

## Discussion on ‘An enigmatic echinoid spine from south Devon, UK: Devonian or Cretaceous?’, *Proceedings of the Yorkshire Geological Society*, 61, 165–167



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The echinoid spine described by [Donovan & Fearnhead \(2017\)](#) is reportedly from close to the famous Wolborough Quarry [SX 852704], which is located just to the SW of Newton Abbot in south Devon. The Middle Devonian limestones of this quarry have been described by [Scrutton \(1978\)](#), [Leveridge \*et al.\* \(2003\)](#), [Leveridge \(2011\)](#) and [Wilmot \*et al.\* \(2014\)](#). As indicated by the authors, and previous research, cherts are exceedingly rare in these limestones.

The paper explores the possibility that these echinoderm spines are Cretaceous in age. This seems to be the most likely explanation as both cherts and flints of Cretaceous age are known from the surrounding area. There are two immediate possibilities:

- (1) cherts of mid-Cretaceous (Albian) age that are locally well-known; or
- (2) flints of Turonian–Campanian age that have been described from the nearby Haldon Hills, and are derived from a time when Dartmoor was, almost certainly, inundated by the Cretaceous sea.

### Mid-Cretaceous cherts

Around the Bovey Basin are a series of outcrops of the Upper Greensand Formation, the majority of which contain brown to grey-coloured cherts in which one can often identify the original bedding structures and bioturbation. One of the best localities in which to see these cherts is Zig Zag Quarry [SX 878690], which lies immediately to the SE of Newton Abbot in the Decoy Basin. A working quarry, it is often difficult to access a face within the Upper Greensand Formation in which the cherts can be found. These are the Cullum Sands-with-Cherts Member of the Haldon Sands Formation ([Hamblin & Wood 1976](#)) and are characteristically coarse-to fine-grained, glauconitic sands with layers of nodular, brown, fresh chert. Overlying the *in-situ* Cretaceous rocks are the Aller Gravels that are formed of sands, silts, and containing abraded flints and cherts. These are thought to be of Paleogene age ([Edwards 1973](#); [Edwards & Freshney 1982](#); [Selwood \*et al.\* 1984](#)).

The cherts from both deposits are exceptionally fossiliferous, often being crowded with fossils such as bivalves

(*Exogyra* sp.), serpulids (*Rotularia concava*) and the large foraminiferid *Orbitolina* sp. (see [Nicholas & Hart 2004](#), fig. 2). Orbitolinids have also been recorded at Wolborough ([Schroeder \*et al.\* 1986](#)), where – in 1974 – a trench was constructed [SX 855700] near the limestone quarry in order to expose the Upper Greensand Formation that had been discovered during the BGS-funded re-mapping of the area by the University of Exeter ([Selwood \*et al.\* 1984](#), p. 122, fig. 21).

### Upper Cretaceous flints

Resting on the Upper Greensand Formation across the top of the Haldon Hills are a series of flint gravels of Eocene age ([Jukes-Browne & Hill 1904](#); [Hancock 1969](#); [Hart 1982](#)). The fauna collected from these flint gravels ranges from the *Sternotaxis planus* Zone of the Turonian to the *Belemnitella mucronata* Zone of the mid-Campanian. Similar gravels are also known from a number of locations across SE England, including Orleigh Court in north Devon ([Rogers & Simpson 1937](#)).

### Summary

There are a great many potential sources of fossiliferous cherts and flints in the Newton Abbot area of south Devon. A study of the specimen should indicate if it is typical of either of these chert or flint assemblages as they appear very different, even in hand specimen. It is not possible to speculate which is the case using the image presented in [Donovan & Fearnhead \(2017\)](#), fig. 1).

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