of outcrop, core, well log and seismic data in this context are covered comprehensively and clearly in the early chapters and there is a short, but very useful, section describing a workflow for sequence stratigraphic analysis. The treatment of up-dip, coastal sedimentation and stratigraphy is exemplary in its clarity and depth of coverage. This is the depositional sector where many of the principles of sequence stratigraphy were established and besides being important in its own right this sector it is also crucial in terms of potential sediment supply farther down-dip.

The text covering deeper water settings discusses shelf-edge deltas in the context of sediment delivery to deep water settings, but the nature of slopes, specifically topographically complex slopes influenced by salt- and/or mud-deformation, receive scant attention which is unfortunate in view of the importance of the slope in current hydrocarbon exploration. The text also deviates from its pragmatic emphasis and becomes rather idealized and model-driven in this section. The account of deep water sequences is organized around an idealized sequence. Condensed sections are naturally used to define the sequence, but their lithology and sub-surface expression, briefly discussed in Chapter 4, are under-reported here. The account of deep water depositional elements returns the reader to the pragmatic theme of the book and is well illustrated by seismic cross-section and map views of the elements. The application of sequence stratigraphy to carbonate settings is discussed largely with respect to shelf type platforms. This approach highlights essential differences in the response of carbonate and siliciclastic settings to base level changes that stem largely from contrasts in sediment supply (in situ production versus external delivery) and bathymetry.

This book covers basic principles yet manages to reach a research level in a commendably concise manner. The focus on pragmatism is key to this text surpassing all of its rivals as a comprehensive and advanced introduction to the subject of sequence stratigraphy. It deserves to be used selectively as an entry level to the subject, and comprehensively by those in academic, industrial and survey settings who aim to unravel the stratigraphic record and predict facies distributions.

Trevor Elliott

MÄRSS, T. WILSON, M. V. H. & THORSTEINSSON, R. 2006. *Silurian and Lower Devonian thelodonts and putative chondrichthyans from the Canadian Artic Archipelago*. Special Papers in Palaeontology no. 75. 144 pp. London: The Palaeontological Association. Price £54.00 (paperback). ISBN 0 901702 99 4; ISSN 0038-6804. doi:10.1017/S0016756807003615

As one of the reviewers of the original manuscript I early declared my interest in this work, and indirectly I also had the opportunity to guide and support the progress of getting it published. Therefore, it comes rather naturally to say that I am pleased to see this work published after all the effort I know was put into it, not forgetting the great scientific value it provides.

Thelodonts, which are the main focus of this work, are an ensemble of fossil jawless vertebrates distinguished from other jawless vertebrates by the organization of their exoskeleton which is entirely made up by minute scales that resemble the placoid scales of sharks. Most studies on thelodonts have been based on isolated scales only, but more recent studies on articulated thelodonts have shown that simple scale taxonomy can be misleading because of the wide range of scale morphologies that can occur in the same individual. Some scientists, including the authors of this monograph, have instead used articulated specimens to establish a more stable taxonomic approach, and have provided a model for how a set of scales in a 'microvertebrate' assemblage can be used to recognize taxa that better represent a species. This approach, obviously, gives a more accurate account for taxonomic diversity. However, articulated specimens are rare and the difficulties in understanding the fossil record have hampered accurate estimations of general diversity and potential radiation events, despite the fact that isolated scales of thelodonts for a long time have been regarded as very useful tools in biostratigraphy.

The present monograph, which is primarily a taxonomic study, provides a large amount of new data based on material yielding 39 thelodont species from the Canadian Arctic Archipelago, of which 12 are based on articulated material. Using this new information, Märss and her co-authors have been able to revise thelodont systematics and minimized many of the taxonomic problems that have followed this research for some years.

The accumulated knowledge from previous work in general and this work in particular shows that both taxonomic and morphological diversity of thelodonts is much greater than previously believed. This new information can and will be used both in a phylogenetic context and greatly to improve biostratigraphical resolution.

Beside its systematic value, this well illustrated volume clearly demonstrates, using the articulated material, the morphological variability of scales in one individual and how that can be used for 'microvertebrate' assemblages. In this context, this monograph is also of educational value and interest for a broader readership of geologist, palaeobiologists and students, and not only the more obvious readers such as specialists on early fishes and biostratigraphy. It is however likely that the price of this volume (£54.00 paperback) will prevent the general category of readers from exploring this book for educational purposes, but for us specialists this is a much valued contribution.

Henning Blom

KNIGHT, P. G. (ed.) 2006. *Glacier Science and Environmental Change*. xiv + 527 pp. Oxford: Blackwell Publishing. Price £125.00 (hard covers). ISBN 1 4051 0018 4. doi:10.1017/S0016756807003639

In the last decade the burgeoning field of glaciology has seen the publication of several textbooks that demonstrate the subject's interdisciplinary nature, and its increasing importance in the context of understanding global environmental change. Hence, practitioners frequently need updates and syntheses of key topics within the field. Therefore, the glaciological community will find *Glacier Science and Environmental Change* especially welcome.

The book is divided into five parts, each with a keynote introduction by a leading specialist, followed by topical reviews and case studies, together totalling no less than 92 contributions. The major themes are: glaciers and their coupling with hydraulic and sedimentary processes; glaciers, oceans, atmosphere and climate; changing glaciers and

their role in earth surface evolution; glacier composition, mechanics and dynamics; practice of glaciology.

