
Snape Hill

[SE 509 787]

J.K. Wright

Introduction

Snape Hill Quarry is a large disused, wooded quarry cut into the steep northern and western flanks of Snape Hill approximately 1 km to the south-west of Kilburn (Figure 4.31). Oxfordian rocks occur here at the south-western extremity of the Yorkshire Corallian outcrop and are preserved within the E–W-trending Asenby–Coxwold Graben (Figure 4.1), bounded to the north by the Kilburn Fault. Interest is focussed on the eastern face of the quarry [SE 5090 7870] where a N–S-trending outcrop includes a semi-vertical pitch and weathered-back ledges with talus slopes beneath.

The locality was referred to by Hudleston (1878) and was described by Fox-Strangways (1892). There were at one time several quarry sections available on Snape Hill, and the present section and other exposures now filled in were subsequently described by Wilson (1933) and Arkell (1933). Wright (1972) designated Snape Hill Quarry the stratotype section of the Snape Sandstone Member of the Upper Calcareous Grit Formation. Sykes and Callomon (1979) listed several ammonite species from this quarry, and suggested that several of the beds included by Wright in the Snape Sandstone would be better allocated to the Spaunton Sandstone. Powell *et al* (1992) published a generalized section of the quarry, adopting Sykes and Callomon's suggested change in nomenclature. The measured section below is as published by Wright (1996a) and takes account of these views.

Description

The following section is currently exposed at Snape Hill Quarry:

	Thickness (m)
Upper Calcareous Grit Formation	
<i>Snape Sandstone Member</i>	
7. Massive, fine-grained <i>Rhaxella</i> spiculite, with siliceous or calcified spicules in a calcareous matrix. The unit contains flaggy partings, and distinctive, fine, argillaceous laminae, with distinct lustre mottling. The unit becomes flaggy below with alternations of shale and impure limestone. <i>Belemnites explanata</i> Phillips is very common	seen to 4.5
— fault — unknown gap —	
<i>Spaunton Sandstone Member</i>	
6. Blocky, yellow spiculite, very tough although weathered. The spicules are all siliceous. Occasional <i>Belemnites</i> sp. and shell fragments occur	seen to 1.5
5. Thin-bedded to flaggy, fossiliferous, sandy argillaceous spiculite containing equal proportions of siliceous and calcified spicules, and siliceous bands. <i>Chlamys midas</i> (Damon) and <i>Decipia</i> sp. were found loose in this matrix	1.3
4. Rubbly weathering, massive spiculite with siliceous knots containing siliceous spicules in a calcareous matrix. Elsewhere the spicules are completely calcified	1.0
<i>North Grimston Cementstone Member</i>	

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|---|-------------|
| 3. Light to grey to whitish, fine-grained limestone with delicate, small-scale scour structures. Strongly recrystallized, but scattered calcified spicules in a ?pelletoidal matrix are visible | 0.5 |
| 2. Grey-brown, impure limestone with intercalations of silty, flaggy limestone | 1.0 |
| 1. Grey, brown-weathering, silty, shaly flaggy limestone, with alternations of more calcareous and less calcareous, flaggy bands. The more calcareous bands contain calcified spicules in a ?pelletoidal matrix | seen to 9.0 |

The North Grimston Cementstone was seen by Fox-Strangways (1892) to rest on 1.2 m of Coral Rag containing *Thecosmilia annularis* (Fleming), *Lopha gregarea* (J. Sowerby) and *Paracidaris florigemma* (Phillips). Bed 1 is recorded as being 11 m thick when fully exposed (Wilson, 1933), and the upper part is still well seen (Figure 4.32). Most of the bivalves recorded by Wilson (1933) almost certainly came from the brown, flaggy, decalcified Spaunton Sandstone (Bed 5). Bed 7, the Snape Sandstone, is exposed at the very back of the quarry and is downfaulted against beds 1–6, the section thus being discontinuous (Figure 4.33). The Snape Sandstone is a calcareous spiculite containing only a minor proportion of quartz grains. It is readily distinguished by its massive bedding, very characteristic, gently bioturbated lamination, and the common occurrence of belemnite guards, which are not decalcified, whereas in the Spaunton Sandstone decalcification is very common.

