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# Lamb and Flag

[SU 381 974]

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## Introduction

Lamb and Flag Inn Quarry lies about 2 km WSW of Kingston Bagpuize, Oxfordshire (Figure 2.39), and about 16 km WSW of Oxford. Since first reported by Hull and Whittaker (1861), the quarry has occupied a prominent position in the literature on the Middle Oxfordian successions of southern England. Most of the area of the quarry is now given over to growing crops, but a small face 30 m long on the northern side of the quarry with an exposure of the Upper Trigonina Bed is conserved (Figure 2.39).

Blake and Hudleston (1877) gave a detailed description of the site, which is the type locality of their Corallian 'Trigonina-bed' regarded at the time as a unique horizon traceable across Oxfordshire. The description was later reiterated by Woodward (1895). Pringle (1926) and Arkell (in Buckman, 1923–1925, pp. 57–9) and Arkell (1927) described the section in more detail, further information and conclusions being added subsequently (Arkell, 1939a, 1947b). The bivalve and ammonite faunas from the quarry were monographed by Arkell (1929–1937, 1935–1948). Since Arkell's time, the exact stratigraphical position of some of the beds that he described has been the subject of debate (Callomon, 1960; Wright, 1980; Johnson, 1983).

## Description

The following is a complete section of the strata that have been exposed in the quarry. It is *basically* the section of Arkell (1927) updated by later observations made by Arkell (1947b) and by the present author in 1983, when the exposure was more complete than it is now. Information in brackets is taken from Arkell (1927).

	Thickness (m)
<b>Kingston Formation</b>	
<i>Highworth Grit Member</i>	
(11. Fissile sandstone with white ooids	0.3)
(10. Yellow sand with ooidal rubbly seams	1.2)
<i>Highworth Clay Member</i>	
(9. Brown clay	1.2)
— erosion surface —	
<i>Highworth Limestone Member</i>	
(8. <i>Urchin Marl</i> : white oolite, weathering flaggy	0.35)
(7. Grey, non-oolidal marl, full of broken shells	0.10)
6. <i>Upper Trigonina Bed</i> : tough, flaggy, sandy bioclastic limestone with frequent dissociated <i>Myophorella</i> sp., <i>Gervillella</i> sp., <i>Chlamys</i> sp., <i>Nanogyra nana</i> (J. Sowerby) and <i>Serpula</i> sp.	0.63
(5. Marl with <i>Perisphinctes</i> and bivalves	0.07)
(4. Impersistent band of <i>Gervillella</i> casts	0–0.15)
3b. <i>Pebble Bed</i> = ? <i>Lower Trigonina Bed</i> : sandy, pisolitic, ooidal, occasionally pebbly marl. Numerous bivalves present, especially <i>Nanogyra nana</i> and <i>Chlamys</i> sp.. Less quartz than 3a, but no real change in lithology	0.77

3a. Very sandy, medium-grained, shelly ooidal limestone.  
Well cemented and very pebbly at the base, with clasts of chert and fine-grained, calcareous sandstone 0.57

#### **Lower Calcareous Grit Formation**

(2. Indurated sandstone 0–0.45)  
(1. Yellow sand with occasional doggers seen to 1.5)

A weathering profile of the section as seen in 1983 is given in (Figure 2.40). Beds 3a, 3b and 6 were well exposed and fossiliferous at the time, but only Bed 6 is presently exposed.

The ammonite fauna collected from this quarry is very rich and diverse (Arkell, 1935–1948, pp. 392–3). Callomon (1960), using Arkell's collections, recognized three ammonite faunas:

#### **Bed 6, Antecedens Subzone**

*Perisphinctes* (*Arisphinctes*) spp. and *P.* (*Kranosphinctes*) spp. main stream (9 spp.)

*P.* (*Liosphinctes*) *apolipon* (Buckman)

*P.* (*L.*) aff. *linki* Choffat

*Cardioceras* (*Maltoniceras*) *maltonense* (Young and Bird)

*C.* (*Subvertebriceras*) cf. *dieneri* Neumann

#### **Beds 4 + 5**

*Perisphinctes* main stream (2 spp.)

#### **Bed 3, Vertebrale Subzone**

*Perisphinctes* main stream (4 spp.)

*Cardioceras* (1 sp.)

*Goliathiceras* (1 sp.)

*Aspidoceras* (1 sp.)

Associated with the ammonites at this locality is a well-preserved, varied bivalve fauna (Arkell, 1929–1937).

