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# Stony Furlong Railway Cutting, Gloucestershire

[SP 0605 1091]–[SP 0635 1027]

M.G. Sumbler

## Introduction

The GCR site known as 'Stony Furlong Railway Cutting' exhibits an important section through the middle and lower part of the White Limestone Formation and formerly exposed strata of the underlying Hampen Formation. The section was first described during its construction by Harker (1892) and, later, by Richardson (1911b), in an influential paper that has been widely quoted by subsequent authors. The cutting (Figure 3.43), on the old Cirencester to Andoversford railway, which was closed in the 1960s, lies immediately south of Chedworth village. Originally 1 km in length, it is crossed by a bridge [SP 0628 1063] that carries the minor road from the A429 Foss Way to Chedworth. That part of the cutting beneath and immediately to the north of the bridge is infilled, as is the north-western end of the cutting. The open cutting between forms the northern half of the GCR site, but exposures are unimpressive. However, the section to the south of the bridge, forming the southern half of the GCR site, still affords exposures showing much of the upper part of Richardson's (1911b) section, including the strata at the junction between the Shipton and Ardley members of the White Limestone Formation. The cutting is situated only 1.5 km from Foss Cross (see GCR site report, this volume) which also exposes these beds, allowing the possibility of interesting comparisons between the two sections.

## Description

Richardson (1911b) described some 30 m of strata at Stony Furlong Railway Cutting (Figure 3.44), and included annotated photographs that enable his beds to be identified in the extant sections. His later graphic composite section of the Great Oolite Group exposed in the cuttings along the Cirencester to Andoversford railway (Richardson, 1933, fig. 2) is compromised by some probable errors in correlation between the different sections (Sumbler, 1995; Sumbler and Barron, 1995). In the following account, Richardson's bed numbers, starting from 8 at the top to 36 at the bottom, are used throughout.

According to Richardson (1911b), beds 8 to 28 were visible in the southern and deepest part of the Stony Furlong Railway Cutting, south of the road bridge, and underlying strata were not seen until considerably farther to the northwest, near a second bridge [SP 0594 1101] that carried a trackway over the railway in a part of the cutting that is now infilled, outside the GCR site. There, the so-called 'Organic Band' (Bed 33) was exposed close to the south-western pier of the bridge. This unit, a brown clay rich in *Praeexogyra hebridica* Forbes (= *Ostrea sowerbyi* of Richardson, 1911b, 1933) is here classified as the topmost bed of the Hampen Formation. Underlying beds of that formation (beds 34 to 36) were described as marls and 'oolitic' limestones. Above the Hampen Formation, beds 32 to 28 of the White Limestone Formation (no longer exposed) are mainly peloidal limestones with some marl bands. Beds 13 to 28 were exposed in a deep 'gully' used as a quarry, on the western side of the railway, just to the south of the road bridge (Richardson, 1911b, pl. 18). A moderately good, though rather dangerous and partly inaccessible, section can still be seen at this point [SP 0628 1058]; it shows some 8.5 m of strata extending from the upper part of Bed 21 up to Bed 13. The section (measured by the present author in 1994) is as follows.

	Thickness (m)
Topsoil, passing down into	
<b>White Limestone Formation</b>	
<b><i>Ardley Member</i></b>	
13c: Limestone, flaggy, thin-bedded, ?cross-bedded; inaccessible but presumed ooidal grainstone	1.2

14: Limestone, yellow-buff, poorly sorted, medium-grained, ooidal and peloidal packstone to grainstone, poorly bedded, in courses 0.05 m to 0.15 m thick, with occasional signs of cross-bedding	2.3
?14 (part): Marl, buff, laminated with nodular limestone midway	0.12
15: Limestone, cream, very coarse, peloidal and ooidal packstone to grainstone; signs of cross-bedding; hard, prominent bed	0.22
16: Marl to marly limestone, somewhat fissile, sandy, ooidal	0.25
17: Limestone, buff-cream, soft, poorly sorted, fine-grained, peloidal packstone, poorly bedded with softer yellowish, crumbly, fissile, somewhat sandy seams for 0.05 m to 0.08 m at base, and 0.65 m and 0.90 m above base	1.35
<b><i>Shipton Member</i></b>	
18: (part): Limestone, pink-fawn, very hard, recrystallized, splintery, uniform micrite; marl parting at base	0.15
18: (part): Limestone, buff, massive, poorly sorted, peloidal packstone; occasional corals; marl parting at base	0.50
19: (part): Limestone, buff, poorly sorted, peloidal packstone; very massive, raggy fracture, but weathering slightly cavernous (?burrows) in top 0.2 m	1.20
19: (part): Limestone, cream, very fine-grained, well-sorted, ooidal grainstone; rare small bivalves; massive, uniform, marly parting near base	0.24
19a: Silt, brown, marly	0.04
20: Limestone, cream to pale-fawn, with some ferruginous mottles; hard, recrystallized micrite or very fine-grained, recrystallized grainstone to packstone; massive, structureless, raggy fracture; burrows, but no obvious fauna	0.60
21: Marl, brown, fawn, slightly sandy, becoming hard and indurated at top; lower 5.6 m obscured to base of cutting	5.9+

