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# Brown's Folly, Somerset

[ST 795 663]–[ST 794 652]

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## Introduction

The main exposures adjacent to Brown's Folly [ST 7947 6606] are located in the crags that extend about 1.5 km along the upper part of the densely wooded, steep hillside to the east of the River Avon, near Bathford, Somerset (Figure 3.7). Another major exposure is present c. 300 m due north of Brown's Folly, about halfway down the hillside. The area is owned by The Wildlife Trust, Bristol, Bath and Avon (the operating name of Avon Wildlife Trust). Together, the exposures have revealed an Upper Bathonian succession ranging from close to the base of the Great Oolite Formation up into the lower part of the Forest Marble Formation; this includes the most complete succession of the Great Oolite Formation in the Bath district. Included in the succession are the oolite freestones of the Bath Oolite Member that were formerly mined as the 'Farleigh Down Stone', and the Corsham and Bradford coral beds in the lower part of the Forest Marble Formation, which are characterized by scattered small coral reef-knolls. The succession was described in detail by Green and Donovan (1969) and, briefly, by Hawkins (1977).

## Description

The following section (see also (Figure 3.8)) is based on that recorded by Green and Donovan (1969).

	Thickness (m)
<b>Forest Marble Formation</b>	
Limestone, brown, shelly, flaggy; lower 3.4 m cross-bedded	c. 4.9
Gap	c. 1.5
Limestone, detrital, buff cross-bedded, ooidal; well-preserved fossils, including <i>Digonella digona</i> (J. Sowerby), on bedding planes	1.5
Marl, brown, sandy, passing into ragged, shelly marly limestone; passing down into	0.3
Clay, grey, fossiliferous with <i>Apiocrinus</i> , <i>Digonella digona</i> , numerous rhynchonellids, oysters etc.; sharp base	0.23
<b>Upper Rags Member</b>	
<i>Bradford Coral Bed</i> : Limestone, brown, shelly, hard, detrital, weathering ragged and cavernous; top surface oyster-encrusted; some beds weathering to rubbly ochreous marl; abundant fossils including corals, brachiopods and large thick-shelled bivalves (including oysters); in places, apparently channelled into bed below, otherwise downward passage	2.7–3.0
Oolite, detrital, creamy-buff, fairly massive; in parts, rather fine grained and marly particularly towards top; some burrows; top locally bored	1.8–2.6
<i>Corsham Coral Bed</i> : Coralline limestone, pale-buff, hard, massive; coarse ooids and coarsely shelly with boring molluscs; top surface extensively bored and oyster-encrusted (Toot' Bed' of Bath Oolite mines)	1.5
<b>Great Oolite Formation</b>	
<b>Bath Oolite Member</b>	

Pure oolite–freestone (formerly mined), fine grained; top surface slightly bored	2.1
Gap (white oolite seen in places)	c. 5.0
<b><i>Twinhoe Member</i></b>	
<i>Winsley facies</i> : Limestone, yellowish, hard, detrital, massive	1.1
Marl, ochreous; sharp base	0.15
<i>Freshford facies</i> : Oolite, cream-coloured, soft, coarse grained; marly with scattered shell-debris	0.9–1.1
Limestone, fawn to yellowish, marly, pisolitic, detrital; irregular bedding	1.1
Limestone, buff, shelly, soft, rubbly, pisolitic, marly; very fossiliferous with abundant bivalve casts	0.7–0.8
Clay and marl, yellowish-brown; sharp base with pocketing into beds below	0.1
<b><i>Combe Down Oolite Member</i></b>	
Limestone, fawn, fine grained, detrital, ooidal; ramifying burrows; 0.31 m-thick brachiopod-rich bed in middle part with <i>Kallirhynchia</i> cf. <i>superba</i> S.S. Buckman and abundant <i>Obovothyris</i> cf. <i>obovata</i> (J. Sowerby); sharp base but joined on to bed below	0.9
Oolite, fawn, massive, fairly hard, current-bedded, shelly with many shell-detrital layers (mined for building stone)	4.6–4.9

An even more complete succession in the lower beds is seen in crags [ST 7943 6634] 300 m north of Brown's Folly. Here, a total of 8.5 m of the Combe Down Oolite Member is present, only a metre or so short of its total thickness hereabouts. The junction of the Bath Oolite and Twinhoe members is sharp, with the oolite piping down into the latter.

