
Blaze Bridge and Scawgill Quarry

[NY 1782 2556]–[NY 1792 2499] and [NY 178 258]

Potential GCR Site

Introduction

This site exposes graptolite-bearing strata in the upper part of the Hope Beck Formation and the lower half of the Loweswater Formation; it is the principal location at which the *varicosus* Zone can be characterized.

The Loweswater Flags was named by Dixon (1925), based on a thick sandstone formation exposed around Loweswater [NY 13 22]. Jackson (1962) recorded graptolites of the *deflexus* Subzone of the *extensus* Zone in the lower part of the formation and the *nitidus* Subzone in the upper part. Cooper *et al.* (1995) redescribed the division and formalized it as the Loweswater Formation. They re-identified the specimens recorded as *Didymograptus deflexus* Elles and Wood from the lower parts of the Loweswater Formation as *D. varicosus* Wang and changed the name of the zone to the '*varicosus* Zone'.

The Hope Beck Slates were first recognized by Jackson (1961), based on strata underlying the Loweswater Flags at Hope Beck, 2 km south of the present site. He described the contact between the Hope Beck Slates and the Loweswater Formation but found no fossils in the lower division. Cooper *et al.* (1995) redescribed the division and greatly extended the known outcrop, formalizing it as the Hope Beck Formation. They recorded graptolites in the upper part of the formation and assigned them to the *varicosus* Zone.

Description

South of Whit Beck and Scawgill Bridge [NY 1775 2571], Blaze Beck exposes part of the Hope Beck Formation about 200 m below the top of the formation ('2' in (Figure 11.1)). It consists of cleaved, thinly bedded mud and silt turbidites, dipping south-west at 24°. Graptolites are scarce but were found at a few sites along Blaze Beck and include *D. vacillans attenuatus* Mosen, *D. cf. varicosus*, *D. filliformis* Tornquist, *D. cf. decens* Tornquist and a large form shaped like *D. balticus* Tullberg but whose proximal structure is unknown. Quarries 200 m west of Blaze Bridge [NY 1792 2499] expose the base of the Loweswater Formation, here consisting of thinly bedded flaggy sandstone turbidites. They contain all but the first-named species above, together with abundant *D. varicosus* and rare *Clonograptus*, *Pseudobryograptus* and *Pendeograptus fruticosus* (Hall).

An east–west fault along Whit Beck throws down the Loweswater Formation to the north, such that Scawgill Quarry [NY 178 258] exposes a level estimated to be 300 or 400 m above the base of the Loweswater Formation. In the quarry there are thick sandstone turbidites dipping west at 16° (Figure 11.4). Many beds show sedimentary structures and some show complete Bouma *a–e* cycles. *D. varicosus* is much the commonest species of graptolite, associated here with rare '*D. aff. balticus*', *T. quadribrachiatum* (Hall), *Dichograptus sedgwickii* Salter, *Schizograptus tardefurcatus* Elles and *Trochograptus diffusus* Holm. About 200 m east of Scawgill Quarry a fault throws down higher parts of the Loweswater Formation with faunas of the overlying *simulans* Zone.

Interpretation

This site exemplifies the contrasting lithologies of the Hope Beck Formation and Loweswater Formation, though the contact between the formations is not exposed. The fossils from the top of the Hope Beck Formation are similar to the much more numerous fossils from the base of the Loweswater Formation, and they are both assigned to the *varicosus* Zone. This zone is considered to correlate roughly with the upper part of the Bendigonian of the Australasian succession and the *balticus* Zone of Scandinavia (Cooper and Lindholm, 1990). The base of the *varicosus* Zone cannot be characterized because no significant graptolites have been collected through the large thickness of strata, perhaps