A quantity of fossil material from this section, much of which was collected by Richardson, is held in the BGS collections. Smaller intermittent exposures can be seen farther south along the cutting. The beds dip southwards along the cutting at c. 2°, but the ground surface also falls in this direction, such that it might be expected that Bed 13 would maintain its position at the top of the cutting to the southernmost end. Thus, it seems likely that Richardson's (1911b) record of some 6.3 m of overlying beds (?8 to 12) in this part of the cutting is an overestimate perhaps involving some mis-correlation.

Bed 19 comprises the so-called '*Lucina Beds*', which have yielded an extensive fauna including corals, gastropods (*Ampullospira canaliculata* (Morris and Lycett), *Ampullospira* sp., *Endiaplocus?*, *Globularia formosa* (Morris and Lycett), *Globularia* sp., *Pseudomelania?*, *Trochotoma?*), numerous bivalves (*Anisocardia minima* (J. Sowerby), *Astarte?*, *Camptonectes* sp., *Ceratomya concentrica* (J. de C. Sowerby), *Falcimytillus?*, *Homomya* sp., *Inoperna plicata* (J. Sowerby), *Lucina anglica* (Rollier) juv., *Lucina bellona* d'Orbigny, *Modiolus* sp., indeterminate ostreid fragments, *Pachyrisma grande* Morris and Lycett, *Palaeonucula waltoni* (Morris and Lycett), *Pholadomya lirata* (J. Sowerby), *Placunopsis* sp., *Plagiostoma?*, *Pleuromya uniformis* (J. Sowerby), *Protocardia* sp., *Pterocardia pesbovis* (d'Archiac), *Vaugonia?*) and echinoids (*Clypeus* sp., *Nucleolites* sp.) (Ivimey-Cook in Sumbler and Barron, 1995); Richardson (1911b) also recorded *Echinobrissus* (= *Nucleolites*) *woodwardi* Wright ('Chedworth buns') (Figure 3.45), and *Clypeus muelleri* Wright. Bed 18, the Excavata Bed, is very fossiliferous in parts with a fauna including *Nerinaea*, *Lucina bellona* d'Orbigny, *Tancredia extensa* Lycett, trigoniids and corals.

Richardson (1911b) stated that the limestone of Bed 14 passes laterally (southwards) into the so-called 'Omithella Beds', fossiliferous marls containing corals (*Corynella* sp., *Dendraraea excelsa* (Edwards and Haime), *Thamnasteria* sp.), and bivalves (*Camptonectes obscurus* (J. Sowerby), *Camptonectes* sp., *Lopha costata* (J. de C. Sowerby), *Lucina bellona* d'Orbigny, *Nanogyra crassa* (Wm. Smith), *Myoconcha actaeon* Morris and Lycett ex d'Orbigny, *Plagiostoma cardiiformis* J. Sowerby, *Plagiostoma subcardiiformis* (Greppin), *Plagiostoma* sp., *Thracia curtansata* Morris and Lycett, *Thracia* sp.) (Ivimey-Cook in Sumbler and Barron, 1995). In fact, photographs of the section (e.g. Richardson, 1911b, pl. 19; Richardson, 1933, p1. 3b) show that the marls underlie the limestone, the latter infilling a channel that cuts down to Bed 15.

