Seavington St Mary Quarry, Somerset

[ST 400 144]

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Introduction

The Seavington St Mary Quarry GCR site lies to the south of the village of Seavington St Mary, north-west of Crewkerne, in Somerset, and is located on a faulted outlier that comprises the most westerly outcrop of the Inferior Oolite Formation in England. The section was first noted by Wilson *et al.* (1958) who recorded *c.* 5 m of beds in a *c.* 90 m-long face. It exposes Aalenian and both Lower and Upper Bajocian strata although, as elsewhere in this region, major non-sequences interrupt the succession. The beds are richly fossiliferous, and the zonal/subzonal sequence is substantiated by ammonites that have contributed to the recognition and definition of Aalenian and Lower Bajocian ammonite biohorizons in southern England (Callomon and Chandler, 1990).

Description

The following description is based on that of Torrens and Parsons (in Torrens, 1969b). The graphic section shown in (Figure 2.23) is based on Callomon and Chandler (1990, fig. 3) who used Torrens and Parsons' bed numbers but added further subdivisions. The informal lithostratigraphical terms follow Parsons (1980a) who based them largely on terms used by Buckman (1893a, 1910a) and Hudleston (1887).

	Thickness (m)
Inferior Oolite Formation	
Burton Limestone	
10: Limestone, rubbly, detrital, cream-coloured, bioturbated; sparse cream-coloured ooids; fossils, including ammonites (*Parkinsonia, Polyplectites, Strigoceras*) and echinoids (*Holectypus, Pygorhytis*), concentrated 0.45 m above base; *Parkinsonia* at base	seen to 0.75
9: Limestone, many, very soft and rubbly; small sphaeroidal, laminated concretions of dark limonite; ammonites (*Parkinsonia*) and echinoids (*Collyrites, Holectypus, Pygorhytis*) common at top; undulating surface at base	0.10
Astarte Bed	
8: Limestone, 'iron-shot' with ferruginous ooids becoming less common towards top; weathering buff-brown, rubbly, with limonitic crusts and concretions; shelly and detrital with abundant belemnites, ammonites (*Garantiana* and *Sphaeroceras*) and echinoids (*Collyrites*); basal 0.13 m locally conglomeratic with ammonite fragments from Bed 7 and pebbles; planed surface at base	0.2–0.4
Irony Bed	
7: Algal limestone, very hard, crinoidal, dark-red; nests of large ooids; limonitic crusts, pebbles and small 'snuff-boxes'; abundant belemnites and crinoid stems, oppeliid ammonites, rhynchonellid brachiopods and casts of pleurotomariid gastropods; prominent flat, bored hardground forming good marker horizon at base	0–0.13
Red Bed (equivalent)	

6: Limestone, very hard, crinoidal; cream-coloured ooids and rare fossils including ammonites (*Oppelia* and *Sphaeroceras*) at top	0.45
5: Marl, silty, finely laminated and cross-bedded; irregular, undulating base, heavily stained with limonite; 'snuffboxes'	0.13 Thickness (m)
4c-d: Limestone, soft, poorly bedded, pale-coloured, crinoidal; sparse, large ooids falling out to leave cavities; ammonites (*Emileia, Papilliceras, Stephanoceras*)*;* planed surface with pebbles and planed ammonites at base	0.20–0.23
4a-b: Limestone, soft, poorly bedded, pale-coloured, cross-bedded; fossils, including ammonites (*Docidoceras, Hammatoceras, Witchellia*)*,* more common towards brown marl at sharp, flat base	0.28–0.30
Bradford Abbas Fossil Bed	
3: Limestone, soft, weathering brown and decalcified; where fresh, blue and marly with large ooids; many fossils including ammonites (*Graphoceras* (very common), *Sonninia* (*Euhaploceras*)*, Trilobiticeras*)*,* small belemnites and *Plagiostoma;* marl parting at undulating base	0.05–0.08
2: Limestone, massive, finely ooidal, dividing into two, approximately equal, tiers; ammonites (including very common *Graphoceras*) preserved at all angles to bedding; rhynchonellid brachiopods; sharp base	0.85
1: Limestone, massive, hard, grey, crinoidal, non-ooidal	seen to 0.15

Other fossils, including bivalves, gastropods and nautiloids, were recorded by Wilson *et al.* (1958) but these cannot be assigned to a specific bed in the section detailed above.

