
Cwm Craig Ddu Quarry

Highlights

Cwm Craig Ddu has yielded the oldest known specimens of *Cooksonia* in Great Britain, and is only marginally pre-dated by the oldest known specimens from anywhere in the world. They represent what is probably the most primitive type of vascular plant, and are thus of key importance for understanding the early phases in the development of vegetation on land.

Introduction

This locality comprises a small roadside quarry in Ludlow-aged siltstones on the north-eastern slopes of Mynydd Eppynt, between Llanwrtyd Wells and Builth Wells, Powys [SN 962 475]. Plant fragments from here were first reported by Straw (1953), and more were discovered in 1973 during a Geologists' Association field meeting (Baker and Hughes, 1979). The most comprehensive account of the flora is given by Edwards *et al.* (1979), who described a number of sterile and fertile fragments of rhyniophytoid plants (*sensu* Edwards and Edwards, 1986).

Description

Stratigraphy

The geology of this quarry has been discussed by Straw (1930, 1937), Bassett (*in* Baker and Hughes, 1979) and Edwards *et al.* (1979). The exposed sequence belongs to the Pterinea Beds, the basal member of the *Wilsonia* Shales Formation (Straw, 1937). The beds represent deposits formed on the palaeoslope on the eastern margin of the Welsh basin. It contains a fauna, including rhynchonellid brachiopods, bryozoans, nautiloids, bivalves and rare graptolites, belonging to the *Saetograptus leintwardinesis incipiens* Zone (Straw, 1937; Bassett *in* Baker and Hughes, 1979), indicating a late Gorstian (early Ludlow) age, although acritarchs collected by K.J. Doming (*pers. comm.*, 1979) have given a mid-Gorstian age.

Palaeobotany

Edwards *et al.* (1979) recorded *Hostinella* sp., *Cooksonia pertoni* Lang, *Cooksonia* sp. and cf. *C. cambrensis* Edwards from here. They are mostly preserved as coalified compressions. Specimens are rare and generally fragmentary, rarely exceeding a few millimetres in size.

Interpretation

The specimens found here have slender, occasionally dichotomous, branching axes. Mostly, they are sterile and thus placed in the form-genus *Hostinella*. A dark central line, suggestive of vascular tissue, occurs along some of them. Even using film pulls, Edwards *et al.* (1979) were unable to obtain microscopic evidence of tracheids to confirm that this is vascular tissue, but they did reveal some evidence of epidermal and/or cortical cells.

Three of the specimens described by Edwards *et al.* showed thin axes terminated by single, small sporangia (one of these specimens is represented by both the part and counterpart). The sporangia varied in shape and were assigned to different 'species', although Edwards *et al.* were clearly uneasy at identifying more than one species from here based on such limited material. There can be little doubt, however, that they belong to the form-genus *Cooksonia* (Figure 3.12).

Cooksonia is widely regarded as the most primitive vascular land plant (Taylor, 1981; Thomas and Spicer, 1987; Edwards *et al.*, 1992). For a time, the Cwm Craig Ddu specimens were the oldest examples of *Cooksonia* known from anywhere in the world. Although older specimens are now known from the Wenlock of Ireland (Edwards and Feehan,

1980; Edwards *et al*, 1983), they are still the earliest found in Great Britain. They are thus of considerable interest for charting the early history of the British land floras and demonstrating the morphological simplicity of the first vascular plants to appear on land in this part of the world. They contrast with the more advanced plants found in approximately coeval strata in Gondwana (the *Baragwanathia* flora) and suggest that even at this early time there was a clear difference between the land vegetation of the southern low palaeolatitudes and the rest of the world.

Conclusion

Cwm Craig Ddu Quarry has yielded specimens of *Cooksonia* that are some 420 million years old, and which are the oldest examples of this primitive land plant to have been found in Great Britain. This is widely thought to be the ancestral form of most if not all land vascular plants. It is only marginally pre-dated by similar fossils in Ireland, which are at present the oldest examples of such plants from anywhere in the world.

References



(Figure 3.12) *Cooksonia pertoni* Lang. Earliest examples of rhyniophytoid land plants known from Great Britain; National Museum of Wales, specimen 79.17G3. *Wilsonia* Shales Formation (lower Ludlow), Cwm Craig Ddu Quarry. x 5. (Photo: Photographic Studio, National Museum of Wales.)