Hackness Rock Pit, North Yorkshire

[SE 965 907]

K.N. Page

Introduction

Hackness Rock Pit (sometimes known as Ilackness Quarry') is a small disused quarry sited on the south side of the road alongside Lowdales Beck, north-west of Hackness Hall, *c.* 7.5 km west of Scarborough, North Yorkshire. It is the type locality of the Hackness Rock Member of the Osgodby Formation and the last significant exposure within the area in which William Smith first recognized and mapped the 'Hackness Rock' (Smith, 1829, 1832; Sheppard, 1917) (Figure 5.20). The underlying Langdale Member is also exposed. William Smith lived and worked in the village of Hackness between 1828 and 1834 (Fox-Strangways, 1892; Cox, 1942), but the quarry is not marked on his geological map of the area dated 1832 (probably drawn in 1829 or 1830; see Sheppard, 1917). This was one of the earliest large-scale geological maps made in Britain and the Hackness area therefore has some significance in the history of geological science. The site, which has yielded Upper Callovian ammonite faunas of importance for international correlation, has been fully described by Wright (1968).

Description

The following description is based on Wright (1968) with additional observations by K.N. Page. The succession in the upper part of the section is now unclear because of deep weathering and vegetation.

	Thickness (m)
Osgodby Formation	
Hackness Rock Member	
6: Limestone with berthierine ooids, flaggy; poorly preserved *Quenstedtoceras*	0.30
5: Sandstone, dark-greenish, somewhat flaggy; berthierine ooids, calcareous in part; band with common *Euaspidoceras hirsutum* (Bayle) associated with *Quenstedtoceras* ex gr. *lamberti* (J. Sowerby) in upper part; otherwise rich fauna dominated by *Q.* ex gr. *lamberti* with rarer *Grossouvria* sp., *Hecticoceras* (*Putealiceras*) cf. *puteale* (Leckenby), *Kosmoceras* (*K.*) ex gr. *spinosum* (J. de C. Sowerby), *Peltoceras* (*Peltomorphites*) *subtense* (Bean) and bivalves including *Chlamys*	0.23
4: Sandstone with berthierine ooids and calcareous concretions; richly fossiliferous with *Kosmoceras* (*Lobokosmokeras*) ex gr. *proniae* Teisseyre and *K.* (*K.*) ex gr. *spinosum* (J. de C. Sowerby), less common *Grossouvria* (*G.*) *sulcifera* (Oppel) and *Hecticoceras* spp., and rare *Binatisphinctes hamulatus* (S.S. Buckman), *Chamoussetia funifera* (Phillips) and *Longaeviceras;* bivalves including *Chlamys, Gryphaea lituola* Lamarck and *Pleuromya;* rhynchonellid and terebratulid brachiopods; small corals	0.15
1–3: Sandstone, pale to orange-coloured, calcareous, flaggy in part; few ammonites including *Kosmoceras* (*L.*) *proniae* and *Peltoceras* sp.	1.33
Langdale Member	

Interpretation

The ammonite faunas of beds 1–3, including forms previously described as *Kosmoceras bigoti* (Douvillé) and *K. rimosum* (Quenstedt), indicate the Proniae Subzone of the Upper Callovian Athleta Zone. Most of the ammonites indicative of this zone at Hackness Rock Pit, some of which have been figured by Callomon and Wright (1989) and Cox (1988), have come from the overlying Bed 4. As here understood, *Kosmoceras* (*L.*) ex gr. *proniae* includes macroconch and microconch forms including those previously described as *K.* (*L.*)*duncani* (J. Sowerby), *K. rimosum* and *K. rowlstonense* S.S. Buckman *non* Young and Bird. *K.* (*K.*) ex gr. *spinosum* possibly includes forms previously described as *K.* (*K.*)*bigoti* (Douvillé), *K.* (*K.*) *compressum* (Quenstedt) and *K.* (*K.*) aff. *transitorius* (Nikitin), and the *Hecticoceras* spp. includes macroconch and microconch forms previously ascribed to *H.* (*Sublunuloceras*) and *H.* (*Brightia*) respectively. The *Pseudocadoceras boreale* S.S. Buckman recorded by Wright (1968) is possibly a microconch *Longaeviceras.* According to Callomon and Wright (1989), the holotype of *Chamoussetia funifera* (Phillips) came from the Athleta Zone of either Hackness Rock Pit (i.e. Bed 4 or below) or Scarborough. Many of the ammonites in Bed 4 are fragmentary, which suggests some reworking; a mixture of both Proniae and Spinosum Subzone forms appears to be present. According to Wright (1968), there is no evidence to support Arkell's (1939b) statement that the Hackness Rock extends down into the Coronatum Zone.

The ammonite fauna of Bed 5 is typical of the *lamberti* Biohorizon (Upper Callovian Lamberti Zone and Subzone). Callomon and Wright (1989) indicated that the type locality of *Quenstedtoceras flexicostatum* (Phillips), a microconch of *Q. lamberti,* could be Hackness Rock Pit or Scarborough but, as the preservation of the specimen is good, Hackness Rock Pit is the more likely. However, it should be noted that since the quarry that forms the GCR site is not marked on William Smith's map made in 1829 or 1830 (Sheppard, 1917), there must be some doubt about it being the source of specimens described by Phillips (1829).

