OLD TOWN, SWINDON

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OS Grid Reference: SU153832

Introduction

The Kimmeridgian GCR site known as Old Town, Swindon comprises a cutting on the former Midland and South Western Junction Railway (M & SWJR) which was made on the south side of Old Swindon, Wiltshire in the 1890s (Figure 2.35). The *c*. 460 m long section, to the west of Swindon Town (Old Swindon) Railway Station and south of Westlecot Road bridge, was first recorded by Woodward (1895). It showed Upper Kimmeridge Clay in predominantly sandy facies, overlain by Portlandian sandy limestones and sands. The presence of sandy beds in the Upper Kimmeridge Clay is a peculiarity of the south and central Midlands as far north as Oxford (see also site report for Littleworth Brick Pit, this volume). At Swindon, the sandy beds were frequently exposed in the cemetery overlooking Clifton Street and, following Buckman (1923), they are called the 'Cemetery Beds'; many fine, uncrushed ammonites have been found in the material thrown out during grave-digging (Chatwin and Pringle, 1922). The town gives its name to the Swindon Clay, which overlies the Cemetery Beds (or their lateral equivalents) in this region; this is the highest part of the Kimmeridge Clay Formation that is preserved at Swindon.

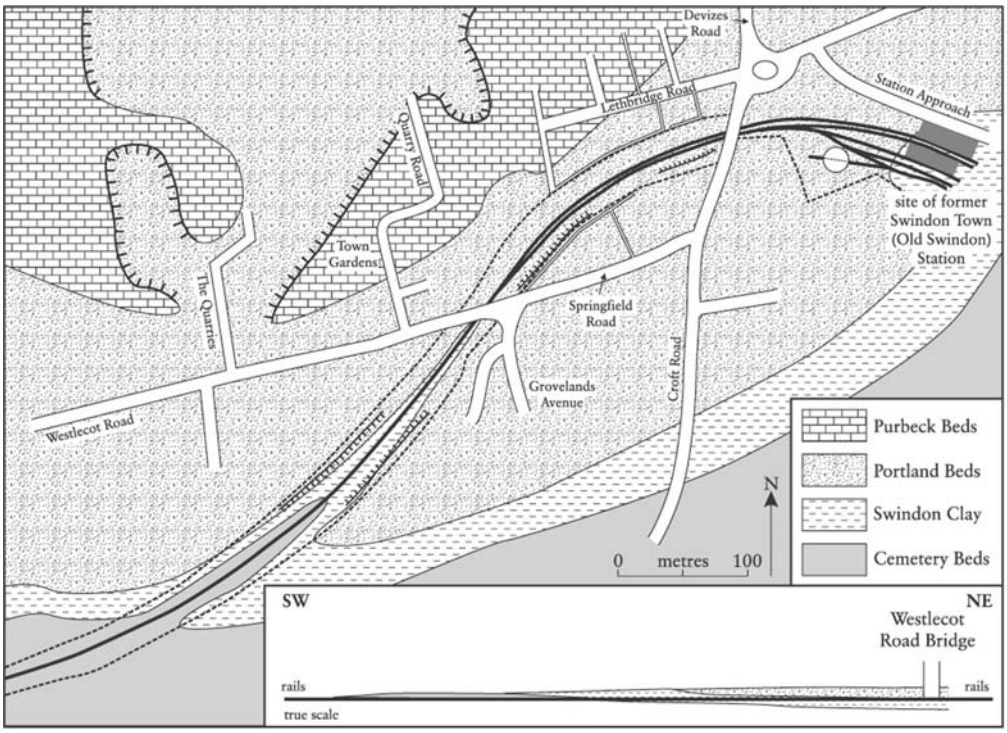

Figure 2.35: Sketch map of the cutting on the former Midland and South Western Junction Railway. The line is now dismantled. The section south-west of Westlecot Road bridge constitutes the Kimmeridgian GCR site. (Geology based on Arkell, 1948, fig. 1 and British Geological Survey Sheet SU 18 SE.)

