

Geology of the Llanidloes area: Geological description - Ordovician

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Authors: Wilson, D, Burt, C E, Davies, J R, Hall, M, Jones, N S, Leslie, A B, Lusty, P A J, Wilby, P R, and Aspden, J A.

Ashgill slope-apron succession

The Ordovician rocks of the Llanidloes district are entirely of Ashgill age, and crop out within a series of named inliers in the central, western and northern parts of the district ([Figure P930911](#)). The inliers form a series of second-order periclinal folds ('domes') within the larger Teifi Anticlinorium and Central Wales Syncline (Jones, 1912^[1]), two of the dominant structural features of mid Wales. The oldest Ashgill strata are a succession of predominantly turbiditic slope-apron sediments at least 200 m thick, represented by the **Nant-y-Môch Formation (NF)** and **Dolhir Formation (Dolh)**. The Nant-y-Môch Formation is composed of thinly interbedded bioturbated mudstone, siltstone and sandstone, with units of hemipelagic mudstone, exposed within the Plynlimon Inlier in the westernmost part of the district. The corresponding Dolhir Formation, which crops out within the Carno Inlier in the north, is a more proximal slope facies comprising sandy, burrow-mottled mudstones with locally abundant shelly detritus. Although the boundary between the two formations is thought to be transitional, it is obscured by later strata and its nature cannot be determined with certainty.

For the succeeding stratigraphy, the term 'Yr Allt Formation', widely used on BGS maps throughout central Wales, has been abandoned and the equivalent rocks included in the Drosgol and Brynglas formations (see Davies et al., 2009^[2]; Cave and Hains, 1986^[3]). The Nant-y-Môch and Dolhir formations are both succeeded by the **Drosgol Formation (DF)**, a thick unit (up to 450 m) of slumped and destratified mudstone and sandstone ('disturbed beds'), generated by multiple slope failures due to the rapid build-up and concomitant oversteepening of a prograding sediment pile. The high rates of sedimentation that accompanied slope progradation were a result of glacioeustatic regression during the late Ashgill Hirnantian stage (Brenchley et al., 2006^[4]; Davies et al., 1997^[5]). The uppermost part of the Drosgol Formation is represented by the **Pencerrigtwion Member (PtM)**, a series of amalgamated submarine channel-fill deposits and turbidite lobes (Cave and Hains, 1986^[3]; James, 1983^[6]), comprising up to 180 m of thick-bedded, medium- to coarse-grained, locally conglomeratic sandstone, massive high-matrix sandstone and subordinate mudstone with much evidence of slumping and dewatering. The Pencerrigtwion Member crops out mainly in the Plynlimon and Van inliers, and represents the maximum glacial lowstand when the shelf and slope were effectively bypassed, and coarse sediment was delivered directly to the basin floor (Davies et al., 2009^[2]).

References

1. ^[1] Jones, O T. 1912. The geological structure of Central Wales and the adjoining regions. Quarterly Journal of the Geological Society of London, Vol. 68, 328-344.

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3. ↑ [3.0](#) [3.1](#) Cave, R, and Hains, B A. 1986. Geology of the country between Aberystwyth and Machynlleth. Memoir of the British Geological Survey. Sheet 163 (England and Wales).
4. ↑ Brenchley, P J, Marshall, J D, Harper, D A T, Buttler, C J, and Underwood, C J. 2006. A late Ordovician (Hirnantian) karstic surface in a submarine channel, recording glacio-eustatic sea-level changes: Meifod, central Wales. Geological Journal, Vol. 41, 1-22.
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6. ↑ James, D M D. 1983. Sedimentation of deep-water slope-base and inner-fan deposits — the Drogol Formation (Ashgill), west central Wales. Sedimentary Geology, Vol. 34, 21-40.

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