
Hampen Railway Cutting, Gloucestershire

[SP 0590 2031]–[SP 0629 2050]

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Introduction

Hampen Railway Cutting, on the disused Andoversford to Bourton-on-the-Water railway in Gloucestershire, shows one of the more complete Great Oolite Group sections in the Cotswolds, exposing the upper part of the Fuller's Earth Formation, the Taynton Limestone Formation, the Hampen Formation and the lower part of the White Limestone Formation (Figure 3.48). Most importantly, it is the type section of the Hampen Formation, and indeed one of the few localities where this unit can be observed (Sumbler and Barron, 1996).

The Hampen Formation, first recognized as the 'Marly Beds' (Woodward, 1894) was formalized as the 'Hampen Marly Beds' by Arkell (1933) who suggested the cutting as its type section, based on the sections recorded there by Woodward (1894) and Richardson (1929b). The name adopted by Arkell is a somewhat unfortunate one, for the strata are less marly than is implied by Woodward and Richardson's rather generalized sections. In fact, some 55% of the formation's thickness is made up of limestone, which particularly dominates the lower part of the formation. Nevertheless, the formation is characterized by a distinctive assemblage of lithologies that are quite different from those of the Taynton Limestone Formation below, and the White Limestone Formation above.

Description

Hampen Railway Cutting is, in total, over a kilometre in length, but the best sections are restricted to that portion between the Brockhampton Road, where the original bridge has been replaced by an embankment [SP 0638 2052] and the trackway bridge 650 m to the south-west [SP 0578 2024], which marks the western end of the GCR site. This section of the cutting is up to 15 m deep and, from east to west, exposes progressively lower beds owing to the combined effect of the westward downhill gradient of the old railway track bed, and the gentle eastward dip of the strata. Although parts of the section are overgrown with vegetation, or obscured by slipped material, much of the succession is well exposed, and the units described below should be readily recognizable (Figure 3.49). Adjacent to the Brockhampton Road, where Hampen Railway Cutting can be entered, the basal part of the White Limestone Formation is present in the highest part of the cutting. Succeeding beds of the formation are exposed in that part of the cutting to the east of the road, also part of the GCR site, but exposures there were heavily overgrown and unimpressive at the time of writing.

Hampen Railway Cutting was originally described by Woodward (1894). Later, Richardson (1929b) produced a slightly elaborated version of Woodward's section, with the useful addition of a graphic representation of the succession. The cutting was alluded to by Arkell (1933, 1947b), and more recently by Palmer (1979) but no detailed descriptions were given. The cutting (to the west of Brockhampton Road) was reexamined and measured by the present author and A.J.M. Barron in 1993 and 1995; their section is shown in (Figure 3.48), and more details are given by Sumbler and Barron (1996) and Barron (1998). The section was measured in two halves; the lower strata (beds 1 to 28 of (Figure 3.48)) were measured at a point near the western end of the site [SP 0590 2031], and the succeeding strata were recorded nearer the eastern end (between [SP 0629 2050] and [SP 0615 2045]). Generally, there is a good correspondence between this newly measured section and the beds recognized by Woodward (1894) and Richardson (1929b).

The basal 7.84 m of the section (beds 1 to 18) are assigned to the Fuller's Earth Formation. The lowest bed now exposed (Bed 1) is a grey, shaly mudstone that represents the topmost part of the 10 feet (3.05 m) of bluish-grey shales with bands of hard, pale-grey marl and thin layers of fissile, sandy limestone recorded by Woodward (1894) and Richardson (1929b) at the bottom of their section. The overlying beds 2 to 18 are assigned to the Eyford Member. The lower part is dominated by fissile, calcareous, sandy limestones ('tilestones') interbedded with shaly silts and marls, and, near the base, decalcified, buff-yellow sand. The basal bed (Bed 2) is a hard, micritic limestone, very sandy in the upper part. The

lower part is packed with the small lunate oyster *Praeexogyra acuminata* (J. Sowerby), forming an Acuminata marble'. The upper part of the Eyford Member includes coarsely shelly and peloidal grainstones (Bed 11) not unlike the Taynton Limestone Formation, and finely ooidal tilestones with sporadic strings of coarser, white ooids, rather similar to those of the Hampen Formation (beds 14 to 18).

The overlying Taynton Limestone Formation (beds 19 to 30) is made up mainly of medium- to coarse-grained, shell-fragmental and ooidal grainstones, often exhibiting medium- and large-scale cross-bedding. It also includes some finer-grained bands, and marly beds particularly in the lower part. The total thickness of the Taynton Limestone Formation is just over 4 m.

