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# Hawkham Hollow

[SO 432 975]

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## Introduction

Hawkham Hollow, a small valley at the northern end of the Long Mynd SSSI, has been designated as a GCR site because it contains exposures that span the boundary between the eastern Longmyndian Stretton Group and the western Longmyndian Wentnor Group. The site (Figure 5.17) is important as the only place where the supposed unconformity between these groups can be studied, as well as providing a section through the generally poorly exposed Portway Formation, at the top of the Stretton Group.

Murchison (1839, 1867), Callaway (1891) and other early workers generally regarded the Wentnor and Stretton groups as parts of a conformable succession. It was Blake (1890) who first considered the possibility of an unconformity to explain stratigraphical problems between the eastern and western Longmyndian, although he regarded the latter as Cambrian in age. Although Blake's unconformity locally coincided with the base of the Wentnor Group, it was Cobbold (1925), and subsequently Cobbold and Whittard (1935), who proposed this as a major unconformable surface, the evidence cited being the greater geographical distribution of the overlying strata, implying widespread overstep of the Stretton Group. Until recently, this unconformity has been accepted by most authors (James, 1956; Dean, 1964; Toghil and Schell, 1984), support being provided by the apparent overstep of the Portway Formation and earlier divisions of the Stretton Group (Greig *et al.*, 1968), and a regional divergence in strike between the Wentnor and Stretton groups (James, 1956). However, Pauley (1991) has reinterpreted these overstep relationships and has suggested that the Wentnor Group does not unconformably overlie the Stretton Group; he considered the apparent unconformity to be largely the result of post-Longmyndian tectonism.

In a further development, James (1956) suggested that an unconformity was present at the base of the Portway Formation. He regarded the formation as equal to the Stretton and Wentnor groups and elevated its status accordingly (to his 'Mintonian' series). However, this idea has not been widely accepted, and has been dismissed on stratigraphical and structural grounds by Greig *et al.* (1968).

## Description

The principal exposures through the upper part of the Portway Formation (Stretton Group) and the lowest beds of the overlying Bayston–Oakwood Formation (Wentnor Group) are to be found on the western slopes of Hawkham Hollow. The Portway Formation, intermittently exposed in crags in the upper part of the valley ((Figure 5.17), Locality 1), comprises a sequence of dull purplish brown and subordinate greenish grey, planar laminated mudstones, siltstones and sandstones. The sandstones, which are usually bundled, are fine- to medium-grained lithic arenites occurring in beds up to 0.25 m thick; locally pebbly, they contain intraformational red mudstone clasts in the basal few centimetres. A few rather massive sandstone beds, up to 0.4 m thick, locally displaying low-angled erosional bases, occur at intervals within the sequence, and cross-lamination is visible in a few beds.

A series of massive, parallel-bedded and locally trough cross-bedded, fine- to medium-grained purplish red sandstones (lithic arenites), in beds up to 3 m or more thick, locally with erosional contacts, define the base of the overlying Bayston–Oakwood Formation in the higher crags above Hawkham Hollow (Locality 2). They contain scattered pebbles, thin pebbly layers and local thin conglomeratic beds, with pebbles up to 10 mm commonly visible on weathered surfaces. Although the incoming of these coarse sandstones is well defined in the crags, the junction between the Bayston–Oakwood and Portway formations is not marked by any angular discordance, bedding in both divisions being inclined westwards at angles between 50° and 60°. The formational boundary is cut by a number of small east-trending faults, which feature as 'slacks' on the steep hillside (Locality 3)

## Interpretation

The Portway Formation represents a continuation of the Stretton Group alluvial floodplain facies that began with deposition of the Synalds and Lightspout formations (Pauley, 1990b). The lithologies within the Portway Formation are interpreted in a similar way to these earlier divisions, the siltstones mainly representing overbank deposits, and the sandstones recording a series of sheet floods or crevasse splay deposits; the thicker sandstones are probably the deposits of shallow channels. The common occurrence of laminated and locally cross-laminated sandstones within the succession indicates a greater proximity to the fluvial source than with the earlier formations. Conglomeratic beds within the Portway Formation have been interpreted as the first incursions of coarse braidplain deposits onto the alluvial floodplain (Pauley, 1990a,b). Their petrographical similarity to the trough cross-bedded sandstones and conglomerates of the overlying Bayston–Oakswood Formation,