## Interpretation

The presence of the Hampen Formation at Stony Furlong Railway Cutting is not widely recognized; it is generally thought that the formation has passed into an expanded White Limestone Formation there (Arkell, 1933; Arkell and Donovan, 1952; Palmer, 1979). However, a recent geological survey has shown unequivocally that the Hampen Formation is present at Chedworth, in a facies much like that at the type section (see Hampen Railway Cutting GCR site report, this volume), albeit with a somewhat lower proportion of marl (Sumbler and Barron, 1995). The topmost bed of the Hampen Formation is regarded as Richardson's Bed 33, i.e. the so-called 'Organic Band' of Harker (1892).

Above the Hampen Formation, Richardson (1911b) recorded a total of about 26 m of White Limestone Formation strata. Comparison with the section at Foss Cross (see GCR site report, this volume), about 1.5 km to the south-west of the cutting, shows that Bed 18 (see below) corresponds with the Excavata Bed that marks the top of the Shipton Member (Barker, 1976, 1994; Sumbler, 1984, 1995), and that the thickness of the Shipton Member (i.e. Richardson's beds 18 to 32) is therefore 13.6 m, of which the uppermost 3 m are still exposed just south of the road bridge. The lowest bed seen (Bed 21) may equate with a bed of clay at approximately this level, which has been mapped locally in the Northleach area to the east.

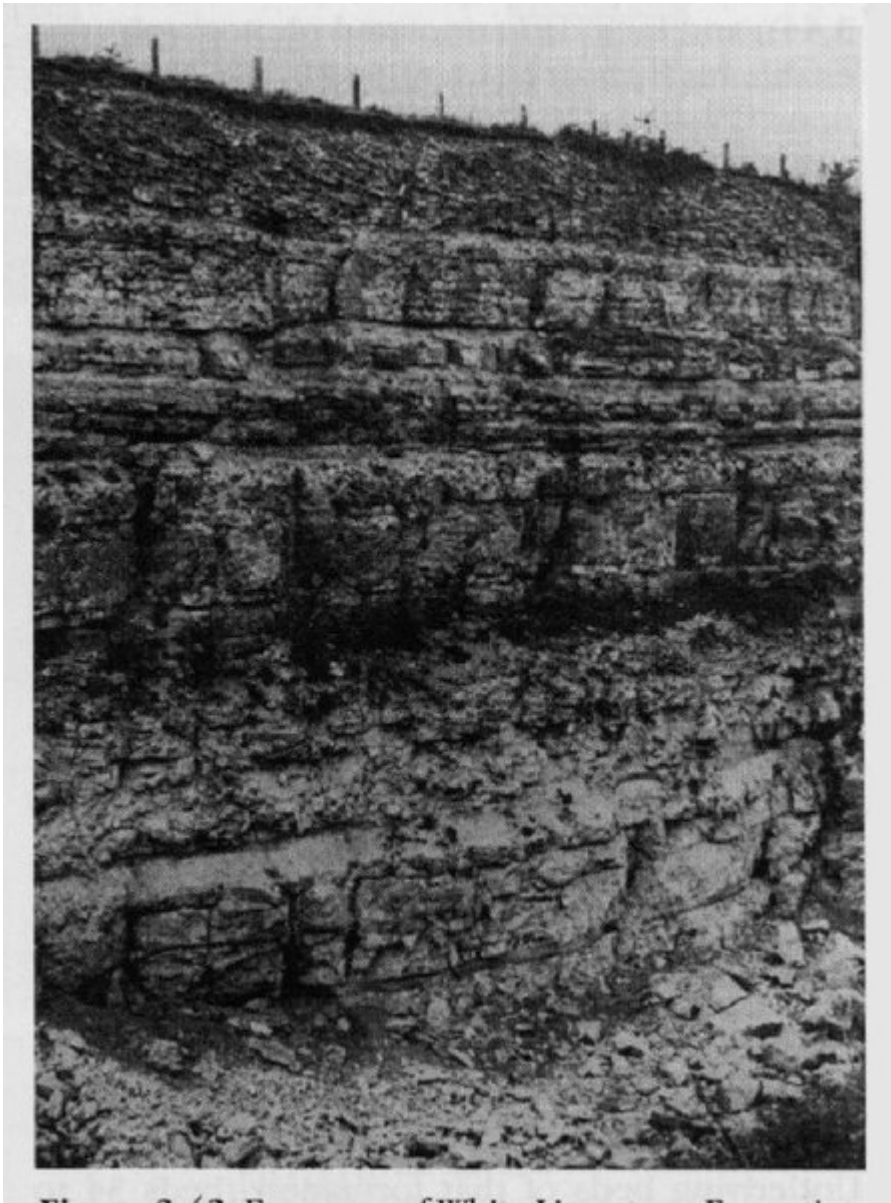
A broken and worn specimen of the ammonite *Morrisiceras* (BGS specimen No. GSM52177) was found loose by Richardson who considered that it came from Bed 18 (Richardson, 1911b); he identified it as *M. morrisoni* (Oppel) but Arkell (1954a) thought that it was 'not identifiable positively'. Nevertheless, the genus indicates the Middle Bathonian Morrisi Zone. The crumbly, fissile, somewhat sandy seams within Bed 17, the basal bed of the Ardley Member, are reminiscent of the Roach Bed and subjacent sand and clay developed in Oxfordshire at this level (Sumbler, 1984). According to Richardson (1911b), Bed 15 locally has a planed, oyster-encrusted, hardground top. This hardground, the lowest such bed recorded in the cutting, occurs some 15 m above the base of the formation. It represents the Langrunensis Bed, which in Oxfordshire is characterized by the gastropod *Aphanoptyxis langrunensis* (Barker, 1976, 1994; Sumbler, 1984). It is widely developed in areas to the east of Chedworth (Sumbler *et al.*, 2000).