## **Interpretation**

Beds 3 to 8 form a continuous limestone sequence 2.5 m thick, and mark a lateral transition between the condensed shell beds of the Oxford and Cothill areas, and the Highworth Limestone of Wiltshire. Arkell did in fact refer to beds 3 to 8 as 'Highworth Limestone'. There is a marked change in lithology from the micritic, oncoidal limestone of Bed 3 (?Lower Trigonina Bed) laid down under low-energy conditions, into the higher-energy, bioclastic limestone of Bed 6 (Upper Trigonina Bed), in which the ooid and oncoid content is minimal. Both limestones are very fossiliferous, and must have accumulated very slowly. The majority of the faunas that occur here are environmentally diagnostic, providing fine evidence for the warm, shallow marine nature of the environmental regime prevailing during the Mid Oxfordian of southern England (Fürsich, 1974, 1975, 1976b, 1977).

The use of 'Lower Trigonina Bed' and 'Upper Trigonina Bed' above follows Callomon (1960) rather than Arkell (1947b). Arkell had applied the term 'Lower Trigonina Bed' to Bed 6, coming in as it did beneath the Highworth Grit. He used 'Upper Trigonina Bed' for the shell bed occurring above the Highworth Grit at Shellingford Crossroads Quarry (Bed 4 at

Shellingford Crossroads GCR site, this volume). When Arkell saw two *Trigonia* beds in one section (beds 6 and 8 at Dry Sandford Quarry — see Dry Sandford GCR site report, this volume), he naturally used the names 'Lower' and 'Upper *Trigonia* Beds'.

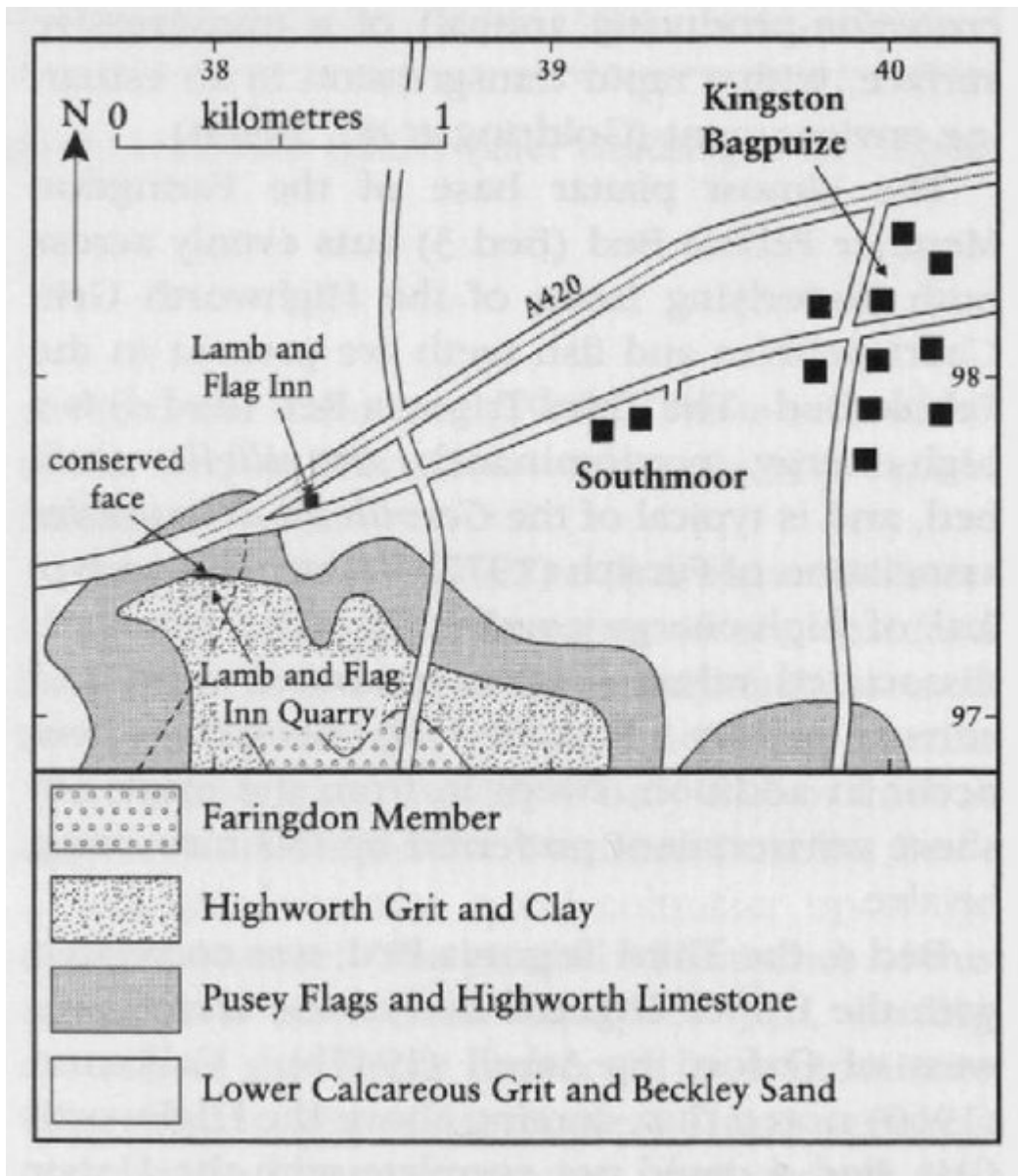
Unfortunately, the Lower and Upper *Trigonia* Beds at Dry Sandford were subsequently shown to be of *Vertebrale* and *Antecedens* Subzone ages respectively (Callomon, 1960). As Bed 6 at Lamb and Flag Quarry was dated as *Antecedens* outcrop of Stanford Formation limestone =Subzone (= *Maltonense* Subzone) in age, it could not be the Lower *Trigonia* Bed, but must be the Upper *Trigonia* Bed. Yet it occurred beneath the Highworth Grit. The shell bed occurring above the Highworth Grit at Shellingford must be a Third *Trigonia* Bed. This correlation is set out in (Figure 2.41). Bed 3 at Lamb and Flag Quarry probably represents the true Lower *Trigonia* Bed (Callomon, 1960).

