7 Upper Afon Melau valley

This circular route of about 7 km, across the core of the Melau anticline immediately south of Rhobell Fawr, (Figure 24) traverses the upper part of the Mawddach Group, a short section through the Rhobell Volcanic Group and the lower part of the Ordovician sequence; it thus covers the same formations as Excursions 4, 5 and 6. The route, mostly along forest roads and good tracks, ranges in elevation from 270 to 460 m OD and should take about half a day. The simplest approach is to follow a minor road signed to Llanfachreth from the Bala to Dolgellau road (A494), about 0.5 km E of the junction with the Brithdir road (B4416). Pass straight through the first cross-roads. The road ahead is gated. At the second crossroads continue straight on, taking the route marked as a 'cul de sac'. From the cross-roads, the road, though largely unmetalled, is passable by car for at least 1 km, but it may be preferable to park near this junction, taking care not to obstruct access to fields, and walk.

Locality 1 [SH 7830 2338] At this old slate working in the Ffestiniog Flags Formation, waste tips occur at two levels near the main adits. One of the adits is on the west of the road just beyond a small ruined building. At this adit the sedimentary features show up clearly on the weathered cleavage surfaces. The cleavage dips at an angle steeper than the bedding. At the mouth of the adit a 40-cm bed of pale grey, fine, quartzose sandstone shows large scale trough cross-stratification, which is rarely seen in natural exposure as the beds tend to break away into flaggy slabs. This is interbedded with alternating beds of grey and pale grey quartzose siltstone. Uphill, above the adit, several trials occur north of the air shaft, where the beds have been worked along strike thus providing a surface on which the lateral variation in the rocks can be examined. The pale quartzose beds show parallel- and cross-stratification, the latter in units as little as 0.5 cm thick. Both these and the thicker units can be seen to die out along the strike. The crags at the top of the hill mark a dolerite intrusion.

Locality 2 [SH 7843 2406] From the quarries the road leads through the forestry area NNW to this exposure by the track side. It is cleaved grey uniform siltstone with sparse quartzose laminae, and is close to the top of the Ffestiniog Flags Formation. Upwards there is a gradual change in colour from fairly uniform mid-grey siltstone to very dark grey and black. The stream section to the north has yielded the typical fossils *Parabolina spinulosa* and *Orusia lenticularis* (Figure 20).

Locality 3 [SH 7837 2410] Beds here consist of dark grey siltstone, but through the gate behind the wall on the left [SH 7832 2412] a shallow quarry is cut in black banded silty mudstone typical of the Dolgellau Member of the Cwmhesgen Formation.

Locality 4 [SH 7829 2414] The crags exposed on the right bank of the stream are not typical of the Dolgellau Member. They are massive and compact, resulting from baking at the contact of the large coarse-grained dolerite intrusion. The dolerite forms the steep scarp to the north of the river and blocks of it may be examined in the scree and in the adjacent stone walls. More exposures occur at the top of the ridge [SH 7834 2426] and [SH 7839 2423].

Locality 5 [SH 7849 2428] Here, the pale grey laminated siltstone of the Ffestiniog Flags Formation exposed on the path is metamorphosed near the contact with the dolerite, which is exposed farther along the path [SH 7859 2434].

Locality 6 [SH 7884 2463] Through the fence, the Rhobell Volcanic Group forms the steep scarp to the west. Where the track passes through the next wall, large blocks of lava occur adjacent to the path. Above the crag the lavas are generally massive and uniform, but lenses of breccia can be seen. The lavas contain an abundance of feldspar phenocrysts, 2 to 3 mm long, in a dark green groundmass. To the north-east, several minor faults displace medium grey shales of the Dolcyn-afon Member [SH 7892 2469] on to the ridge. Farther to the east the ridge passes back on to the Rhobell Volcanic Group, and on Graig Fach, in the crags immediately to the east of the wall [SH 7916 2483], there are intercalated breccias in which large irregular blocks, up to 60 cm across, are contained in a feldspar-rich basaltic matrix. On the eastern' face of Graig Fach the contact of the lavas with the shales of the Cwmhesgen Formation dips to the west.

Locality 7 [SH 7937 2468] The low feature here forms the contact between the two members of the Cwmhesgen Formation. The colour change from the lower darker grey shales to the medium grey hues of the upper member is

gradual.

The track to the north-east swings eastwards through the forest which lies on the outcrop of the Dolgellau Member, here forming the core of the Melau anticline.

Locality 8 [SH 7971 2464] This quarry has been used by the Forestry Commission for roadstone. The beds near the base of the Dol-cyn-afon Member are dark grey shales with a faintly defined lamination and a platy parting. They contain a sparse fauna diagnostic of the Tremadoc Series, including sponge spicules, *Eurytreta* cf. *sabrinae,* a hyolithid and bellerophontid, *Niobella, Shumardia* and *Dictyonema flabelliforme* cf. *sociale.* At the southern end of the quarry, 1 to 2 m of head (loose debris carried down slope by solifluction processes) overlies the solid rock.

