
Hope Quarry and Hope Brook

[SJ 3530 0203]–[SJ 3568 0214]

Introduction

The exposures in and around Hope Quarry form part of the Llandovery outcrop that fringes the north-western side of the Shelve Inlier in the western part of South Shropshire. The section was briefly described by Whittard (1932, pp. 875–6) and, in a little more detail, by Ziegler *et al.* (1968b, p. 743). An exposure at the entrance to Hope Quarry shows the unconformable contact of the Llandovery Venusbank Formation on the Ordovician Hope Shales; this unconformity can be traced into Hope Brook. The type section of the Venusbank Formation is in the brook, extending eastwards from near the quarry, and typical sediments of the lower part of the formation are exposed in the quarry face. Fossils, primarily graptolites, brachiopods and conodonts, show that the Venusbank Formation is of Aeronian age; it is the lateral equivalent of part of the Pentamerus Beds exposed around the Long Mynd and near Wenlock Edge to the east. Mapping shows that it oversteps various units of the underlying Ordovician succession of the Shelve Inlier (Whittard, 1932), resting at Hope Quarry on Llanvirn shales of the Hope Group.

This is one of a number of key sites that demonstrate the nature and timing of the eastward transgression of the sea from the Welsh Basin during the Llandovery Epoch. The exposures show the nature of the first sediments deposited locally by the invading mid-Llandovery sea, and provide a representative section of the Venusbank Formation and its fossil fauna.

Description

The base of the Venusbank Formation in Hope Quarry comprises a calcareous sandstone that contains scattered subangular shale fragments. Above this is a sequence of sandstone beds up to 1 m thick, variably calcareous and sometimes showing parallel lamination or low angle cross-stratification (Figure 3.3). The bases of the beds are sharp but irregular, with patches of coarser clasts and transported brachiopod shells, which are occasionally concentrated to form lenses. Each bed tends to fine upwards and become less calcareous; occasional ripple cross-lamination occurs on the tops of some of the sandstones (Ziegler *et al.*, 1968b; Bridges, 1975). Towards the top of the 10 m section exposed in Hope Quarry, the beds become more flaggy and less calcareous and there are more interbedded thin mudstones. Sandstone beds similar to those in the quarry can also be seen in Hope Brook, and the top of the Venusbank Formation is taken at a prominent sandstone with calcareous concretions exposed below a footbridge.

Ziegler *et al.* (1968b) reported the occurrence of the graptolite *Climacograptus* aff. *rectangularis* near the base of the main face at Hope Quarry, indicative of an Aeronian age. They also noted the presence of brachiopods of the *Stricklandia* Community in the Venusbank Formation, with the subspecies of the eponymous genus present being intermediate between *S. lens intermedia* and *S. lens progressa*. Whittard (1932) also recorded abundant *Atrypa reticularis* and *Tentaculites anglicus* in the lowest beds of the formation, with *Pentamerus oblongus* common in the higher units.

Samples from the more calcareous levels in Hope Quarry, including the basal sandstone, have yielded abundant conodont elements. Important taxa include *Icriodella deflecta*, *Kockelella abrupta*, *Distomodus* sp., *Ozarkodina bassi* and *Ozarkodina oldhamensis* (revised from Aldridge, 1972). Hope Quarry is the type locality for the stratigraphically important conodont species *Icriodella deflecta* Aldridge, 1972, and *Kockelella abrupta* (Aldridge, 1972), and for other taxa including the brachiopods *Leptostrophia compressa* (J. de C. Sowerby, 1839), *Coolinia semicircularis*, (J. de C. Sowerby, 1839) and *Leptaena contermina* Cocks, 1968.

Interpretation

Mapping of the Venusbank Formation in the Hope area and in the Bog Mine outliers within the Shelve Inlier has shown that the Llandovery rocks have a regionally irregular base with a relief of up to 100 m (Whittard, 1932; Ziegler *et al.*, 1968b), reflecting the Llandovery land topography prior to flooding by the transgressing sea. Whittard (1932) concluded that the modern Hope Valley closely corresponds to a pre-existing Llandovery depression, which became filled with the sediments of the Venusbank Formation and the succeeding Minsterley Formation. Evidence from the Hope area, and from other sites including the GCR site at Hillend Farm, shows that the Shelve–Long Mynd area formed a topographical high during the Early Silurian and acted as a source of sediments deposited around the margins. Submersion of the Shelve area during the Aeronian age is indicated by the presence of *Stricklandia lensintermedia* in the Bog Quartzite of the Bog Mine outliers e.g. [SO 3510 9815], where a shallow-water *Cryptothyrella* benthic community mixed with rocky-bottom specialists has been identified (Ziegler *et al.*, 1968a, b).

