



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Llanfrynach	File Number: AH_06
RIGS Number: 756	Surveyed by: AJ Humpage
Grid Reference: SO 08410 25470	Date of Visit: 11 September 2011
RIGS Category: Scientific	Date Registered: Unknown
Earth Science Category: Geomorphological, Sedimentological	
Site Nature: Pasture farmland	Documentation prepared by: AJH
Unitary Authority: Powys CC	Documentation last revised: 6 November 2011
OS 1:50,000 Sheet: 160	Photographic Record: See images attached to this report
OS 1:25,000 Explorer Sheet: OL 12	
BGS 1:50,000 Sheet: 213 (Brecon) and 214 (Talgarth)	
<p>RIGS Statement of Interest: This site forms part of a network of important scientific sites within the South Wales RIGS area associated with ice front stillstand and readvance in glaciated valleys and post-glacial fluvial development.</p> <p>This site comprises three components:</p> <ul style="list-style-type: none"> • Llanfrynach moraine features • Afon Cynrig glacio-fluvial fan and section • Nant Menasgin glaciofluvial fan possibly grading to a fan delta <p>This site marks evidence of the complex relationships which exist between a valley trunk glacier and its tributaries, which are often closer to their source areas. Originally, it was assumed that the morainic deposits at Llanfrynach were part of the main sequence of Usk valley deglaciation stages (Elis-Gruffydd 1972, 1977) but more recent interpretation (Humpage 2007) has suggested that they are associated with the development and advance of small piedmont type lobes at the end of tributary glaciers after the main valley glacier has retreated upstream.</p> <p>In turn, as the tributary glaciers melted, large amounts of meltwater transported coarse sediment downstream and developed large glacio-fluvial fans on the valley floor. Two such fans, issuing from the Cynrig and Nant Menasgin valleys are visible here, flowing around the morainic deposits and intercalating west of Llanfrynach village. Williams (1968) suggested that the eastern margin of the Menasgin fan entered a ribbon lake (Lake Talybont). The fan sediments in places have been subsequently dissected by Holocene fluvial activity.</p>	

Geological setting/context:

The glacial evolution of the middle and lower Usk valley is not well understood, but as this area lies on the margin of the Devensian ice sheet, it is increasingly being recognised as an important area to research system responses to environmental change (Carr et al 2007).

Traditionally, the Usk valley glacier was assumed to reach its maximum extent c 20-22ka and to have disappeared, along with the Welsh ice cap by c.16ka (Thomas 1997). However, more recently, doubt has been cast on this model based on dating evidence from the uplands around Abergavenny, which suggests deglaciation may have been initiated earlier than traditionally thought. Coleman and Parker (2007) suggest ice free conditions may be prevailing in the uplands above Abergavenny as early as 19420+/-64 Cal BP

Llanfrynach village is in an embayment filled with superficial deposits in the south side of the Usk valley one kilometre south of the River Usk itself. This area is surrounded by bedrock on three sides, by Cefn Hill to the east (to the north of which the Usk flows in a narrow rock-cut gorge), the rising ground of Wern and Cefn Cyff to the south, and the steep flanks of Cefn Cantref to the west. Northwards, is an area of hummocky ground and large pool beyond which the land falls gently to the River Usk. Two tributary rivers, which rise on the northern flank of Fan y Big, flow across the area. The Afon Cynrig flows northwards against the foot of Cefn Cantref, and the Nant Menasgin, which flows north-eastwards around the southern flank of Cefn Hill, and upon the left bank of which Llanfrynach village is sited.

The area was first mapped in any detail by Williams (1968) and he proposed that Llanfrynach village is on a glacio-fluvial sandur surface, or "valley train", deposited when the Usk valley ice limit was a short distance upstream. The hummocky ground north of the village at the upstream end of this sandur surface he considered to be morainic ridges partially buried when these sheet deposits were laid down, a large pool being interpreted as a kettle hole formed by the decay of an *in situ* ice mass. North of the morainic ridges, a large low-angle, late glacial alluvial fan, issuing from the Cynrig and sloping gently northwards towards the Usk valley, truncated the glacio-fluvial sheet deposits. Down valley from Llanfrynach, Williams described the sandur as terminating to the north of Pencelli village [SO 093 250] in two terraces which he did not regard as associated with any Holocene downcutting by the River Usk. Rather, he considered these features, and other comparable ones at similar elevations between Pencelli and Buckland to be fan deltas issuing from tributary streams into a large "Glacial Lake Talybont" with a surface elevation at c.120m O.D. This lake may have been dammed by the large complex of moraines at Buckland-Llandetti.

Williams ascribed the deposits around Llanfrynach, with the exception of the Cynrig fan, to deposition associated with the retreating Usk valley glacier, the moraines north of Llanfrynach being linked with a ice retreat stage abutting the western edge of Cefn Hill. At this stage, glacial meltwater flowed either side of Cefn Hill forming a large fan delta into the moraine dammed lake downstream. This view was largely reinforced by Ellis-Gruffydd (1972), who placed one of the Usk valley major retreat moraines (the

“Brynich” Stage) across the Usk between Llanfrynach and Troed yr harn [SO 070 302].

Remapping of the area by the British Geological Survey during 2002 (BGS 2004, 2005) gave some reason to doubt this interpretation. The ridge of the “Brynich moraine” south of Groesffordd, whilst surrounded by glacio-fluvial ice contact deposits, was interpreted as a cross-valley rock bar (Barclay *et al.* 2005) and as a consequence the argument for a major Usk valley glacier halt stage in this area had to be reassessed. Lewis and Thomas (2005) took a similar view, terminating the Brynich moraine north of the River Usk.