The succeeding Hampen Formation (beds 31 to 54) is 8.96 m thick. It comprises limestones with interbedded marls, the latter being particularly common in the upper part. The dominant and characteristic limestone lithology is a grey to brown, flaggy, fine- to very fine-grained, well-sorted ooidal grainstone to packstone; a hand-lens is generally necessary to distinguish the ooids. Some beds contain a proportion of quartz sand, although much less than in the tile-stones of the Eyford Member to which they bear a superficial resemblance; their ooidal composition and the almost ubiquitous presence of ripple bedding distinguish them from the latter. In some cases, the limestones contain strings of relatively coarse-grained white ooids, and they often display burrows and trails on bedding surfaces. The limestones commonly have a faint bituminous smell when freshly broken and, rarely, contain carbonaceous plant-fragments. Many of the beds are extremely hard, and they have been widely used locally as a walling stone.

The marls of the formation are typically bluish-grey to yellowish-brown, and are commonly laminated and rather sandy; they tend to pass laterally into soft, rather shaly limestones. Like the limestones, the marls contain a proportion of organic material giving rise to a bituminous odour, and commonly contain scattered ooids and shell debris. The latter often includes oyster material, notably *Praeexogyra hebridica* (Forbes), which is particularly abundant in Bed 43 (the *Ostrea* Bed of Richardson (1929b)). The upper 2.1 m of the formation are composed almost entirely of marl, with only a thin (0.2 m) bed of limestone (Bed 53), which is a pale-grey, strongly bioturbated peloidal packstone more like the lithologies of the overlying White Limestone Formation than the limestones lower in the Hampen Formation.

About 7.6 m of the White Limestone Formation is represented to the west of Brockhampton Road, although only the basal c. 1.7 m (beds 55 and 56) are cleanly exposed. These beds, assigned to the Shipton Member (Sumbler, 1984), comprise off-white to pale-brown, ooidal and peloidal packstones to grainstones, with a massive character resulting from pervasive bioturbation. Higher beds, possibly extending up into the succeeding Ardley Member, are indifferently exposed in that part of the cutting to the east of the road, where Woodward (1894) and Richardson (1929b) recorded a total of 35 feet 10 inches (10.92 m) of the White Limestone Formation.

Interpretation

Based on mapping, the total thickness of the Fuller's Earth Formation hereabouts is estimated to be some 15 m (Barron, 1998). The beds exposed in Hampen Railway Cutting therefore mainly represent the upper half of the formation. The mudstone at the base of the section (Bed 1) is typical of the lower part of the formation. Acuminata marbles' such as Bed 2 are valuable markers; this particular bed, included here in the Eyford Member, may equate with Unit 6 of the Bath region to the south-west (Penn and Wyatt, 1979; see Sumbler *et al.*, 2000). The succeeding tilestones of the Eyford Member (beds 3 to 12) are directly comparable to the so-called Cotswold Slate of the member's type section at Huntsmans Quarry (see GCR site report, this volume). The upper part of the member (beds 11 to 18), with its ooidal limestones, corresponds to the Charlbury Formation developed below the Taynton Limestone Formation in Oxfordshire (Boneham and Wyatt, 1993; Wyatt, 1996a). The Eyford Member was included in the 'Stonesfield Beds' or 'Stonesfield Slate Series' by Woodward (1894), Richardson (1929b) and Arkell (1933), although the famous Stonesfield Slate of the type area (see Stonesfield GCR report, this volume) is now known to lie within the Taynton Limestone Formation.

The Taynton Limestone Formation was formerly valued as a freestone, and is still worked for this purpose near Soundborough Farm, just over 1 km north-west of the site. Details of Woodward's (1894) section show that his 'Freestone' corresponds exactly with the Taynton Limestone Formation as classified herein, but his recorded thickness of 'about 30 feet' (c. 9 m) is greatly excessive. Richardson (1929b) quoted Woodward's 30 feet of Taynton Limestone

Formation but, as he excluded beds 19 to 22 (1.9 m thick) from the formation (including them in the 'Stonesfield Slate Series'), his figure should have been reduced accordingly. Although these beds are dominated by typical Taynton Limestone Formation lithologies, Richardson interpreted them as the 'Seven-hampton Marl' (Bed 20), *Ostrea acuminata* Limestone (Bed 21) and *Rhynchonella* Bed (Bed 22) which, at their type locality of Sevenhampton Common [SP 018 222], underlie the Taynton Limestone Formation (Richardson, 1929b). However, there seems to be no reason to believe that these beds, either in Hampen Railway Cutting or at the various other localities in which they have been said to be present, necessarily correlate to those of the type section.