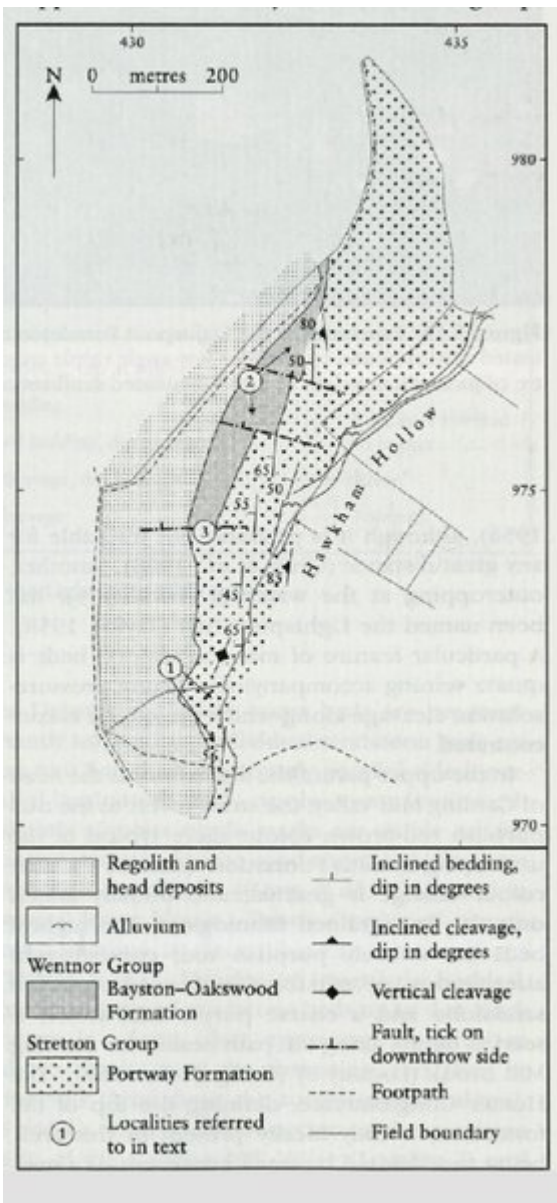
and the lack of any angular discordance at the formational boundary, led Pauley (1991) to suggest that the latter represented the culmination of braidplain progradation that began within the upper part of the Stretton Group. Palaeocurrent analyses (Pauley, 1990a) indicated that the braided fluvial system flowed in a general NNW direction. The relatively abrupt appearance of this facies indicates a rapid influx of coarse detritus, without any transitional facies, and has been linked to rejuvenation of the source areas, possibly by contemporaneous faulting (Pauley, 1990a). The supposed major unconformity between the Stretton and Wentnor groups could therefore be regarded as local disconformity, related to uplift and facies progradation.

The apparent regional overstep of the Portway Formation by the Bayston–Oakswood Formation cannot be demonstrated at Hawkham Hollow. However, there is a regional divergence in strike between the Wentnor and Stretton groups over this site, which is mirrored at other localities, and has been cited by James (1956) as evidence of major unconformity. In detail, this is evident as a gradual anticlockwise rotation of cleavage and bedding within the Portway Formation, as the boundary with the Bayston–Oakswood Formation is approached. Pauley (1990b, 1991) has suggested that the rotation is tectonic in nature as it affects structural elements (cleavage and fold axes) as well as bedding. He interpreted it as an incremental rotation within the Portway Formation, either through shear along cleavage and fault planes (Pauley, 1990b), or by rigid block rotation of the sandier Wentnor Group when the more argillaceous Stretton Group was undergoing ductile deformation (Pauley, 1991). He considered that the rotation is due to strike-slip movements, which occurred during or after folding of the Stretton and Wentnor groups. The movements were considered to have been taken up along major boundary faults within the Church Stretton and Pontesford lineaments, which have a documented history of strike-slip movement (Lynas, 1988; Woodcock, 1984b, 1988; Woodcock and Gibbons, 1988). Pauley's model does not, however, explain the relationship whereby the Bayston–Oakswood Formation (Wentnor Group) locally rests on successively older formations within the Stretton Group (Greig *et al.*, 1968), unless this can be attributed to facies change, faulting at the Portway to Bayston–Oakswood junction, or a combination of both.

## Conclusions

Hawkham Hollow is an interesting and informative site, as it provides an opportunity to study the sedimentological and structural relationships between the Wentnor and Stretton groups. Although an unconformity between these groups remains to be proved, the site enables comparisons to be made of the evidence that has supported the previous sedimentological and structural models relevant to the evolution of this part of the Longmyndian Supergroup. It particularly demonstrates an abrupt sedimentary change, from proximal alluvial floodplain environments in the Portway Formation to the proximal braidplain conglomerate facies of the overlying Bayston–Oakswood Formation.

## [References](#)



(Figure 5.17) Geological map of Hawkham Hollow site. can be studied, as well as providing a section through the generally poorly exposed Portway Formation, at the top of the Stretton Group.