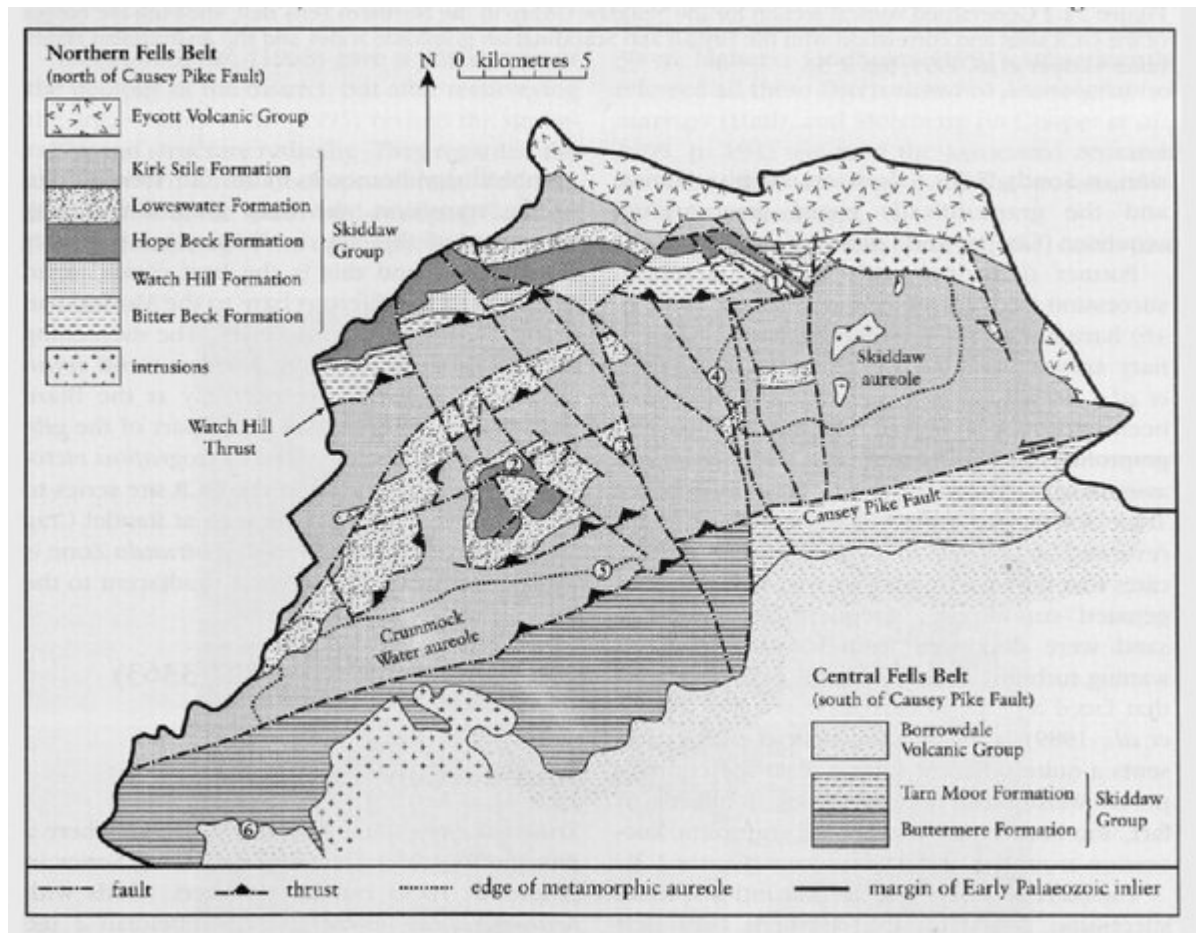
amounting to 400 m, that underlies the Blaze Beck localities and overlies the fauna from near the base of the formation at Trusmador (see site report).

The faunas from Scawgill Quarry are also referred to the *varicosus* Zone, on account of the abundance of the zone fossil. However, a relatively small thickness above, at about 100 m above the Scawgill horizon, new taxa such as *Didymograptus deflexus* and *D. simulans* Elles and Wood appear, and these characterize the overlying *simulans* Zone (see the Barf site report).