Description

The following section is based on that recorded by Woodward (1895), Chatwin and Pringle (1922) and Buckman (1922–1923); for ease of reference in the present account, bed numbers (1–5) have been added to their beds. A longitudinal section of the cutting was shown by Woodward (1895, fig. 99) and Arkell (1933, fig. 79) but Arkell's (1948) later section and plan are used as the basis of Figure 2.35. The railway is now dismantled and the old trackway is a designated cycle route.

		Thickness (m)
Upper Kimmeridge Clay		
Swindon Clay		
5	Clay, blue, poorly fossiliferous, sandy at base	4.3–6.1
4	Clay, marly and sandy, hard, greenish, glauconitic, very shelly with numerous large oysters (many encrusted with serpulids); phosphatic nodules and pebbles, and lydite pebbles (Lower Lydite Bed)	0.2
Upper Cemetery Beds		
3	Sands and clays with *Nanogyra nana* (J. Sowerby)	0.9–1.2
2	Sandstone, green and red, marly, highly glauconitic, very shelly, with tiny lydite pebbles	0.9–1.2
Lower Cemetery Beds		
1	Sand, grey and buff, fine grained, poorly fossiliferous; large, spheroidal, hard, calcareous sandstone doggers	9.1–12.2

The Swindon Clay is overlain by the Upper Lydite Bed, the base of which marks the unconformity at the base of the Portlandian succession. Chatwin and Pringle (1922) described it as a bluish, marly limestone, 0.3 m thick, with many lydite pebbles and numerous reworked fossils including phosphatized pavloviid ammonites derived from the Swindon Clay.

Interpretation

The sandy beds in the Upper Kimmeridge Clay are particularly well developed at Swindon where for many years they were thought to represent the lower part of the Portlandian succession, equivalent to the Portland Sand of the Dorset type area (e.g. Woodward, 1888; Blake, 1892). Consequently, in many early accounts, they are discussed under the heading of 'Portland Beds' rather than 'Kimmeridge Clay' (e.g. Blake, 1880; Woodward, 1895). They indicate the availability of coarser material and suggest the proximity of land in Late Kimmeridgian times. Their zonal position was established by the palaeontological work of Salfeld (1913, 1914) whose results were subsequently amended and amplified by Chatwin and Pringle (1922) (Arkell, 1933). Chatwin and Pringle (1922) based their evaluation of the Swindon succession largely on a collection of fossils, many from the M & SWJR cutting, made by W.H. Hudleston, which was subsequently presented to the Geological Survey in 1920. The Portland Sand is, in fact, rather thinly developed at Swindon, being represented by only 1.5 m of glauconitic sandy limestone (Wimbledon, 1980). The subdivision of the Kimmeridgian sandy beds into Lower and Upper Cemetery Beds (Buckman, 1922–1923) is based on their contrasting lithologies. The upper unit is highly glauconitic and very shelly whereas the lower unit is dominated by soft sands that were sufficiently loose to be dug by hand in the upper pit of the former Hill's Brickyard (SU 140 837); in the BGS Swindon Borehole, they were washed away during drilling (Gallois and Cox, 1994).

The lateral thickness variation of the Upper Cemetery Beds over relatively short distances probably indicates that they occur in channels cut into the underlying Lower Cemetery Beds; an irregularly channelled and scoured surface has been reported between the two in Victoria Road, Old Swindon (Gallois and Cox, 1994). Although the Upper Cemetery Beds are clearly a shallow-water, intensely winnowed, condensed deposit containing numerous minor erosion surfaces, the ammonite evidence suggests that they belong entirely within the Upper Kimmeridgian Pectinatus Zone (Eastlecottensis Subzone) (Cope, 1978). The type specimen of *Pectinatites (P.) eastlecottensis* (Salfeld) came from the Upper Cemetery Beds at 'Eastlecott', Swindon, although Salfeld (1913) had originally but erroneously described it as coming from the lydite bed above the Swindon Clay (i.e. the Upper Lydite Bed) (Chatwin and Pringle, 1922; Cope, 1967). The characteristic very fine ribbing of this taxon makes it the most readily identifiable *Pectinatites* species (Figure 2.36). Beautifully preserved ammonites in a typical Upper Cemetery Beds matrix, from both the cemetery and railway cutting, are amongst the

