Shipton-on-Cherwell Quarry, North-West Corner, Oxfordshire

[SP 475 178]

Highlights

Shipton-on-Cherwell Quarry is the best source of Mid Jurassic crocodilians in Britain, and perhaps the best source of freshwater forms in the world. The site has also produced a range of bones of other species, including turtles and dinosaurs.

Introduction

From the older portions of Shipton-on-Cherwell Quarry the earliest recorded find was a partial *Steneosaurus* skull collected in the early 19th century (Conybeare, 1821, p. 591), and this specimen (OXMFS J1401) was the first crocodile known from the British 'oolites'. Later finds of crocodilian and dinosaurian remains were described by Phillips (1871). The crocodiles were later redescribed by Phizackerley (1951). A stegosaur femur was made type of *Lexovisaurus vetustus* by Huene (1910c), and it was redescribed by Galton and Powell (1983) and by Galton (1985b). The quarry at about [SP 477 177] was known as Gibraltar Quarry or 'Enslow Bridge', until about 1920,when it was engulfed by the huge Shipton Cement Quarry (Arkell, 1931, pp. 577–8). Parts of the old faces are still extant at [SP 475 178], and they display sections in the Upper White Limestone, Forest Marble and Cornbrash. The potential for further finds, particularly through careful sampling in the *fimbriatus–waltoni* Beds, and other clay units, adds to its value.

There is a problem over the nomenclature of the seven or so quarries around the bend in the River Cherwell in this area (Figure 6.10). Hull (1859, pp. 20–1) refers to sections at Kirtlington Station (the railway cutting, [SP 482 181]) and 'on the right bank of the river, in a semi-circular cliff (probably Quarry Bank, Enslow Bridge, [SP 475 183]). Phillips (1860, pp. 117–18) describes these same sections. H.B. Woodward (1894, p. 322) gives a more detailed log for Quarry Bank: 'the section south-west of Enslow Bridge'. Further, he describes a series of quarries 'south of Bletchington station, and on the western side of the railway'. These are, no doubt, the Greenhill Quarries ([SP 483 179], [SP 485 177]) on the eastern side of the railway, and an old portion of the Shipton Cement quarry (?[SP 480 175]) on the western side of the railway. The 'Old quarry a little east of Bletchington railway-station' (H.B. Woodward, 1894, pp. 323, 373–4) is probably Phillips' *Cetiosaurus* Quarry [SP 484 182]. We may summarize these and later references:

1. Bletchington Station Quarry /Kirtlington Station Quarry/*Cetiosaurus* Quarry [SP 484 182]: Phillips (1871, p. 251); H.B. Woodward (1894, p. 323); Pringle (1926, p. 25); Richardson *et al.,* 1946, p. 67); Arkell (1947a, pp. 57–8); Huene (1910c, p. 75).
2. Quarry Bank, Enslow Bridge [SP 475 183]: Hull (1859, p. 21); Phillips (1871, p. 239); H.B. Woodward (1894, p. 321); Arkell (1947a, p. 58 (?): 'Bunker's Hill quarries in the woods west of Enslow Bridge').
3. North-west corner of Shipton-on-Cherwell Quarry/Gibraltar Quarry [SP 475 178]: Phillips (1871, pp. 151–2, 247); Odling (1913, pp. 496–8); Arkell (1931, pp. 579–80; 1947a, p. 58); Richardson *et al.* (1946, pp. 66–7); Palmer (1979, pp. 191, 202–3, 205, 208, 210: 'Shipton Quarry').
4. Lower Greenhill Quarry [SP 483 179]: H.B. Woodward (1894, p. 322); Odling (1913, pp. 495–6); Pringle (1926, p. 24); Arkell (1931, pp. 580–2; 1947a, pp. 58–9); Richardson *et al*. (1946, p. 68).
5. Upper Greenhill Quarry [SP 485 177]: H.B. Woodward (1894, p. 322); Odling (1913, pp. 494–5); Pringle (1926, p. 24); Douglas and Arkell (1928, pp. 129–30; 1932; 1935, p. 319); Richardson *et al.* (1946, pp. 67, 77–8); Arkell (1947a, pp. 59–60); Torrens (1968, p. 248); Palmer (1979, pp. 190, 208: 'Greenhill Quarry').
6. Oxford Portland Cement Works (old pit, ?[SP 480 175]): H.B. Woodward (1894, p. 322), see no. 3.
7. Whitehill Quarry, Gibraltar. [SP 477 186]: Palmer (1979, pp. 190, 206, 209).

