

Crookhill Brickpit, Dorset

[SY 644 798]

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Introduction

Close to the shores of the Fleet on the Dorset coast (see Shipmoor Point–Butterstreet Cove and Tidmoor Point–East Fleet Coast GCR site report, this volume), the disused brickpit (Figure 2.8) at Crookhill, Chickerell, exposes a degraded section in the Oxford Clay Formation spanning the Middle–Upper Callovian substage boundary. The succession, in predominantly mudrock facies, has yielded a rich fauna of ammonites, belemnites and bivalves, particularly from the Upper Callovian *Athleta* Zone.

Description

The site was referred to by Spath (1933) and described more fully by Arkell (1947a) as later reviewed by Macfadyen (1970). Smith (in Torrens, 1969c) re-described the section, as summarized by Callomon and Cope (1995), and the following details are based on their combined records; the lower beds, as described below, are no longer visible.

	Thickness (m)
Oxford Clay Formation	
?Stewartby Member	
21: Clay, weathered brown, with large septarian concretions; well-preserved ammonites (mainly body chambers) including <i>Peltoceras trifidum</i> (Quenstedt) (= <i>P. athleta</i> auctt non Phillips), <i>P. (Rursiceras) baylei</i> Prieser, <i>Kosmoceras</i> ex gr. <i>proniae</i> (Teisseyre) (including <i>K. bigoti</i> Douvillé); abundant <i>Gryphaea lituola</i> Lamarck	5.0
20: Clay, blue-grey; small septarian concretions; fauna as in Bed 21 but sparser with ammonites including <i>Hecticoceras</i> , <i>Kosmoceras</i> , <i>Pseudopeltoceras chauvinianum</i> (d'Orbigny) and <i>Reineckeia</i> (<i>Collotia</i> ?)	3.0
Peterborough Member	
19: Mudstone, hard; ammonites including <i>Brightia</i> and <i>Lunuloceras</i>	0.2
18: Mudstone, soft; <i>Lunuloceras</i>	0.2
17: Mudstone, tough, bituminous; ammonites including <i>Brightia</i> , <i>Kosmoceras</i> and <i>Peltoceras (Rursiceras)</i>	0.25
16: Mudstone, soft; abundant bivalves including astartids and nukulaceans	0.95
15: Mudstone, hard; ammonites including <i>Brightia</i> , <i>Lunuloceras</i> and <i>Kosmoceras phaeinum</i> (S.S. Buckman)	0.20
14: Clay and soft, friable mudstone	0.25
13: Mudstone, hard, brown, bituminous; many oppeliid ammonites including <i>Brightia</i> and <i>Lunuloceras</i> ; <i>Kosmoceras aculeatum</i> (Eichwald) and <i>K. phaeinum</i>	0.80
12: Mudstone and soft clay; many nukulacean bivalves and crushed <i>Gryphaea</i>	0.35