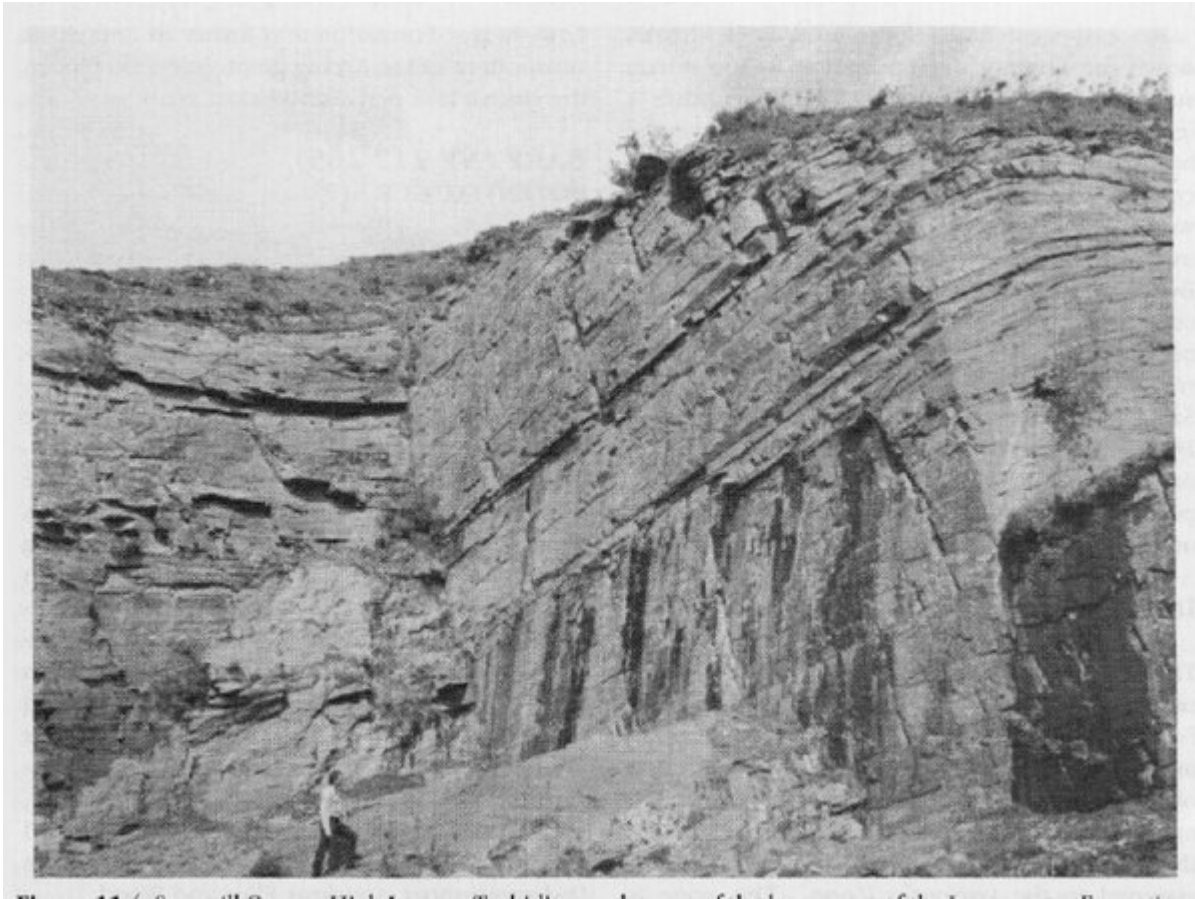
Conclusions

This site encompasses the best localities at which to characterize the *varicosus* Zone. This zone is significant for dating and correlating the Loweswater Formation and forms an important component of the Arenig graptolitic sequence in the British and peri-Gondwanan areas.

References



(Figure 11.1) Geological sketch-map of the Skiddaw Group in the main outcrop of the English Lake District, after Cooper et al. (1995, fig. 2). GCR localities: 1, Trusmador; 2, Blaze Bridge and Scawgill Quarry; 3, Barf; 4, Randel Crag; 5, Outside; 6, River Calder (Tremadoc, Chapter 7).



(Figure 11.4) Scawgill Quarry, High Lorton. Turbidite sandstones of the lower part of the Loweswater Formation, dipping west at 16°. Some thicker units show complete Bouma a–e cycles and some thinner bedded units are fossiliferous. (Photo: British Geological Survey photographic collection, D3832.)