Richardson *et* al. (1946, p. 67) noted that Bletchington Station quarry was 'probably the original 'Gibraltar Quarry' and they refer to Phillips (1871, p. 247). However, Phillips (1871, p. 247) does not make clear whether the quarries at Enslow

Bridge and Gibraltar were separate localities or part of one quarry, stating that the bones of *Cetiosaurus* came from 'the quarries at Gibraltar, near Enslow Bridge, and close to the railway station for Kirtlington and Bletchingdon'. Huene (1910c, p. 75) referred to two reptile quarries, that at Bletchington Station and one '300 m west of Bletchington Station on the other side of the river in the western valley wall'. This could be Quarry Bank or Gibraltar, about 300 m west of the station in the middle of the flood plain in the bend in the River Cherwell. McKerrow *et al.* (1969, p. 61) further complicated the issue by giving a map reference for a 'Gibraltar Quarry (477 185)'. The quarry at [SP 477 185] (Whitehill Quarry) is a relatively recent excavation, and has nothing to do with the old Gibraltar quarry. Galton and Powell (1983, p. 220) failed to mention Gibraltar Quarry, referring to the locality simply as a 'series of quarries, about 9.6 km north of Oxford, in the west bank of the River Cherwell, which extend about 0.8 km southwards downstream from Enslow Bridge itself', but provided the grid reference [SP 4247 7177]. The grid reference appears to coincide with the assumed location of Gibraltar Quarry as is indicated in the accounts of Odling (1913, pp. 486, 496–8) and Arkell (1931, pp. 577–80).

Description

The sequence at Shipton-on-Cherwell Quarry [SP 475 178] is based on Arkell's (1931, pp. 579–80) description, with modifications from Richardson *et al.* (1946, pp. 36–8).

	Thickness (m)
Lower Cornbrash	
In field immediately above the quarry (also at top of section to the south; Arkell 1947a, p. 58)	
Forest Marble Formation	
9. ('Wychwood Beds'). Clays, greenish grey dominant at N end; thinly laminated cross-bedded sand gradually replaces clays elsewhere (?=beds a-h of Odling 1913, p. 496)	1.8–3
8. (Tipper Kemble Beds') Limestone, cross-bedded, hard, white, blue-hearted, coarsely oolitic, locally split up by thick lens of dark-blue, shaly clay. (?=beds i, j of Odling, 1913, p. 496)	*c.* 3
White Limestone Formation	
Bladon Member	
7. Upper *Epithyris* Bed (Coral — *Epithyris* Limestone) (='Fossiliferous Cream Cheese' Bed of Odling 1913, p. 496, and Arkell, 1931, p. 579; 'Cream Cheese Bed' of Barrow, 1908; Upper *Epithyris* Bed of Richardson *et al.,* 1946, p. 66). Limestone, cross-bedded, hard, similar to 8. Abundant *Epithyris, Modiola,* etc.	0.6–0.9
——— plane of erosion with a few pebbles ———	
Beds 6–3: *fimbriatus–waltoni* Beds	
6. (=Beds 2–4 of Odling, 1913, p.497). Marl, green, lignitiferous, black and shelly at base; 90 cm thick at N end, reducing to 15 cm band of white pellets at S end	0.1–0.9
5. (=Beds 5 and 6 of Odling, 1913, p. 497). Limestone, greenish grey, argillaceous, weathering soft. Abundant *Gervillia, Astarte.* Expands N	0.15–0.3
4. (=Beds 7 and 8 of Odling, 1913, p. 497). Clay, dark green with white pellets. Thins N 0.23–0.45	
3. Limestone, hard, unfossiliferous, thins N	0–0.25
2. *Oyster–Epithyris* Marl (=Bed 9, first *Terebratula* bed of Odling, 1913, p. 497; Middle *Epithyris* Bed of Arkell 1931, p. 580, and Richardson *et al.,* 1946, p. 66).	

