# Ashes Hollow Quarry

[SO 434 930]

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## Introduction

This site is located within the outcrop of the Longmyndian Supergroup (Figure 5.1), to the west of the Church Stretton Fault. It is a long-abandoned quarry on the steep valley-side on the north of Ashes Hollow (Figure 5.9), one of a series of river valleys that cuts directly across the strike of the Longmyndian Supergroup. Ashes Hollow is named after the eponymous cottage, towards its south-eastern end, which is now abandoned.

Precambrian strata of the Burway Formation exposed in this quarry are of great importance as preservers of various trace fossils. Some of these were first interpreted as of organic origin by Salter (1856), but subsequently most authors (e.g. Greig *et al.,* 1968) have treated them as inorganic impressions. More recent investigations by Pauley (1986) were largely inconclusive, although this author does provide good descriptions and figures of the types of structure that occur. Among other considerations, Pauley (1990b) showed that the strata at Ashes Hollow Quarry were marine in origin and that therefore the so-called 'rain imprints', first described by Salter (1856) and described and figured in detail by Greig *et al.* (1968), formed in a depth of water that precluded subaerial exposure. Some other process is thus required to explain these small closely spaced imprints, and an organic origin seems at least possible. One of the most convincing arguments for the organic affinities of at least some of these impressions is that similar marks have been found in several other parts of the world in rocks of identical age, but never in rocks younger than early Cambrian (T.P. Crimes, pers. comm.). A full description of these impressions is under preparation by Crimes and Pauley.

Some of the Longmyndian impressions are similar to those found in latest Neoproterozoic strata of the White Sea area of northern Russia (see Palij *et al.,* 1979) or the Nama Group of Namibia (Crimes and Germs, 1982) or the sequence in the Boston Basin, USA (B.H. Bland, pers. comm.). Bland (1984) figured and described examples of the problematic organism *Arumberia* from lower horizons in the Longmyndian than those exposed in Ashes Hollow Quarry. In fact this quarry at Ashes Hollow is only one of many such localities within the outcrop of the Longmyndian Supergroup that has yielded impressions that are probably of organic origin. In addition to the Burway Formation, the overlying Synalds Formation has also yielded many such impressions at various horizons. The principal works on these rocks, with references to the impressions, are those by Salter (1856, 1857); Cobbold (1900); James (1956); Greig *et al.* (1968); Bland (1984) and Pauley (1986, 19906.)

## Description and interpretation

Ashes Hollow Quarry was clearly worked for the well-bedded sandstone units that are interbedded with shaley mudstones in the west wall of the main quarry. The Burway Formation comprises a succession of mudstone, siltstone and sandstone beds that are well exposed in Ashes Hollow and described more fully by D. Wilson in Chapter 5 of this volume. The Ashes Hollow quarry ((Figure 8.9)a) has exploited some of the few thicker and therefore workable sandstone beds in this succession, those in the quarry being of fine to medium grade, showing both planar and cross-lamination. To the west of the principal quarry face, a thicker mudstone unit intervenes before two further sandstone horizons crop out. Altogether about 35 m of rock is exposed from the eastern to western extremities, the dip being locally steepened to near-vertical in the quarry.

The probable organic structures may be seen in various mudstone horizons within the quarry. They include features described by Greig *et al.* (1968) as pit and mound structures ((Figure 8.9)b) and interpreted as air-heave structures caused by escaping bubbles of gas. Bland (1984) has suggested that they were possibly related to medusoids such as *Cyclomedusa.* However, it is noted that in some cases the laminae for some distance beneath the structure are disturbed, for example Greig *et al.* (1968, p. 70) recorded a case of 7 mm penetration, suggesting that the circular