The highest strata now exposed (Bed 13) are cross-bedded oolites that typify the upper part of the Ardley Member in the Chedworth area. Comparison with other sections suggests that Richardson's recorded thickness for Bed 13 and the succeeding strata (beds 8 to 12) is approximately 2–3 m too great, and that his Bed 10 of Stony Furlong Railway Cutting includes the Solenopora Bed of Foss Cross (see GCR site report, this volume), i.e. Richardson's (1911b) Bed 12 of the Aldgrove Cutting. On this basis, the total thickness of the Ardley Member is approximately 12 m or 13 m at Stony Furlong Railway Cutting; the succeeding Signet Member (Sumbler, 1991) crops out a few hundred metres to the south-east of the cutting (Sumbler and Barron, 1995).

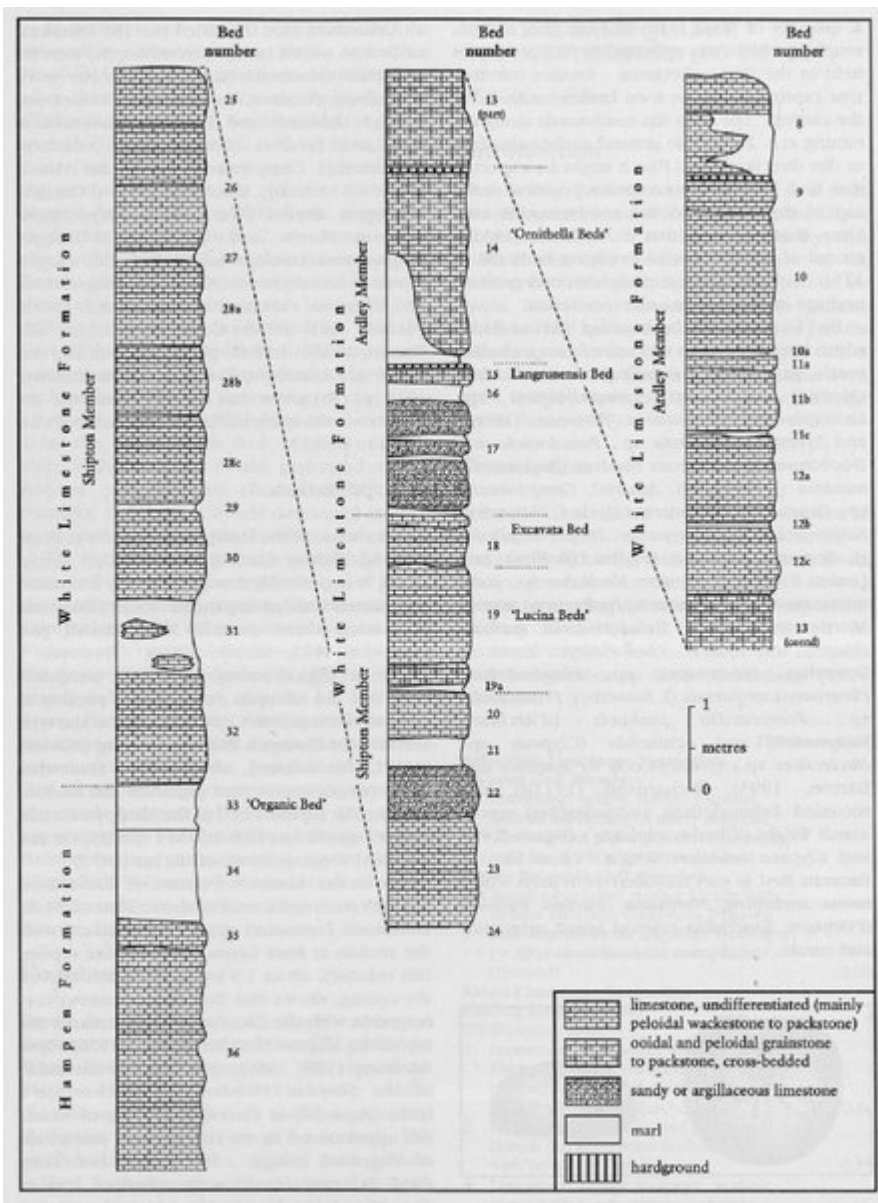
## Conclusions

Stony Furlong Railway Cutting provides an important section through the middle part of the White Limestone Formation. The top of the