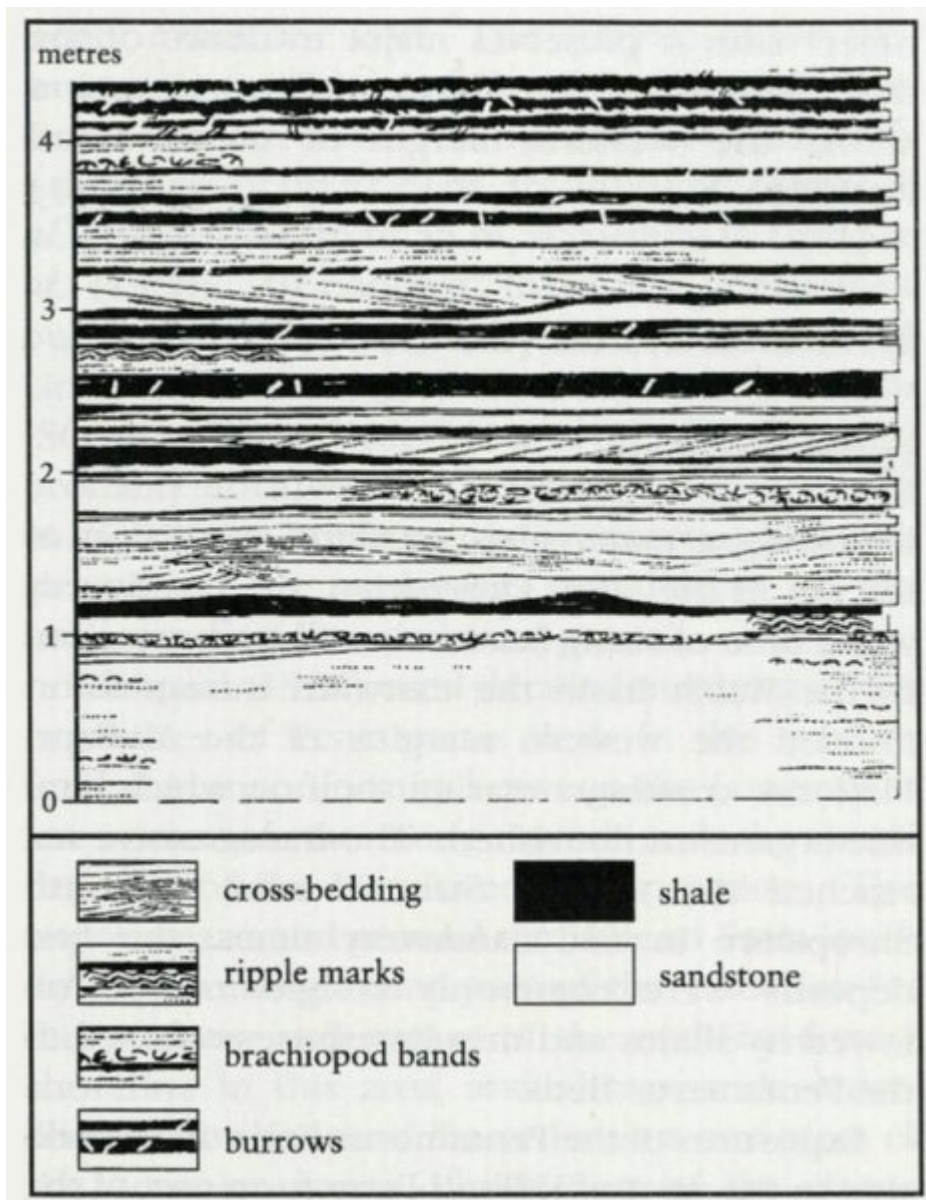
Ziegler *et al.* (1968b) suggested that the sediments at Hope Quarry might be proximal turbidites, filling the topographical depression under fairly deep water, as indicated by the presence of *Stricklandia* and *Pentamerus* benthic communities. Bridges (1975), however, interpreted the sedimentary structures as showing a tidal or storm origin, with the ripple drift lamination and wide range in current directions indicating that much of the sediment was transported in suspension (Figure 3.3). He drew an analogy between the Shelve Bank and the modern submarine banks off the south-east coast of Canada, where the coarser detritus remains as lags on the summit, while the sand is dispersed on the slopes.

This locality relates to other GCR sites at Hillend Farm in Shropshire and at Gullet Quarry in the Malvern Hills, both of which expose shoreline deposits of the Llandovery transgression, and to the site at Wistanstow, Shropshire, where younger (Telychian) strata also rest unconformably on Ordovician shales. Together these sites enable interpretation of the nature of the eastern shoreline of the Welsh Basin during middle and upper Llandovery times.

Conclusions

The exposures in and around Hope Quarry display the important regional unconformity between Ordovician and lower Silurian strata, resulting from the late Ordovician glacially-induced regression followed by early Silurian sea-level rise and transgression. Mapping of the Hope Quarry; Hope Brook and other local exposures provides significant evidence for reconstructing the nature of the local topography transgressed by the invading early Silurian sea. The type section of the Venusbank Formation is situated in Hope Brook, and the sandstone successions here and in the quarry are instructive in displaying the initial marine sedimentary cover and faunal colonization of the pre-existing Llandovery land surface of the western Shelve Inlier. The conservation of this site is of more than local importance, as in conjunction with other sites it preserves major evidence of the development of the Llandovery transgression across the western margin of the Midland Platform.

[References](#)



(Figure 3.3) Sedimentary log of representative open marine sandstones in the main face at Hope Quarry (after Bridges, 1975).