Interpretation

The North Grimston Cementstone can be traced throughout the Howardian Hills, and west to Snape Hill. At its type locality at North Grimston Cementstone Quarry [SE 8510 6705] it consists of alternating calcareous flags and limestone bands. At Snape Hill the lithology is a little more argillaceous, with shaly bands separating the more calcareous beds. The cementstone represents sedimentation in an offshore region distant from any source of elastic sediment. The lateral transition into this facies from the spiculite of the Newbridge Member of the Upper Calcareous Grit present to the east (see site report for Nunnington, this volume) is demonstrated by the common occurrence of *Rhaxella* spicules, largely calcified at Snape Hill.

Beds 4 to 6 at Snape Hill Quarry (Spaunton Sandstone) are the only beds exposed within the quarry to yield ammonites. Sykes and Callomon (1979) record *Amoeboceras transitorium* Spath, *A. newbridgense* Sykes and Callomon and *A. glosense* (Bigot and Brasil) and Arkell (1935–1948) recorded *Perisphinctes (Amphillia) aff. amphillensis* Arkell and *P (Arisphinctes) aff. kirkdalensis* Arkell. Comparison with the succession at Leysthorpe Quarry (see site report for Nunnington, this volume) suggests the middle Glosense Subzone. These beds mark the progradation of shallower shelf conditions with the prolific growth of siliceous sponges. Intense *Thalassinoides* bioturbation has destroyed much of the bedding structure.

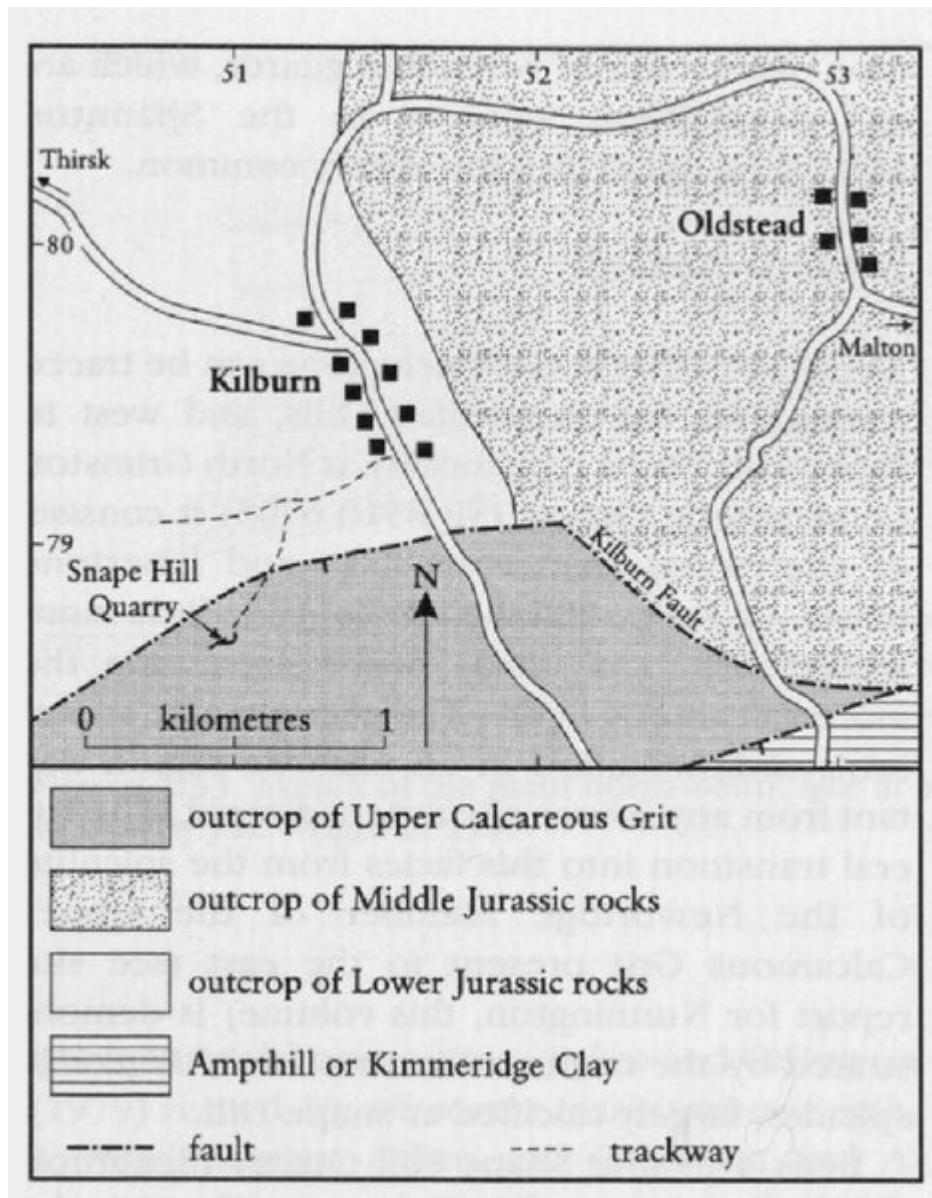
The Snape Sandstone, with its distinctive calcareous lithology, fine lamination, moderate bioturbation and belemnites, marks a return to slightly deeper-water shelf conditions. It was easily recognizable as a distinct unit in the West Newton Grange borehole (Wright, 1996a), and appears to occur over the whole of the western end of the Vale of Pickering and south to North Grimston (Wright, 1972). Fragmentary *Amoeboceras* were found by V. Wilson in a small quarry [SE 511 788] adjacent to Snape Hill Quarry (Arkell, 1935–1948). Powell *et al.* (1992) recorded Serratum Zone *Amoeboceras* from slightly younger beds exposed to the north-west [SE 5114 7877].

