

REVIEWS

Encyclopedia of Caves and Karst Science. edited by John Gunn. 2004. Fitzroy Dearborn. New York. HB 902pp Price £95 ISBN 1 57958 399 7.

This is not the sort of book to read from cover to cover - even for a reviewer! At 788 pages of text (and a further 114 pages for notes on contributors and an index!) and more than 350 entries this is a book to dip into. But don't think of taking it along to while away time in airport lounges, at a weight of ~3 kg you may end up paying excess baggage! The list of contributors is impressive, 202 in all, so much so that the publishers struggled to find appropriate reviewers who did not contribute to the volume. Potentially this lends it greater authority than any book written by just a small number of authors, since one assumes that each contribution is written by one of the foremost experts in that particular field. The introduction makes the rather rash claim that the work is comprehensive, virtually setting a challenge for readers to identify omissions. Certainly the range of topics covered is impressively broad but, to many readers, may seem a little odd at times. Certainly most of the expected topics to be found in karst and caving textbooks are here too, but there are others that seem somewhat bizarre, such as 'speleotherapy' or 'music in and about caves', or at best of only marginal relevance to the subject, such as 'speciation'. The explanation, apparently (although it is not immediately clear from the introduction), is that whereas the 'karst' entries deal with science, the 'caves' entries cover nonscientific aspects too. I suspect that the readership of the volume will be almost exclusively scientists (geologists, biologists and archaeologists) and cavers, rather than philatelists or musicians, although perhaps we scientists will benefit from a better perception of the peripheral reaches of our subject.

The first entry in the book, 'Accidents and Rescue', is not something in which I have any particular interest but it is so well written that I found myself drawn in. The same is true of many other entries, such as the series of contributions on 'Groundwater' commencing on p.394 or the entry on 'Paragenesis', a particularly poorly recognised phenomenon, on p.569. Certainly I can see that the best of these entries will become standard citations for some years to come.

Just in terms of the number of entries, the book is particularly strong on biospeleology and descriptions of cave and karst regions of the world. The latter is understandable; the world is, after all, a big place with lots of limestone. But the biospeleology entries seem rather oversplit. A further criticism here is the absence of any scale for many illustrations of the critters. Nonetheless, I came across some fascinating, albeit sometimes contradictory, facts. For instance on p.8 I learnt that troglomorphy is not found in organisms inhabiting energy-rich environments, although 520 pages later I read that most invertebrates in Moville Cave (relatively energy-rich) are strongly troglomorphic.

Of course there are omissions and biases, with topics that are absent or poorly covered in existing books sometimes also absent or poorly covered here. In the entry for 'Mollusca' (p.516) I was disappointed to find no reference at all to the 'snail holes' that are common on the underside of limestone overhangs across Europe (I had hoped to learn if the phenomenon is worldwide), despite mention in the literature (though not in textbooks) for more than 175 years. They may be of only minor significance but they are the sort of thing that might arouse the curiosity of those with no particular interest in either molluscs or limestone. Lacustrine karst, the peculiar pitting and etching of limestone around lake edges, is also omitted despite the inclusion of still more esoteric ('Stripe Karst') or non-karstic ('Pseudokarst') categories. The most serious omission, however, is any specific entry for 'Mixing Corrosion'. This gets barely

a mention anywhere, even in the entry on 'Inception of Caves', yet the great importance of the concept is stressed in a brief biography of Bögli on p.381. Errors seem very few but the one that did hit me concerns the most important definition in the entire volume, that on 'Karst' (also cited in the editor's introduction), which fails to recognise the fundamental distinction between porosity and permeability of rock.

Despite minor niggles, which no doubt can be found in every book of this size, this encyclopedia certainly will prove an invaluable source reference for students and teachers in higher education. On the whole it fulfills this role admirably with generally concise, well written accounts of the various topics, each followed by a list of cited works and/or further reading. The index is very extensive, although at times rather confusing. The price might seem rather high but that should be weighed up against the size of the book and the large number of entries from a diverse range of experts. Certainly all higher education establishments teaching any of the sciences should hold a copy in their library, as should anyone with a broad interest in geomorphology. Its contents too are very pertinent to particular disciplines within biology and archaeology. For the amount and breadth of information contained within this volume, it really is good value and every reader should find plenty to interest them.

Mike Simms

Incomplete solution: weathering of cave walls and the production, transport and deposition of carbonate fines. Nadja Zupan Hajna. 2003. Carsologica, ZRC Publishing, Slovenian Academy of Sciences and Arts, Postojna - Ljubljana, Slovenia. 167pp. Price €14.93. ISBN 961 6358 85 5. Available from: Založba ZRC / ZRC Publishing. P.O. Box 306 SI-1001 Ljubljana, Slovenia Fax: +386 1 425 77 94 E-Mail: zalozba@zrc-sazu.si

This monograph concerns the weathering of limestone and dolomite on the walls of cave passages in nine Slovenian caves, and the deposition of autochthonous carbonate lithoclasts in four others. Many of us have noticed that weathered cave walls are often pale and sometimes covered by a thick, soft zone of a white, clay-like substance. Nadja Zupan Hajna at last provides us with an explanation, but not one that we might expect. The clay and the zone of paler, weathered wallrock prove to be almost identical to the parent rock in their mineral and chemical composition, only more porous. Karst theory predicts that limestone should dissolve completely, leaving only the insoluble component of the bedrock as a residue on the cave wall. Yet here we have evidence of incomplete limestone solution, with a *soluble* residue of loosely attached carbonate grains. These grains are easily removed by mechanical erosion, such as rinsing by flowing water. The carbonate fines are then transported in suspension by cave streams where they may dissolve, be carried out from the cave, or be deposited within the cave as a sediment.

In Nadja Zupan Hajna's case studies, the most weathered bedrock is found where percolation water soaks the cave walls at the junction with floor sediments, and also where the walls are exposed to condensation corrosion. In these places, thick layers of carbonate fines remain in place because they are protected from further dissolution and from mechanical erosion. In an experiment on a sample of weathered limestone, she found that it could absorb 10% by weight of moisture in a mere 5 minutes. In a cave setting, aggressive water would be drawn into the limestone, away from the surface layer of fines. To erode these fines, periodic cascades or water trickles must flush the cave walls after rainfall. This is most apparent in stepped shafts, where the highest proportion of carbonate clasts were found in floor sediments.