11: Mudstone, hard, bituminous; ammonites including <i>Kosmoceras aculeatum</i> with <i>Reineckeia</i> (<i>Reineckeites</i>) and other perisphinctids	1.70
10: Mudstone, soft, friable	0.15
9: Mudstone, hard, brown, bituminous; ammonites including <i>Hecticoceras</i> , <i>Kosmoceras aculeatum</i> , <i>K. ornatum</i> (Schlotheim) and <i>K. phaeinum</i>	0.25
8: Clay, soft, blue	0.10
7: Clay, tough, brown, bituminous; ammonites including <i>Binatisphinctes comptoni</i> (Pratt) (macroconch and microconch) and other perisphinctids, <i>Kosmoceras acutistriatum</i> (S.S. Buckman), <i>K. ornatum</i> and <i>K. phaeinum</i>	0.35
6: Clay, soft; ammonites including <i>K. ornatum</i>	0.40
5: Mudstone, tough, calcareous; abundant kosmoceratid and perisphinctid ammonites including <i>K. aculeatum</i> , <i>K. acutistriatum</i> , <i>K. gemmatum</i> (Phillips), <i>K. phaeinum</i> and <i>Binatisphinctes comptoni</i> (macroconch and microconch)	1.5
4: Mudstone, tough, brown, bituminous; abundant ammonites including macroconch and microconch <i>Binatisphinctes comptoni</i> , <i>Hecticoceras</i> , <i>Kosmoceras castor</i> (Reinecke), <i>K. gulielmi posterior</i> Brinkmann, <i>K. grossouvrei</i> Douvillé and <i>K. pollucinum</i> (Teisseyre); bivalves, including <i>Bositra buchii</i> (Roemer); cerithiid gastropods and crustaceans	1.2
3: Mudstone, hard, bituminous, alternating with soft clay with septarian cementstone doggers; abundant crushed and finely pyritized ammonites including <i>Erymnoceras coronatum</i> (Bruguère), <i>Kosmoceras castor</i> , <i>K. grossouvrei</i> and <i>K. pollux</i> (Reinecke)	6.15
2: Mudstone, bituminous, greenish-grey with bands of clay; crushed ammonites including <i>Erymnoceras coronatum</i> , <i>Kosmoceras castor</i> , <i>K. gulielmi</i> and <i>K. obductum</i> (S.S. Buckman); fairly common belemnites (<i>Cylindroteuthis pusoziana</i> (d'Orbigny)); abundant nuculacean bivalves with <i>Gryphaea</i> and cerithiid gastropods	3.8
1: Clay, tough, blue and grey, bituminous; crushed ammonites including <i>Kosmoceras gulielmi</i> and <i>K. jason</i> (Reinecke); many oysters and nuculacean bivalves; palynomorphs reported by Sarjeant (1960)	seen

Beds 4 and 5 form a more resistant, prominent band in the western face of the pit.

Interpretation

The succession exposed at Crookhill Brickpit shows the boundary between the Peterborough and Stewartby members (the Lower and Middle Oxford Clay of traditional usage) although the two are not so clearly differentiated as in the South and East Midlands (see Chapter 4), where the Oxford Clay Formation is best known. In the

Midlands, the Peterborough Member mainly comprises predominantly brownish-grey, fissile, 'bituminous' (i.e. organic-rich) mudstone with a fauna dominated by crushed aragonitic ammonites and bivalves, the latter including nuculacean and *Meleagrinella* shell beds. The Stewartby Member is predominantly pale- to medium-grey, commonly smooth-textured, variably silty, calcareous, generally rather poorly fossiliferous, blocky mudstone with ammonites and

other macrofauna usually preserved as pyritic internal moulds (Cox *et al.*, 1992). At Crookhill Brickpit, beds up to and including Bed 19 are clearly Peterborough Member and the top of that bed has generally been accepted as the boundary between the two members.

