitisation can also be seen in argillaceous sediments. Feldspathisation is patchy in the contact rocks, within 0.3 m of the edge of the lodes, and lead and zinc concentrations associated with this alteration are the highest determined in the wall rocks.

The age of the mineralisation was formerly assumed to be post-Carboniferous (Dewey and Smith, 1922; Archer, 1959), although a dating of 340 ± 70 million years by Moorbath (1962) raised the possibility of an earlier (?Carboniferous) mineralisation. Ineson and Mitchell (1975), using potassium-argon methods, have determined two Carboniferous ages of mineralisation at 320 and 280 million years.

References

Glossary

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