Marl, brown, ferruginous. In places, rolled fragments of limestone and corals at base. Abundant *Epithyris.*	0.23
——— plane of erosion———	
Ardley Member	
1. (=Beds 10–12 of Odling, 1913, p. 498). Limestones, creamy white, compact. In places the *Epithyris* Limestone (=Lower *Epithyris* Bed) is typically represented, while elsewhere it is absent.	seen *c.* 2.0

Odling (1913, p. 498) recorded a further 3 m of section in the old Gibraltar Quarry, down to a compact limestone below the *Nerinea eudesii* Beds (lower Ardley Member).

Problems of lithostratigraphy and disagreement over the placing of the Forest Marble/White Limestone boundary are discussed by Richardson *et al.* (1946), Arkell (1947a), Palmer (1973, 1979), Torrens (*in* Cope *et al.,* 1980b, pp. 36–8) and Sumbler (1984). The main difficulty concerns the classification of beds which are, to an extent, transitional between the White Limestone and Forest Marble formations, and the confusion arising from different usage of the two formation names has been increased by the introduction of various subdivisions which have been used in different senses by different workers. The stratigraphic position of the transitional beds has recently been standardized by their inclusion in the Bladon Member of the White Limestone Formation (Sumbler, 1984).

Reptiles were found at three or four levels within the sequence: in the ?Ardley Member (?bed 1, or lower of Arkell, 1931; Richardson *et al.,* 1946), in the *fimbriatus–waltoni* Beds, in the lowest unit and the top of the Forest Marble (Arkell, 1931; Richardson *et al.,* 1946: beds 8 and 9), and in the Lower Cornbrash.

The most abundant remains appear to have come from the *fimbriatus–waltoni* Beds here and nearby. The bones excavated at Bletchington Station quarry between 1868 and 1870 lay 'on a freshly-bared surface of the Great Oolite… and covered by the laminated clay and thin oolitic bands which occupy the place assigned to the Bradford Clay of Wiltshire' (Phillips, 1871, p. 248). The bones clearly lay within clay bands above an oolitic limestone and, because of their size, they passed up into different thin clay and marl units. Phillips' detailed section (1871, p. 251) shows seven thin argillaceous and calcareous units that cannot be matched with sections recorded nearby in the railway cutting (Hull, 1859, p. 20; Phillips, 1860, p. 117, 1871, p. 154), nor at Shipton. Nevertheless, it may be concluded that all of these belong to the *fimbriatus–waltoni* Beds. This is confirmed by H.B. Woodward (1894, p. 154) and Arkell (1931, pp. 565, 566). Richardson *et al.* (1946, pp. 39, 65, 67, 70) and Palmer (1979, p. 221) note the occurrence of *Cetiosaurus* bones in these beds at several quarries.

De la Beche and Conybeare (1821, p. 591) recorded 'an undoubted species of crocodile, somewhat resembling the Gavial… in the upper beds of the Great Oolite, or in the Cornbrash… at Gibraltar, eight miles north of Oxford'. Phillips (1871, p. 251) later noted that 'heads of teleosaurs are not infrequent at Enslow Bridge, and in beds of Great Oolite below the strata containing 'ceteosaurus', and in summarizing an excursion to Enslow Bridge (Phillips, 1871, p. 239) he noted that 'the members were highly gratified to learn that during the morning a very fme skeleton of *Teleosaurus* had been found and the head was exposed to view. This quarry is in the Great Oolite, the lower and uppermost strata of which in Oxfordshire yield remains of *Megalosaurus* while in the middle beds we find '*Teleosaurus'.* These probably refer to finds in the old Gibraltar/Shipton Quarry in or below the *fimbriatus–waltoni* Beds. Further, 'remains of *Teleosaurus* were obtained at Enslow Bridge (south of Kirtlington) a little below the '*Terebratula-bed'* (H.B. Woodward 1894, p. 323), thus below bed 2 of Arkell's (1931) section, probably at Shipton. *Teleosaurus* occurs as low as the Upper Shipton Member at Lower Greenhill Quarry (Odling, 1913, p. 496, Bed 18).

The large *Cetiosaurus* femur obtained in 1848 from the railway cutting south of Bletchington Station was apparently 'assigned to the base of the Forest Marble' by Prestwich and another specimen was found 'within two feet of the Cornbrash' (H.B. Woodward, 1894, p. 323). These indicate horizons equivalent to beds 8 and 9 respectively in the section given above.

