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Notes on some borings, Angela Marmont Centre, Natural History Museum, London

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Abstract

Fossil specimens are collected more expeditiously than they can be documented and published. Thus, museum collections invariably contain interesting specimens that remain undescribed. Herein, we document three intriguing specimens from the Angela Marmont Centre. All are borings. *Apectoichnus longissimus* (Kelly and Bromley) from the Albian of Kent is phosphatized and preserves two generations of borings in wood. A single Recent *Caulostrepsis taeniola* Clarke is associated with multiple *Maeandropolydora sulcans* Voigt, emphasising their common derivation as the spoor of spionid polychaetes. *Maeandropolydora* is reported from the Recent of Lyme Regis, Dorset, and Blue Anchor, Somerset, for the first time.

Key words: ichnology, systematics, *Apectoichnus*, *Caulostrepsis*, *Maeandropolydora*

1. Introduction

This contribution is concerned with two aspects of our science, known to all, but discussed by few. It is much easier and faster to collect fossil and rock specimens than it is to analyse and describe them. In consequence, our museums abound with undescribed specimens that may or may not be of significance, but, until they are documented, they cannot be assessed or even known to exist by the many. The late Fiona Fearnhead recognised this anomaly, but had made little progress in her crusade to document the specimens of the Angela Marmont Centre (AMC). We are pleased to present this account of some of the borings in the collection of the AMC,

each of which presents some feature(s) that we consider worthy of record.

Specimens are deposited in the Angela Marmont Centre for UK Nature, Natural History Museum, London (prefix NHMUK AMC). The images were taken with a Canon G11 digital camera in natural light. Terminology of the morphology of the borings follows Häntzschel (1975), Kelly & Bromley (1984) and other standard references.

2. Systematic ichnology

Ichnogenus *Apectoichnus* Donovan, 2018

Type ichnospecies: *Teredolites longissimus* Kelly and Bromley, 1984, pp. 804, 806, text-fig. 11 (Donovan,

2018, p. 96), from the Aptian (Lower Cretaceous) of Hythe, Kent, England.

Diagnosis: (After Donovan, 2018, p. 96.) Elongate borings, commonly circular in section, smooth-sided, straight or sinuous to contorted and intertwined, with or without a calcareous lining. The boring may change direction and cause a constriction of the tube, but tubes are commonly of more or less constant diameter. May be solitary or gregarious.

Range: Cretaceous to Recent (Bromley, 2004, p. 462).

Remarks: For discussion of the relevance of calcareous lining to ichnotaxonomy, see Donovan (2002).

***Apectoichnus longissimus* (Kelly and Bromley, 1984)**
(Fig. 1)

Material: One specimen, NHMUK AMC 0627 (Fig. 1).

Locality and horizon: “Fossil Driftwood with Borings of Unident. Mollusc. Mammillatum Zone. Squerries Main Pit. Westerham. Kent” (specimen label).

The Mammillatum Zone is upper Lower Albian, Lower Cretaceous; Gault Formation (Ewin, 2018, p. 27).

Diagnosis: As for the ichnogenus.

Description: Specimen phosphatized, including sediment infill of borings, the calcareous lining (Donovan, 2002) and the remnants of the wood (Gale and Owen, 2010, p. 14). Borings of circular section: one certain specimen oriented parallel to the grain of the wood (= long axis of specimen) and straight, cylindrical, tapering slightly if at all; or irregular, gregarious, sinuous to geniculate, conical, cross-cutting grain, but penetrating wood rather than other specimens, clustered towards wider end of specimen (Fig. 1). Some sinuous borings have obvious annulations/growth lines in the boring lining. Irregular branching channels on the surface of the long boring (that is, inside the lining) may be flaws of the phosphatization process or burrows close to *Arachnostega gastrochaenae* Bertling, 1992 (not figured).



Fig. 1. *Apectoichnus longissimus* (Kelly and Bromley), NHMUK AMC 0627. Squerries Main Pit, Westerham, Kent; Mammillatum Zone, upper Lower Albian, Lower Cretaceous, Gault Formation. To the left the infill of a straight boring is protruding from the wood; curved borings are concentrated to the right. Scale in cm and mm.

