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FIELD CLUB

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ON SOME DIBRANCHIATE CEPHALOPODA FROM THE
UPPER LIAS OF GLOUCESTERSHIRE.

BY

The late G. C. CRICK, F.G.S.

INTRODUCTION.

The first reference to the remains of Dibranchiate Cephalopoda, other than Belemnites, in the "Saurian and Fish-bed" of the Upper Lias of Gloucestershire seems to have been by Charles Moore in 1852,¹ but it was not until the publication of the same author's paper "On the Middle and Upper Lias of the South-West of England," some fourteen or fifteen years later² that generic names were assigned to these Cephalopods, when Moore recognised them as being referable to the genera *Geoteuthis*, Münster, and *Teuthopsis*, Deslongchamps, but assigned no specific names to them.

In 1871 Professor J. Phillips, in his *Geology of Oxford*, of Liassic Dibranchiate Cephalopods other than Belemnites, records (p. 131) a *Geoteuthis*, *Acanthoteuthis speciosa*, and an "ink-bag" from the Upper Lias of Dumbleton, Gloucestershire; and on pl. viii. (plate facing p. 136), fig. 40 of the same work he gives a small figure of a "Dorsal plate of *Geoteuthis* with 'ink-bag,'" from the Upper Lias of Alderton, Gloucestershire.

In 1879 Dr. Wright records in his 'Monograph on the Lias Ammonites of the British Islands,' from the Upper Lias, zone of "*Harpoceras serpentinum*"—the zone including the "Saurian and Fish-bed"—in Gloucestershire (pt. 2, 1879, p. 126) a Dibranchiate Cephalopod as "*Belemnosepia* (ink-bag and osselets)." This is doubtless the same form referred by other authors to *Geoteuthis*.

¹ *Proc. Somerset Archæol. and Nat. Hist. Soc.*, 1852 (1853), pt. 2, p. 69.

² *Op. cit.*, vol. xiii. (1867), pt. 2, p. 183; also issued as a reprint of 67 pages.

The Upper Liassic Dibranchiate Cephalopods, other than *Belemnites*, recorded in the list of fossils at the end (p. 342) of the Survey Memoir, published in 1893, on "The Lias of England and Wales (Yorkshire excepted),"¹ by H. B. Woodward are: "*Teudopsis*" from the Upper Lias (zone of *Amm. annulatus*) of Dorset and Yorkshire; and "*Belemnosepia* [*Geoteuthis*]" from the Upper Lias (zone of "*Amm. serpentinus*") of Gloucestershire.

Although the occurrence of the remains of *Geoteuthis* and *Teuthopsis* has thus been known in the "Saurian and Fish-bed" of the Upper Lias in the South-West of England for nearly fifty years, there appears to have been no attempt to specifically determine them, probably owing to their usually fragmentary character.

Mr. L. Richardson has, however, recently submitted to the writer a series of Dibranchiate remains from the Upper Lias of Alderton, Gloucestershire, some of which are worthy of notice. The series includes examples of both *Geoteuthis* and *Teuthopsis* as well as some detached hooklets. Both these genera, as well as detached hooklets, are also represented in the British Museum collection from the same locality.

Geoteuthis, Münster.²

The best preserved example of this genus from the Upper Lias of Gloucestershire that has come under the notice of the writer is a specimen (plate A) submitted to him by Mr. L. Richardson. It is displayed on the broken and partly weathered surface of one of the lenticular masses occurring in the "Fish-bed," and presents a dorsal aspect of the remains. These include the greater portion of the gladius, a small portion of the muscular substance of the body, and, where the gladius is absent, the hollow ink-bag with its duct; there are no remains of the head and arms. In this genus the gladius is elongated-oval in outline, truncated anteriorly and rounded posteriorly; it consists of several very thin alternating chitinous and calcareous layers. Diverging from the posterior end are two

¹ Memoirs of the Geological Survey of the United Kingdom, *The Jurassic Rocks of Britain* vol. iii., 1983.

² G. Münster, *Beitrage zur Petrefacten-kunde*, Heft vi. (1843), p. 68.

straight well-defined bands dividing its surface into a triangular median area which broadens anteriorly, and bears a median, narrow filiform keel, and on each side a finlike expansion, having a convex outer boundary and extending along a considerable portion of the length of the gladius. The lateral bands are ornamented with transverse backwardly-bent lines; whilst each lateral expansion, which extends almost to the anterior end of the gladius, is ornamented with fine oblique striæ.