Galton and Powell (1983) and Galton (1985b) suggest that the holotype of the stegosaur *Lexovisaurus? vetustus* (a right femur) probably derived from the top of the Forest Marble, because of its eroded nature and the fact that bones are virtually unknown in the Cornbrash, but do occur in the lagoonal facies of the Forest Marble Formation. The bone, however, bears an example of the bivalve *Meleagrinella echinata* on its surface (P. Powell, pers. comm.), firm evidence of a Lower Cornbrash derivation. This relocation of the find is of little significance, since both the Lower Cornbrash and the top of the Forest Marble are within the *Clydoniceras discus* Subzone of the *C. discus* Zone (Late Bathonian, Mid Jurassic; Torrens, *in* Cope *et al.,* 1980b, fig. 6a).

The bones from all levels at Shipton are generally well preserved, but disarticulated. Taphonomic information is only available for the *Cetiosaurus* find of 1868–70 at nearby Bletchington Station quarry. Phillips (1871, pp. 248–51) noted that the large bones were largely shattered (?by compression from the weight of the superincumbent sediment). The separate elements were disarticulated, but associated, remains of three individuals of different size being preserved within an area measuring 6 m by 6 m. Vertebrae and ribs were much broken and mixed in 'confused' groups. No cranial remains were found. Thus, as Phillips (1871, p. 249) realized, the animals had died elsewhere, 'the parts separated by decay; the massive limbs disjointed, and the bones displaced'. The bones were washed in, but have not suffered much wear.

Fauna

The majority of the specimens labelled 'Enslow Bridge' or 'Gibraltar' appear to have come from the old Gibraltar Quarry which is now part of the Shipton-on-Cherwell cement works. Specimens from Bletchington Station Quarry are normally noted as 'Bletchington Station' or 'Kirtlington Station', and they are not listed here. Most specimens are labelled 'Great Oolite', and they probably came from beds 3–6 (*fimbriatus–waltoni* Beds) or lower.

Testudines

'turtle scute' OUM J17567.

Archosauria: Crocodylia: Thalattosuchia: Steneosauridae

Steneosaurus boutilieri J.A. Deslongchamps, 1869 OUM J1401–4, J1412, J1416–7

Steneosaurus brevidens (Phillips, 1871) BMNH R78–79, 44821

Steneosaurus aff. *larteti* Q.A. Deslongchamps, 1866) OUM J.1408–10

Steneosaurus megistorhynchus J.A. Deslongchamps, 1866 OUM J.1414–5

Steneosaurus meretrix Phizackerley, 1951 Type specimen: OUM J.29850. Also, OUM J.29851, J.1407

Steneosaurus sp. BGS(GSM) (old no.); OUM J.10590–1, J.29495; CAMSM J.21952–3

Teleosaurus subulidens Phillips, 1871 OUM J.13599–600

Archosauria: Crocodylia: Thalattosuchia: Metriorhynchidae

Metriorhynchus cf. *geoffroyi* Meyer, 1832 OUM J1418

Dinosauria: Saurischia: Theropoda: Megalosauridae

Megalosaurus bucklandi Meyer, 1832 OUM J.13598, J.29773, J.13882, J.29765

Dinosauria: Saurischia: Sauropoda: Cetiosauridae

?Cetiosaurus OUM J.29806

Dinosauria: Ornithischia: Ornithopoda

?Iguanodon OUM J.29805

Dinosauria: Ornithischia: Stegosauria:

Stegosauridae

Lexovisaurus? vetustus (Huene, 1910) Type specimen: OUM J.14000

Interpretation

The biostratigraphy is difficult to establish because of the general absence of ammonites here and in comparable units nearby. Three or four specimens of *Tulites* and *Procerites* have been recorded from Bletchington Station and Enslow Bridge, but they are either lost or stratigraphically unlocalized (Torrens, 1969b, p. 69, *in* Cope *et al.,* 1980b, pp. 37–8). The stratigraphic units are assigned within the Late Bathonian as follows (Palmer, 1979; Torrens, in Cope *et al.,* 1980b): Ardley Member (?lower *hodsoni* Zone), Bladon Member (?upper *hodsoni–lower aspidoides* Zones), Forest Marble Formation (*?aspidoides*–lower *discus* Zone), Lower Cornbrash (?upper *discus* Zone).