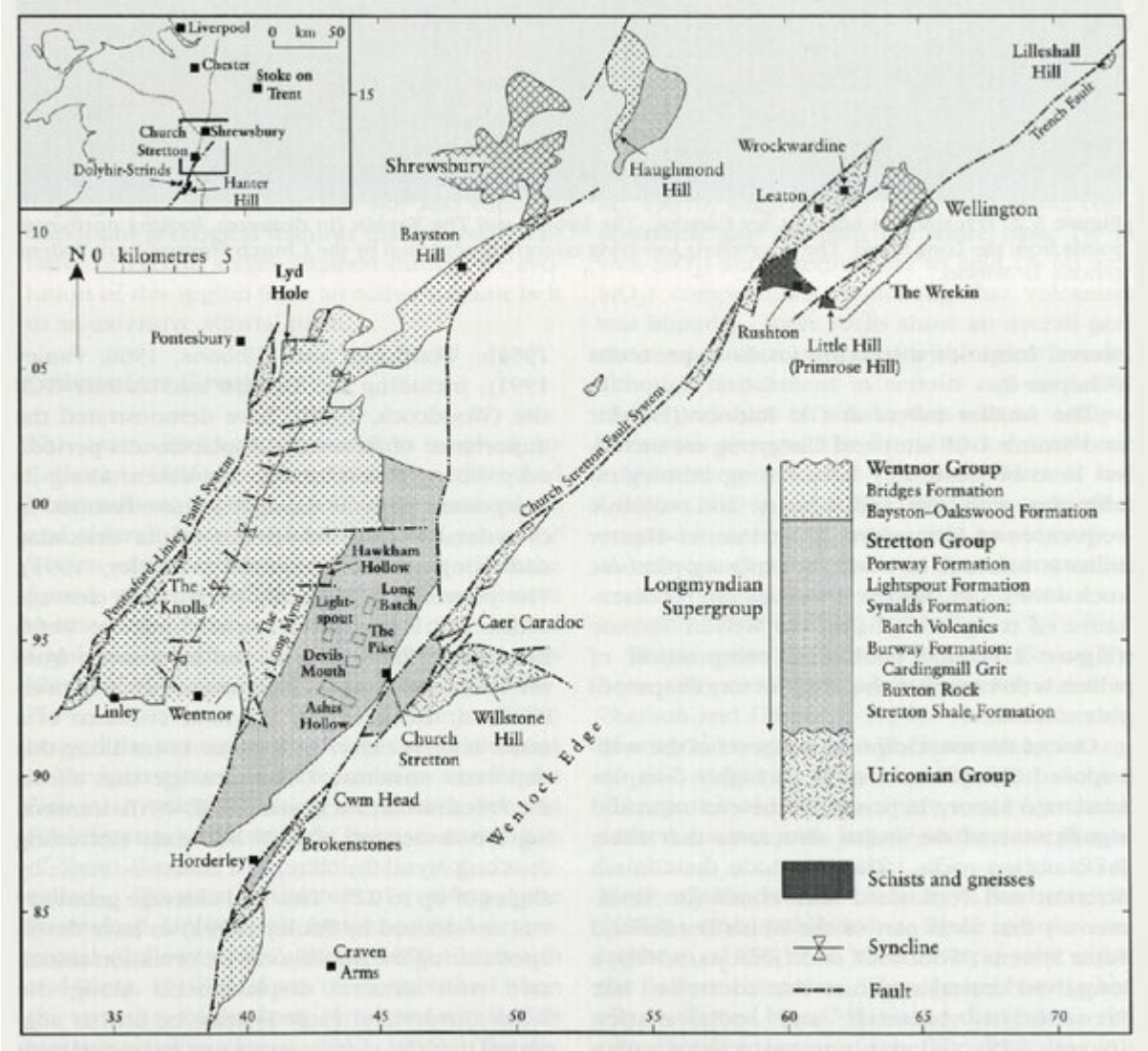
structures are unlikely to be of medusoid origin. Their affinity remains uncertain, but while they have been noted from other Neoproterozoic rocks (e.g. Plummer, 1980) they do not seem to have been recorded from younger strata. Pauley's (1990b) interpretation of these rocks as having been formed in a prodelta makes it unlikely that these are gas-escape structures, although it does not rule out soft-sediment deformation as a cause.

Other structures are small and circular (although the cleavage has sometimes elongated these to ellipses) and are present either as positive hyporeliefs or as positive epireliefs (i.e. the rings may be positive facing downwards or upwards). Greig *et al.* (1968, Plate 5) recorded the hyporeliefs and figured some examples. These structures are up to 10 mm in diameter and often closely crowded together on a bedding-plane. Once more they appear at first sight to be inorganic, but again their restriction to the Neoproterozoic suggests that they are of biogenic origin. The larger of these circular impressions resemble some of the forms recorded from the Nama Group of Namibia and referred by Crimes and Germs (1982) to the genus *Bergaueria.* The same genus was also figured from the White Sea area of Russia by Palij *et al.* (1979) together with another circular genus, *Beltanelloides* that is smaller and very like some of the smaller circular Long Mynd impressions. Runnegar and Fedonkin (1992, fig. 7.5.10.B) figured *Beltanelloides soichevae* from the White Sea area and this species has affinities with some of the Longmyndian impressions. The smallest impressions, generally less than three millimetres in diameter, often with a depressed centre, can be identified with *Intrites punctatus* Fedonkin, the holotype of which was refigured by Fedonkin and Runnegar (1992, Fig. 7.6.4.B).