Southwards along the track a few exposures appear through head, and fragments of *Dictyonema flabelliforme* may be found.

On the eastern limb of the Melau anticline the road crosses on to the lowest part of the Aran Volcanic Group. There is some discordance in dip between the Cambrian and Ordovician rocks in the Cae'r-defaid area, but both dip to the east. The Aran Volcanic Group seen here is quite different from the section in the Cwmhesgen valley (Excursion No. 6). The road gives access only to the lower part of the group.

Locality 9 [SH 7961 2372] The Garth Grit Member, which marks the base of the Allt Allt-L■yd Formation to the north, is not seen here, and the lowest exposed beds are banded dark grey siltstone with thin pale laminae (p. 40). Moving eastwards, up the succession, beds of pale grey feldspathic sandstone are intercalated with the siltstones, but the well-developed cleavage obscures the sedimentary structure.

Through the gate and to the north of the fence, the crags adjacent to the track are thickly bedded coarse-grained sandstone made up of feldspar crystals and lithic fragments. Locally the beds show parallel- and cross-stratification. The dark siltstones are absent here.

Locality 10 [SH 7977 2368] The roadside exposure, still within the Allt Allt-L■yd Formation, is of tuffite, which consists almost entirely of lapilli of feldspar-porphyry. The beds are crudely graded, and show parallel- and cross-lamination that indicate reworking of the sediment by water. A bed of fine vitric tuff 20 to 30 cm thick, overlies the coarse beds.

Locality 11 [SH 79729 23598] The stream crossing the road follows an outcrop of a softer-weathering basalt. In the exposure to the south of the road the basalt shows good columnar jointing.

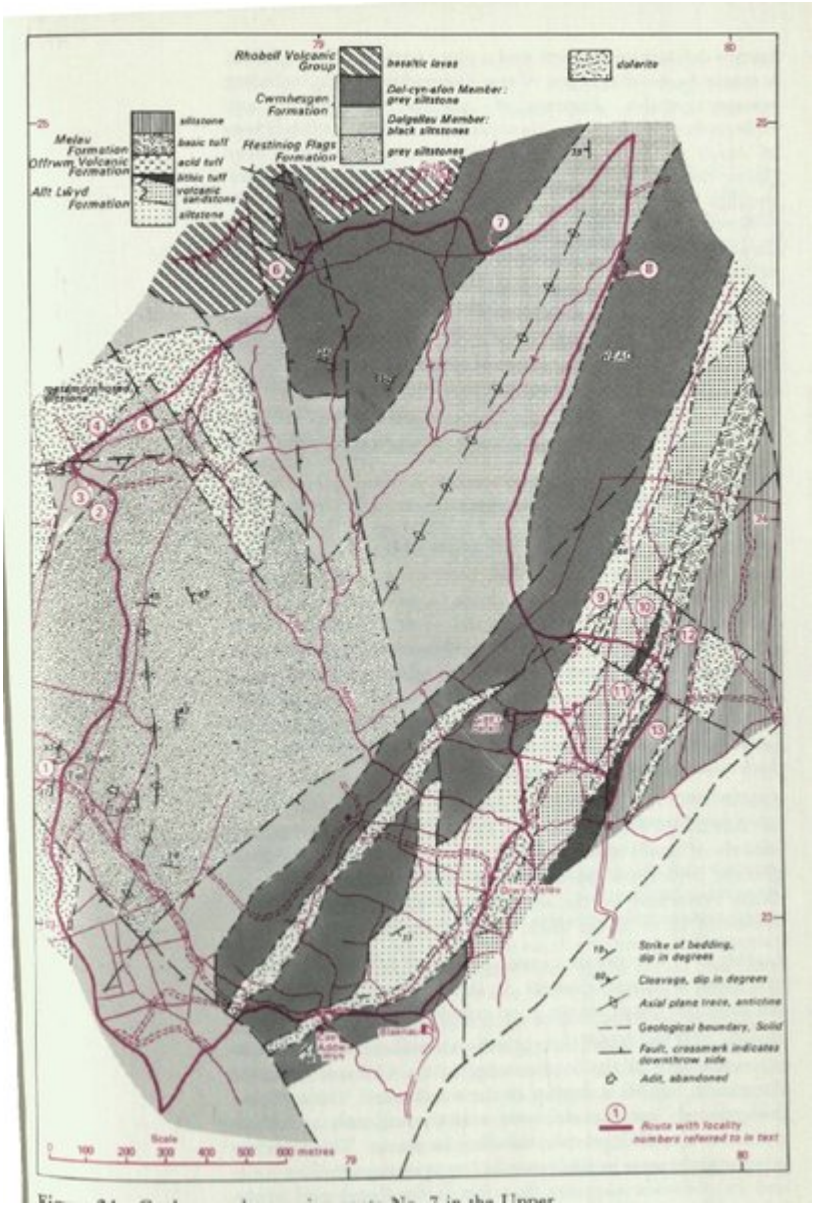
Locality 12 [SH 7983 2366] Acid tuffs, characteristically bleached, occur here at the feather edge of the Offrwm Volcanic Formation, which is thicker to the south-west. The tuffs are fine-grained, but contain some scattered crystals and clasts and show a well-developed banding in places. This banding is commonly seen in the reworked tops of the ash-flow units and its presence suggests that this is the distal part of the original flow.

