Barf

[NY 217 265]

Potential GCR Site

Introduction

This is the best locality for graptolites of the *simulans* Zone in the whole Skiddaw Group outcrop and is the type locality for several species.

Barf is a distinctive bare mountain at the southern end of Bassenthwaite Lake. It is composed of sandstones of the upper part of the Loweswater Formation. The screes below its south-east face have been a favoured collecting locality since the days of Harkness (1863), such that it is now much less productive than formerly; but a great number of specimens, representing a fauna of over 20 species, are preserved in museum collections. Jackson (1962) referred the fauna to the *nitidus* Subzone of the *extensus* Zone and considered Barf to be the best exposure of the subzone. Cooper *et al.* (1995, p. 190) regarded the division as a zone and named it after the more characteristic species *Didymograptus simulans* Elles and Wood.

Description

The south-east face of Barf is made up of flaggy sandstones of the Loweswater Formation dipping steeply to the south-east at 60–80° (Figure 11.5). They pass up into the lower beds of the overlying Kirk Stile Formation, which are mapped in the lower ground to the south-east, but the junction here is covered by scree material of Loweswater Formation that has fallen, presumably by post-glacial collapse, from the mountain-side. The Loweswater Formation consists of sand turbidites (see the Blaze Bridge and Scawgill Quarry site reports), and some beds are micaceous, enabling the rock to be split into large bedding-parallel slabs. A few hundred metres of the upper half of the Loweswater Formation are exposed around Barf, but the great bulk of the fossils came from the screes derived from around Slape Crag and the strata topographically beneath it, which are estimated to originate from around 100 m below the top of the formation. Thus, although many of the specimens are not well localized, they probably all came from a relatively thin interval.

Among the commonest graptolites from Barf are *Didymograptus simulans, D. deflexus* Elles and Wood (*sensu stricto*) *, D. kurcki* Tornquist (='*nicholsoni*' of authors) and *Azygograptus eivionicus* Elles. Longer-ranging forms include abundant *Pseudophyllograptus angustifolius* (Hall) and various *Tetragraptus* spp.. Rarer species include *D. gracilis* Tornquist, *D. infrequens* Kraft, *Didymograptellus minutus* (Tornquist), *Pseudobryograptus cumbrensis* (Elles), *Pseudotrigonograptus ensiformis* (Hall) and *Isograptus* cf. *primulus* Harris. Trace fossils, sponge spicules and the ubiquitous arthropod *Caryocaris wrightii* Salter have also been collected.