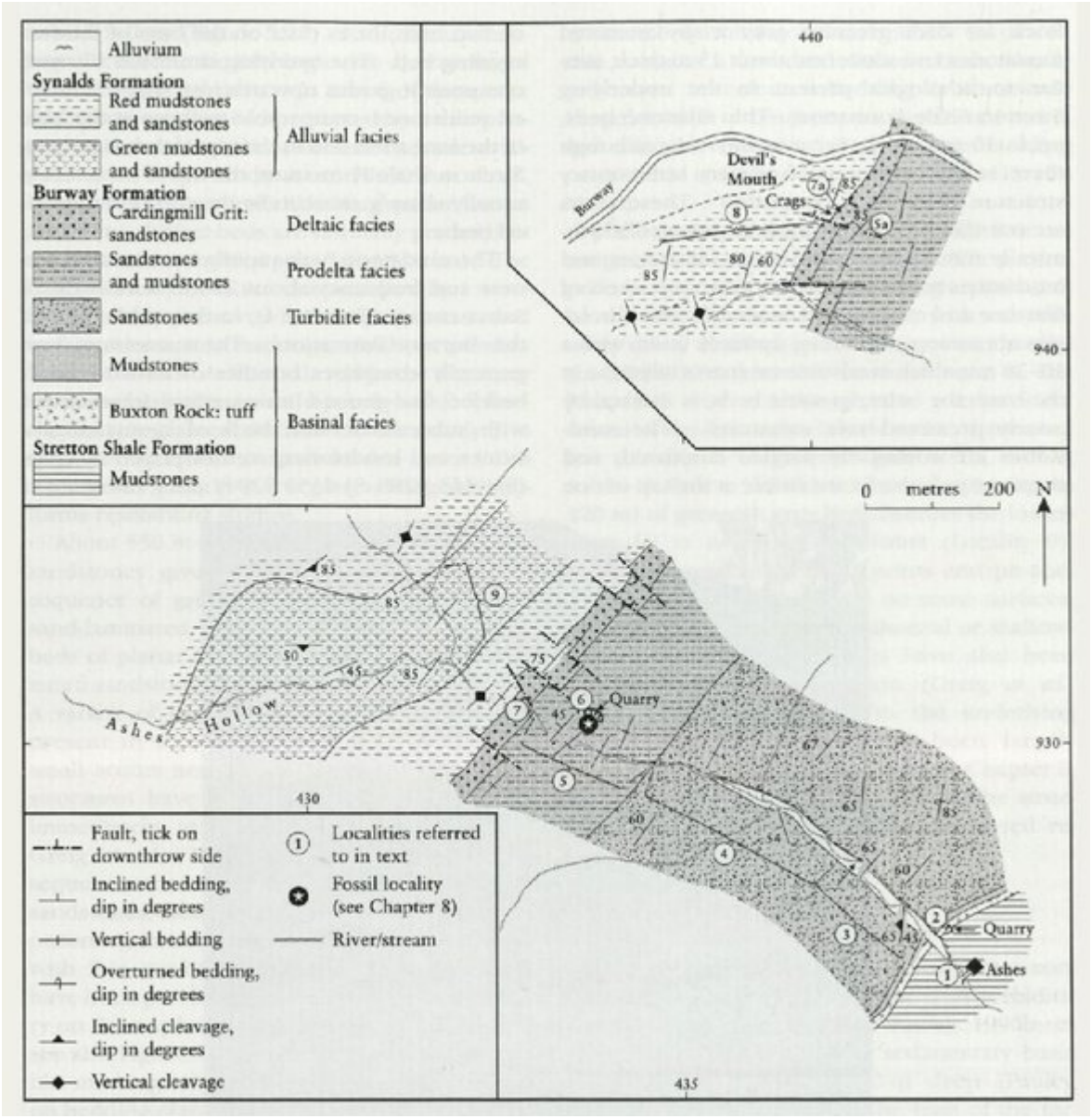
## Conclusions

A variety of enigmatic impressions occur within the Burway Formation and Synalds Formation of the Longmyndian rocks. The earliest interpretation of these impressions as organic by Salter (1856, 1857) seems to some extent to have been finally confirmed. But despite the likely organic origin of many of these impressions, which is emphasized by their apparent stratigraphical restriction to the late Neoproterozoic and early Cambrian, we are far from understanding their true nature.

