

Lower Devonian brachiopod faunas from within the Meneage mélange, south Cornwall

K.M. EVANS

15 Christchurch Gardens, Reading RG2 7AH



Introduction

The work of Sadler (1973) on conodont faunas from the Roseland area of south Cornwall has enabled a Devonian succession to be recognised locally which includes a condensed Gedinnian -- Eifelian sequence. No macrofauna has been recorded from the Roseland succession to date and, similarly, none has been recorded from the main Devonian outcrop of south Cornwall with the exception of fragmentary plant material from the problematical Gramscatho and Mylor Beds (Lang 1929).

Palaeozoic macrofaunas, including brachiopods of Ordovician and Devonian age, were described by Stubblefield (1939) from beds which are now considered to lie within the Meneage mélange (Vearncombe 1980). In the present work the determinations of Stubblefield are revised, however, the Emsian date is confirmed and it is considered that the fauna is sufficiently well preserved to enable a Lower Emsian position to be recognised.

Description

An Emsian fauna was described by Stubblefield (1939) from two localities within the "Meneage Crush Zone" to the north of the Lizard peninsula: a small quarry at Mudgeon (Grid reference SW738246) and from the head of Gillan Creek (SW7724). It is unfortunate that neither of these localities is accessible today: the Mudgeon quarry has been filled in and the Gillan Creek locality is covered by a thick layer of Recent sediments.

Examination of the material described and figured by Stubblefield (1939), which is held in the collections of the Institute of Geological Sciences at London, has enabled the following brachiopod fauna to be determined (Table 1).

(this work)

Platyorthis cf. *circularis* (Sowerby 1842)
Chrinistrophia elegans (Drevermann 1902)
Plebejochonetes plebejus (Schnur 1853)
Ardusspirifer arduennensis (Schnur 1853)

A footnote (Stubblefield 1939, p.65) noted that the material which had been referred to *S.* cf. *hercyniae* had alternately been referred to *S.* cf. *arduennensis*. Re-examination of this material enables it to be referred to *A. arduennensis* s.l. but the specimens are not sufficiently

well preserved to enable a subspecific determination to be made. The *A. arduennensis* group has been subject to detailed examination and numerous subspecies and forms have been recognised from Germany (Solle 1953; Jahnke 1971), however, the Cornish material can only be taken to indicate an Emsian age.

Recent works (Jahnke 1971; Harper and Boucot 1978) have given the range of *C. elegans* as restricted to the Lower Emsian and on this basis it is considered a Lower Emsian position is indicated for the Mudgeon locality. The Gillan Creek locality did not yield this species, or any spirifers, so that the age can only confidently be given as early Devonian, probably Emsian.

Discussion

These isolated Lower Devonian horizons have been previously interpreted as exotic blocks within a crush zone or mélange (Edmonds and others 1975; Vearncombe 1980) which seems to be the most likely explanation; the source of this exotic material is not, however, immediately apparent. The main outcrop of the Lower Devonian in north Cornwall is the Meadfoot Group (Harwood 1976) which would appear to be a possible source, but problems arise when the brachiopod fauna is examined in detail. The fossiliferous horizons of the Meadfoot Group in Cornwall, around Looe and Fowey, have yielded brachiopod faunas indicative of an Upper Siegenian position (Evans 1980; 1981). The younger horizons of the Meadfoot Group in Cornwall, mapped as the Staddon Grit (Ussher 1907; Ussher and others 1909), are very poorly fossiliferous and no fauna of undoubted Emsian age has been recorded.

The record of *A. arduennensis* in Cornwall is limited to a single, unfigured reference (Collins 1910, p. 400) which

(Stubblefield 1939)

"*Orthis*" sp.
Douvillina elegans
Chonetes (Plicochonetes) plebejus
Spirifer cf. *hercyniae*

cannot be confirmed as the specimen has not been located in any museum collections. *A. arduennensis* s. l. is a common fossil in the Meadfoot Group of the Torbay area which is of Emsian age (Evans 1980) but *C. elegans* has not been recorded.

C. elegans is a common fossil in the Lower Emsian of the Rhenish magnafacies (Erben and Zagora 1968) of Germany but the record of this species from Mudgeon is unique in Great Britain. The absence of *C. elegans* from the Lower Emsian horizons of the Meadfoot Group, although this unit is typical of the Rhenish magnafacies, may indicate that the Mudgeon beds were derived from outside the main British Lower Devonian succession.

It has been suggested that the exotic blocks in south Cornwall were derived from the south (Edmonds and others 1975, p.31) which might explain the discrepancies between this locality and the main Lower Devonian outcrop. While this explanation may be the case it would seem that the Armorican Massif, which includes extensive Lower Devonian horizons, is unlikely to be the source area as there is no record of *A. arduennensis* and the record of *C. elegans* is restricted to a single, unfigured reference (Renaud 1942).

It is unreliable to attempt to identify the origin of such scanty material but it is suggested here that the source lay within the Rhenish magnafacies, possibly to the south, in an environment partially isolated from where the Meadfoot Group was being deposited.

Conclusions

Devonian brachiopod faunas from exotic blocks within the Meneage m61ange are indicative of an early Emsian age. The fauna and lithology are referable to the Rhenish magnafacies but the brachiopods are not consistent with the Meadfoot Group of south-west England. A southerly source of this material is possible but it is unlikely to have been derived from the Armorican Massif.

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