Interpretation

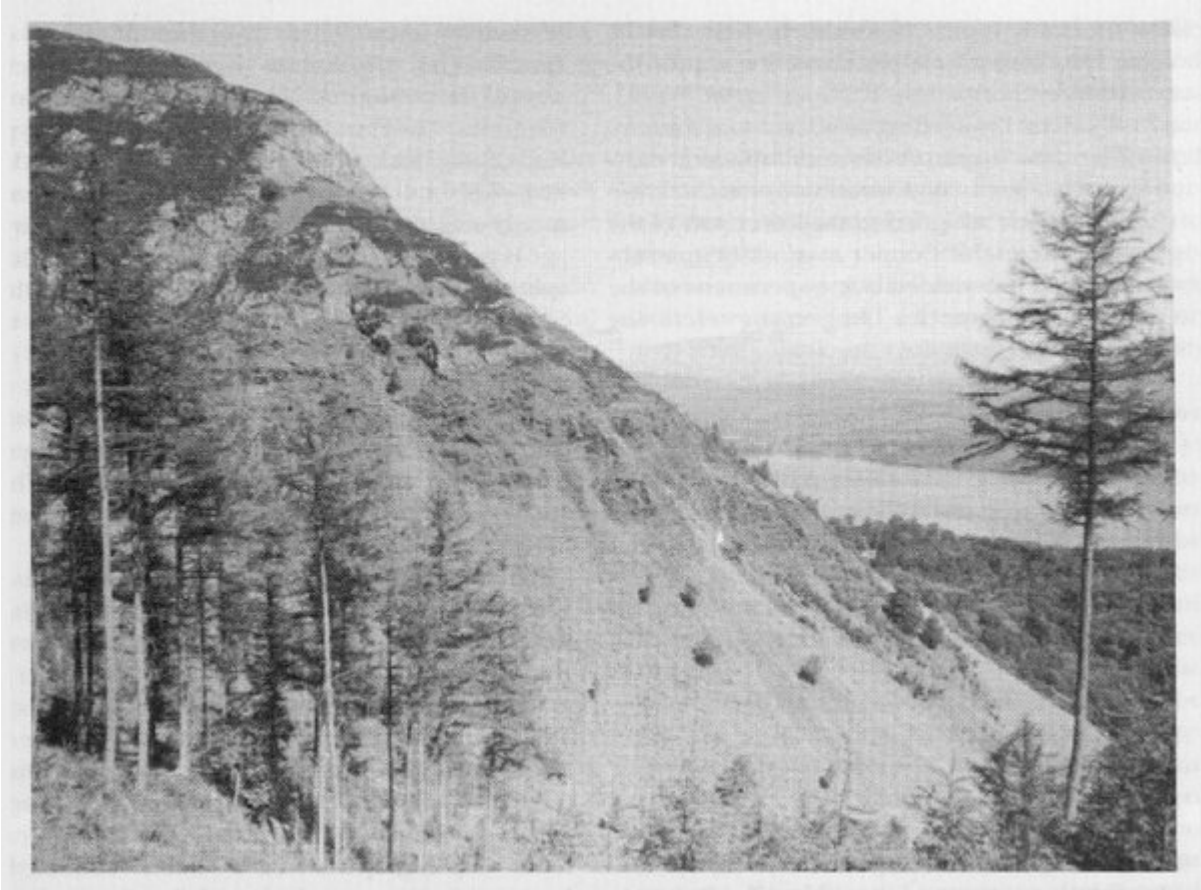
Elles (1933) thought that five graptolite zones and subzones, including Tremadoc rocks, were present at Barf, but subsequent work has not upheld this (Jackson, 1962, table 2; Bulman, 1971, p. 370). The commoner species listed above are considered typical of the *simulans* Zone and recur as an assemblage at various localities from Loweswater and the Lorton Fells to Skiddaw and Mungrisdale. None of the typical species appears in the underlying *varicosus* Zone, with the possible exception of *D. deflexus,* which is doubtfully present at the base of the Loweswater Formation. The *simulans* Zone may be correlated abroad, rather more securely than is the *varicosus* Zone, with the Chewtonian of Australasia and the *densus* Zone of Scandinavia (Cooper and Lindholm, 1990). Some of the species that characterize the *simulans* Zone appear to be preferentially associated with coarse-grained sediments: they are not found in the fine-grained beds of the Kirk Stile Formation, which overlies the Loweswater Formation, but a few species reappear in

sand-rich strata that lie some hundreds of metres above the top of the Loweswater Formation (Cooper *et al.,* 1995, p. 190). The intervening strata contain *Pseudophyllograptus angustifolius* and horizontal didymograptids such as *Expansograptus hirundo* (Salter) and are assigned to the lower part of the *gibberulus* Zone of Cooper *et al.* (1995), a subdivision that has yielded a few specimens of the Castlemainian species *Isograptus victoriae* Harris.

Conclusions

Barf is biostratigraphically a nationally significant site because the fauna collected there is the best representative of the *simulans* Zone of the British graptolitic sequence. Furthermore, certain rare graptolites from Barf enable international correlation of the *simulans* Zone.

References



(Figure 11.5) View of south-east face of Barf, north-west of Keswick, looking north, with Bassenthwaite Lake in the background. At the top of the hill the upper beds of the Loweswater Formation dip steeply to ESE and lower down are inverted. They form big screes from which many fossils have been collected. 'The Bishop' is the white-painted rock near the centre and Slape Crag is the vertical face near the top of the hill. (Photo: British Geological Survey photographic collection, D3838.)