The reptiles from Shipton are generally large, with none of the 'lizards', pterosaurs, amphibians or mammals that are known from deposits of the same age at Kirtlington. This is probably the result of different collecting techniques, rather than any major habitat distinction. Nevertheless, the dominance by crocodilians is typical of most British Bathonian sites.

The long-snouted crocodilians *Steneosaurus, Teleosaurus* and *Metriorhynchus* are well known from several British Mid Jurassic sites from the Early Bathonian (e.g. New Park Quarry), the Mid Bathonian (Huntsman's Quarry; Stonesfield) and the Late Bathonian (e.g. Kirtlington, Oxfordshire). These forms were revised by Phizackerley (1951), but Steel (1973), in a recent review, was unable to clarify their complex taxonomy. The distinctions between the species, and the assignment of valid species to different genera, have yet to be assessed in an overview. In other words, the total of seven species from Shipton is almost certainly an overestimate and it is not clear to which genus each should be ascribed. Nevertheless, the Shipton specimens are largely skulls and lower jaws, which are taxonomically and functionally important elements, and these should be of extreme importance when a review is undertaken. The importance is heightened by the fact that the type specimens of most of the species erected by Deslongchamps and French authors, from the 'Fullers Earth' and 'Great Oolite' of Normandy, were destroyed in 1944.

Several of the crocodile skulls from Shipton are significant. OUM J.1401 (*S. boutilieri*) was the first recorded British Mid Jurassic crocodile ((Figure 6.11)A, and casts of it were used by E.E. Deslongchamps to supplement his studies of the Normandy crocodiles. OUM J.1403 (*S. boutilieri*) unusually preserves posterior parts of the skull and palate very well. OUM J.1416, part of the type material of *Teleosaurus brevidens* Phillips (1871), is a remarkably complete lower jaw, ascribed to *S. boutilieri* by Phizackerley (1951, pp. 1177–85). OUM J.1414 (*S. megistorhynchus*) is part of the type material of *Teleosaurus subulidens* Phillips (1871) and is a fine lower jaw. OUM J.29850 and J.29851 (formerly Oxford Zool. Dept. 1639/1 and 1639/2) are holotype and paratype respectively of *S. meretrix* Phizackerley (1951). They, and OUM J.1407, show an animal with a 1 m long, very low skull, a depressed snout and little anterior rostral expansion.

Other reptiles are less well represented. There is one plate from a turtle carapace, about which little can be said. The carnivorous dinosaur *Megalosaurus* is very rare here, being represented by a scapula and isolated dagger-shaped teeth. This compares with its rarity at Kirtlington and other Late Bathonian sites also, but in the Mid Bathonian it is one of the commonest finds (e.g. Huntsman's Quarry and Stonesfield, see above). A bone referred to *Cetiosaurus* was reported in a footnote in Phillips (1871, p. 213). *Cetiosaurus* bones are relatively abundant nearby in the Late Bathonian (e.g. Bletchington Station quarry, Kirtlington Cement Quarry, Glympton ([SP 427 217]), Stratton Audley [SP 60 26)]and Blisworth SP 72 53]). In the same footnote, Phillips (1871) records a specimen that he tentatively refers to *Iguanodon,* but this is questionable since *Iguanodon* comes mainly from the Early Cretaceous of Europe (Norman, 1980, 1986), with only a single occurrence from the Late Jurassic (a referred mandible from the Portlandian; see below).

Finally, the 700 mm long right femur of the stegosaur *Lexovisaurus* (type specimen of *Lexovisaurus? vetustus* (Huene, 1910c)), probably from the Lower Cornbrash of Shipton (see above) is of great importance ((Figure 6.11)B. The femur exhibits certain juvenile features such as a gentle curve between the head and shaft in anterior view, the persistence of the cleft between the lesser and greater trochanter, and the lack of prominent longitudinal ossified cords proximally and on the shaft. It is proportionately more massive when compared with those of other stegosaurs from England, such as *Dacentrurus armatus* (Owen) from the Kimmeridgian and *D. ?phillipsi* (Seeley) from the Oxfordian (both Late Jurassic) and *Lexovisaurus durobrivensis* (Hulke) from the Callovian (Mid Jurassic). *Lexovisaurus? vetustus* is one of the oldest stegosaurs known (see New Park Quarry report), and it is similar to *Kentrosaurus* (Hennig) from the Tendaguru Shale (Kimmeridgian) of East Africa and shows similarities to the Chinese Bathonian *Huayangosaurus.*