Geoteuthis agassizii, Deslongchamps.

In the present specimen the posterior end of the gladius is wanting; the fossil, which is now 235 mm. long, probably originally attained a length of at least 290 mm. Only fragments of the actual gladius are preserved, but the form of the greater part of it is indicated as an impression on the surface of the slab. The anterior end of the gladius is broadly convex and about 50 mm. wide; the thickened lateral bands limiting the median area are indicated by shallow depressions, which are here each about 4 mm. wide; they do not appear to have been continued around the anterior border of the gladius; posteriorly they converge at an angle of about 20°. They do not exhibit any curved transverse lines, and therefore closely resemble the corresponding bands in the gladius of *Pterioeuthis* and *Leptoteuthis*. The median keel, also indicated by a shallow groove, extends nearly if not quite to the anterior border of the gladius; it appears to have been relatively feeble over the greater part of the length of the specimen, in fact some fragments near the posterior end of the gladius exhibiting the dorsal surface of the structure appear to lack any definite median keel. The impression also shows that the whole of the inner or ventral surface of the anterior part of the gladius was covered with very fine straight longitudinal striæ. The lateral expansions extend from the posterior end of the gladius to within a short distance (apparently about 20 mm.) of its anterior end; each attains its greatest width (about 38 mm.) at about 160 mm. from the anterior border, and as shown by the impression each was traversed by several obscure

longitudinal ridges. At about the centre of the specimen the impression of the ink-bag with its duct is displayed; the posterior boundary of the ink-bag is 171 mm. from the anterior boundary of the gladius, the length of the ink-bag with its duct being about 83 mm. The ink-bag is comparatively small, oval in outline, about 21 mm. long and 14 mm. wide; whilst the duct is about 2.5 mm. in diameter. Around the end of the duct and extending for some 40 mm. in front of it the surface is stained with the ink. On the left side of the anterior end of the pen traces of the mantle are preserved displaying the usual rather coarse transverse striæ.

The specimen is evidently referable to Münster's genus *Geoteuthis* and comes nearest to the species which in 1849 Quenstedt named *coriaceus*.¹ To this species Quenstedt² also referred, after an examination of the original, the fossil which Deslongchamps³ had previously described from the Upper Lias of Curcy in Normandy as *Teudopsis agassizii*, a species considered by d'Orbigny⁴ at one time to be the pro-ostracum of a Belemnite, and subsequently⁵ referred by him to the genus *Belopeltis* of Voltz. A. Wagner⁶ regarded Quenstedt's *coriaceus* as identical with Münster's *hastata*, but beyond remarking that, according to the dimensions given by d'Orbigny, Deslongchamps' *agassizii* came nearer to Münster's *Geoteuthis sagittata* than to his *G. hastata*, he ventured no definite opinion as to the affinities of Deslongchamps' species. The English example, then, seems to be referable to *Geoteuthis coriaceus*, Quenstedt sp., a species in Quenstedt's own opinion identical with Deslongchamps' *Agassizii*, so that the name *Geoteuthis agassizii* Deslongchamps sp. is adopted for the specimen.

Deslongchamps' type-specimen came from the Upper Lias of Curcy, Normandy, whilst under the name of *Idiginites coriaceus* Quenstedt figured the species in 1849 from the Upper Lias (Lias ϵ) of Württemberg. From the Upper Lias (Toarcian)

¹ *Die Cephalopoden* (1849), p. 512, pl. xxxiv., figs. 5-8.

² *Der Jura*, 1858, p. 245.

³ *Mém. Soc. Linn. Normandie*, tom. v. (1835), p. 72, pl. ii., fig. 15.

⁴ *Pal. Franç., Terr. Jurass.*, tom. i. (1842), p. 38.

⁵ *Prod. de Paléont.*, tom. i. (1849) [*i.e.* 1850], p. 243.

⁶ *Abh. k. Bayer. Akad. Wissensch., Munich*, Bd. viii., Abth. 3 (1860), pp. 809 and 816.

of Whitby the species has been recorded in 1855 by Martin Simpson (as *Sepia haustum* and possibly also as *Sepia obtusalis*) and in 1876 by Professor J. F. Blake (as *Geoteuthis coriaceus*).

Teuthopsis, Deslongchamps.