Remarks: For a specimen to be deposited in a museum by an (anonymous) donor, it presumably had one or more points that were considered noteworthy. We would suggest that NHMUK AMC 0627 (Fig. 1) shows several features of its preservation that are worthy of comment. Certainly, the incidence of *Arachnostega gastrochaenae* in *Apectoichnus longissimus* appears to be a first such occurrence. The phosphatization is of interest in the number of different substrates that have been equally effected. The wood, the infill of the borings (presumably originally Gault Clay) and the formerly calcitic linings of the borings are all equally mineralized. The mineralization of the boring fill is at least broadly analogous to the solid preservation of the infilled body chambers of ammonites (Gale and Owen, 2010, p. 14). Such preservation is likely "... present throughout the Gault of southern and southeastern England ... Commonly found ... at the base of the Gault at Folkestone" (Todd, 2010, p. 50).

A further feature is the occurrence of *A. longissimus* both parallel to the grain of the wood, and (subsequent?) borings perpendicular and oblique to the grain (compare with Hadland, 2018, p. 48, top of page). This is presumed to represent two different times of infestation. For discussion of the possible implications of such associations, see Donovan et al. (2009).

Ichnogenus *Caulostrepsis* Clarke, 1908

Type ichnospecies: *Caulostrepsis taeniola* Clarke, 1908, p. 169, pl. 12, figs. 3, 4, from the Lower Devonian of Germany (Häntzschel, 1975, p. W126).

Diagnosis: (After Bromley and D'Alessandro, 1983, p. 286). Single-entrance borings or embedment structures having a pouch shape produced by a gallery bent in a U. More complex structures can be produced by development of multiple lobes on the same basic U-plan. The limbs may be clearly visible throughout their length and connected by a vane, or they may be fused to produce an oval or flattened pouch lacking a vane. All intermediate states, involving an axial depression, occur. At the distal end the width is at least double the thickness; the shape in cross-section here varies from flat-oval, elliptical or constricted to dumbbell-shaped. At the apertural end the width is normally noticeably less than at the distal end, but the shape of the section may be more or less the same, or

subcircular. In some cases symmetrical rows of deep pits may be developed towards the apertural end. The aperture itself may have the same form as the proximal cross section, or it may be modified by the development of superficial branches or apertural grooves, normally 2 to 4 in number, radiating from it.

Range: Devonian to Recent (Bromley, 2004, p. 460).

Remarks: *Caulostrepsis* is particularly common in bio- and lithoclasts around the coast of England (Donovan et al., 2019).

Caulostrepsis taeniola Clarke, 1908

(Fig. 2)

Material: A single specimen, NHMUK AMC 2016-0909 (Fig. 2), without counterpart.

Locality and horizon: Recent from float, the coast at Lyme Regis, Dorset. Although the label states "Lower Jurassic", this is considered improbable.

Diagnosis: (After Bromley and D'Alessandro, 1983, p. 287). Gallery cylindrical, bent in a narrow U which is sometimes enlarged in the shape of a tongue. The inward-facing margins of the limbs are always interconnected by a distinct vane. Limbs closer or partially fused towards the apertural extremity. Transverse section dumbbell-shaped, aperture 8-shaped.

Description: A slender, U-shaped boring, 13.5 mm long, the two branches parallel and separated by a central vane. The curved extremity is slightly swollen. Branches cylindrical in section, slightly divergent at apertural end (Bromley and D'Alessandro, 1983, fig. 2).

Remarks: *Caulostrepsis* is commonly gregarious and locally abundant in beach clasts (see, for example, Donovan, 2017). To find one, solitary *C. taeniola* is notable. Some *M. sulcans* borings are certainly convergent on the form of *Caulostrepsis* (such as towards the left in Fig. 2), suggesting an unrecognised environmental control on the boring forms of spionid polychaetes.

Ichnogenus *Maeandropolydora* Voigt, 1965

Type ichnospecies: *Maeandropolydora decipiens* Voigt, 1965, p. 204, pl. 27, figs. 1, 2, from the bryozoan layer in the Kunrader Limestone facies, Maasticht Formation of the lower Upper Maastichtian (*Belemnitella junior* zone; Christensen, 1995, text-fig. 9; Jagt and Jagt-Yazykova, 2012).

