
Cook's Wood Quarry, Somerset

[ST 669 478]

Introduction

The Cook's Wood Quarry GCR site is situated close to Stoke St Michael and 6.5 km to the northeast of Shepton Mallet in the eastern Mendips. This disused quarry [ST 669 478] offers an outstanding section of the top part of the Clifton Down Limestone (Holkerian), and the Hotwells Limestone (Asbian). The succession displays a number of well-defined and glacio-eustatically controlled depositional carbonate cycles that record an important evolutionary phase in the development of the South Wales–Mendip Shelf during the earlier part of late Dinantian times. Regrettably, however, published details relating to this section are decidedly lacking.

Description

This site is located on the northern limb of the Beacon Hill Pericline. The exposed section dips steeply (c. 80°) to the north (see Welch, 1933), and includes approximately 200 m of massive and well-bedded bioclastic (crinoidal) and oolitic limestones, with subordinate developments of shale, carbonate mudstone and chert. Corals and brachiopods occur at various levels in the sequence.

Although the topmost beds of the Clifton Down Limestone are exposed at the southern end of the site, no formal detailed description of them has, to the authors' knowledge, ever been published. However, Green and Welch (1965) described the upper part of this formation approximately 2 km to the west as 'consisting predominantly of calcite–mudstone', a lithofacies widely recognized at this level elsewhere in southern England (Mitchell and Green, 1965; Murray and Wright, 1971; Green, 1992; Kellaway and Welch, 1993). Above these beds, the bulk of the section is represented by the Hotwells Limestone. This unit is characterized by the development of well-bedded and massive calcarenites and the development of several soft-weathering shale bands which occur in the prominent recesses of the quarry faces (Figure 9.43). Solitary and colonial rugose corals and productoid brachiopods occur in some of the limestone beds, and thin 'stringers' of coal may be found in some of the shale bands.

A key feature of the section is the development of sedimentary cycles, each approximately 10–20 m thick, in the Hotwells Limestone. In the lower part of the sequence this cyclicity is reflected by gradational changes in bed thickness and colour, the lower beds in each cycle appearing as thicker and paler coloured units than higher intervals. Higher in the succession, regularly spaced shale bands representing possible palaeosols define the position of cycle boundaries within the massive lithofacies (Figure 9.43). A similar pattern of cyclic sedimentation in the Hotwells Limestone was recognized throughout the northern Mendips by Green (1992).

Interpretation

Despite the lack of published information relating to the Cook's Wood section, comparisons made with other sections facilitate a general interpretation of the sequence. Wright (1987a), for example, regarded the Holkerian Clifton Down Limestone as the lateral back-barrier facies equivalent of the Dowlais Limestone which developed behind the Hunts Bay Oolite barrier complex in South Wales and part of the 'catch up' phase of ramp development. In addition, Wright (1987a) regarded the massive and thickly bedded calcarenites of the Asbian succession in southern Britain, i.e. the Hotwells Limestone (southern England) and the Oxwich Head Limestone (South Wales), as the deposits of a 'uniform, shallow, relatively flat' shelf area (see (Figure 9.3)). The Cook's Wood section therefore records a critical stage in the development of the South West Province, namely the ramp to shelf transition.