The claim made for the book is that it is an authoritative and comprehensive reference work on contemporary issues in glaciology. It is certainly authoritative, with many of the world's leading figures in glaciology having provided contributions, but there are also plenty of welcome short articles by early career researchers who offer stimulating new insights into traditional and still sometimes unresolved problems. These articles are supported by a consolidated reference list running to 57 pages, comprising around 2000 entries. The book addresses many of the key issues facing glaciologists, ranging from process studies (including techniques), to how real data inform numerical modelling approaches in understanding glacier and ice sheet behaviour. Some controversial topics are covered by contributions from opposing standpoints. Perhaps the most personalized example is the subglacial flood hypothesis of Shaw and co-workers that is rather scathingly dismissed by Benn & Evans, but vigorously defended by Shaw himself. Issues such as this demonstrate that glaciological research continues to be healthy and vigorous, and reinforce the point that gathering of facts and data in the field remain vital to resolving complex physical questions.

Whether the book will be seen as comprehensive depends on one's perspective. For the geologist, key issues relate to the imprint of glaciers on the terrain and the stratigraphic record, in particular how modern processes can be used to interpret ancient glacial sedimentary sequences. Whereas many landscape features are covered in this volume, the coverage of such topics as glacial sedimentology and glaciotectonics is scanty. So for the geologist to translate understanding of the behaviour of glaciers, which *is* well covered, into an understanding of the geological record, the reader must turn to other volumes, such as David Evans's edited book entitled *Glacial Landsystems* (Evans, 2003).

Glacier Science and Environmental Change is a well illustrated volume, with good clear line drawings throughout. In contrast, the numerous black-and-white photographs are mostly of a disappointing flat appearance, and many are reproduced at little more than thumbnail size. The idea of leading major sections of the book and the individual contributions with photographs is a good one but, frustratingly, these images have no captions. The middle of the book contains much better reproduced plates, including coloured diagrams, such as ice sheet reconstructions, and colour photographs, but it is a shame they are divorced from the papers to which they refer. Presumably this approach is a cost-saving measure of the publishers.

The editor's target readership for this book includes advanced undergraduates, postgraduate students and professionals. Glaciologists (if not geologists) will be well served by this book, but the hefty price tag of £125 is likely to restrict purchasers mainly to libraries. Overall, this is a worthy volume that should be widely consulted, especially by professional glaciologists and geomorphologists. However, it is not flawless, and many geologists will find that it does not serve their needs as well as other glacier texts.

Michael J. Hambrey

Reference

EVANS, D. J. A. (ed.) 2003. *Glacial Landsystems*. London: Arnold.

FRANCIS, J. E., PIRRIE, D. & CRAME, J. A. (eds) 2006. *Cretaceous–Tertiary High-Latitude Palaeoenvironments. James Ross Basin, Antarctica*. Geological Society Special Publication no. 258. v + 206 pp. London, Bath: Geological Society of London. Price £75.00, US $135.00; GSL members' price £37.50, US $68.00; AAPG/SEPM/GSA/RAS/EFG/PESGB members' price £45.00, US $81.00 (hard covers). ISBN 1 86239 197 1. doi:10.1017/S0016756807003640

The Cretaceous and Paleogene periods have long been recognized as globally warm 'greenhouse' episodes in Earth history, and have consequently been used as analogues for future global warming. The polar regions are considered to be most sensitive to climate fluctuations and therefore research efforts in these areas are attracting interest from a wide audience. The recent increase in the British government's interest in climate change issues and the global debate on the subject means that this Geological Society Special Publication is extremely timely.

The editors' introduction provides an historical background to the exploration of the James Ross Basin and outlines the 13 papers included in the volume, seven on the Cretaceous and six on the Paleogene. The first two papers (Crame *et al*. and Whitham *et al*.) set the scene for the Cretaceous interval, presenting work on the sedimentary sequence and providing a framework for the following papers on the radiation and extinction of floras and faunas. This is a critical sequence for regional stratigraphic correlation and these papers provide thorough reports covering the sedimentology, tectonics, and volcanism of the fault-bounded basin margin. This work is supported by partial strontium isotope data that clarify some key biostratigraphic problems.

Two contributors investigate the macrofloral evidence for climate change and vegetation diversity from the Late Cretaceous to the Cenozoic. Hayes *et al*. concentrate on angiosperm leaf floras whilst Poole & Cantrill focus on the fossil wood record. Hayes *et al*. applied a range of quantitative (e.g. CLAMP analyses) and qualitative (NLR) techniques to the flora to deduce palaeoclimatic conditions during the Cretaceous. Poole & Cantrill concentrate on the evolution of biotas and the development of Southern Hemisphere biogeography. These studies provide a wealth of information on the composition and biodiversity of the vegetation that grew on the emergent volcanic arc and a record of the past climates.

The remaining three Cretaceous papers have a palaeontological theme. The first (Kriwet *et al*.) investigates the palaeogeographical and palaecological implications of Antarctic fish diversity. The second paper (Martin) puts marine lizards into a wider context with their last occurrence coinciding with the K–T boundary. The last of these papers (Martin & Crame) addresses the palaeobiological significance of vertebrate fossils.

The first of the Paleogene papers (Marenssi) investigates the James Ross Basin in a global context by describing erosional surfaces that coincide with sea-level lowstands. The majority of the Paleogene papers focus on Eocene palaeontology discussing mammals (Goin *et al*. and Bond *et al*.), penguins (Tambussi *et al*.) and the climatic significance of the terrestrial vertebrate fauna (Case). I would have liked to have seen photographs to complement the detailed sketches of the holotype described in Bond *et al*. These papers show the crucial biogeographic importance of Antarctica presenting a new genus, species and biozone. Case *et al*.