The members of this genus possessed a gladius which was thin, spoon-shaped, expanded and rounded posteriorly, produced anteriorly into a narrow handle, and somewhat convex outwardly. A strong meridian keel begins at the hinder end and increases in breadth and strength towards the anterior end. The broad lateral portions are ornamented with growth-lines parallel to the margins of the gladius. The expansion of the posterior portion is rather sudden, and can be traced by the growth lines from near the posterior end of the specimen to the margin of the pen, and along the course thus indicated by this sudden bending of the growth-lines the surface of the gladius is very slightly depressed.

Teuthopsis brunelii, Deslongchamps.

An excellent example of this genus from the Upper Lias of Alderton, Gloucestershire, has been brought under my notice by Mr. L. Richardson (plate B). It is displayed on the surface of a portion of a nodule, and exhibits the greater part of the dorsal aspect of the gladius. There are only a few fragments of the outer layer of the pen, but the general form of the gladius is well shown, the specimen being uncrushed and not split at the posterior end as is the case in most examples of the genus.

The fossil, which is not quite complete anteriorly, is 67 mm. long as measured along the median line.

The posterior portion is truncated oval in outline. It is about 40 mm. long, and has its greatest width of 31 mm. at a point about 30 mm. from the obtusely-pointed posterior boundary, whence it narrows gradually to a width of 24 mm. at about 40 mm. from the posterior end; the posterior pointed extremity of the shell is not visible, this being turned towards the vstral surface is doubtless buried in the matrix. The anterior portion of the gladius is lanceolate, its margins nearly straight or only very slightly waved and converging at an angle

of about 20° . The specimen is broken off obliquely by the edge of the block of limestone in which it is imbedded; the width of the gladius here (at right-angles to the mid-rib) being 14 mm. A prominent median keel extends throughout the entire length of the gladius, being fine and well-defined at the posterior end, becoming more elevated, broader and less distinctly bounded as it passes towards the anterior end. The surface of the posterior portion of the gladius is convex, becoming flatter on the anterior part, which has a rounded elevated ridge near each margin. Portions of the surface of the gladius are preserved, showing that it was of a dark brown colour, fairly smooth except for the rather strong and somewhat distant lines of growth.

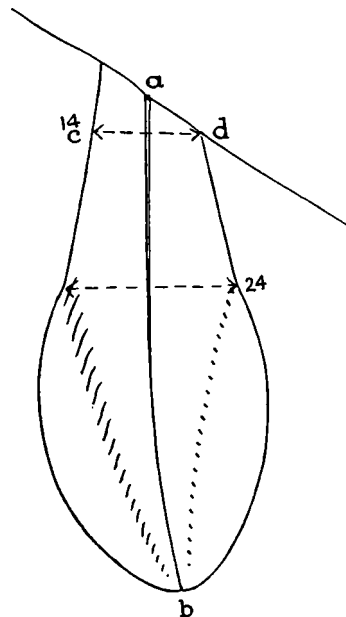


FIG. 1.—*TEUTHOPSIS BRUNELII* DESLONGCHAMPS.

(a-b) Length along midrib	67 mm.
(c-d)	14 "
Greatest width	31 "
(At about 30 mm. for posterior end.)	
Greatest width of wings	9 "
Length of wings from posterior end ..	42 "
Greatest width at top of wings	24 "

The British Museum collection includes an example, in counterpart [C5253], from the Upper Lias of Alderton, Gloucestershire. It was rather larger than the specimen first described, being about 80 mm. long; it is indistinctly defined at the posterior end, and incomplete anteriorly, being here about 12 mm. wide. Only scraps of the surface of the pen are preserved. There is an obscure ridge near each margin of the anterior part of the pen. The pen is almost perfectly flat, the median keel apparent throughout its entire length, the pen is split at the posterior end, nearly but not quite in the median line, as in the majority of examples. This shows, though very obscurely, the pseudo wing-like portion of the posterior part.

The same collection contains a much larger example from the Upper Lias of Dumbleton, Gloucestershire. The specimen is merely the impression of the dorsal surface of a pen to which are attached a few fragments of the pen. It is 108 mm. long. Shows the broadly-rounded posterior end, which in this case is split open for a distance of about 20 mm. The greatest width of the pen is now about 46 mm., but each margin is very imperfect, so that originally it must have been much wider than this. The width at the anterior end must have been about 30 mm., for the impression of the half of the pen, which is all that is preserved here, is 15 mm. at the posterior part of the specimen, this impression of the dorsal surface exhibits obscurely the sudden binding of the lines of growth.

All these specimens appear to be referable to the same species, viz. *Teuthopsis*.

