Book Review

Jo De Waele and Francisco Gutiérrez

Karst hydrogeology, geomorphology and caves

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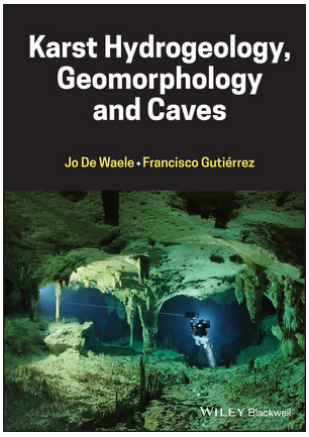

The publication of books about karst has gone through profound changes over the past decades. In the 1970's (e.g., Jennings, 1971; Sweeting, 1973; Bögli 1978), it was possible to fit a comprehensive summary of all aspects of karst and cave science into a single volume. The advancement of karst research in the various fields in science no longer allows this. The last such attempts in the 1980's (White, 1988; Ford and Williams, 1989, 2007) resulted in landmark books that are still highly cited. The last decades saw the branching of karst research into separate disciplines, first with karst hydrogeology in the 1970's (Zötl, 1974) and, more recently, speleothem paleoclimate (Fairchild and Baker, 2012). Each one of these subjects now has its own separate group of scientists, meetings, and books. Topical and thematic books became the norm in the 21st century, with encyclopedia (Gunn, 2004; Culver and White, 2005; White and Culver, 2012; White et al., 2019) and volumes containing essays on selected subjects (Frumkin, 2013), or focusing on specific topics, such as cave geology (Palmer, 2007) or management and conservation (Gillieson, 2021). The publishing business has gone in recent years through a revolution, due to electronic books and print-on-demand, and more karst and cave books are being published now than ever before. The challenge, however, of producing an all-encompassing single book dealing with the vast range of karst and cave-related science is becoming an untenable goal. Jo De Waele and Francisco Gutiérrez (2022) have produced a different concept in their new Karst Hydrogeology, Geomorphology and Caves. It neither tries to cover all topics related to karst research nor is it a collection of thematic articles written by different authors. Instead, it offers a thorough review of most of the core karst subjects, without the ambition of encompassing everything or the risk of ending up being too shallow.

The beautiful cover brings an upside down (which depends, of course, on the perspective of the photographer!) picture of a cave diver. I prefer to interpret the bubbles coming from the floor as being the first image of an active hypogenic vent! The structure of the book is like other karst textbooks, with initial chapters devoted to definitions and distribution of karst, karst rocks, then chemistry, followed by hydrogeology, karst geomorphology and finally caves. The only exception is, unlike the sequence of karst development, the chapter on cave deposits precedes the one on speleogenesis. Each chapter has its own list of references.

This book is not intended (as stated by the authors) to be an updated version of Ford and Williams (2007), although a comparison is inevitable. The new book has a wider treatment of non-carbonate karstifiable rock types and has more extensive sections about caves (about a third of the book). It is also more global in scope, bringing a larger number of case studies from most continents. References are up to date. An additional important bonus has to do with the images. There are many color photographs (especially in the chapters about caves) by some of the world's top cave photographers. Unfortunately, to benefit from these outstanding pictures, the electronic version is needed, since the small size of the photos (usually combined as "mosaics") and print and/or paper issues impair image resolution.

In a book like this it is always difficult to keep a balance between topics. Most chapters are comprehensive, with chapter 3 (Dissolution of Karst Rocks) ranking as one of the most comprehensive treatments ever published on the subject. The same goes for the detailed Chapter 6 (Karren and Sinkholes). On the other hand, the more specific Chapter 8 (Special Features Associated with Evaporites) seems a bit out of place amidst other wide-ranging chapters. The book ends abruptly after the section on cave decay and abandonment. A reader could expect chapters on applied karst, environmental impacts, conservation, and management, but as pointed out by the authors, given the level of detail, a second volume would be required to expand the coverage. The same applies to more advanced treatments of some hot topics such as geomicrobiology (dealt with in the

last section of Chapter 3), hydrogeological karst modelling (a short last section in Chapter 5) or the voluminous literature about speleothem paleoclimate.

In summary, this new book is certainly a major accomplishment - a comprehensive volume that offers a very updated, in-depth review of core subjects related to cave and karst science. The challenge of reviewing the now vast karst literature was tackled with parsimony, resulting in an excellent work of synthesis. The writing style, although technical, is easy to follow, being suitable for both amateurs (cavers) or professionals / academics at various levels. Each one of the chapters could become a separate book on its own but presenting them as a unified textbook comes as a bonus to the reader, which otherwise could easily become lost in the huge and ever-expanding number of publications on caves and karst.

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REFERENCES

Bögli, A., 1978. Karsthydrographie und Speläologie. Springer, Berlin, 294 p.
Culver, D.C., White, W.B. (Eds.), 2005. Encyclopedia of caves. Academic Press, Amsterdam, 680 p.
De Waele, J., Gutiérrez, F., 2022. Karst hydrogeology, geomorphology and caves. Wiley Blackwell, Chichester, 888 p.
Fairchild, I.J., Baker, A., 2012. Speleothem science. From process to past environments. Wiley-Blackwell, Chichester, 431 p.
Ford, D.C., Williams, P.W., 1989. Karst geomorphology and hydrology. Unwin Hyman, London, 601 p.
Ford, D.C., Williams, P.W., 2007. Karst hydrogeology and geomorphology. Wiley, Chichester, 562 p.
Frumkin, A. (Ed.), 2013. Karst geomorphology. In Treatise on geomorphology. Elsevier, Amsterdam, 483 p.
Gillieson, D.S., 2021. Caves. Processes, development and management. Wiley Blackwell, Oxford, 508 p.
Gunn, J. (Ed.), 2004. Encyclopedia of cave and karst science. Fitzroy Dearborn, New York, 1940 p.
Jennings, J.N., 1971. Karst. MIT Press, Cambridge, 253 p.
Palmer, A.N., 2007. Cave geology. Cave Books, Dayton, 454 p.
Sweeting, M.M., 1973. Karst landforms. Columbia University Press, New York, 362 p.
White, W.B., 1988. Geomorphology and hydrology of karst terrains. Oxford University Press, New York, 480 p.
White, W.B., Culver, D.C. (Eds.), 2012. Encyclopedia of caves. Academic Press, Waltham, 945 p.
White, W.B., Culver, D.C., Pipan, T. (Eds.), 2019. Encyclopedia of caves. Academic Press, London, 1225 p.
Zötl, J.G., 1974. Karsthydrogeologie. Springer, Wien, 291 p.