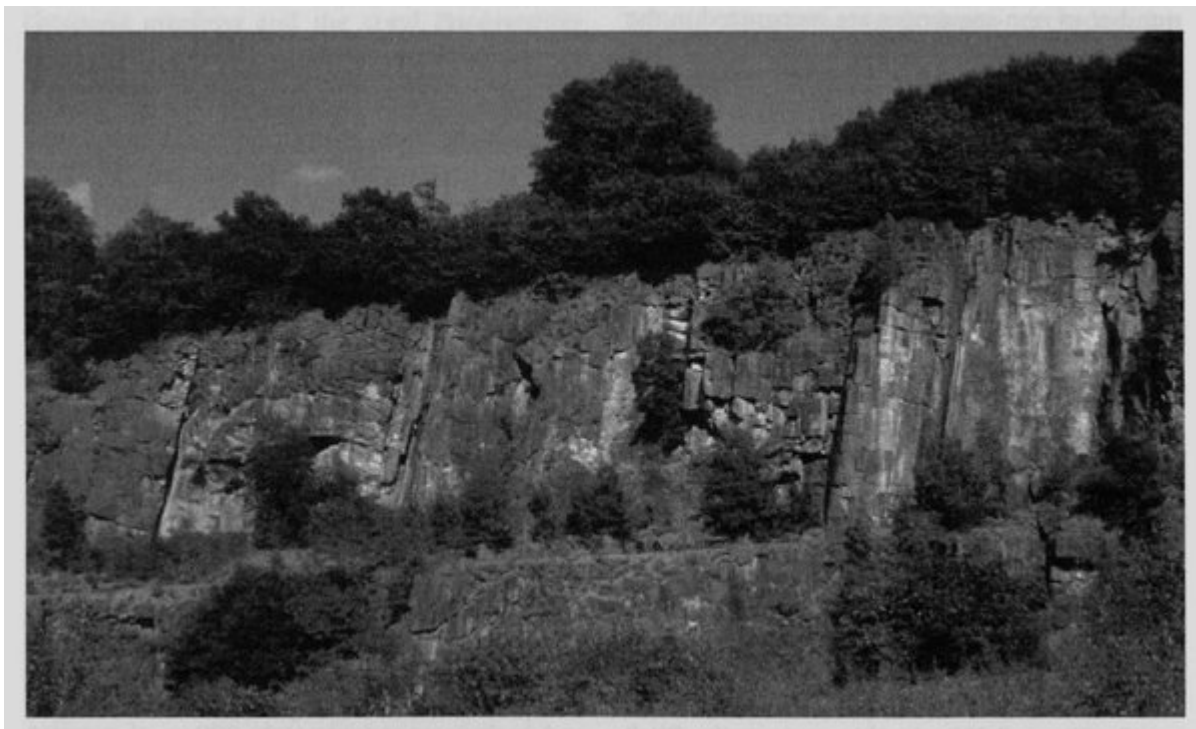
The character of the sedimentary cycles in the Hotwells Limestone strongly resembles those reported from other Asbian sections in Wales and England (Walkden, 1984, 1987; Somerville, 1979a; Horbury, 1989; Davies, 1991; Vanstone, 1998;

and see Ilston Quarry GCR site report, this chapter, and Eglwyseg Mountain GCR site report, Chapter 8). Their formation bears testament to fluctuating sea levels across the Mendip Shelf during late Dinantian times and to periods of subaerial weathering when the shelf area was exposed above sea level. For a more detailed account of the origin and significance of these glacio-eustatically controlled cycles (Wright and Vanstone, 2001), see Ilston Quarry GCR site report (this chapter).