collections of several museums. According to Wignall (1990a), the abundant non-ammonite macrofauna of the Upper Cemetery Beds is dominated by cemented epifaunal forms although infaunal bivalves are also important; the rarity of free-lying epifaunal forms may reflect unstable, shifting substrate conditions. Assigned to his 'B7 *Cycloserpula intestinalis–Nanogyra nana* Association', Wignall (1990a) reported the serpulid *Cycloserpula intestinalis* (Phillips) and the bivalves *Nanogyra nana* (J. Sowerby), *Myophorella voltzii* (Agassiz), *Camptonectes auritus* (Schlotheim) and *Nicaniella cuneata* (J. Sowerby) as the most common taxa. *Nanogyra nana* (*Exogyra bruntrutana* (Thurmann) in the early literature) is sufficiently abundant that the beds have been referred to as the 'Exogyra nana Bed(s)' or 'Exogyra Bed(s)' (Woodward, 1895; Arkell, 1933, 1947b; Cope 1978, 1980).

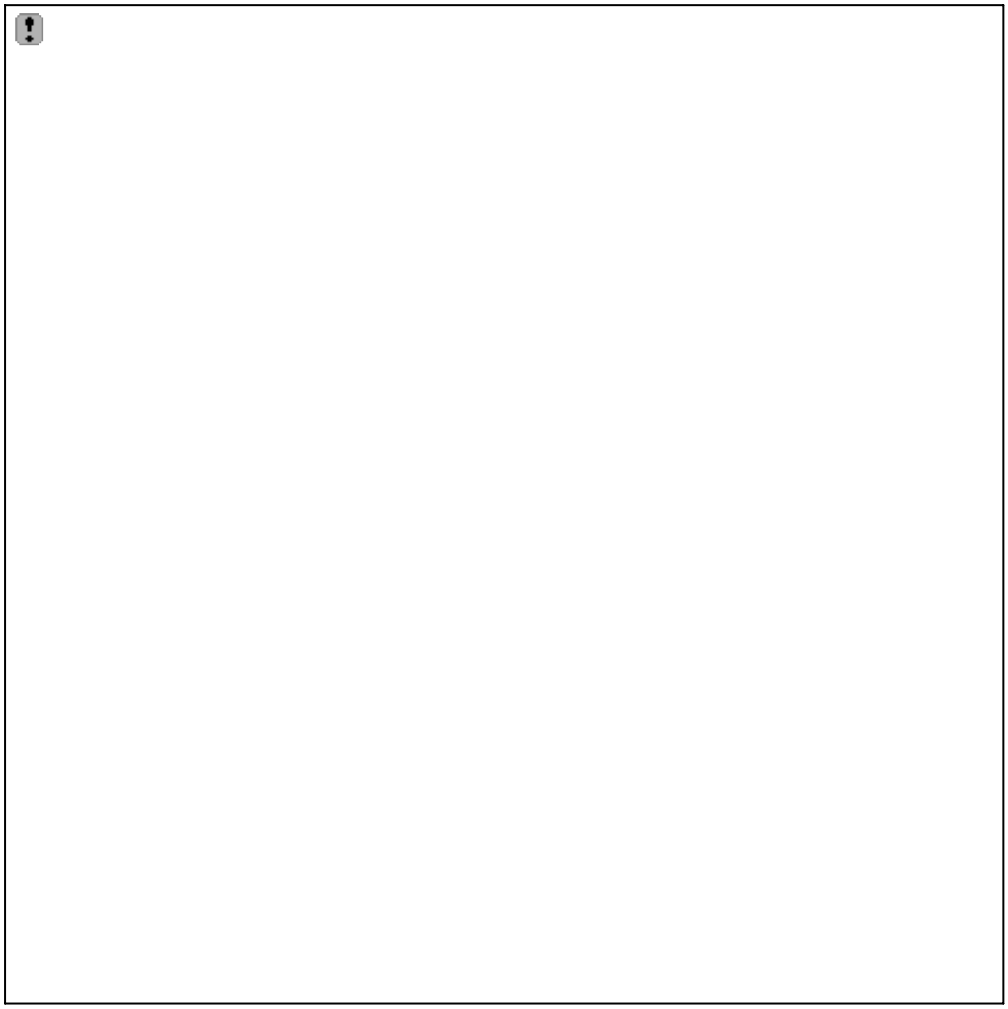

Figure 2.36: The type specimen of Pectinatites (P.) eastlecottensis (Salfeld) as figured by Salfeld (1913) but enlarged to natural size.

In contrast, the fauna of the Lower Cemetery Beds is poorly known but generally believed to be sparse, although there may be sufficient fossil specimens in museum collections for the age of these beds to be determined (Gallois and Cox, 1994). A limited bivalve fauna has been reported from the sandstone doggers (Blake, 1880). Woodward's (1895) extensive faunal list, based largely on Blake (1880), is misleading as it actually relates to the lowest part of the Upper Cemetery Beds. The age of the Lower Cemetery Beds is therefore not proven although, on the basis of data from the BGS Swindon Borehole, Gallois and Cox (1994) suggested that they belonged to the Upper Kimmeridgian Wheatleyensis and Hudlestoni zones but probably no higher, given that the base of the Upper Cemetery Beds appears to mark a substantial erosional hiatus; at least part of the underlying Scitulus Zone is developed in 'normal' clay facies.

The presence at Swindon of indigenous *Pavlovia pallasioides* (Neaverson) in the Swindon Clay indicates that it belongs to the Upper Kimmeridgian Pallasioides Zone and that it correlates