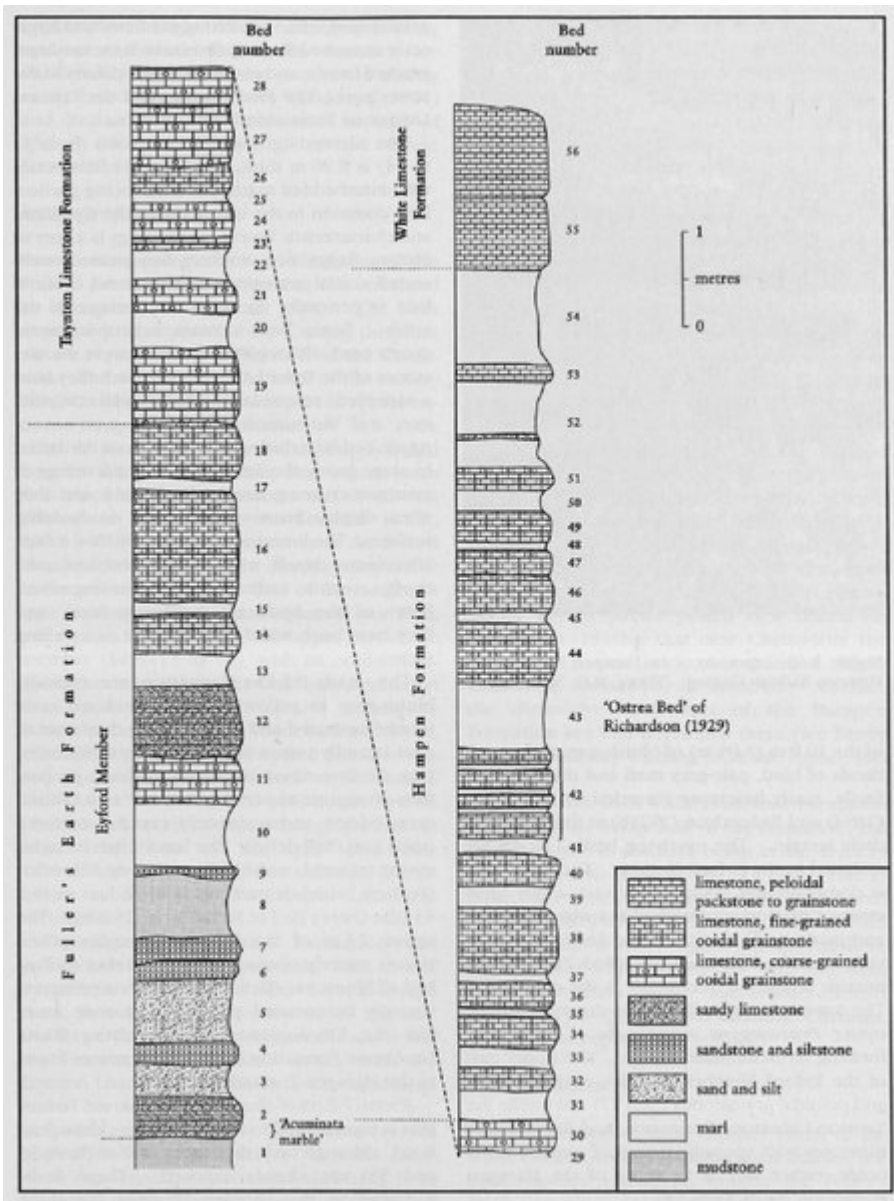
The thickness of 8.96 m for the Hampen Formation recorded herein is satisfactorily close to 8.61 m of 'Marly Beds' recorded by Woodward (1894) and Richardson (1929b). The formation at this locality represents a passage between the non-marine and paralic facies of the Rutland Formation, developed in the land-marginal areas of the London Platform and East Midlands Shelf, and the more open marine, oolite shoal environment offshore (Palmer, 1979; Horton *et al.*, 1995). Thus, to the west and south-west, limestones become ever more dominant, but Arkell's (1933, 1947b) often-repeated view (based on Richardson, 1911b), that near Chedworth, the formation passes into an expanded White Limestone Formation, is incorrect. In fact, the distinctive limestones of the Hampen Formation are well developed there (see Stony Furlong Railway Cutting GCR site report, this volume).