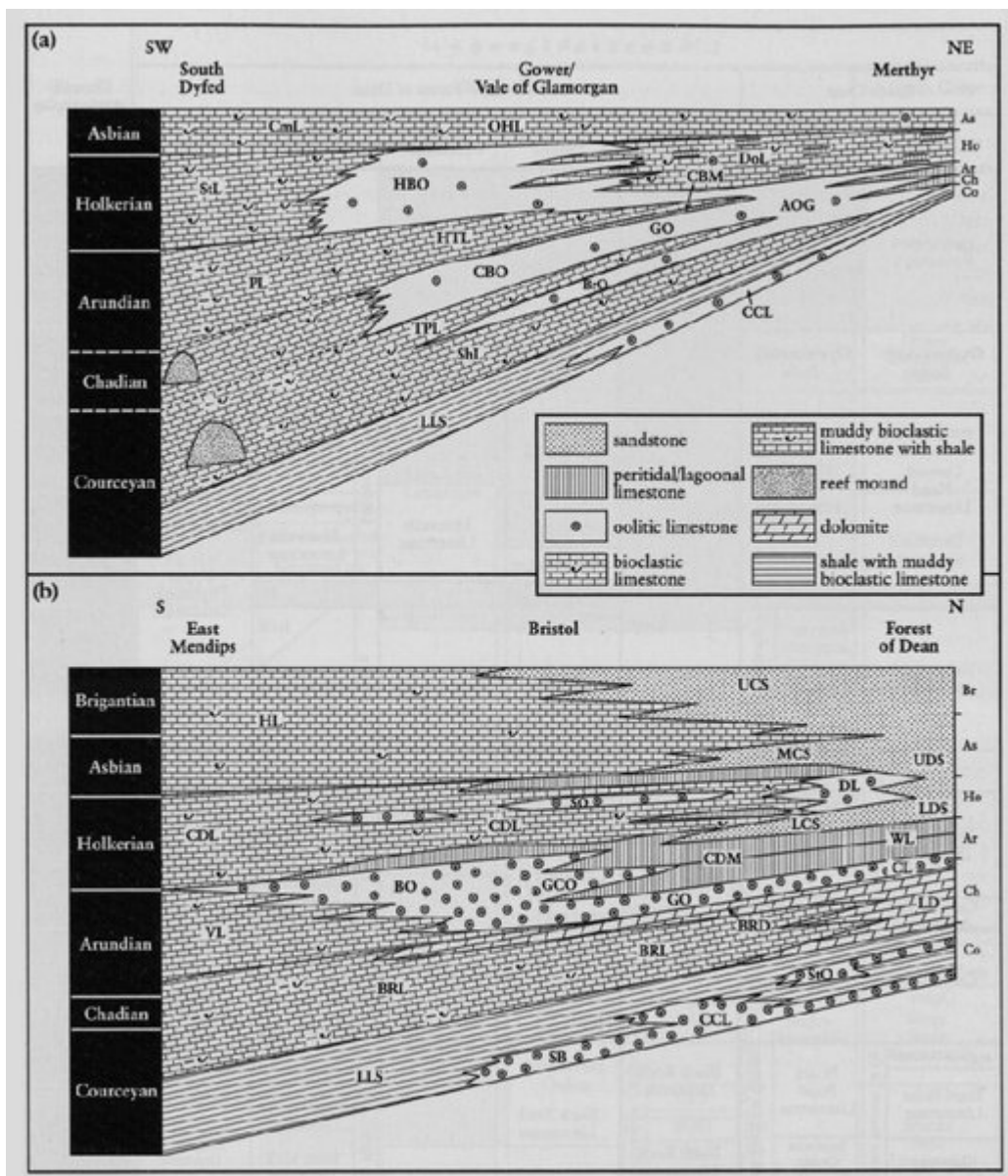
Conclusions

This site provides the finest and the most easily accessed section of the Hotwells Limestone (Asbian) in the Mendips, and reveals arguably the finest example of the development of sedimentary cycles in the Lower Carboniferous rocks of southern England. The succession was formed predominantly in a shallow marine environment as the Mendip Shelf was transformed from a gently dipping carbonate ramp to a broad flat-lying shelf. It is particularly important for understanding the changes in palaeoenvironment and palaeoclimate that occurred south of the Wales–Brabant Massif during the later part of Dinantian times and as such it provides a valuable research site and teaching resource.

[References](#)



(Figure 9.43) Minor cycles in the Hotwells Limestone (Asbian) at Cook's Wood Quarry. The height of the cliff face is approximately 18 m. (Photo: P.J. Cossey.)



(Figure 9.3) Simplified stratigraphical sections of Dinantian strata in south-west Britain illustrating the distribution of Dinantian lithofacies. Section (a) based on Wright (1986a) and Burchette et al. (1990); approximate length of section, 100 km. Section (b) based on information from Kellaway and Welch (1955, 1993), Burchette et al. (1990) and Green (1992); approximate length of section, 80 km. (LLS — Lower Limestone Shale; CCL — Castell Coch Limestone; ShL — Shipway Limestone; BrO — Brofiscin Oolite; TPL — Tears Point Limestone; CBO Caswell Bay Oolite; GO — Gully Oolite; AOG — Abercriban Oolite Group; CBM — Caswell Bay Mudstone; PL — Pen-y-Holt Limestone; HTL — High Tor Limestone; StL — Stackpole Limestone; HBO — Hunts Bay Oolite; DoL — Dowlais Limestone; CmL — Crickmail Limestone; OHL — Oxwich Head Limestone; SB — Shirehampton Beds; StO — Stowe Oolite; BRL — Black Rock Limestone; BRD — Black Rock Dolomite; LD — Lower Dolomite; CL — Crease Limestone; VL — Vallis Limestone; BO — Burrington Oolite; GCO — Goblin Combe Oolite; CDM — Clifton Down Mudstone; WL — Whitehead Limestone; CDL — Clifton Down Limestone; SO — Seminula Oolite; DL — Drybrook Limestone; LDS — Lower Drybook Sandstone; UDS — Upper Drybook Sandstone; LCS — Lower Cromhall Sandstone; MCS Middle Cromhall Sandstone; UCS — Upper Cromhall Sandstone; HL — Hotwells Limestone.)