The Brachiopod Foliomena Fauna in the Upper Ordovician Ballyvorgal Group of Slieve Bernagh, County Clare
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Source: *Journal of Earth Sciences*, Vol. 2, No. 2 (1979), pp. 189-192
Published by: Royal Irish Academy
Stable URL: http://www.jstor.org/stable/30002273
Accessed: 07/08/2013 19:57

THE BRACHIOPOD *FOLIOMENA* FAUNA IN THE UPPER ORDOVICIAN BALLYVORGAL GROUP OF SLIEVE BERNAGH, COUNTY CLARE

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(Received March 26th 1979)

Abstract

The sparse and poorly preserved brachiopod fauna of the Ballyvorgal Group (upper Ordovician) of Slieve Bernagh, County Clare is re-examined and considered to belong to the distinctive *Foliomena* fauna, a late Ordovician deep-water shelly assemblage. The stratigraphical and palaeoecological implications of this occurrence are briefly discussed and the contribution to the understanding of the depositional environment of the Ballyvorgal Group assessed. The Irish occurrence is found to be consistent with the other known environmental settings of the *Foliomena* fauna.

Introduction

Sheehan and Lespérance (1978) in a recent study of a brachiopod fauna from the Ashgill White Head Formation at Percé, Quebec have emphasised the need to educate field geologists about the kinds of fossil encountered in deep-water Ordovician rocks. Reports and illustrations of even small and poorly preserved shells are therefore needed to facilitate comparisons between such faunas and to assist in documenting their distribution and development. This paper records such a fauna from southwest Ireland.

The Ballyvorgal Group, which crops out in the Slieve Bernagh inlier, County Clare, has recently been described by Weir (1962). Within the group a good shelly fauna was obtained from a thin band approximately 2 m above the base of the brown mudstone consisting principally of trilobites but also of brachiopods, crinoid ossicles, and cystid plates (*op. cit.* p.240). Weir (1959) revised in some detail the trilobites which dominate the fauna and concluded that this assemblage belonged to the distinctive upper Ordovician *Cyclopyge* fauna.

Often occurring elsewhere with the *Cyclopyge* fauna is a distinctive assemblage of commonly minute and thin-shelled brachiopods. This is a low diversity association typically composed of certain key elements e.g. *Dedzetina, Sericoidea, Christiania,* and *Foliomena,* characteristically enclosed by fine-grained sediments. This situation occurs in the Jerrestad Mudstone of Sweden (Sheehan

J. Earth Sci. R. Dubl. Soc. **2,** 1980, 189-192.

1973), the Králův Dvůr Formation of Bohemia (Havliček and Vaněk 1966), and in parts of the Upper Whitehouse Group at Girvan (Harper, in press). A re-examination of the Ballyvorgal brachiopod fauna suggests that the same relationship occurs in the County Clare succession.

The *Foliomena* fauna of the Ballyvorgal Group

Weir (1962, p.241) recorded the following brachiopods from the Ballyvorgal Group:

Cyclospira sp.
Christiania sp.
Ptychopleurella sp.
Chonetoidea sp.

Over the last few years more information has become available on the occurrence and systematics of this type of faunal association, and a re-examination of this assemblage, through the kindness of Dr Weir, has established the presence of species of the following brachiopod genera (Fig. 1, A-F): *Dedzetina*, *Sericoidea*, *Foliomena*, *Christiania*, and *Cyclospira* together with a leptellinid (gen. et sp. indet.). All the specimens are minute (with the exception of the leptellinid), poorly preserved, and broken in varying degrees. These factors, together with the small size of the sample, preclude any more specific determinations. A larger sample would be desirable not only for specific determinations but also for analysis of the structure of the assemblage, but brachiopods here are rare, and a considerable amount of rock was processed to recover even these few specimens. Furthermore, the original locality is no longer accessible (Weir, personal communication).