Shipton Member is notable for having yielded the ammonite *Morrisiceras*, confirming the Mid Bathonian age of this part of the section. The north-westernmost part of the cutting, now infilled, formerly exposed beds extending down into the Hampen Formation, which, although not previously recognized at this locality, is developed in fairly typical facies.

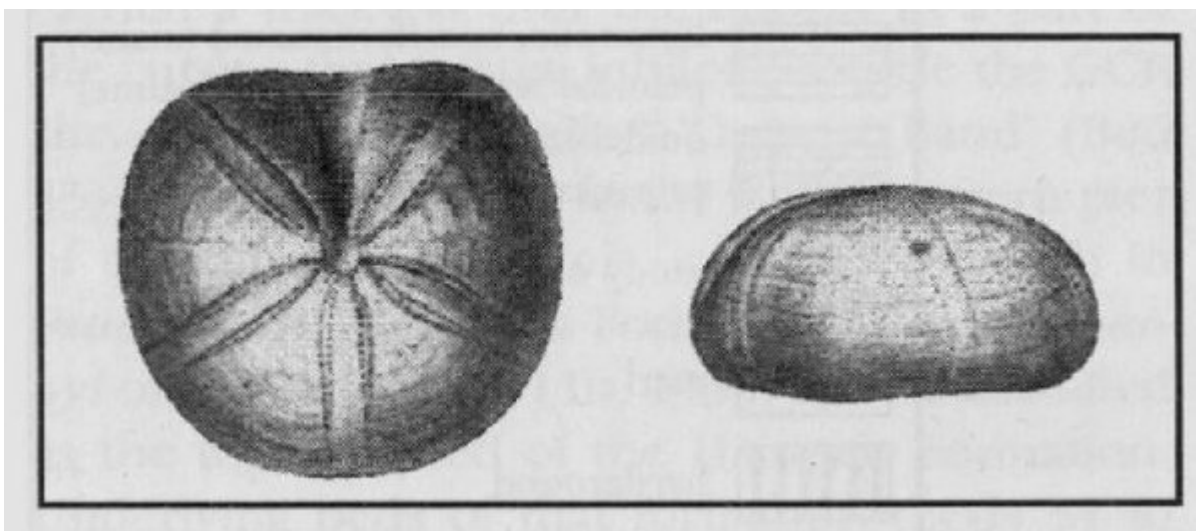
## References



*(Figure 3.43) Exposure of White Limestone Formation (beds 13 (top) to 28 (bottom)) in Stony Furlong Railway Cutting. (Photo: British Geological Survey, No. A5758, 1929.)*



(Figure 3.44) Graphic section of the Bathonian succession in Stony Furlong Railway Cutting. Beds 13–21 are as exposed in the extant section described in the text; the remainder is based on Richardson (1911b).)



(Figure 3.45) The 'Chedworth Bun' — *Nucleolites woodwardi* Wright. (Reproduced from Wright, 1854, p1. 12, figs 5a-e). Natural size.)