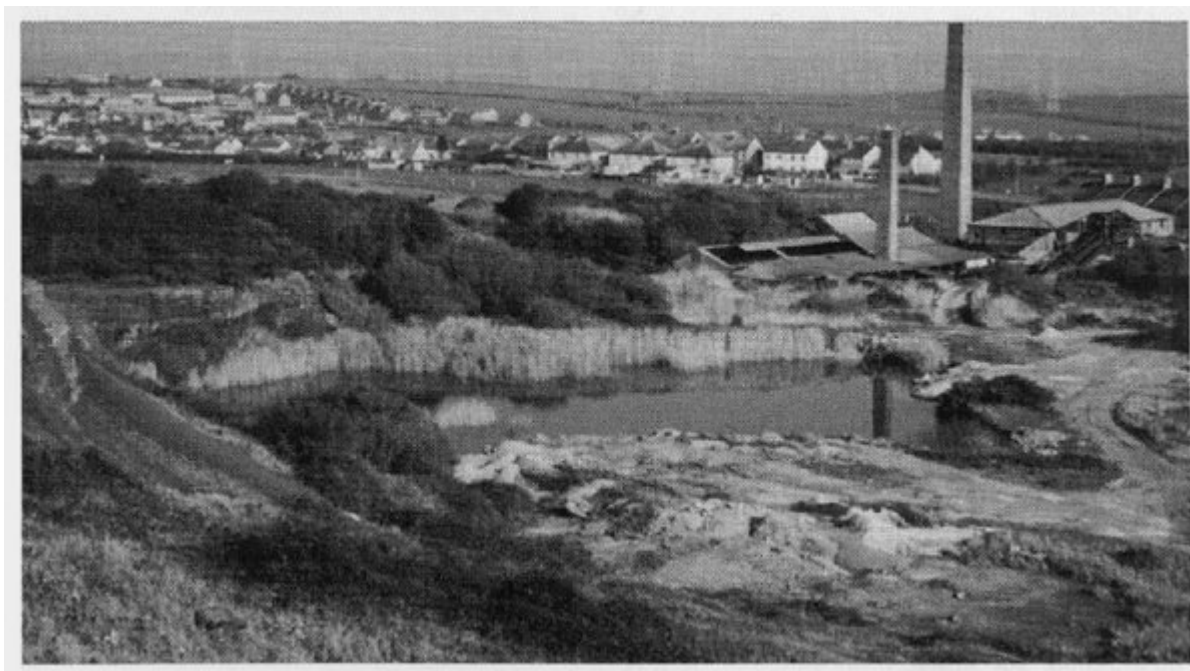
The ammonite faunas enable recognition of the Middle Callovian Jason Zone (and Subzone) (Bed 1) and Coronatum Zone (beds 3–4), and the Upper Callovian Athleta Zone (beds 5–21). Both subzones of the Coronatum Zone are present, the Obductum Subzone in Bed 2 and the Grossouvrei Subzone in beds 3–4. Specimens of the ammonites *Erymnoceras coronatum* and *Kosmoceras grossouvrei* from here were figured by Page (1991). The presence in Bed 4 of the ammonite *Binatisphinctes comptoni* indicates its nominal biohorizon, which terminates the latter subzone, and correlation with the marker bed known in the Midlands as the Comptoni Bed. The Grossouvrei Subzone here has also yielded an interesting teuthid (i.e. non-belemnite coleoid) fauna (Carreck, 1960; Page and Doyle, 1991), and teleostean fish (Carreck, 1960).

Ammonites in the lower part of the succeeding Bed 5 indicate the *K. acutistriatum* Biohorizon at the base of the Athleta Zone. This bed is partly equivalent to the well-defined marker horizon called the Acutistriatum Band' in the Midlands succession (see Peterborough Brickpits GCR site report, this volume). The Phaeinum Subzone, the oldest of the Athleta Zone, is recognized up to and including Bed 19. Above this bed, the ammonite fauna in beds 20 and 21 is characteristic of the Proniae Subzone, an interval that is not now as fully exposed and with such a varied fauna anywhere else in Britain. The presence of several Tethyan Reineckeidae at this level is potentially significant for detailed correlations with more southerly areas of Europe where the genus *Reineckeia* is common and used as a stratigraphical index fossil.

Conclusions

The brickpit at Crookhill, Chickerell, Dorset, which ceased to be worked in 1969, has been known in the literature for over 60 years. Correlatives of the Comptoni Bed and Acutistriatum Band, well-known widespread marker beds in the Oxford Clay Formation of central and eastern England, can be recognized here, and the ammonite faunas endorse the Middle-Upper Callovian substage boundary at this level. The ammonites of the Athleta Zone are of particular interest as they include Tethyan elements, not well represented elsewhere in Britain; these offer the potential of detailed correlations with Callovian successions elsewhere in Europe.

References



(Figure 2.8) General view of the Crookhill Brickpit GCR site. (Photo: K.L. Duff.)