with part of the thick sequence of relatively uniform calcareous mudstones that underlie the Rotunda Nodule Bed in the cliffs adjacent to Chapman's Pool, Dorset (Cope, 1978; Gallois and Cox, 1994). The erosional ‘gap' between the Swindon Clay and overlying Portland Beds at Swindon corresponds with about 80 m of calcareous mudstones, silty mudstones and muddy siltstones (the beds above the Rotunda Nodule Bed) in Dorset (Chatwin and Pringle, 1922; Gallois, 2000; see site report for Tyneham Cap–Hounstout, this volume).

Conclusions

In the 19th century, some of the best exposures of Kimmeridge Clay in the country were to be seen at and near Swindon where several large brickpits and cuttings, made during the construction of the railway network of which Old Swindon became the centre, exposed the formation (Arkell, 1947b). In this area, as elsewhere in the south and central Midlands (see site report for Littleworth Brick Pit, this volume), the Upper Kimmeridge Clay includes units of sand that are not seen in the formation's type section on the Dorset coast or elsewhere in Britain. Fossils, particularly ammonites, are much better preserved in these sandy lithologies than in the equivalent clay beds of the type section, and many museums contain fine specimens of ammonites collected from the Upper Kimmeridgian Pectinatus Zone of Swindon. Extensive fossil collections were made during construction of the old Midland and South Western Junction Railway to the south of Old Swindon in the 1890s including the now-abandoned cutting that comprises the GCR site. These enabled the Upper Jurassic succession at Swindon to be finally resolved. The cutting provides a reference section (in its type area) for the ammonite *Pectinatites (P.) eastlecottensis* (Salfeld), which gives its name to the Eastlecottensis Subzone of the Pectinatus Zone, as well as for the Swindon Clay, the youngest member of the Kimmeridge Clay Formation here, which is recognized as a separate entity as far north-east as Aylesbury (see site report for Littleworth Brick Pit, this volume). The Lower and Upper Lydite beds which represent pauses in deposition are also well developed, the latter marking the hiatus with local erosion that preceded limestone deposition in Portlandian times.

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