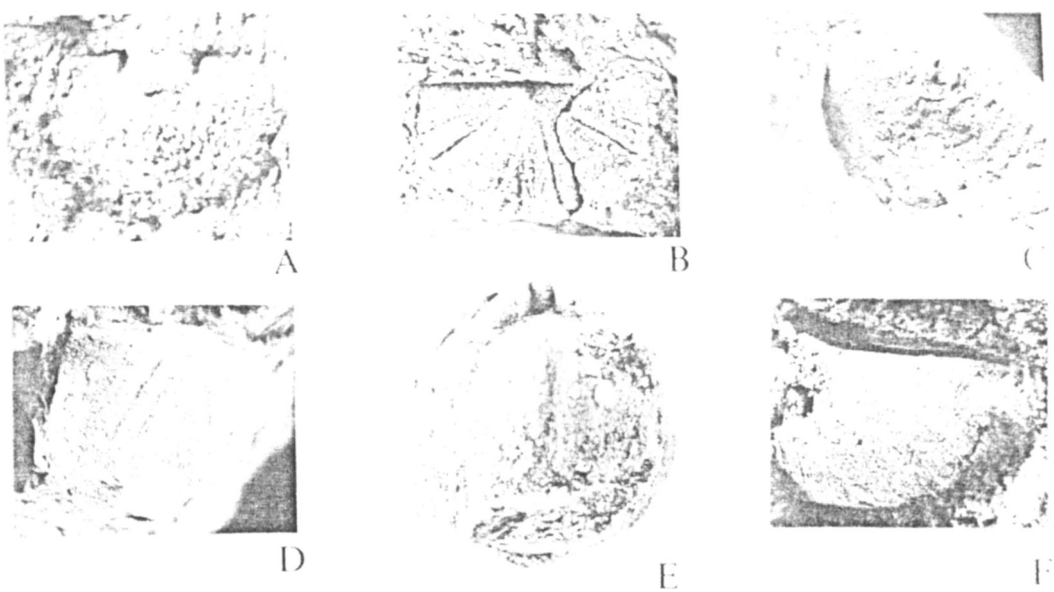

Fig. 1. Brachiopods from the Ballyvorgal *Foliomena* fauna.A. *Dedzetina* sp. (internal mould of pedicle valve) x 20, B. *Sericoidea* sp. (external mould of brachial valve) x 15, C. *Foliomena* sp. (external mould of pedicle valve) x 12, D. *Christiania* sp. (internal mould of pedicle valve) x 6, E. *Cyclospira* sp. (internal mould of pedicle valve) x 10, F. leptellinid gen. et sp. indet. (internal mould of pedicle valve) x 4.

The *Foliomena* fauna – general considerations

The *Foliomena* Community of Sheehan (1973) is deemed to be characteristic of relatively deep-water settings (Sheehan and Lespérance 1978, p.454), and moreover Sheehan (1977) has suggested that supposed epiplanktonic species (see Bergström 1968) may have attached themselves to fallen seaweed on the ocean floor. Clearly on the available evidence there can be no absolute confirmation of this envisaged habit. Harper (in press) has argued that, since the autecology of the individual elements of such an assemblage is in dispute, the use of the less interpretive term *Foliomena* fauna is preferable to that of *Foliomena* 'Community'. Percival (1978) in a thorough appraisal of the palaeoecology of inarticulate brachiopods has also emphasised the need for the sound interpretation of the mode of life of taxa before assignation to a specific benthic, nektic, or planktic community; only then can the relevant comparisons be made. At this time such divisions, if present, in the *Foliomena* fauna cannot be made.

It is probable that the Ashgill Bohemian Province of Williams (1969, p.137) is less controlled by province than by facies. It now appears that most *Foliomena* faunas compare closely at generic level with the isolated Bohemian Province, which is based on the assemblage from the Czechoslovakian Králuv Dvůr Formation.

Stratigraphical and environmental implications

The suggested age of the Ballyvorgal Group is based principally on the report of the occurrence of *Dicellograptus complanatus* Lapworth, 1880 thirty centimetres below the shelly band (J.C. Harper *in* Smyth *et al.* 1939), together with a comparison of the Ballyvorgal *Cyclopyge* fauna with that near the top of the Upper Whitehouse Group described by Reed (1903-1935). But Ingham (*in* Bassett *et al.* 1974; 1978) has reported a similar, previously unknown trilobite fauna from red mudstones at the base of the Upper Whitehouse Group; these beds are of latest Caradoc (Onnian) age. This new record of the *Cyclopyge* fauna at Girvan associated with the first reported pre-Ashgill occurrence of both the genus *Foliomena* and the *Foliomena* fauna (Harper, in press) suggests that comparison with the Girvan faunas cannot be used unequivocally to support an Ashgill age for the Ballyvorgal Group. Evidence of the age of the group thus rests only on J.C. Harper's record of *D. complanatus;* and even this has been described as rather tentative (J.C. Harper *in* Weir 1973). Weir (1973, p.446) considers the Ballyvorgal trilobite fauna, of predominantly both eyeless and large-eyed forms, as suggesting adaptation to a dimness, itself reflecting depth of water. Current activity was only occasional, and the overall setting of the group is considered to lie 'athwart a persistent and major oceanic current system' (*op. cit.*, p.452). Weir's interpretation, then, appears consistent with the known occurrences of the *Foliomena* fauna, which are typically located in relatively deep-water environments. Pickerill and Brenchley (1979, p.260) have recently argued that assemblages of this type may have occurred within normal shelf depths. It is however likely that their comparison of the Berwyn *Onniella* community with the associations mentioned by Sheehan (1977) is unjustified. For, in the Upper Ardmillan succession at Girvan, associations dominated by *Onniella* but also with *Sericoidea,* though admittedly not *in situ,* do appear to have occupied a quite different habitat most probably up-slope from the deeper *Foliomena* fauna (Harper, in press).

Conclusions

The sparse and poorly preserved brachiopods of the Ballyvorgal Group are considered to belong to the distinctive deep-water *Foliomena* fauna. Its occurrence in the County

Clare succession appears environmentally consistent with other reported facies of the fauna; and thus the known spatial distribution of the *Foliomena* fauna is extended to include western Ireland. But since both *Foliomena* and a *Foliomena* fauna are now recorded from late Caradoc (Onnian) rocks at Girvan, this occurrence cannot be used to confirm an Ashgill age for the Ballyvorgal Group.

Acknowledgements

I thank Professor A.D. Wright for his comments on the manuscript and Dr J.A. Weir for the loan of his Ballyvorgal brachiopod collection and for useful discussion. Photographs are by Seán Watters.

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