## Interpretation

The cross-bedded, shell-fragmental oolites of the Combe Down Oolite Member, which rarely yield whole fossils, were deposited by mobile sand-waves in a high-energy, shallow-water, carbonate shelf-sea with strong currents, where benthic organisms were unable to colonize. However, periodical stabilization of the substrate is indicated by ramifying burrows, which can be seen locally, as in the uppermost bed at Brown's Folly, and by the well-preserved brachiopods of that bed. Burrow-fills at the top of this bed suggest a break in sedimentation before the basal clay and marl of the Twinhoe Member were deposited. Elsewhere, locally, the upper surface of the Combe Down Oolite Member is planar, extensively bored and oyster-encrusted, attesting to such a depositional break, with concomitant lithification of the substrate.

The limestones of the Twinhoe Member (*Freshford facies*), which comprise coarse ooids, pisoids and shell debris in a fine-grained marly matrix, are inferred to have been deposited in somewhat deeper, quieter waters than the Combe Down Oolite Member, where calcareous mud and silt predominated. Ooids and pisoids commonly have an algal coating, the development of which supports the prevalence of less turbulent conditions. The uppermost detrital limestone (*Winsley facies*) is deemed by Penn and Wyatt (1979) to represent the deepest-water phase in a transition from the oolites of a shallow shelf-sea to the mudstones (Frome Clay Formation) of the Wessex Basin margin.

Piping of the overlying Bath Oolite Member into the top of the Twinhoe Member indicates a depositional break. This oolite represents a return to high-energy, current-dominated conditions, in which a constantly mobile substrate led to the development of pure, even-grained, well-sorted oolites. Borings at the top of the Bath Oolite Member imply a further depositional break.

Turbulent, shallow-water conditions continued during deposition of the Upper Rags Member of the Forest Marble Formation, but sorting by currents was now much less effective. The basal Corsham Coral Bed, although coralline, does not display the discrete reef-knolls that are so characteristic in the Corsham Railway Cutting (see GCR site report, this

volume). The bored top of the bed represents yet another depositional break, during which sessile oysters encrusted the sea floor. The uppermost Bradford Coral Bed is lithologically similar, but a passage into a typical reef-knoll, up to 3 m thick, is seen c. 45 m north of Brown's Folly.

As at Corsham Railway Cutting (see GCR site report, this volume), the clay above the Upper Rags Member reflects an influx of muddy and sandy terrigenous sediment, which in part contains elements of the so-called 'Bradford Clay fauna'. The limestones that form the remainder of the succession are witness to the renewal of carbonate sand sedimentation, in which the influence of strong currents is demonstrated by the dominance of cross-bedding structures.

The high-energy, shallow-water, carbonate shelf-sea in which the bulk of the succession at Brown's Folly was deposited, extended northeastwards well into Oxfordshire; its southern margin was located about 9 km south of the site, trending west–east through Trowbridge. However, the lithologies of the Twinhoe Member, which represent foreslope deposits at the edge of the Wessex Basin, indicate a temporary northward shift of the shelf-sea margin to just north of Brown's Folly. These carbonate rocks, which are characteristic of the Bath district as a whole, have been compared with sediments currently being deposited on the Andros Platform of the Great Bahamas Bank, and in the Persian Gulf (Green and Donovan, 1969).