Brunelii Deslongchamps, originally described from the Upper Lias of Normandy.¹ The British Museum includes a number of examples from Normandy, chiefly from Curcy; one, however, the original of Deslongchamps' fig. 3, is from Amayé-sur-Orne [74009] and another from the Carrières de Laquaine. The last-mentioned specimen is interesting because it is associated with the remains of an ink-bag and a portion of the mantle of the creature. The largest specimen [74011] is 170 mm. long, and lacks a small piece at the anterior end,

¹ Eudes-Deslongchamps. "Mémoire sur les Teudopsides, animaux fossiles, voisins des calmars," *Mém. Soc. Linn. Norm.*, tom. v. (1835), pp. 74-76.

which is here 9 mm. wide, being interrupted by the edge of the slab. The extreme width of the pen is not shown, but half the width equals 34 mm.

The British Museum collection [22580] contains a fairly well-preserved example from the Lias east of Bal, Württemberg. The dorsal surface is exhibited, but only in part ; one portion, however, is well shown, this has a length of 105 mm., and its greatest breadth 25 mm., so that the full width of the pen must have been quite 50 mm.

EXPLANATION OF PLATE A.

Geoteuthis agassizii, Deslongchamps.

Horizon : " Fish-bed." Upper Lias [Whitbian].

Hemera : *Exarati*.

Locality : Alderton Hill, Gloucestershire.

Collection : Cheltenham Town Museum.

EXPLANATION OF PLATE B.

Teuthopsis brunelii, Deslongchamps.

Horizon : " Fish-bed." Upper Lias [Whitbian].

Hemera : *Exarati*.

Locality : Alderton Hill, Gloucestershire.

Collection : Cheltenham Town Museum.

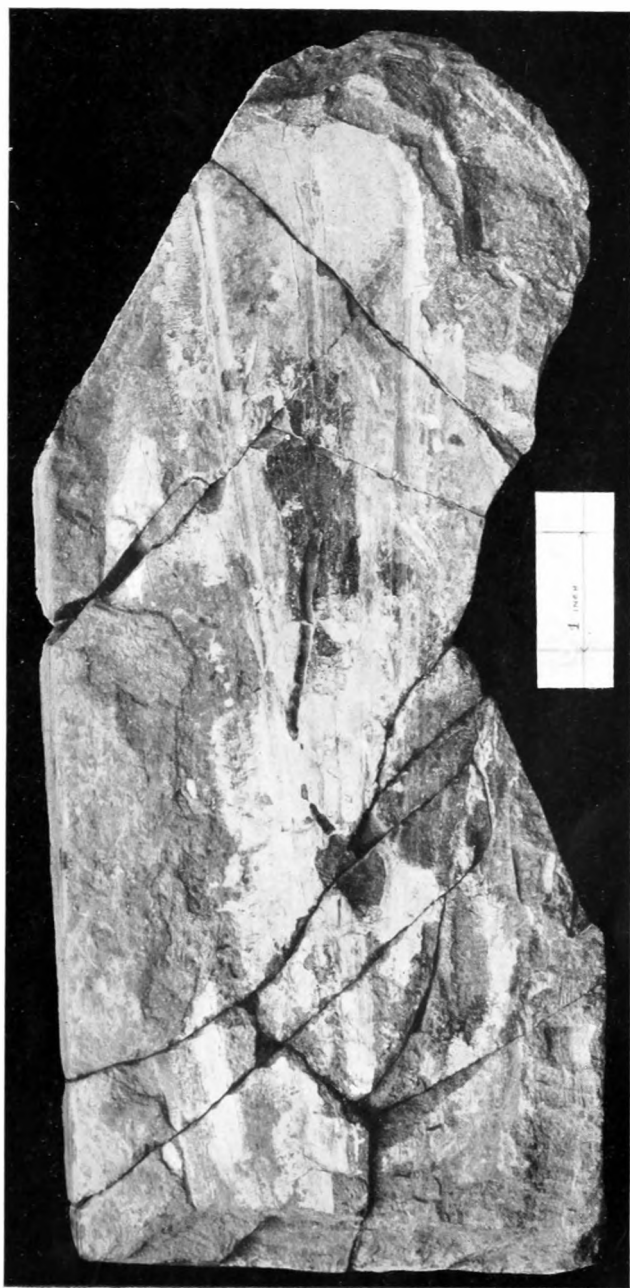


PLATE B.

