

Palaeobiogeography and Biodiversity  
Change: the Ordovician and  
Mesozoic–Cenozoic Radiations

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# Palaeobiogeography and Biodiversity Change: the Ordovician and Mesozoic–Cenozoic Radiations

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## Preface

Biodiversity change is now one of the most important topics of investigation for biogeographer and palaeobiogeographer alike. Demonstrably, great shifts in the numbers of plant and animal taxa are occurring on certain parts of the Earth's surface at the present day, and much effort is currently being expended to determine why this should be so. Climate change in particular is held by many to be the most likely cause of dramatic range shifts and local extinctions.

With their longer time perspective, palaeontologists are continually surveying the fossil record for signs of global biodiversity change in the past. Much attention has rightly been paid to studying the spectacular mass extinctions during the Phanerozoic, but what happens in between them? Many palaeobiologists now believe that there may have been two pronounced intervals when life radiated (i.e. diversified) spectacularly: the Ordovician Period, and the mid-Mesozoic–Cenozoic eras. These episodes mark the steepest sustained rises on the 'curve of Life through time'; the intervening Silurian–Jurassic interval is the much flatter plateau, punctuated by mass extinctions and their recovery intervals.

Both the scale of these spectacular diversity increases and their probable causes are currently topics of intense debate. To the geologist, there is an intriguing link here between dispersed continents (as opposed to the presence of supercontinents), changing climates (both intervals ended with widespread glaciations), and the proliferation of life. We now know that the accumulation of Life on Earth is extremely complex; it is not just a matter of packing more taxa into any one habitat, but also of packing more habitats within a province, more provinces within a region, and more regions within the biosphere. Were the Ordovician and mid-Mesozoic–Cenozoic two intervals of time when there was a fundamental reorganization of biodiversity on a hierarchy of biogeographical scales?

Further study of these two great evolutionary radiations by a mixed group of geologists, palaeontologists and biogeographers was the theme of the 2001 Lyell Meeting convened on behalf of the Joint Committee for Palaeontology representing the Palaeontological Association, Geological Society of London and British Micropalaeontological Society. Entitled 'Palaeobiogeography and Biodiversity Change', it was held at Burlington House on 21 February 2001 and received generous financial support from the Geological Society and Palaeontological Association. Some 75 scientists attended and contributed to a lively debate on the fundamental causes of major evolutionary radiations. With half of the programme devoted to the Ordovician radiation, and half to the Mesozoic–Cenozoic one, it was possible to compare and contrast these two great evolutionary events.

The results of this meeting are presented in this volume as a series of individual papers. These represent by no means the last word on this important topic, but serve instead as an introduction to some of the key issues involved. In particular it is hoped that, collectively, they demonstrate how long periods of time and plate tectonic movements can have a fundamental influence on the generation and maintenance of major biodiversity patterns.

We are indebted to many colleagues for their help in refereeing the papers in the volume, including: H. A. Armstrong, R. Askin, C. Babin, M. J. Benton, M. Caron, A. Clarke, E. N. K. Clarkson, S. Damborenea, W. T. Dean, A. Hallam, R. Hill, P. Janvier, S. Lidgard, C. Little, R. A. Livermore, A. I. Miller, T. McCormick, J. A. Rasmussen, M. Romano, A. W. A. Rushton, D. J. Siveter, M. P. Smith, S. P. Tunnicliff, J. Whittaker and P. B. Wignall.

**Alistair Crame and Alan Owen**