The 11 m or so of White Limestone Formation represents the lower half of the formation, the total thickness in this area being in the order of 25 m. The beds are generally of a higher-energy facies than those in the type area of the Cherwell Valley in Oxfordshire, illustrating the westward transition to a more open marine, offshore environment represented by the Athelstan Oolite Formation of the Malmesbury district (e.g. Veizey's Quarry and Kemble Cuttings, see GCR site reports, this volume).

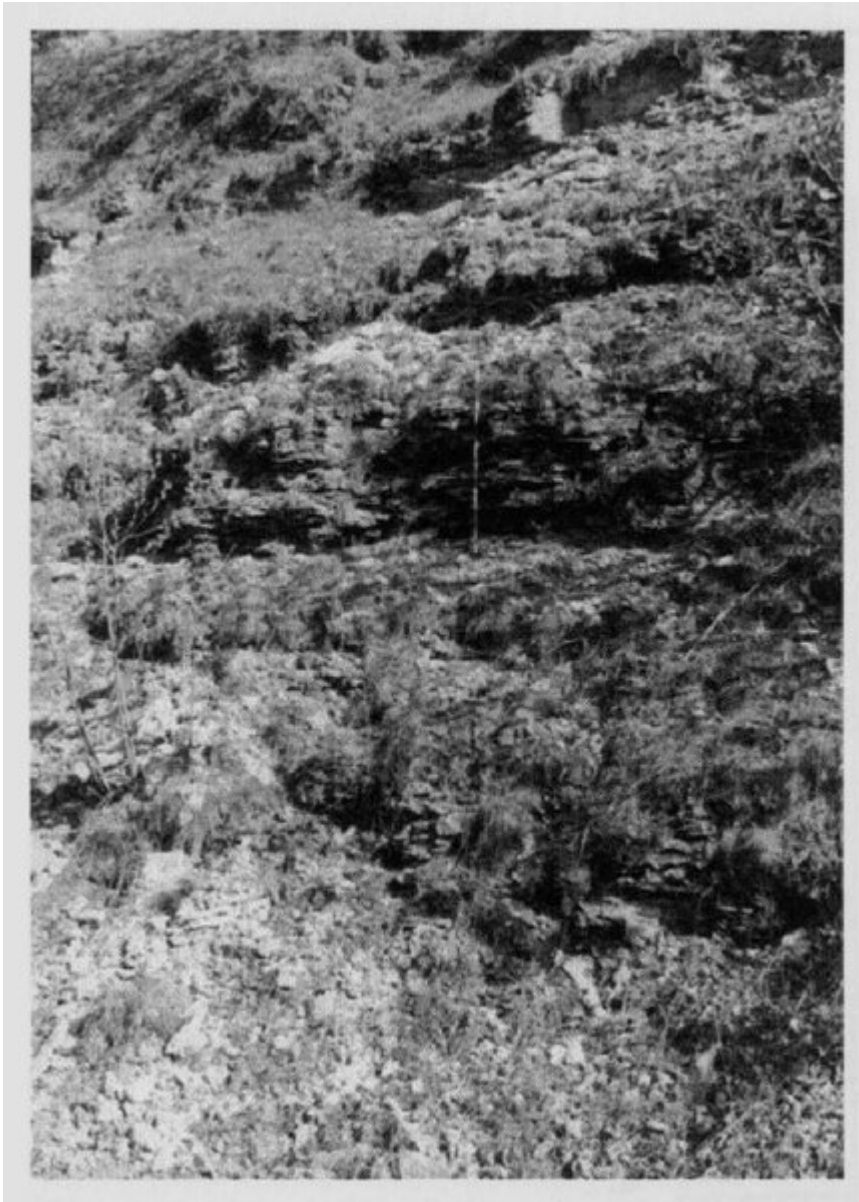
Conclusions

Hampen Railway Cutting exposes much of the Great Oolite Group, including parts that are seldom exposed elsewhere, notably the Fuller's Earth Formation, Hampen Formation and basal White Limestone Formation. It is particularly important as the stratotype of the Hampen Formation.

[References](#)



(Figure 3.48) Graphic section of the Bathonian succession at Hampen Railway Cutting. Bed numbers follow Sumbler and Barron (1996) and Barron (1998).)



(Figure 3.49) Exposure of the Hampen Formation in Hampen Railway Cutting. (Photo: M.G. Sumbler.)