Interpretation

The ammonite faunas enable recognition of the Aalenian Concavum Zone in Bed 2, with the Bradfordensis Zone possibly represented by Bed 1 (Parsons, 1980a). All of the Lower Bajocian zones, except the Ovalis Zone, are represented albeit incompletely, but much of the Upper Bajocian succession is missing (Figure 2.23); only the youngest part of the Garantiana Zone and the Parkinsoni Zone are represented (Bed 8 and beds 9/10 respectively). The Lower-Upper Bajocian boundary is thus marked by a significant non-sequence spanning much of the Humphriesianum Zone, the Subfurcatum Zone and much of the Garantiana Zone (Parsons, 1980a). According to Callomon and Chandler (1990), the youngest Lower Bajocian ammonite biohorizon recorded here is their Bj-14 (*Poecilomorphus cycloides*) although this has subsequently been replaced by biohorizons Bj-14a (*Chondroceras delphinum*) and Bj-14b (*Chondroceras wrighti*)(Callomon and Cope, 1995). Other Bajocian biohorizons recognized are shown in (Figure 2.23) (see also (Figure 1.4), Chapter 1), and details of their diagnostic ammonite taxa were given by Callomon and Chandler (1990). These authors recognized only biohorizons Aa-14/15 (*Graphoceras concavum/Graphoceras formosum*) in the Aalenian strata here but they considered that the ammonite data from the Aalenian–Bajocian boundary (base of Bed 3) interval was sufficient to merit the site as a possible candidate reference section for this stage boundary. Subsequently, Morton and Chandler (1994) recognized the *Euhoploceras acanthodes* Biohorizon (Horizon Aa-16 of Callomon and Chandler, 1990), with species of *Graphoceras, Euaptetoceras, Euhoploceras* and *Hyperlioceras* in Bed 2 here, and reaffirmed the *Hyperlioceras politum* Biohorizon (Horizon Bj-1 of Callomon and Cope (1995) emend.), with species of *Hyperlioceras, Eudmetoceras, Euhoploceras* and *Graphoceras* in Bed 3.

