Welsh Mines Society

Cymdeithas Mwyngloddiau Cymru

FIELD MEET NOTES – June 2004

A geological guide to the Bryneglwys area

The Bryneglwys slate mine lies on a monocline dipping ca 40° - 60° to the southeast a short distance southeast of the major fault system which passes through Tal-y-llyn and extends northeast via Bwlch Llyn Bach to Bala. The rocks are of Ordovician age, dominantly of mudstone lithology, deposited between about 455 and 445 million years ago, following cessation of a major period of volcanism, the products of which are well displayed around Cader Idris. The slates are thus younger than those around Rosebush and Blaenau Ffestiniog, which in turn, are younger than those around Nantlle and Bethesda. The fault system was active during deposition of the mudstones and defined the upper part of a submarine slope extending southeast into deeper water. The mudrocks were deformed by tilting, folding and the imposition of cleavage, here striking ca 035°, about 396 million years ago. Metal mineralisation in Central Wales took place around 390 million years ago but is rare around Bryneglwys (barren quartz veins are not however uncommon in the slate workings).

The area saw its first modern mapping almost 80 years ago (Jehu,1926) with the result that several of the stratigraphic units were given the names used by the miners here and around Corris. It has recently been restudied, with addition of much useful detail, by the British Geological Survey (1995, see also the accompanying memoir by Pratt, Woodhall and Howells,1995) as part of the 1:50,000 mapping of the Cader Idris area. Bryneglwys lies within the Corris Slate Belt which follows the outcrop of the slate 'veins' and extends from Tywyn to Dinas Mawddwy.

The rock units are categorised as follows :-

The **Ceiswyn Formation** (oldest) is ca 1400 m thick and forms most of the ground between Abergynolwyn and the mine. It contains common intercalations of sand and silt turbidites within grey mundstones and is locally disturbed by syndepositional sliding. It is thus unsuitable for making good slates although limited working has been made nearby, e.g. at Perfeddnant (SH 630 054).

The **Nod Glas Formation** is only ca 20 m thick but is a very distinctive coal-black mudstone containing much pyrite. It records a period of anoxic bottom water and is a very useful marker horizon for mapping although unsuitable for making slates. It may be seen in the Nant-y-nod stream at SH 6921 0580, in the portal of the Long Tunnel and in the spoil of the manganese trial.

The **Broad Vein Formation** is ca 380 m thick and its light grey colour and occasional burrow-mottling indicates a reversion to oxic bottom waters, although at its top a darker, more pyritous facies (the Red Vein *sl*) shows that

oxygen levels fell off again. The basal portion, Broad Vein *ss*, was worked for slate / slab and is well seen in the quarries around SH 694 057 and in most of the Long Tunnel. The Red Vein is beautifully displayed in the Daylight Tunnel and can also be seen in the tail race cuts of the haulage wheelpit.

The **Narrow Vein Formation** is ca 18 m thick, dark grey and the principal slate horizon. It is largely composed of hemi-pelagic mudstones deposited in poorly oxygenated waters but with little of the undesirable pyrite (which ruined the saws), at least in its lower portions. It is best seen at surface at SH 6942 0522, in an unstable arch separating the now collapsed chambers 5B and 6B (numbering after Holmes, 1999); its contact with the Garnedd-wen Formation is exposed close by at SN 6942 0520 and the contact with the Red Vein just inside the mouth of the adjacent Daylight Adit at SN 6938 0522. Both adit and arch are accessible without rope but need great care.

The **Garnedd-wen Formation** (youngest) is at least 650m thick and formed of silty slumped mudrock with local mass-flow sand and conglomerate which records a major sea level fall and development of oxic bottom water due to the late Ordovician ice age. It rests abruptly on the Narrow Vein and may be seen in the hanging walls of the collapsed chambers and the hillsides to the south. It was tried for slate on Tarren Hendre at SH 6829 0440 but was found there, and is generally, totally unsuitable.

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References

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