Conclusions

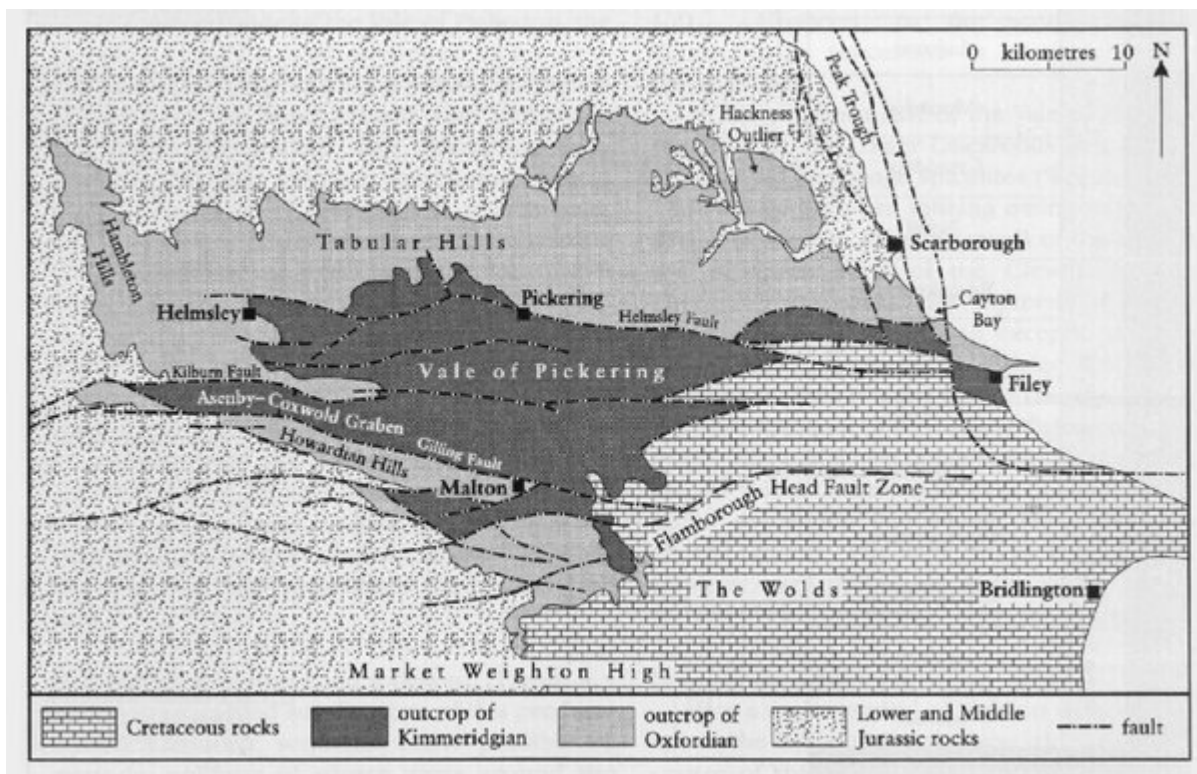
This is an important site for understanding the facies variations that existed in the Cleveland Basin during Oxfordian times and their relationship to biostratigraphy. Snape Hill Quarry displays excellently the North Grimston Cementstone, an atypical shaly limestone facies of the otherwise shallow-water, carbonate- or clastic-dominated successions in the Yorkshire Corallian. The Spaunton Sandstone has yielded numerous Glosense Zone ammonites. It is succeeded by the