Comparison with other localities

The reptiles from Shipton-on-Cherwell Cement Works/Gibraltar Quarry [SP 475 178] must first be compared with the other 'Enslow Bridge' localities. The best known is Bletchington Station Quarry [SP 484 182], which has yielded remains of *Cetiosaurus, Megalosaurus* and *Steneosaurus* from the *fimbriatus–waltoni* Beds (Phillips, 1871, pp. 151, 247–94; Arkell, 1933, p. 289). The productive layer here was quarried up to the road (the A4095, also known as Lince Lane), but cannot be worked any further. A few *Cetiosaurus* bones were also found in the railway cutting south of Bletchington Station [SP 482 181], possibly in the *fimbriatus–waltoni* Beds and Forest Marble. Some *Steneosaurus* teeth and bones are recorded from Lower Greenhill Quarry [SP 483 179]. A more useful comparison may be made with the better known faunas from Kirtlington Cement Works [SP 494 199]. Here, steneosaurs are relatively common in the *fimbriatus–waltoni* Beds, with some remains of *Cetiosayrus* and *Megalosaurus.* The Kirtlington Mammal Bed, at the Forest Marble/White Limestone boundary is dominated by fishes, crocodilians (*?Goniopholis*), turtles and 'lepidosaurs', with rarer frogs, salamanders, choristoderes, pterosaurs, ornithischian dinosaurs, theropods, *Cetiosaurus,* tritylodontids and mammals (Evans and Milner, 1994). The fauna of the latter unit is biased towards small fossils because of sedimentological and palaeontological factors, as well as by the means of collection. Such remains may occur at Shipton and detailed sampling of the *fimbriatus–waltoni* Beds and other argillaceous units would be useful.

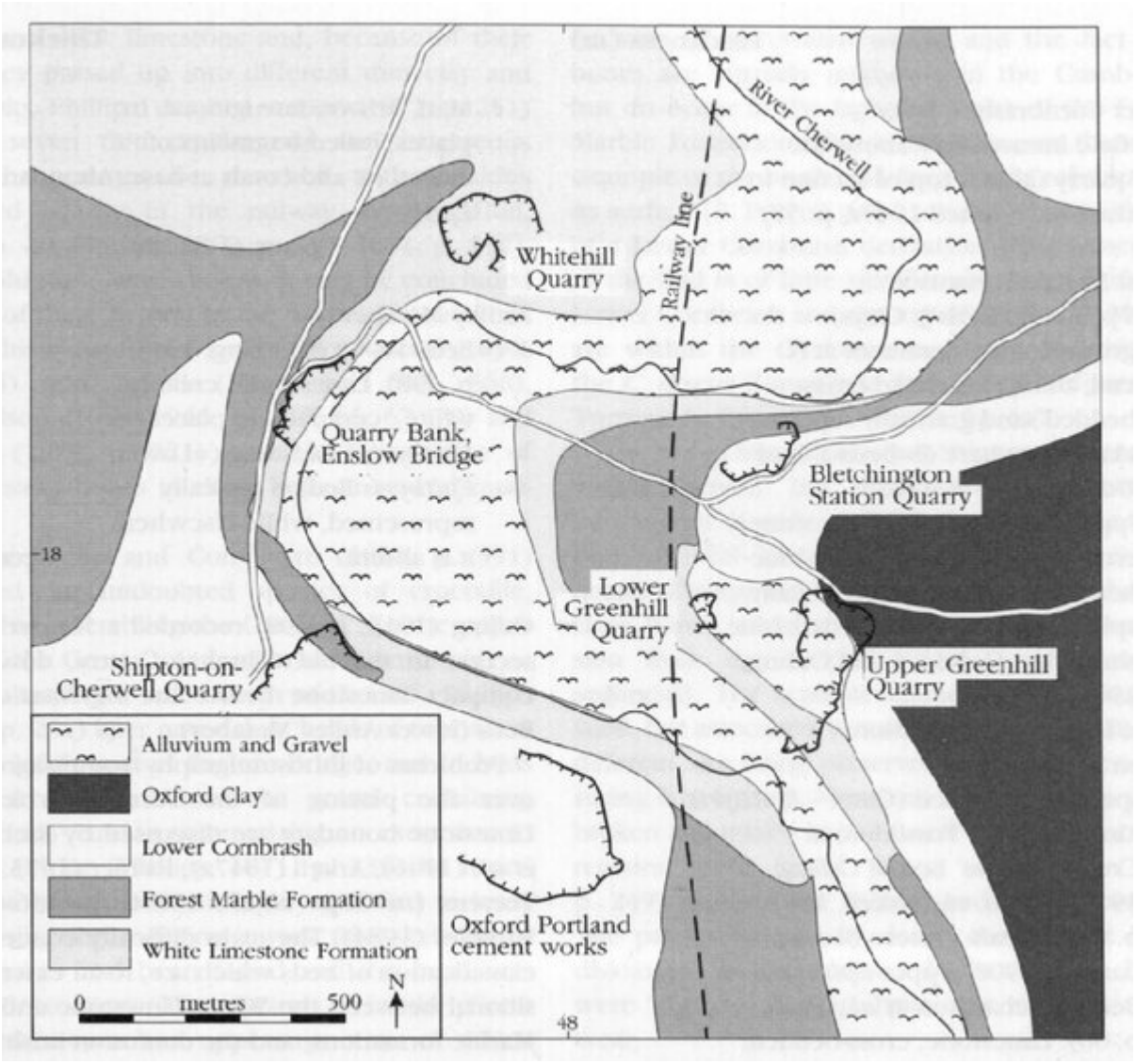
The stegosaur *L.? vetustus* is known elsewhere from the Early Bathonian (Bed 18, Perna bed, *tenuiplicatus* Zone) of the Sharps Hill Formation at Sharps Hill Quarry, near Hook Norton, and the Chipping Norton Member (*convergens* Subzone of *zigzag* Zone) of the Chipping Norton Formation of New Park Quarry, Longborough. The Mid Callovian form (*L. durobrivensis* Hulke) is known from the Oxford Clay of brick pits around Fletton, Peterborough (Galton, 1985b, p. 236).

