BEDRUTHAN STEPS

OS Grid Reference: SW849695

Highlights

Bedruthan Steps, Cornwall, is the source of rare fish specimens representing possibly a late and large pteraspid. The importance of the specimens is raised because they are rare elsewhere in north Cornwall, and because these may be some of the last recorded pteraspids.

Introduction

Fish remains were first reported by W. Pengelly (1848). Bedruthan Steps has been recognized as a fossil site for many years and has yielded many fossil invertebrates (Pattison, 1848; M'Coy, 1851; Reid and Scrivenor, 1906; Reid *et al.*, 1910).

Description

The Middle Devonian of North Cornwall consists of a thick series of argillites, which are highly tectonized. At Bedruthan Steps (see asterisk, Figure 7.3), the Slates of Porth Cothan and Bedruthan Steps are exposed (House, *in* House *et al.*, 1977). Pattison (1848) recognized crinoidal remains, bivalves, and a specimen rather like a trilobite.

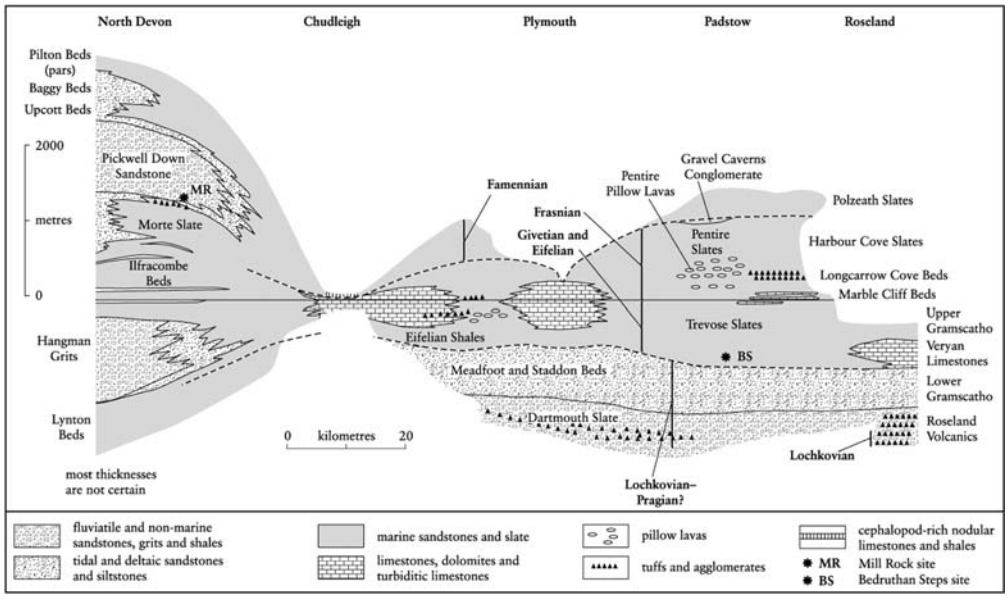

Figure 7.3: Simplified non-palinspastic facies section of Devon and Cornwall (after House, 1975).

Fauna

Heterostraci: Pteraspidiformes: Pteraspididae

Pteraspis cornubica Woodward, 1900

Pengelly (1848) recorded the presence of *Steganodictyum*, a possible pteraspid, which was identified as *Pteraspis cornubica* by Woodward (*in* Fox, 1900). The original identifications are uncertain, and the material is being re-examined by the French palaeontologist Dr A. Blieck in Lille. The fossil material is fragmentary and distorted but sufficient surface detail and bone morphology is present to suggest that taxonomic study, though difficult, is not impossible. As at Watergate Bay, large heterostracans seem to be indicated.

Interpretation

It has proved impossible to date the Slates of Porth Cothan and Bedruthan Steps, partly because of the rarity of biostratigraphically useful fossils, and partly because the sediments are so tectonized. The invertebrate fauna suggests an Eifelian age, and the large pteraspid fish, if such it is, would suggest a maximum age limit of Eifelian. The Purple and Green Slates of Watergate Bay, which lie at the bottom of this succession, have produced rare fish remains that might indicate Pragian age (White, 1956). The Staddon Grits may be Emsian in age (House, *in* House *et al*., 1977), hence bracketing the Slates of Porth Cothan and Bedruthan Steps as Emsian to Eifelian. The Trevose Grits of the neighbouring Trevone region, which are higher stratigraphically, yield a fauna of Givetian invertebrates.

The Watergate Bay pteraspid fossils appear to include a very large form, also tentatively identified as *P. cornubica* by White (1956). This would seemingly give the species a uniquely long stratigraphical range. There are close lithological similarities between the slates at both Bedruthan Steps and Watergate Bay, and preservation of the fragmental vertebrates is also similar. The pteraspids (and other vertebrates) of the Dartmouth Beds in south Devon (Dineley, 1966, 1986) are taxonomically different and essentially older than those in Cornwall.

If the Bedruthan fish proves to be a pteraspid, then it is an important record, since Eifelian representatives of this group are extremely rare, having been recorded before only as fragments from Morocco and Spitsbergen (Blieck, 1985). These specimens represent the last declining remnants of this previously abundant group. The last pteraspid, and last member of the Order Pteraspidiformes, listed by Halstead (1993), is an unnamed form from the Eifelian Widje Bay series of Spitsbergen. The abundance of vertebrate fragments in thin restricted beds suggests local current activity, possibly gathering bones from several pre-existing assemblages.

Conclusions

Fish remains from Bedruthan Steps have always been rare in the extreme, but the site is important and has a conservation value because such specimens are virtually unknown elsewhere in the Cornubian marine beds. Further specimens could come to light in the future at this coastal site.

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