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A well-preserved crinoid stem in a building stone (Early Carboniferous, Mississippian) at Maastricht, the Netherlands

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Abstract

An exceptionally well-preserved and long crinoid stem is exposed on a slab of decorative Lower Carboniferous (Mississippian) limestone in front of an optician's in Maastricht-Wyck, the Netherlands. The pluricolumnal is incomplete, but is *c.* 176.5 mm long by at least 7.0 mm wide and with a broad axial canal. The column is heteromorphic, N3231323. The specimen most likely represents a cladid or monobathrid that was preserved parallel to bedding.

Key words: urban geology, Palaeozoic, limestone, taphonomy

Introduction

Upper Palaeozoic limestones, mainly Mississippian (Dinantian, Lower Carboniferous), are commonly found as building stones and street furniture in Dutch cities (Verhofstad and Van den Koppel, 2006; Dubelaar *et al*., 2007, 2014; De Ceukelaire and Dusar, 2015; Wyse Jackson, 2015, Reumer, 2016). Rocks of this age and broadmorphology do not outcrop in the Netherlands, but have been imported, mainly from southern Belgium (Dinant and Namur areas) and, in recent years, from Ireland. The surfaces of these slabs and decorative stones have been cut and polished, although at least some have been etched by many years of acid rain. The enclosed fauna of these rocks includes the common trinity of marine fossil groups typical of the post-Cambrian stages of the Palaeozoic, namely articulated brachiopods stony (most prominently productids and spiriferids), corals (tabulates, and solitary and colonial rugose corals) and debris of crinoids.

The last-named group occurs most commonly as single ossicles (mainly columnals) and rarer pluricolumnals. Two of the authors, S.K.D. and J.W.M.J., both have a specialist research interest in fossil echinoderms. Hitherto, they have never noted a section in such limestone street furniture of the Netherlands that indicated a more complete specimen, such as an echinoid test or a crinoid theca. It is therefore significant to report an unusually complete extinct crinoid from a limestone in a Dutch street.

Terminology of the crinoid endoskeleton follows Moore *et al*. (1968, 1978), Webster (1974) and Ubaghs (1978). Our philosophy of open nomenclature follows Bengtson (1988).

Locality and horizon

The crinoid specimen (Fig. 1) is preserved on the bottom right-hand side of a facing stone at the front of an optician's, Mestrini Optiek, at Stationsstraat 58, 6221 BR Maastricht-Wyck. The rock is a medium grey limestone rich in echinoderm debris and brachiopods. It is closely comparable, both in facies and macrofossil content, to a number of Lower Carboniferous (Dinantian, Mississippian) limestone types from southern Belgium (Dinant and Namur areas; Poty *et al*., 2002) that have commonly been used in the building trade of southern Limburg, the Netherlands ('Petit granit de l'Ourthe' of Dubelaar *et al*., 2007, pp. 32, 63-76; 'Belgische Blauwe Hardsteen' of De Ceukelaire and Dusar, 2015, fig. 7).

Description

Pluricolumnal long, *c.* 176.5 mm, but incomplete. Cross-section of column and axial canal may be circular by comparison with disarticulated columnals of similar geometry preserved in close association (Fig. 1). Column at least 7.0 mm in maximum diameter. Features of articular facet not seen (articulation most probably marginal



Fig. 1. Cladid or monobathrid sp. indet., in Dinantian (Mississippian, Lower Carboniferous) limestone outside Mestrini Optiek, Stationsstraat 58, Maastricht-Wyck, the Netherlands. Note that disarticulated crinoid debris (mainly columnals) forms a prominent part of the matrix. Scale bar is in cm.

symplexy; see discussion in Donovan, 1990). Axial canal broad, constricted by jugula. Latera gently convex to planar, except for nodals (N) and priminternodals (1IN) which are more strongly convex. Column heteromorphic, N3231323, may be consistent throughout length of pluricolumnal.

Discussion

This specimen is unusually complete. Examination of any Dinantian (Mississippian) limestone used as building stone or street furniture in a Dutch city is likely to encounter a myriad of disarticulated crinoid columnals, associated with rarer brachials and short pluricolumnals (see matrix in Fig. 1). We have not hitherto discovered such a long pluricolumnal as the one described above. Its preservation must be regarded as exceptional.

Classifying this specimen is problematic as no part of the crown, the focus of most crinoid systematic studies, is preserved. However, a stem of this size and geometry in Lower Carboniferous rocks is most likely to be derived from either a cladid or a monobathrid camerate. We therefore refer to this crinoid as a cladid or monobathrid sp. indet.

It is most probable that this pluricolumnal was preserved on a bedding surface. How much more complete the specimen was is impossible to determine, but some of its length has undoubtedly been lost through the vagaries of cut effect (see Donovan and Pickerill, 1995). What can be inferred is that the limestone bed has been cut and/or polished parallel to bedding. No other long crinoid pluricolumnals were apparent on this slab and we propose that such preservation was exceptional in the limestone bed from which it was collected.

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