Other comparable Late Bathonian localities in Oxfordshire and Northamptonshire include Slape Hill, Woodstock [SP 425 196], which has yielded crocodile bones and teeth from the White Limestone, Glympton Quarry ([SP 427 217]; *Cetiosaurus* vertebrae, Forest Marble), Tolley's Quarry, Bladon (?[SP 449 150]: *?Cetiosaurus* scapula and other bones, *fimbriatus–waltoni* Beds: Richardson *et al.,* 1946, p. 65), Ardley quarries ([SP 539 272], [SP 541 265]; crocodile teeth and bones from the White Limestone), Stratton Audley ([SP 60 26]; *Cetiosaurus* and other ?dinosaur bones, Forest Marble), Blisworth railway cuttings ([SP 725 543]; *Cetiosaurus, Steneosaurus* bones in Blisworth Limestone or Clay), Kingsthorpe ([SP 75 63]; *Steneosaurus* bones) and Thrapston LMS station quarry ([SP 998 777]; *Steneosaurus, Cetiosaurus, Megalosaurus, 'Plesiosaurus'* from 'Great Oolite' or Cornbrash). Clearly, only Kirtlington, and possibly Thrapston, are of comparable stature to Shipton for Late Bathonian reptiles.

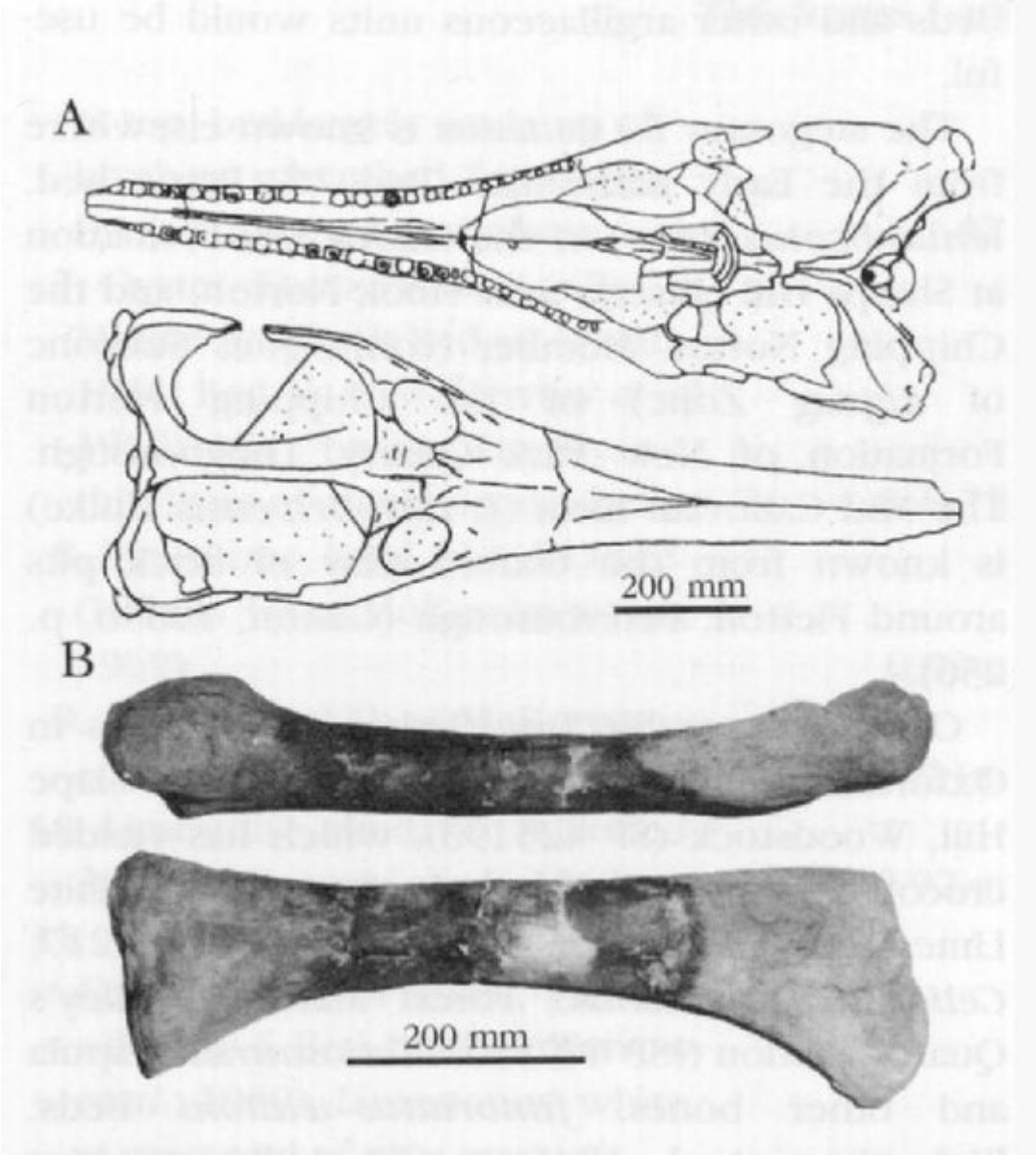
Conclusions