On this interpretation, the Upper *Trigonia* Bed at Dry Sandford Quarry (this volume, Figure 2.42) should have been succeeded by the Pusey Flags, Highworth Clay, Highworth Grit and Third *Trigonia* Bed. All these are present in the Shellingford—Lamb and Flag area, but all are missing at Dry Sandford. This is presumably due to erosion or non-deposition. Johnson (1983) did not accept this conclusion, and claimed there were only two *Trigonia* beds, and that the missing beds at Dry Sandford were represented by Bed 7, coming in between the two *Trigonia* beds. This is only possible if one rejects the evidence of Callomon (1960) as to the age of the Lamb and Flag *Trigonia* bed (Bed 6) as revealed by its ammonite content. Neither of Johnson's proposals are accepted here: the ammonite evidence at Lamb and Flag Inn Quarry is as conclusive as it can be, and the lithology of Bed 7 at Dry Sandford is not that of the Highworth Grit, but is typical of the Shelly, medium-coarse grained sands of the Beckley Sands.

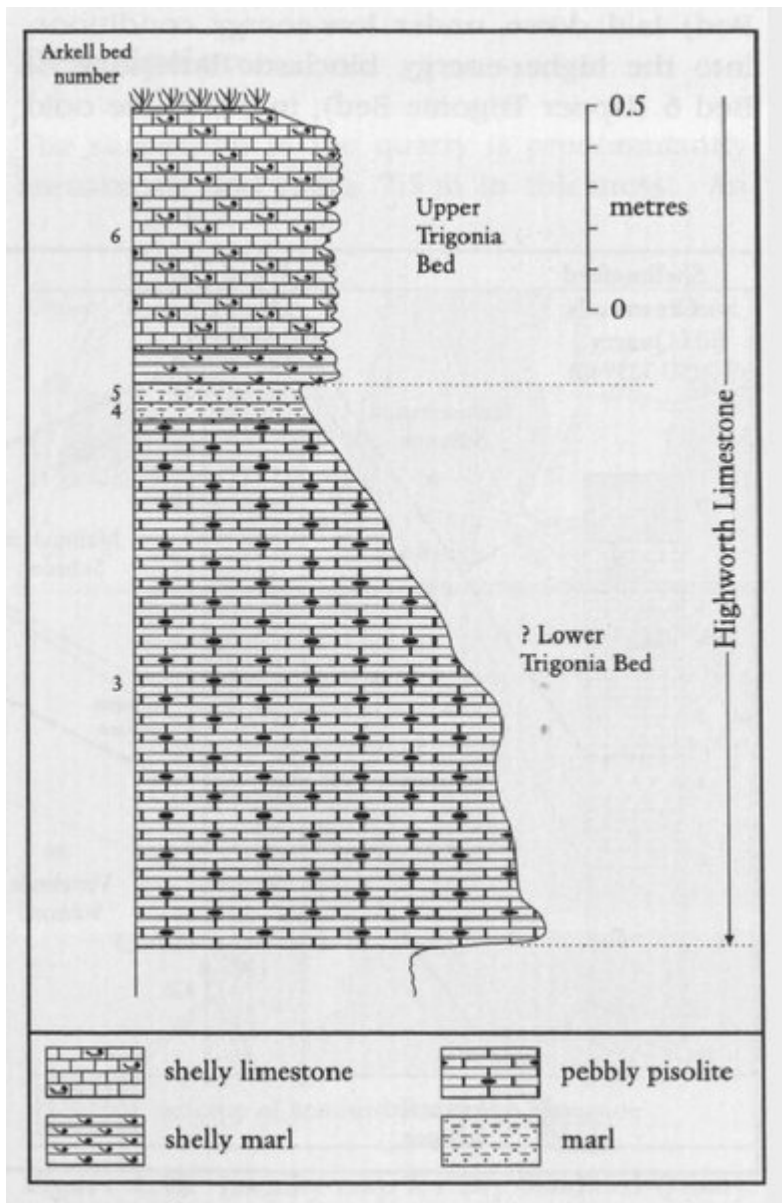
## **Conclusions**

The Lamb and Flag Inn Quarry includes an important section through the *Trigonia* beds of the Kingston Formation, and is the only section currently available exposing beds allocated to the Highworth Limestone Member. This site is noteworthy for its rich and well-preserved ammonite and bivalve faunas which have proved invaluable in stratigraphical, palaeogeographical and palaeoecological analyses of the complex Wiltshire—Oxfordshire Corallian outcrops.

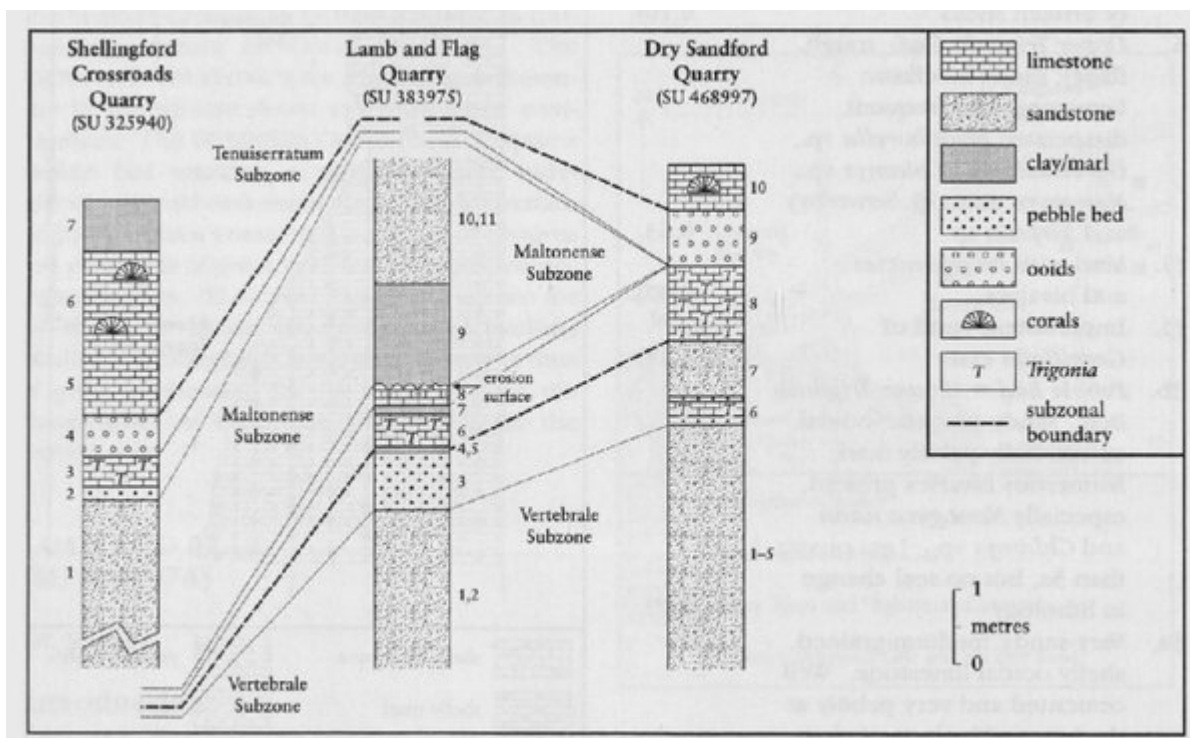
## **References**



(Figure 2.39) Locality map for the Lamb and Flag Inn Quarry. Corallian outcrops from Arkell (1939a, plate 30).



(Figure 2.40) Weathering profile of the Lamb and Flag Inn Quarry as seen by J.K. Wright in 1983.



*(Figure 2.41) Correlation of sections at Shellingford Crossroads Quarry, Lamb and Flag Quarry, and Dry Sandford Quarry (after Johnson, 1983, fig. 2).*