stratotype section of the Snape Sandstone *sensu stricto*, the highest, markedly calcareous member of the Upper Calcareous Grit Formation, with its prolific belemnite fauna.

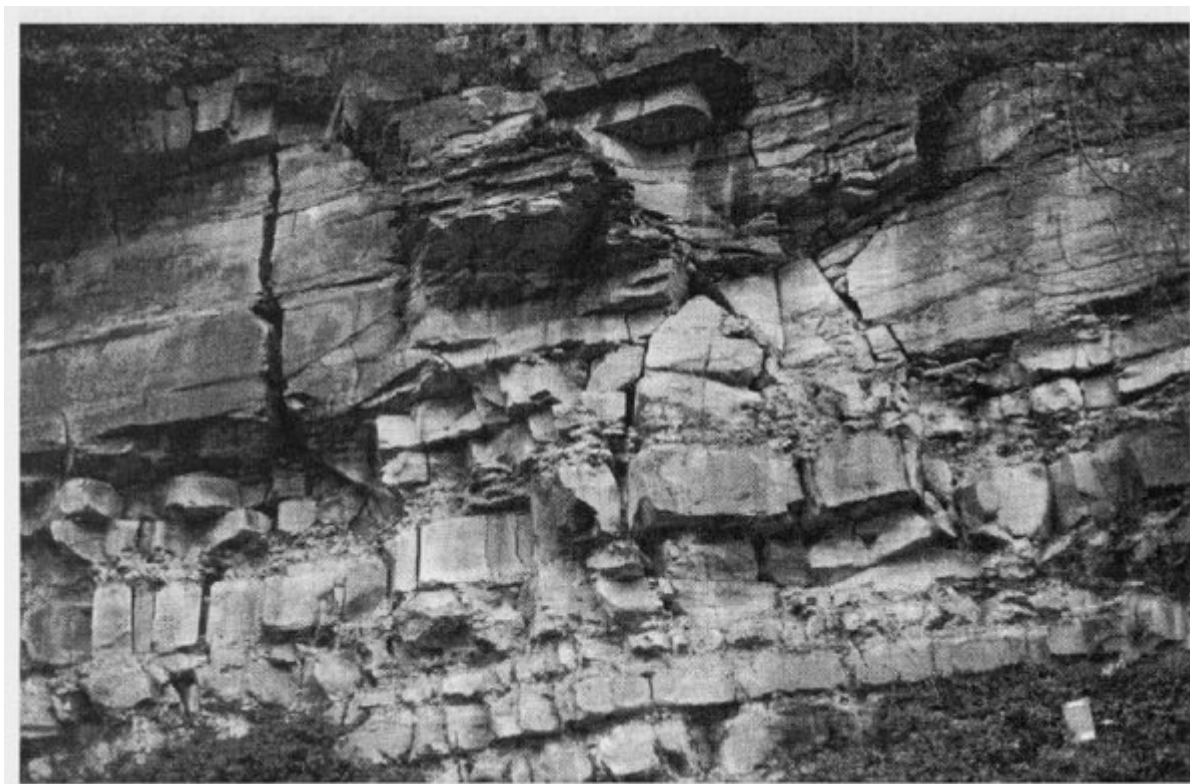
References



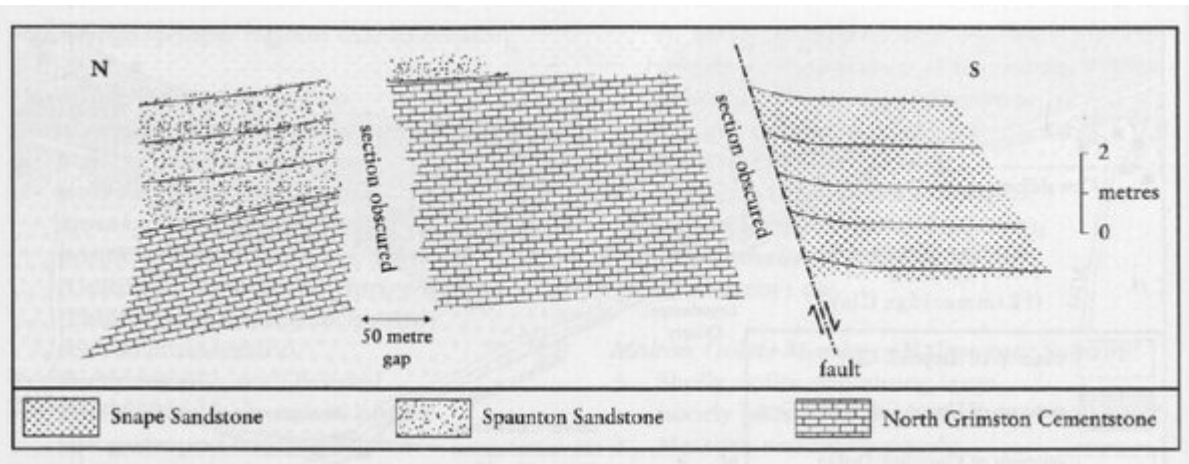
(Figure 4.31) Local ty map of Snape Hill Quarry. Geological information from BGS Sheet 52 (Thirsk) (1992).



(Figure 4.1) Map showing the solid geology of the Oxfordian and Kimmeridgian beds in the Cleveland Basin, with the principal structural and geographical features. (Based on Versey, 1929, fig. 1; BGS 1:250 000 Solid Sheet 54N 02W (Tyne-Tees) (1981); BGS 1:1 500 000 Tectonic map of Britain, Ireland and adjacent areas (1996) and BGS 1:50 000 Sheet 54 (Scarborough) (1998)). In the Vale of Pickering there is a thick cover of Quaternary lacustrine deposits.



(Figure 4.32) North Grimston Cementstone (Bed 1) at Snape Hill Quarry. Alternations of limestone and calcareous mudstone are overlain by massive, flaggy weathering limestone. Mapcase 35 cm. (Photo: J.K. Wright.)



(Figure 4.33) Sketch of the main north-south face at Snape Hill Quarry showing the two separate successions, as seen by J.K. Wright in 1997.