
Afon Rhaeadr at Pistyll Rhaeadr, Powys

[SJ 068 297]–[SJ 078 287]

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Highlights

The falls at this site are the largest in Wales, and are spectacular under high-flow conditions. In detail, they illustrate the close relationship between their form and underlying lithology and geological structure.

Introduction

Pistyll Rhaeadr on the Afon Rhaeadr is, at 75 m, the highest waterfall in Wales (Figure 3.4). It is at the head of Cwm Blowty, 6 km north-west of Llanrhaeadr-ym-Mochnant. The falls mark the boundary between an upland boulder-lined channel originating in peat, and downstream sections with characteristic point bar depositional features. Water falling over the protruding bedrock benches of Ordovician slates has created a series of plunge pools. The upper and lower pools of the fall are separated by an arch formed by the river exploiting weaknesses in the bedding planes of the slate.

Below the waterfall, the river widens and there is a reduction in velocity such that for a distance of half a kilometre or so, boulders of up to 1 m in diameter have been deposited. More resistant beds of rock below the falls have resulted in the formation of a series of rapids.

Description

The Afon Disgynfa rises at 610 m in the southern foothills of the Berwyn Mountains. The river flows in a north-west to south-east direction in accordance with the regional dip. Downstream of Tan-y-pistyll [SJ 076 286], it joins the Nant y Llyn to form the Afon Rhaeadr, which flows in a glacially deepened valley. Upstream of this confluence the river plunges 75 m over an erosion-resistant sandstone precipice. The fall is two-staged, with a near vertical fall of 50 m separated from a smaller 25 m fall by a plunge pool and a natural arch in the Ordovician slates (Figure 3.5). The plunge pool at the base of the falls is deeper than the upper pool. Immediately below the falls, deposits of gravel-sized materials have built up; the river then enters a rock-lined channel upstream of Tan-y-pistyll bridge. The falls are bordered by slaty scree deposits originating from the Ordovician slates, which Davies *et al.* (1983) suggest form a 50 m thick sequence overlain by a 15 m thick ignimbritic ash flow. These in turn are topped by a further thin unit of slate.

Upstream of the falls, the river drops 40 m in the space of 100 m by way of two smaller waterfalls, the lower of which is separated into three minor branches before entering a plunge pool. In this upstream section, the channel has a boulder bed, but the banks are dominated by finer material which tends to be scoured at higher flows. There is evidence of such erosion scars on the right bank of the stream. Downstream of the falls, however, banks are composite, with coarse gravel units at the base and finer deposits above.

Recent channel change is evidenced by the presence of palaeochannels and terrace levels. Gravel deposits occur in the form of bars, especially in the confluence area with the Nant y Llyn.

The main strike of faults in the area is NE–SW. The faults are the locations of mineralized lodes which have been quarried, for example, at [SJ 075 286]. Scree deposits lead down from such quarries and, in places, form part of the floodplain.

Interpretation

The waterfalls and rapids separate two contrasting channel types in the upper and lower reaches of the river. Upstream, the river is characterized by boulder-bed, peat-lined channels (a mountain torrent type channel), whereas downstream the channel is more typical of a meandering river, with gravel bars and composite banks. Juxtaposition of the two types of channel is particularly abrupt here, and the contrast is on a more spectacular scale than at many other sites at which the transition is progressive. The falls themselves owe their origin to the outcrops of resistant slate and ignimbrite, and the effects of glacial overdeepening of the downstream valley. The detailed characteristics of the falls are influenced by the structural and lithological variations in the Ordovician bedrock. There is evidence of channel change across a glacially overdeepened valley floor. The falls at Pistyll Rhaeadr are, in addition, the largest in Wales at 75 m and have unique features, such as the natural arch formed by weaker bedding planes in the Ordovician slates.