Diagnosis: (After Bromley and D'Alessandro, 1983, p. 293). Long cylindrical galleries having two or more apertures, running through the substrate sinusuously or in irregular contortions. Galleries may run parallel to contact with each other in pairs, with or without fusion. Loose or tight loops may occur; the limbs of these may be connected by a vane or form a pouch.

Range: Possibly Silurian and/or Devonian, certainly Triassic to Recent (Bromley, 2004, p. 461, fig. 1).

Remarks: Donovan et al. (2019) identified a trinity of common borings found around the coast of the British Isles, namely *Caulostrepsis* Clarke (see above), *Entobia* Bronn and *Gastrochaenolites* Leymerie. Other borings occur more patchily and it is

notable to add two sites to the distribution of *Maeandropolydora* herein.

Some confusion may exist due to the too limiting diagnosis in the *Treatise* (Häntzschel, 1975, p. W129), "... furrows sunk into outer or inner side of Cretaceous oysters and pectinids". The stratigraphic range extends far beyond the Cretaceous and substrates include the lithic as well as bioclasts. Such specificity in defining substrates is counterproductive (Pickerill, 1994), but sadly continues. For example, Brustur (2020, p. 203) considered that the trace *Patellichnus brusturii* Dragastan was limited to "... the surface of *Chaetetopsis zonata* colony (Demospongia)" and are "... produced by patello-gastropods". Both statements are likely to prove too restrictive in the future.



Fig. 2. *Caulostrepsis taeniola* Clarke (upper centre) and *Maeandropolydora sulcans* Voigt (all other borings), NHMUK AMC 2016-0909. Lyme Regis, Dorset, Recent. *Maeandropolydora sulcans* is also common on the reverse face of the specimen and at the end to the left. The image is in the assumed life orientation of the borings. Scale in cm and mm.

***Maeandropolydora sulcans* Voigt, 1965**

(Figs. 2, 3)

Material: Two specimens, NHMUK AMC 2024-15990 (collected by B. D.) and 2016-0909 (collected by F. E. F.), both without counterpart.

Localities and horizon: Both specimens are Recent. NHMUK AMC 2016-0909 is from the coast at Lyme Regis, Dorset. Although the label states “Lower Jurassic”, this is considered unlikely, the borings being unfilled, fresh and extending through most of 360° around a siltstone pebble. NHMUK AMC 2024-15990 is from Blue Anchor, Somerset.

Diagnosis: (After Bromley and D’Alessandro, 1983, p. 295). Cylindrical gallery having at least two apertures, irregularly contorted, commonly bent in loops, never showing fusion where walls are in mutual contact; vane absent.

Description: Both specimens comprised of well-indurate siltstone, not bedded, coloured beige (Lyme Regis) or grey (Blue Anchor). Borings not infilled. Borings multiple, sinuous, forming loops varying from parallel-armed to broad and open (Figs. 2, 3); associated with a single *Caulostrepsis* on NHMUK AMC 2016-0909 (Fig. 2). Borings of consistent

width within any individual, branches rare although cross-cutting common.

Remarks: These borings are notable because *Maeandropolydora* is not widely reported from the coast of southern England. It is an allochthonous component derived from the *Trypanites* Ichnofacies *sensu* Donovan et al. (2019). Like *Caulostrepsis*, *Maeandropolydora* is the spoor of spionid polychaetes (Bromley, 2004, p. 461). It has yet to be identified from the North Sea coast or the Irish Sea coast of Lancashire (Donovan, research in progress).

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4. References

Bertling, M. 1992. *Arachnostega* n. ichnogen. – burrowing traces in internal moulds of boring bivalves (Late Jurassic, northern Germany). *Paläontologische Zeitschrift* 66: 177–185.



Fig. 3. *Maeandropolydora sulcans* Voigt, NHMUK AMC 2024-15990. Blue Anchor, Somerset, Recent. *Maeandropolydora sulcans* is also common on the reverse face of the specimen and on the bottom. The life orientation of the borings is uncertain. Scale in cm and mm.

