

# BOOK REVIEW

**Caves: Processes, Development, Management.** David Gillieson, 1996. Blackwell Publishers, Oxford. xi + 324 pp. Hardback, ISBN 0631 178198, RRP \$200. Paperback, ISBN 0631 191755, RRP \$45. **Review by Elery Hamilton-Smith.**

This is a great book. It is comprehensive, takes a multi-disciplinary look at caves as a phenomenon, properly places caves in their total geomorphic and temporal context, and on top of all that, it is clearly and well written with generous illustration. The extent to which it integrates management with good science makes it particularly appropriate, indeed, almost compulsory, for managers.

David commences by discussing the nature and variety of caves. Recognition of his three basic propositions should be taken for granted, but all too few even think about these or their immense significance.

- 'caves are a measure of the intensity and persistence of the karst process'
- 'caves tend to integrate both surface and underground geomorphic processes'
- 'once (the) products of surface and underground processes enter the cave system, they are likely to be preserved with minimal alteration for tens of millenia, perhaps even millions of years'.

The following two chapters deal respectively with karst hydrology and cave development. These discuss in a truly elegant way the diversity and variation in karst processes, and the way in which the outcome of these processes in any one karst are or any one cave shape what we see. Partly because of his global perspective, David avoids the over-generalisations that are all too common in the karst literature and shows how much each cave must be separately considered if we are to develop a real understanding of cave phenomena. At the same time, he develops general principles which enable us to more readily understand the processes themselves. His diagram of the Carbon Dioxide cascade (p. 72) is a masterpiece and is already being widely used by at least several people - but note his caution in the caption that the details of CO<sub>2</sub> concentration levels are based only on temperate zone data.

Next here turns to the products of past processes - speleothems, sediments, dating of sediments and the climatological evidence from sediments. This is an excellent account of the current state of a rapidly evolving art, and is perhaps the most important section of the book in its provision of a truly current review.

But it is about here where I must voice my first criticism. On p. 11, David uses the words 'cave formation' to identify the processes of cave genesis and development. Then in Chapter 4, he uses the same words to describe speleothems. This is, of course, a familiar confusion which is perpetrated by

many cave managers and tourist guides. When the Jennings terminology was compiled for ASF many years ago, Joe decided that he would not include the term 'formation' for this very reason; he argued that there were very adequate terms to describe the first of these phenomena and he selected the word 'decoration' to designate the second. Some of us argued at the time that he should note that the term 'formation' was being used in a confusing way and so should not be used at all. I wish we had persisted; if we had, David might not have further perpetuated it. I know it is all just a matter of semantics - but semantics are the basis of clear communication.

My other major criticism also arises here. I was disappointed to find relatively little reference to palaeokarst, nothing on its potential complexity, and nothing to its influence upon and relationship to the morphology of the caves which we now visit. Armstrong Osborne has demonstrated important aspects of this phenomenon right under our noses in New South Wales, while there are spectacular examples in South-east Asia. It deserves more notice than David has given it. Chapter eight then turns to cave ecology. This is a very competent and well-balanced introduction to a very complex, specialised and again rapidly evolving area of cave science.

But most readers of this review will be especially interested to see the last two chapters, dealing respectively with cave management and karst watershed management. David commences by outlining aspects of the human use of caves, then focuses in on the most widespread human use today - tourism. He locates this in the context of impacts from other uses (some of them much more destructive) but then turns to the issues of tourism and recreation impact - the ones which most concern cave managers - in more detail.

This is followed by other issues of management concern, including radon, 'carrying capacity', interpretation, cave lighting and cave classification. The chapter closes with a discussion of the Waitomo Glowworm cave as a case study. I can only be very critical of the fact that in dealing with Australian experience in classification, he has used a preliminary suggestion proposed by Worboys in 1977, but has wrongly referenced it the much more adequate scheme later developed in the well-known and widely used 1982 paper by Worboys, Davey & Stiff. He has also failed to deal with any of the later developments or to the critique of cave classification which was generated by that paper.

The final chapter on watershed management returns to the excellent standard of the early chapters. It covers issues in defining watershed

boundaries in karst, vegetation, soil losses, agricultural impacts, water pollution, fire management, establishment of management guidelines, conservation, rehabilitation and restoration, international co-operation, and again closing with a case study, this time of the Lune River quarry. The book concludes with an excellent

glossary, based upon and essentially providing an invaluable update of Jennings (1979).

No book is perfect - many of them are much worse than this one, so despite my criticisms, I repeat my opening comment that this is a great book. If you can only afford one book on karst, then I thoroughly recommend this one.