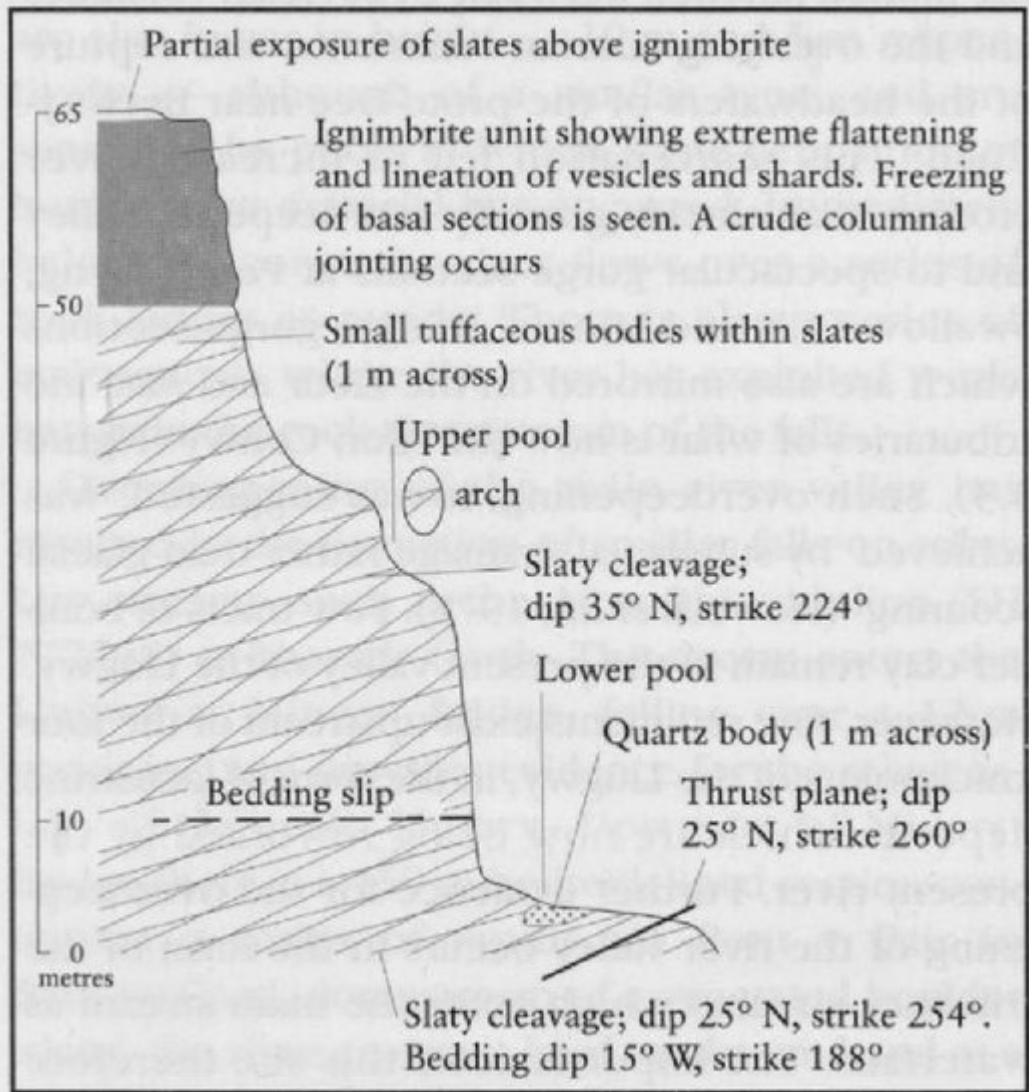
Conclusion

The Rhaeadr falls are the highest in Wales and mark an abrupt transition from an upland mountain torrent flowing through boulders and peat, to a lowland meandering stream. The formation of the falls themselves and their detailed structure are due to the geological characteristics and the glacial history of the area.

References



(Figure 3.4) Pistyll Rhaeadr. With a drop of 75 m from a sandstone precipice, this waterfall is the highest in Wales. (Photo: S. Campbell.)



3.5

(Figure 3.5) A section through Pistyll Rhaeadr, at [SJ 073 295].