
Lyd Hole

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Introduction

The stream section at Lyd Hole is of particular importance as being one of the few places in the Welsh Borderlands where a contact between Uriconian and Longmyndian rocks is exposed. It also includes excellent exposures of volcanic and sedimentary rocks in the river bed and along the steep sides of the gorge, although parts of the section are more accessible during periods of low water. The Uriconian–Longmyndian junction is controversial, having attracted the interest of a succession of researchers who have provided a number of interpretations discussed in the introduction to this chapter.

The earliest descriptions of the section include those of Callaway (1882), who believed the junction between the Uriconian and Longmyndian to be a fault, and Blake (1890) who considered it an intrusive contact. Pocock *et al.* (1938) subsequently decided that the contact showed some evidence of disturbance, but regarded it as essentially conformable. These ideas were partly influenced by regional considerations of the relationships between the various Uriconian outcrops and their association with Longmyndian sediments. The presence of Uriconian volcanic fragments within the Longmyndian demonstrated that the latter were younger, but general acceptance that the disparate outcrops of lithologically similar Uriconian rocks form part of the same volcanic complex came only gradually (cf. Blake, 1890; Lapworth and Watts, 1910). Work by James (1952, 1956) finally established that Uriconian rocks underlie the Longmyndian succession east and west of the Long Mynd, and that the volcanic sequences were everywhere older than the Longmyndian sediments. It follows that the relationship of the Western Uriconian to the Longmyndian, such as that displayed at Lyd Hole, was not an intrusive contact but must be either an unconformity or a fault.

Description

The Uriconian rocks below the waterfalls at Lyd Hole mainly consist of a sequence of ochreous-weathered and silicified acid tuffs and spherulitic rhyolites, separated by a fine-grained, altered vesicular basic rock. The rhyolites are massive, reddish brown, flow-banded lavas, largely devitrified and somewhat ferruginous, with numerous amygdaloidal silica segregations in places, which probably fill vesicles ((Figure 5.8), Locality 1). Spherulites of microcrystalline feldspar, concentrated along the foliation, weather out to give the rock a nodular appearance, well demonstrated at the waterfalls (Locality 3). The pyroclastic rocks are vitric-lapilli tuffs which, in thin section, locally reveal a partially welded fabric enclosing rounded and altered igneous lithoclasts. The basalt, below the lower waterfall (Locality 2), appears to form part of the volcanic succession (Pocock *et al.*, 1938) although it is highly altered and its contacts are not immediately obvious. In thin section it consists of a microcrystalline groundmass of albitized oligoclase feldspar and glass, with vesicles mainly containing feldspar, quartz and chlorite aggregates.

Immediately above the waterfalls, Longmyndian sandstones overlie the Uriconian rocks, the junction being straight, sharp and approximately vertical, striking at about 015°. The rocks on either side show local evidence of movement, with a small amount of brecciation and quartz veining resulting in a poorly developed fault gouge; slickensides also occur along the contact and in the adjacent Uriconian rocks (Locality 4). Dean and Dineley (1961) have commented on a small disparity that occurs between the contact and the strike of bedding in the overlying Longmyndian sandstones.

The Longmyndian strata above the contact are representatives of the Bayston–Oakswood Formation (Pocock *et al.*, 1938; Dunning, 1975), the lowermost division of the western Longmyndian Wentnor Group. They comprise a succession of up to 120 m of dull purplish red, medium- to coarse-grained sandstones (lithic arenites), containing a significant proportion of volcanic material, in beds up to 1 m thick, with local thin micaceous partings. About 100 m upstream from the waterfall they are succeeded by a sequence of at least 25 m of quartz-rich, clast-supported granule-pebble

conglomerates, in planar beds up to 0.2 m thick, with subordinate coarse, locally cross-bedded, pebbly volcanoclastic sandstones (Locality 5). This division has been named the Radlith Conglomerate (Pocock *et al.*, 1938), the lowest of three major conglomeratic units that punctuate the Bayston–Oakwood Formation in this area. The top of the conglomerate is unexposed, although the overlying sandstones reappear in the river near the footbridge.

Interpretation

The Uriconian rocks of Lyd Hole compare with those in other parts of the Welsh Borderlands and demonstrate the explosive, probably sub-aerial volcanism that characterized this succession. The basaltic rock was regarded by Pocock *et al.* (1938) as a lava within the eruptive sequence, although it is identical to other basic rocks on nearby Pontesford Hill which were considered as intrusive. Despite its equivocal contacts, it is considered more likely that the basalt represents a later intrusion into the Uriconian rocks, although there is no reason to suppose it is much younger. Indeed Pocock *et al.* (1938, p. 34) show this and other rocks at Lyd Hole to be overlain unconformably by Ordovician strata. It is likely that it forms part of a widely recognized suite of late Precambrian Uriconian basic intrusions (James, 1956; Greig *et al.*, 1968).