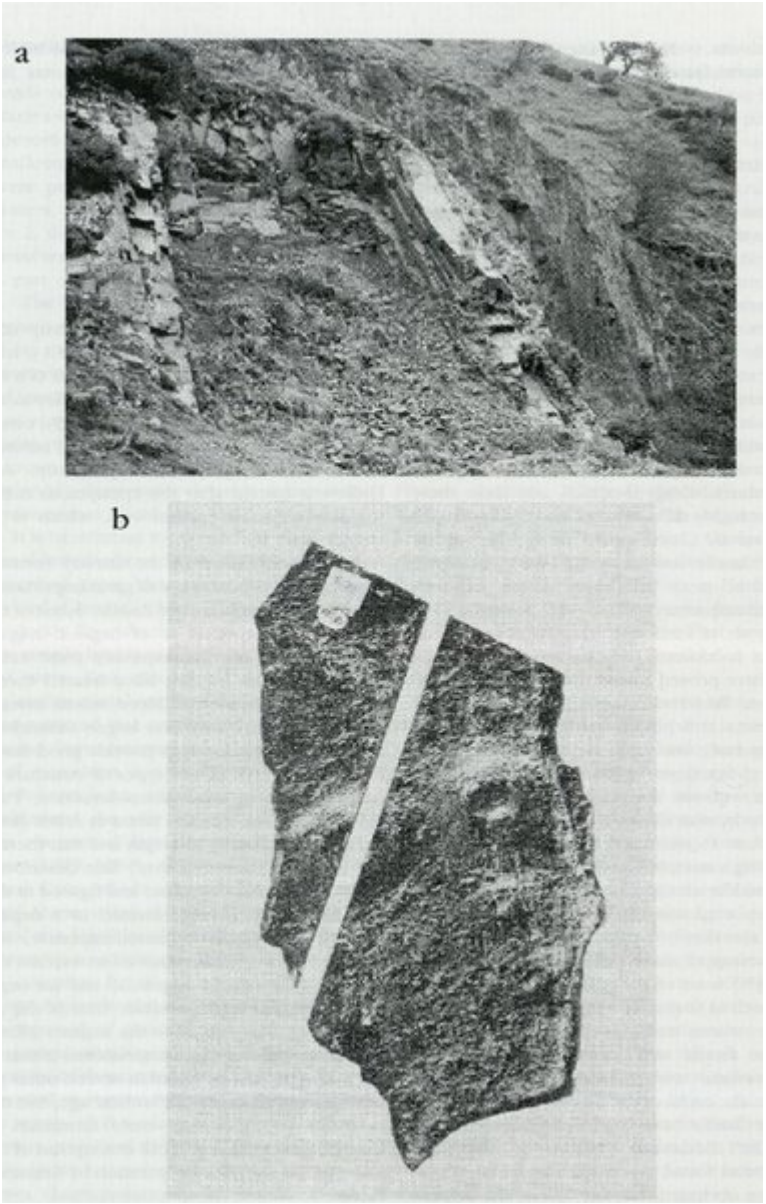
**References**




*(Figure 5.1) Geological map of the Shropshire Precambrian outcrops (modified from Pauley, 1991), with the GCR sites indicated by bold lettering. The Radnor inliers (Dolyhir and Strinds quarries and Hanter Hill sites) are shown by the inset at top left. The location of the Llangynog site is given in (Figure 6.1).*




*(Figure 5.9) Geological map of the Ashes Hollow and Devil's Mouth sites. The range of sedimentary environments in this part of the Stretton Group is indicated on the explanation at top left.*




*(Figure 8.9) The fossiliferous locality at Ashes Hollow. (a) View of Ashes Hollow Quarry looking from the northwest. Note the near vertical dip of the beds, and the well-defined joint planes. The sandstone bed has been quarried in the foreground, leaving siltstones exposed at either side of the pit (Photo: J.C.W. Cope). (b) Specimen from Ashes Hollow, featuring probable organic unidentifiable `medusoid' impressions (Plate 5A of Greig et al., 1968).*