- Bromley, R. G. 2004. A stratigraphy of marine bioerosion. In D. McIlroy, ed., *The Application of Ichnology to Palaeoenvironmental and Stratigraphic Analysis*. Geological Society, London, Special Publication 228: 455–479.
- Bromley, R. G., and A. D'Alessandro. 1983. Bioerosion in the Pleistocene of southern Italy: ichnogen-era *Caulostrepsis* and *Maeandropolydora*. *Rivista Italiana di Paleontologia e Stratigrafia* 89: 283–309.
- Brustur, T. 2020. Modern limpet home scar on the Devonian cliffs, north coast central and west Cornwall (United Kingdom), and Lower Cretaceous *Patellidichnus* from Romania. *Geo-Eco-Marina* 26: 195–209.
DOI: 10.5281/zenodo.4700209
- Christensen, W. K. 1995. *Belemnitella* from the Upper Campanian and Lower Maastrichtian Chalk of Norfolk, England. *Special Papers in Palaeontology* 51: 1–84.
- Clarke, J. M. 1908. The beginnings of dependent life. *New York State Museum Bulletin* 121: 146–169.
- Donovan, S. K. 2002. A new ichnospecies of *Gastrochaenolites* Leymerie from the Pleistocene Port Morant Formation of southeast Jamaica and the taphonomy of calcareous linings in clavate borings. *Ichnos* 9: 61–66.
DOI: 10.1080/10420940190034085
- Donovan, S. K. 2017. Two forms of the boring *Caulostrepsis taeniola* Clarke on Queen Victoria's bathing beach, East Cowes. *Wight Studies: Proceedings of the Isle of Wight Natural History & Archaeological Society* 31: 98–101.
- Donovan, S. K. 2018. A new ichnogenus for *Teredolites longissimus* Kelly and Bromley. *Swiss Journal of Palaeontology* 137: 95–98.
DOI: 10.1007/s13358-017-0142-9
- Donovan, S. K. with P. H. Donovan, and M. Donovan. 2019. A recurrent trinity of Recent borings in clasts around the southern and western North Sea. *Bulletin of the Geological Society of Norfolk* 68 (for 2018): 51–63.
- Donovan, S. K., D. A. T. Harper, and J. A. Rasmussen. 2009. Taphonomy of logs bored with *Teredolites longissimus* Kelly and Bromley in the Danian (Lower Paleocene) of West Greenland. *Ichnos* 16: 186–192.
DOI: 10.1080/10420940802686020
- Ewin, T. A. M. (ed.). 2018. *British Mesozoic Fossils*. Eighth edition. Natural History Museum, London.
- Gale, A. S., and H. G. Owen. 2010. Introduction to the Gault. In J. R. Young, A. S. Gale, R. I. Knight, and A. B. Smith, eds., *Fossils of the Gault Clay*. Palaeontological Association Field Guide to Fossils 12: 1–15.
- Hadland, P. 2018. *Fossils of Folkestone, Kent*. Siri Scientific Press. Manchester.
- Häntzschel, W. 1975. Trace fossils and problematica (2nd edition, revised and enlarged). In C. Teichert, ed., *Treatise on Invertebrate Paleontology, Part W, Miscellanea, Supplement 1*. Geological Society of America and University of Kansas. Boulder and Lawrence.
- Jagt, J. W. M., and E. A. Jagt-Yazykova. 2012. Stratigraphy of the type Maastrichtian – a synthesis. In J. W. M. Jagt, S. K. Donovan, and E. A. Jagt-Yazykova, eds., *Fossils of the type Maastrichtian (Part 1)*. *Scripta Geologica Special Issue* 8: 5–32.
- Kelly, S. R. A., and R. G. Bromley. 1984. Ichnological nomenclature of clavate borings. *Palaeontology* 27: 793–807.
- Pickerill, R. K. 1994. Nomenclature and taxonomy of invertebrate trace fossils. In S. K. Donovan, ed., *The Palaeobiology of Trace Fossils*. Chichester, Wiley: 3–42.
- Todd, J. A. 2010. Bioerosive trace fossils. In J. R. Young, A. S. Gale, R. I. Knight, and A. B. Smith, eds., *Fossils of the Gault Clay*. Palaeontological Association Field Guide to Fossils 12: 47–51.
- Voigt, E. 1965. Über parasitische Polychaeten in Kreide-Austern sowie einige andere in Muschelschalen bohrende Wurmer. *Paläontologische Zeitschrift* 39: 193–211.