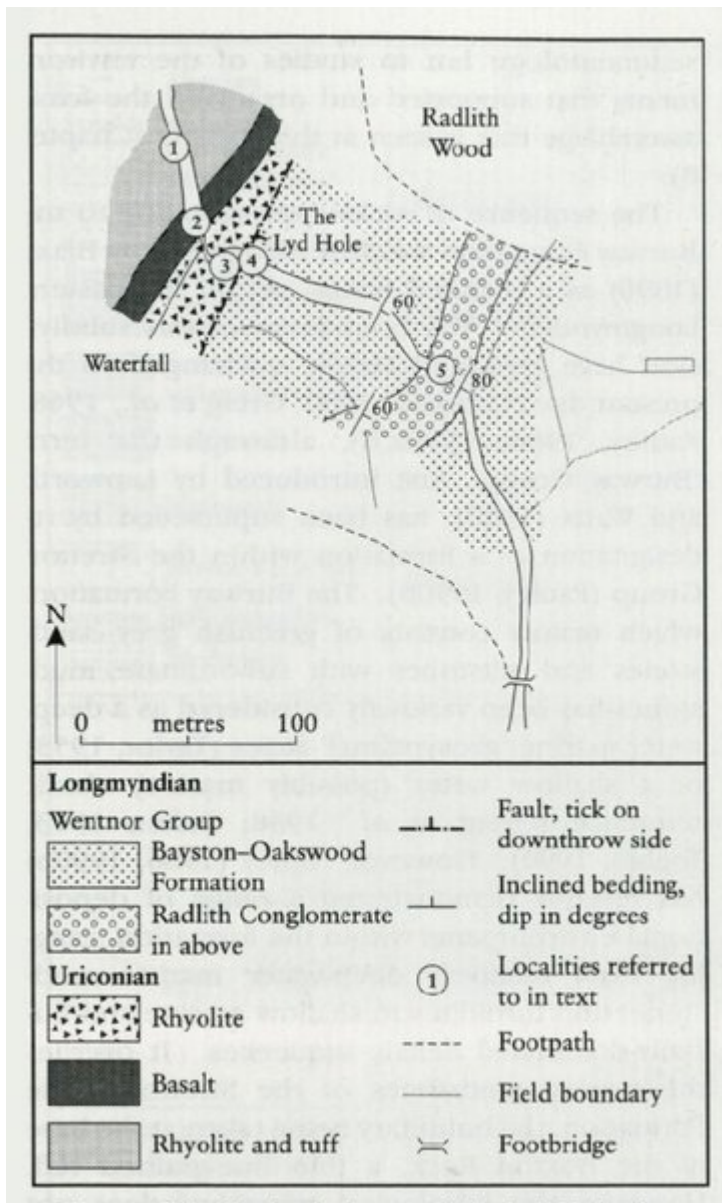
The boundary between the Uriconian lavas and Longmyndian strata is clearly a zone of movement. Pocock *et al.* (1938) considered that there must have been some movement along the junction, but that it did not amount to very much. The small obliquity of the contact to the strike of bedding in the basal Longmyndian, noticed by Dean and Dineley (1961), is strongly suggestive of a normal fault although, in the absence of any definitive evidence, it is difficult to say how much movement has occurred on the structure.

The overlying Bayston–Oakwood Formation is representative of the braided fluvial sedimentary facies that extended across the region during the early part of Wentnor Group (Pauley, 1990b). The Radlith Conglomerate is one of a series of conglomerates that probably developed as longitudinal bars in these high-energy environments. The lateral extent of these deposits suggests that they formed on an alluvial braidplain rather than within a restricted fluvial system.

Conclusions

Lyd Hole is an informative site that provides an opportunity to study a rare contact between Uriconian and Longmyndian Wentnor Group rocks. Although the contact appears to be faulted, the magnitude of the displacement is unknown. The site displays important sections through the otherwise poorly exposed and much faulted 'Western Uriconian' volcanic sequence, as well as providing a good reference section through fluvial sedimentary rocks of the western Longmyndian, Bayston–Oakwood Formation.

[References](#)



(Figure 5.8) Geological map of the Lyd Hole site.