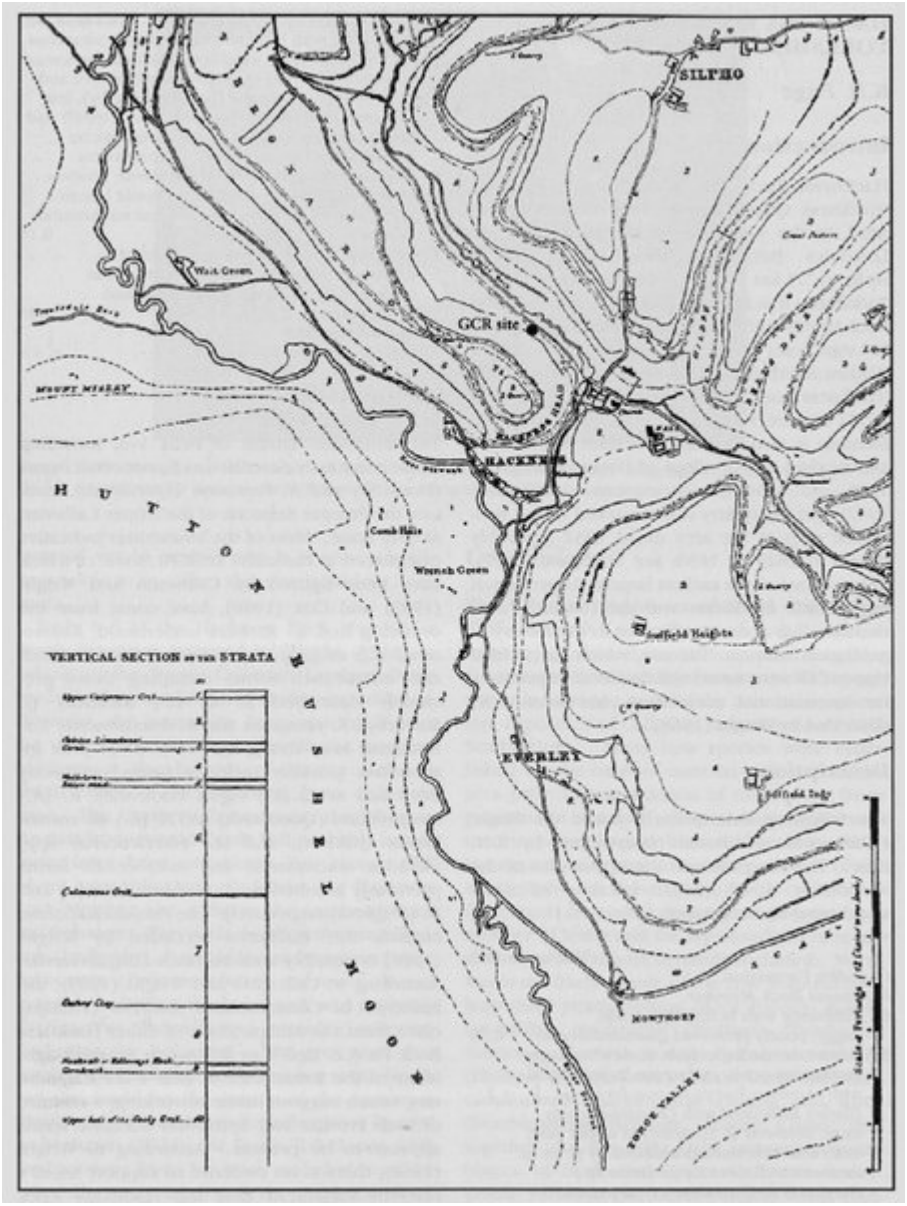
Loose specimens of *Cardioceras* (*Scarburgiceras*) aff. *scarburgense* (Young and Bird) indicative of the Lower Oxfordian Mariae Zone, have been found in rubble in Hackness Rock Pit, having been washed down from the Oxford Clay Formation above Bed 6 (Wright, 1968). This suggests that excavations at the site might reveal a good Callovian–Oxfordian stage boundary section (Wright, 1968).

Conclusions

As type locality of the Hackness Rock Member of the Osgodby Formation, Hackness Rock Pit is an important lithostratigraphical reference section.

The sequence of ammonite faunas here is also of significance; it is virtually the only remaining site where good Athleta Zone faunas can be collected *in situ* in the region and it also appears to show a sequence of Lamberti Subzone faunas. Indeed, further sampling may well reveal new stratigraphical information of international correlative significance including data on the Callovian–Oxfordian stage boundary.

References



(Figure 5.20) Part of the uncoloured lithograph of William Smith's map of Hackness with the location of the Hackness Rock Pit GCR site added. (Modified from Sheppard, 1917, pl. 17.))