The acid tuff is overlain by a thin horizon of crystal-rich or tuffaceous siltstone, but northwards along strike basic tuff occupies this position. The rubbly basic tuff, exposed in the field to the north [SH 7993 2393], consists of fragments of scoria, or highly vesiculated basalt, in a matrix of chlorite and calcite.

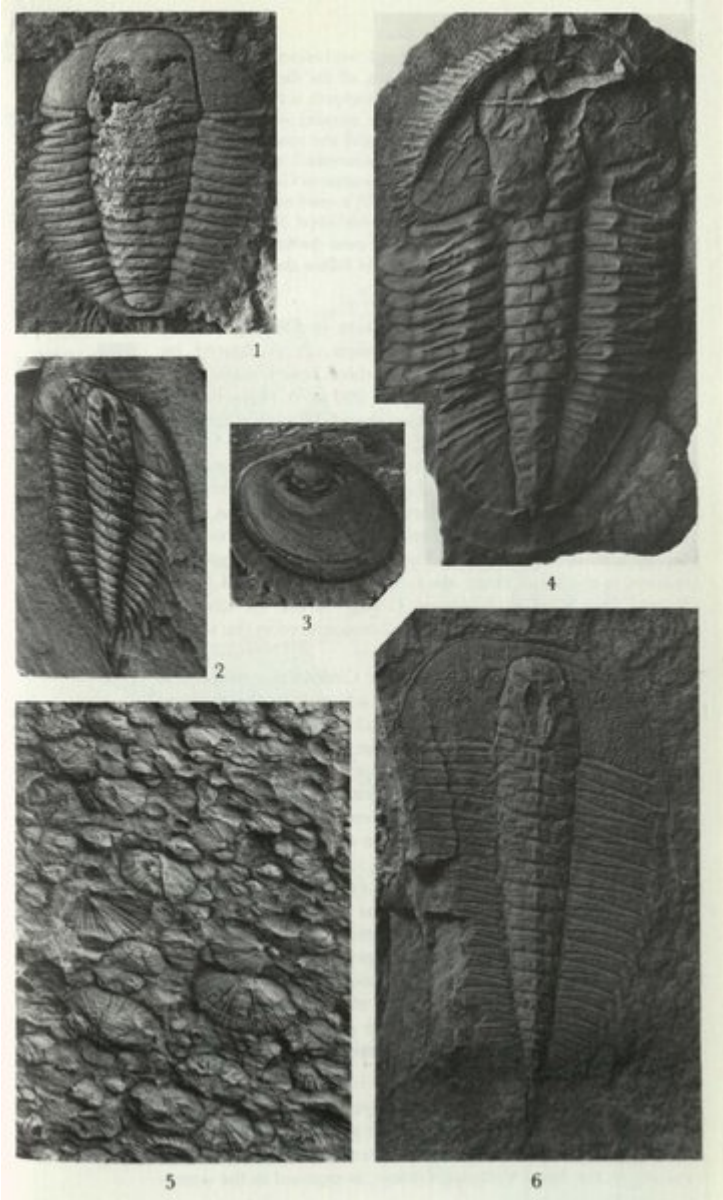
Locality 13 [SH 79763 23475] The Benglog Volcanic Formation, which crops out on Craig y Benglog to the north-east of this area, is underlain by a thick siltstone unit above the Allt Offrwm and Melau formations. It is exposed to the east of the road where this turns downhill to the south. The medium grey siltstone contains laminae and thin beds of crystals and crystal pseudomorphs, which indicate continuing contemporaneous volcanism. The cleavage is almost at right angles to the bedding and makes a search for fossils very difficult.

From the road, turn west towards Cae'r-defaid cottage where the footpath to the south passes into the Forestry Commission area, then downhill to the Afon Melau. Continue SSW along the wall, and follow the farm tracks to Drws-Melau and Cae-Addw-wyn. From Cae-Addw-wyn the footpath is not well marked but follows the stream westwards, veering south-west where it passes through a wall, past a ruined barn, and then uphill back to the track (Figure 24).

References



(Figure 24) Geology and excursion route No. 7 in the Upper Mon Melau valley.



(Figure 20) Fossils from the Dolgellau Member 1. Peltura scaraboides (Wahlenberg), x3, from the P. scarabaeoides Zone. 2. Parabolina spinulosa, (Wahlenberg), x3 from the P. spinulosa, Zone. 3. Broeggeria salteri (Hull), ventral valve, x3, from the Acerocare Zone. 4 Niobella homfrayi (Salter), x2, from the Acerocare Zone. 5 Orusia lenticularis (Wahlenberg), x3, from the P. spinulosa Zone. 6 Parabolina heres Brögger, x3, from the Acerocare Zone.