No biostratigraphically useful ammonites are known from the Brown's Folly succession, but the occurrence of *Procerites hodsoni* Arkell in the lower part of the Combe Down Oolite Member just north of Bath assigns these lower beds to the Retrocostatum Zone. Ammonites characteristic of this zone have also been collected from the Twinhoe Member south of Bath. Since this member passes laterally northwards into the lower part of the Bath Oolite Member, the latter, and probably also its upper part, are included in the Retrocostatum Zone. *Clydoniceras hollandi* (S.S. Buckman) is present in the Bradford Clay at its type locality, indicating that beds of the Forest Marble Formation above the Upper Rags Member belong to the Discus Zone (Hollandi Subzone). The Upper Rags Member, which has not yielded diagnostic ammonites, were referred to the Discus Zone by Penn and Wyatt (1979) and Wyatt (1996a), but to the *orbis* (now Retrocostatum) Zone by Torrens (1980b).

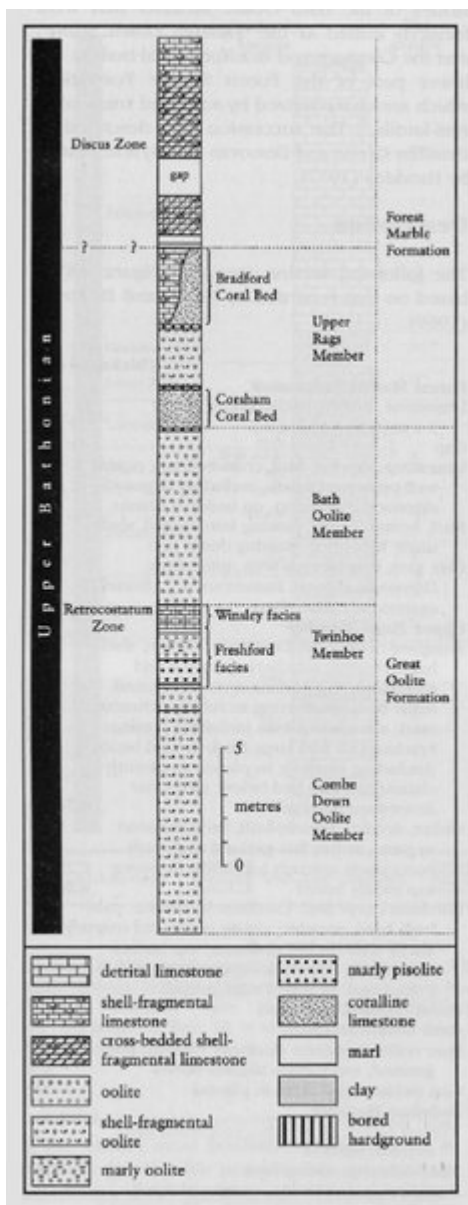
## Conclusions

The composite section at Brown's Folly exposes an Upper Bathonian succession that includes most of the Great Oolite Formation and the lower part of the Forest Marble Formation. It demonstrates a period of sedimentation during which oolites and shell-fragmental limestones, deposited in a high-energy, shallow-water, carbonate shelf-sea covering the western portion of the London Platform, were dominant. Deeper-water, foreslope deposits (Twinhoe Member), which represent a transition into the mudstone succession of the steadily subsiding Wessex Basin to the south, are also exposed. The succession may be viewed as a 'fossilized' equivalent of the present-day sediments that characterize the Great Bahamas Bank and the Persian Gulf. Features of special interest in the Brown's Folly section include the formerly commercial Bath Oolite Member freestone (Farleigh Down Stone) and the Bradford and Corsham coral beds, in which small reef-knolls are locally characteristic. Bored and burrowed beds, associated with planed and oyster-encrusted surfaces, provide evidence of periodic pauses in sedimentation with local lithification of the substrate. Overall, the section illustrates the general character of the Upper Bathonian succession of the Bath district.

## [References](#)



*(Figure 3.7) Exposure of Great Oolite Formation on the wooded slopes below Brown's Folly. (Photo: M.G. Sumbler.)*



(Figure 3.8) Graphic section of the Bathonian succession at Brown's Folly.)