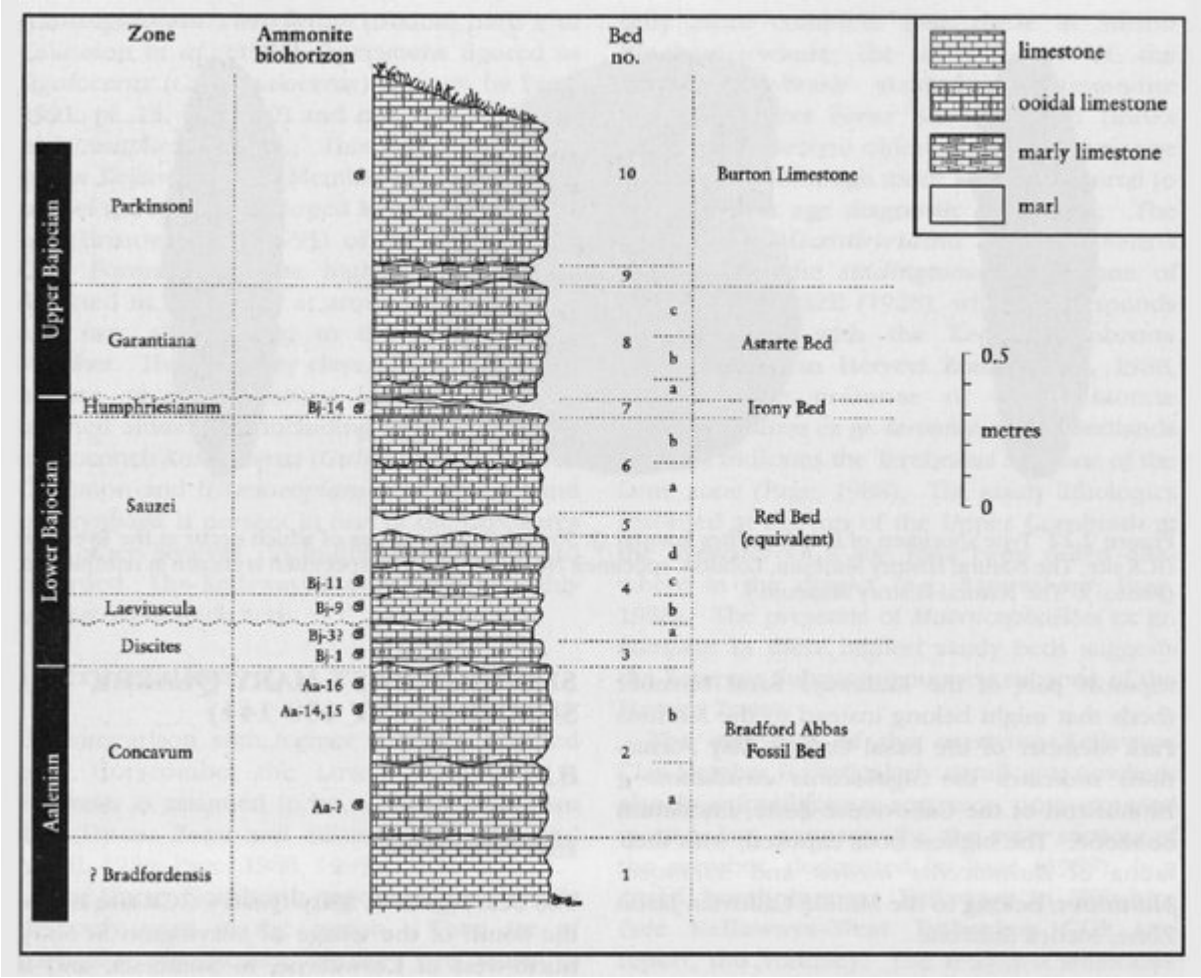
The succession at Seavington St Mary Quarry is typical of the Inferior Oolite Formation in Dorset and Somerset, with small stratal thicknesses but with individual beds that do not give the impression of being particularly condensed (Callomon and Chandler, 1990). According to these authors, ammonites preserved at all angles to the bedding (for example, in Bed 2 of the above section) indicate that the sediments remained unconsolidated for a relatively long time

(although not necessarily more than a few years). Marked changes in the ammonite faunas between beds are not necessarily accompanied by a profound lithological change but, in other cases, non-sequences are revealed by spectacular erosion planes marked by stromatolitic crusts and other epifauna and flora, borings, and planing off of large body fossils such as ammonites (for example, in Bed 4c). Lateral persistence of thin beds, their facies and faunas, point to tranquil bottom conditions during depositional periods and there are no indications of the proximity of shorelines. The causes of the complex pattern of deposition, non-deposition and erosion are almost certainly predominantly tectonic (Callomon and Cope, 1995).

Conclusions

The section at Seavington St Mary Quarry complements other local sections that together enable the complex geological history of the Aalenian and Bajocian stages in this region to be unravelled. Ammonite faunas enable recognition of distinctive faunal horizons and help to substantiate breaks in the succession. The ammonites are sufficient to justify the site as a possible candidate reference section for the Aalenian–Bajocian stage boundary in England. It is thus of both national and international importance for Aalenian–Bajocian stratigraphy as well as the depositional history and palaeogeography of the Wessex region.

References



(Figure 2.23) Graphic section of the Inferior Oolite Formation at the Seavington St Mary Quarry GCR site. (After Callomon and Chandler, 1990, fig. 3.) For lithologies, see text.)

(Figure 1.4) Ammonite biohorizons recognized in the British Middle Jurassic Series (for sources, see text).)