Shipton/Gibraltar quarry has yielded the largest variety of British Mid Jurassic crocodiles. The specimens consist of skulls and jaws which are of prime importance for classification and ecological studies. More specimens have been found at Stonesfield (early Mid Bathonian), but these are largely isolated teeth, scutes and bones. In view of the fact that the Normandy type specimens have been destroyed, the Shipton steneosaurs are the best in the world for studies of Mid Jurassic crocodiles. The stegosaur *Lexovisaurus? vetustus* is the oldest member of its genus, and one of the oldest members of Stegosauria, a group which radiated in the Late Jurassic and Early Cretaceous of Europe, Africa and North America. Shipton's crocodiles and its stegosaur make it a Mid Jurassic site of international importance, and this importance combined with a potential for future finds give its considerable conservation value.

References



(Figure 6.10) The quarries around Shipton-on-Cherwell. Up to seven quarries (detailed in the text) appear to have yielded fossil reptiles from the White Limestone and the Forest Marble formations. Based on old Ordnance Survey maps.



(Figure 6.11) Bathonian reptiles from Shipton-on-Cherwell. (A) The crocodile Steneosaurus boutilieri Deslongchamps, 1869, skull in dorsal and ventral views; (B) the stegosaur Lexovisaurus vetustus Huene, 1910, right femur in lateral and anterior views.