It was also apparent that much of the land surface around Llanfrynach slopes gently down towards the north, a feature that Williams had also noted. As a consequence, the surface deposits previously described as a valley train south of Cefn Hill have been reclassified as an area of extensive late glacial glacio-fluvial fan deposits issuing from Nant Menasgin into what was probably a pre-glacial course of the River Usk. This does not preclude the possibility of glacio-fluvial sheet deposits being present below these fan deposits.

The form of the hummocky ground north of Llanfrynach has mounds with crests oriented east-west or north-easterly and are here considered to be deposits of a terminal moraine associated with a northward re-advance of tributary glaciers from the Cynrig and Nant Menasgin valleys. Such a re-advance must have occurred after the relatively earlier retreat of the Usk valley glacier from the Llanfrynach area suggesting that these tributary glaciers, close to their source areas in the Brecon Beacons, were sustained and remained active for some time after the main valley glacier had decayed. As the ice fronts of these tributary glaciers in turn retreated southwards into the mountains, large quantities of glacio-fluvial deposits were deposited in the Cynrig valley and the southern margin of the morainic topography was partially buried by late glacial alluvial fan deposits. The large pool, described by Williams as a kettle hole and still present today, may have formed by dead ice decay after alluvial fan sedimentation had largely ceased, otherwise the basin would probably have been infilled. However, it has been extended and deepened in recent years so its original form is no longer apparent.

References:

Barclay, W.J., Davies, J.R., Humpage, A.J. Waters, R.A., Wilby, P.R., Williams, M. and Wilson, D. (2005). Geology of the Brecon district – a brief explanation of the geological map. *Sheet Explanation of the British Geological Survey*. 1:50,000 Sheet 213 Brecon (England and Wales).

British Geological Survey (2004). *Talgarth. England and Wales Sheet 214. Solid and Drift Geology*. 1:50,000. British Geological Survey, Keyworth, Nottingham.

British Geological Survey (2005). *Brecon. England and Wales Sheet 213. Bedrock and Superficial Deposits*. 1:50,000. British Geological Survey, Keyworth.

Carr, S.J., Coleman, C.G., Humpage, A.J. and Shakesby, R.A. (2007). *Quaternary of the Brecon Beacons: Field Guide*. Quaternary Research Association, London.

Elis-Gruffydd, I.D. (1972). *The Glacial Morphology of the Upper Usk Basin (South Wales) and its right-bank Tributaries*. Unpublished Ph.D. Thesis. University of London.

Elis-Gruffydd, I.D. (1977). Late Devensian glaciation in the Upper Usk Basin. *Cambria*. 4 46-55.

Humpage, A.J. (2007). Llanfrynach. In: Carr, S.J., Coleman, C.G., Humpage, A.J. and Shakesby, R.A. (Eds). *Quaternary of the Brecon Beacons: Field Guide*. Quaternary Research Association, London.

Lewis, C.A. and Thomas, G.S.P. (2005) The Upper Wye and Usk Regions. In: C.A. Lewis and A.E. Richards (Eds). *The Glaciations of Wales and Adjacent Regions*. Logaston Press, Logaston, Herefordshire.

Thomas, G.S.P. (1997). Geomorphology of the Middle Usk valley. In: S.G Lewis and D. Maddy (Eds). *The Quaternary of the South Midlands and Welsh Marches: Field Guide*. Quaternary Research Association, London.

Thomas, G.S.P. and Humpage, A.J. (2007). The glacial geomorphology of the lower and middle Usk valley. In: S.J. Carr, C.G. Coleman, A.J. Humpage and R.A. Shakesby (Eds). *Quaternary of the Brecon Beacons: Field Guide*. Quaternary Research Association, London.

Williams, G.J. (1968). *Contributions to the Pleistocene Geomorphology of the Middle and Lower Usk*. Unpublished PhD. thesis, University of Wales.

SECTION B**PRACTICAL CONSIDERATIONS:**

Please score Accessibility and Safety Red Amber or Green

Accessibility:

X

Comment: Easily accessible where crossed by public roads and rights of way allowing features to be viewed. Otherwise, permission will be required.

Safety:

X

Conservation status:

The western, and northern boundary is defined by the River Usk (Tributaries) and River Usk SSSI respectively. In addition, a second tributary also scheduled by the River Usk (Tributaries) SSSI flows through Llanfrynach village. A Roman site lies within the parkland of Maesderwen. The whole area is within the Brecon Beacons National Park, otherwise there are no other known conservation designations on this RIGS.

OWNERSHIP/PLANNING CONTROL:**Owner/tenant:** Unknown / various**Planning Authority:** Brecon Beacons National Park Authority**Planning status/constraints/opportunities:** There are no known planning constraints or opportunities**CONDITION, USE & MANAGEMENT:****Present use:** Farmland**Site condition:** Good**Potential threats:** Development activities within Llanfrynach village.**Site Management:.****SITE DEVELOPMENT:****Potential use (general):** detailed scientific research and geomorphological mapping, would benefit this site**Potential use (educational):** Good accessible site to view morainic deposits and the interaction between glaciers and river drainage, and also between trunk and tributary glaciers.**Other comments:**

Photographic Record



View looking north-west over the moraines of the Cynrig/ Nant Menasgin valley glacier readvance.



View eastwards towards Cefn Hill showing the flat Nant Menasgin glacio-fluvial outwash fan surface.