

Preface

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This two-part special issue, *Brachiopod Research into the Third Millennium*, is published in honour of Sir Alwyn Williams (8 June 1921–4 April 2004). One section deals with fossil brachiopods while the other concentrates on aspects of modern material. The special issue comprises 23 invited papers, all dealing with current brachiopod research. In producing this special issue we honour the immense contribution made by the late Alwyn Williams to this field of research.

Alwyn's direct scientific engagement forms a rich legacy by way of his numerous publications. But the inspiration that he provided to others is specifically acknowledged here. Indeed, amongst the authors of the manuscripts are many colleagues who collaborated and published with Alwyn over the years, as well as younger scientists who were influenced by his work and several who enjoyed the benefit of even the briefest scientific interaction and debate with Alwyn. His scientific thoroughness and indefatigable enthusiasm for his science were inspirational. He provided wholehearted support for promising young scientists and a keen willingness to embrace cutting-edge techniques. This open-minded approach, combined with his scientific rigour, drive and enthusiasm, are illustrated by the breadth and depth of work that Alwyn completed. Those who worked with him were keenly aware of the quality and quantity of work expected together with promptitude of delivery. Brachiopod research benefited greatly from his characteristic drive. For example, Alwyn's deep commitment and qualities of leadership ensured the prompt and timely production of the revised brachiopod volumes of the *Treatise on Invertebrate Paleontology*, the fundamental source of information on the phylum.

The range of research in this special issue is testament to the extent of Sir Alwyn's scientific legacy. His cutting-edge research on statistical methods in brachiopod taxonomy, the use of brachiopods in palaeobiogeographical and environmental analyses, together with his fundamental work on the classification and phylogeny of the group, is matched by the advances he made in studies of the growth and ultrastructure of the brachiopod shell. This special issue could never be comprehensive; there are many more areas of brachiopod research not covered here. But this is a consequence of the good health and high level of activity in contemporary brachiopod research. Nevertheless a number of areas of research require mention.

Alwyn advanced our knowledge of brachiopod growth and evolution through his pioneering ultrastructural studies of brachiopod shells. From 1968 until his death in 2004, Alwyn published about 40 papers dealing with brachiopod shell ultrastructure. It is therefore fitting that several of the papers include work on shell ultrastructure (e.g. Alvarez *et al.* on Megathirididae loop development; Gaspard *et al.* and Lee *et al.* on modern rhynchonelliform brachiopods; and Streng *et al.* on acrotretid-type shell structures within the Linguloidea). Alwyn was also interested in the functional morphology of brachiopods and this theme is pursued by Manceñido & Gourvenec (spire-bearers) and Mergl *et al.* (siphonotretids).

The relationships between biogeography and phylogeny are explored by a number of authors, including Lee *et al.* (Late Cretaceous rhynchonellides), Hiller *et al.* (Kraussinoidea) and Lüter *et al.* (Thecidellina).

This special issue also provides a flavour of the many more innovative areas of research being currently tackled. For example, the interpretation of stable isotopes in brachiopod shell calcite (Angiolini *et al.* and Cusack *et al.*) and macroevolution and phylogenetics (Carlson & Fitzgerald), including combined morphological and molecular approaches (Bitner *et al.*), crystallography (Pérez-Huerta *et al.*) and larval development in the brachiopod shell (Freeman & Lundelius).

As well as these many exciting aspects of brachiopod research *per se*, insights into brachiopod development, evolution and distribution continue to contribute to many wider scientific issues; for example, the papers by Peck on climate change, Cocks & Rong on brachiopod recovery after glaciation, Taddei Ruggerio & Bitner on bioerosion and Harper & Stewart, Lee & Motchurova-Dekova and Zhan & Jin on aspects of biodiversity. Thus, this special edition is not restricted to aficionados of the phylum, but includes those with an appreciation of the wider contribution to the many aspects of science that brachiopod research makes. But brachiopod research is also a dynamic process. The paper by Bassett *et al.* on pedicle preservation in a Silurian rhynchonelliformean brachiopod prompted an immediate reply from Sutton *et al.*, which is published here.

We are delighted that the huge contribution made by Lady Williams to our science is appropriately acknowledged here with the establishment of the new genus, *Joania* (Alvarez *et al.*). It is very appropriate that Joan's substantial support for Alwyn's work, and their generous hospitality and friendship, has been acknowledged spontaneously by many members of our research community. Alwyn receives a similar tribute from Bitner *et al.* with the establishment of the species *Gyrothyris williamsi*, whereas Hints & Harper have removed the fascinating genus *Alwynella* from synonymy with *Grorudia*.

It is appropriate too that we highlight the paper by Tony Wright and Jiayu Rong on Ordovician pentamerides. Alwyn's sense of humour would, no doubt, have approved of a 'Wright & Rong' paper in an issue in his honour!

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