

BOOK REVIEW

Review of GASIEWICZ & SLOWAKIEWICZ (eds): Palaeozoic climate cycles
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This volume deals with one of the key phases of Earth history: the great oscillations of global climate that preceded the warmth of the Mesozoic greenhouse. Packed with solid detail and weighing in at a little under one and a third kilos (hardback, admittedly), it provides a good deal of closely analysed geology for one's money. It is not all, though, that it seems from the cover.

The title 'Palaeozoic climate cycles' suggests an overview of the era. Well, it is not quite that, encompassing about half of that time span. The 24 component papers focus mostly on the Carboniferous and the Permian, though a few dip their toes into the Devonian, or reach up into the early Triassic. We are dealing, then, with the Permo-Carboniferous glaciation. Other significant Paleozoic climate events, such as the end-Ordovician glaciation or the perturbations around the end of the era, associated with the Triassic-Jurassic boundary, fall outside the scope of the book. The latter is only represented by the cover photo, a striking picture of the Navajo Sandstone of Arizona – which is lovely, but a little quirky given some of the splendid photographs of properly Permo-Carboniferous rocks within the pages of the book itself.

The focus, if a touch misleading regarding the title, is sensible. The glaciation at the heart of the volume is a big, protracted and complex event that is of crucial importance to human economic life, through the concatenation of palaeoclimatic, tectonic and evolutionary events that happened to produce and bury a superabundance of coal. It is also more than a little significant to the Earth history, given the likely consequences of burning a good deal of that coal in a geological instant. The event, hence, has had a long history of study, and is clearly worth still analyzing in detail – hence this volume.

A pity, then, that it is so squarely aimed at the specialist in late Palaeozoic stratigraphy. The large questions, of how the phases of ice growth and ice decay migrated through time and space, and of quite how they were modulated by astronomical and other factors, cry out for a clear and lucid

summary outlining the state of the art and the unknowns that remain, that might be more or less easily absorbed by the interested bystander (a category in which I put myself). There is, though, little help here for the non-specialist seeking such an accessible up-to-date overview of late Palaeozoic glaciation. The introductory chapter by the editors plays it brief and straight, in essence providing summaries of the main finding of each component paper.

The nearest thing to a general overview is the paper by Wopfer, on Gondwana, from the Samfau mountain belt on the edge of Panthalassa, to the shores of Tethys. This synthesizes a wealth of stratigraphic, tectonic and climate data, though the mechanism chosen as primary driver for climate regulation is non-standard: changes in galactic parameters – cosmic ray flux and such – as a Solar System wheels around the Milky Way. Wang *et al.* also provide an overview, of Permo-Carboniferous biological events and climate cycles preserved in China.

After that, there is the detailed patchwork of more or less local studies that makes up the bulk of the book. The papers here range in topic from analyses of the characteristic sedimentary cycles, to palaeontological or isotopic patterns shown by various fossil groups – reef biotas, plants, corals, brachiopods – to analyses of the various sedimentary facies: carbonate build-ups, distal glacial facies (finely illustrated, these), sand seas, evaporate basins. There are studies, too, of palaeoclimate, both *per se* and as a control on sedimentation. The geographic range is equally wide, the individual studies hailing from Svalbard, Tasmania, Texas, Venezuela, Poland, Argentina, south China and elsewhere.

These studies are consistently detailed, well-illustrated, closely described and discussed, and build up a mosaic of geological process and product in this phase of Earth history. The volume is harder work for the non-specialist, who does not possess the context acquired from years of work within the topic, but the book has not really been designed or aimed for this audience. All in all, then, a solid and worthwhile compilation: both source-book and reference book that will be very useful - and perhaps indispensable - to those who are researching the many geological enigmas of the late Palaeozoic.