

SPELEOGENESIS: EVOLUTION OF KARST AQUIFERS

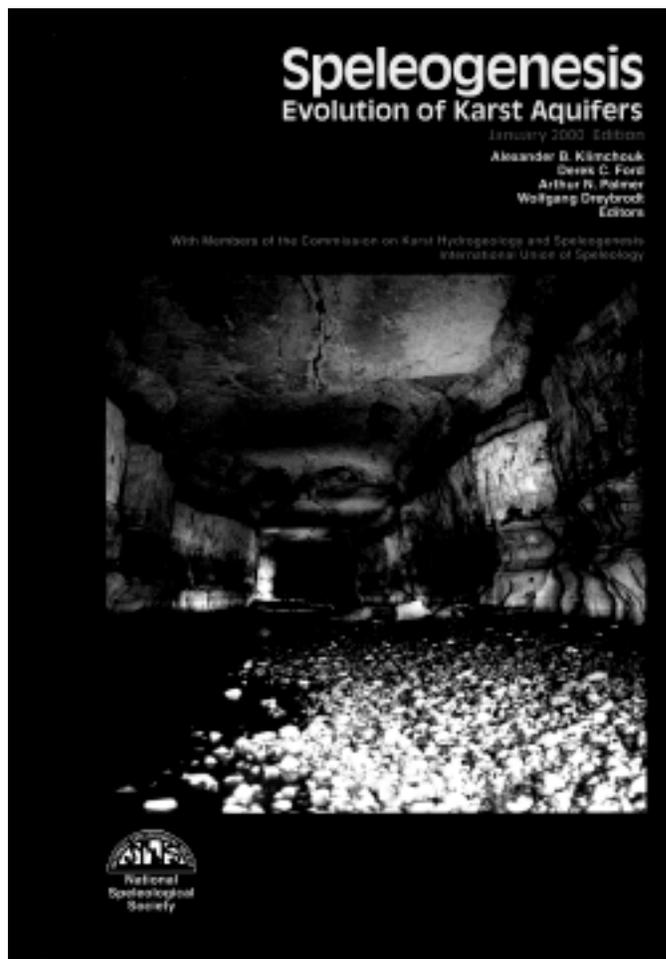
Alexander B. Klimchouk, Derek C. Ford, Arthur N. Palmer, and Wolfgang Dreybrodt (editors) with members of the Commission on Karst Hydrogeology and Speleogenesis, International Union of Speleology. January 2000 Edition. National Speleological Society, Huntsville, Alabama 527 p., ISBN 1-879961-09-1. \$60.00US. Order on line at <http://www.caves.org/service/bookstore>.

Speleogenesis, published by the National Speleological Society in 2000, is a monumental book, long in the making and eagerly awaited by speleologists and cavers worldwide. Without doubt, it is the most inclusive compilation of English-language papers yet published in a single volume on the origin of caves and the hydrogeomorphic evolution of karst groundwater systems. It is a veritable textbook on the subject of karst processes.

The concept of a comprehensive reference book on the physical and chemical processes that form caves and karst had been discussed and formulated for many years. In fact, several notable textbooks in English have been published within the last three decades, including those of Sweeting (1973), Jakucs, (1977), Bogli (1980), Jennings (1985), Trudgill (1985), Dreybrodt (1988), White (1988), Ford and Williams (1989), and Gillieson (1996). Most of these works are an assimilation of knowledge compiled by one or two internationally recognized authors.

Speleogenesis, as stated in the preface and introduction, is “a pioneer attempt by an international group of cave scientists to summarize modern knowledge about the origin of caves in various settings, to examine the variety of approaches that have been adopted, and to outline the role of speleogenesis in the evolution of karst aquifers.” Concepts presented in this compilation are largely based on advances in cave and karst science made during the last few decades.

The book consists of 61 selected contributions from 44 authors and co-authors representing 15 countries. The papers were prepared during the years 1994 to 1998 and edited by four internationally noted speleologists: Alexander B. Klimchouk (Ukraine), Derek C. Ford (Canada), Arthur N. Palmer (USA), and Wolfgang Dreybrodt (Germany). Some of the papers are upgrades, revisions, or summaries of previously published findings of the individual authors, many of which have appeared in refereed journals, proceedings of symposia, or elsewhere in the technical literature. The astute reader will recognize many of the contributions as modified benchmark papers. However, many of the articles in this book are original contributions. In all cases, *Speleogenesis* includes the most recent findings, interpretations and principles as described by those who have developed them. The most important aspect of the volume is that it represents the state of the art in modern speleology, as presented by the leading researchers, all in one readily accessible resource. Not only is the book encyclopedic



in covering virtually all aspects of speleogenesis and karst processes, but each paper is supported with ample references to the extant literature of interest. This fact alone is of prime consideration, as anyone wishing to access current research in speleology need only refer to this book, rather than track down dozens if not hundreds of references in a widely scattered literature. There is a large bibliography (28 pages) on caves and karst at the back of the book, as well as detailed indices to authors and subjects covered in the text.

Some comments on the contents, layout, and organization of the book are in order. The magnitude and scope of the emerging book dictated that it would have to be produced as a volume of large format (22 cm x 29 cm) and length (527 pages), which makes it similar in size to a standard desktop dictionary. Pages are laid out in three columns, 6 cm wide and the type is a small (~8) font. Despite this compact style, the text is clear; although prolonged reading may lead to eyestrain. The staff responsible for design, layout, style and production (in particular, David McClurg, Margaret Palmer, and George Moore) is to be commended for maximizing the content while keeping the cost of this encyclopedic tome at a minimum. In comparison to other geologic advanced textbooks and specialized reference books produced by major publishers, *Speleogenesis* is a bargain, well within the budget of any seri-

ous speleologist or caver.

The articles range in length from 2-14 pages, with most around 6-8 pages. This is comparable to the length of papers in professional journals. The figures, photographs and line drawings have been reduced to efficiently fit 1, 2, or 3 columns or, in places, half the width of a page. Many of the figures are quite detailed; however, clarity has been maintained despite reduction. All photographs are black-and-white and are reasonably clear. The line drawings are crisp and very readable.

As expected, each paper is technical in nature, comparable in scientific detail and vocabulary to articles in refereed technical journals. Geologists, especially geomorphologists and hydrogeologists specializing in karst, will find the writings and expositions to be consistent with the geotechnical literature and should have little difficulty following the text. Cavers who are not professional earth scientists, for example most of the rank-and-file members of the National Speleological Society, may find the material somewhat challenging to read. However, a great many cavers have been exposed to cave science in the course of exploring, mapping, and communicating about caves and, in general, have assimilated considerable knowledge about geologic processes in the development of caves and karst. By and large, long-term active cavers should benefit greatly from this book. As a whole, *Speleogenesis* integrates the complexities implicit in the hydrogeomorphology of karst into a coherent whole.

Papers are grouped into seven major parts within the book. The first two are an introduction (1 paper) and a historical overview of cave science (3 papers) consisting of abbreviated versions of more extensive discourses by Shaw (1992), Lowe (1992a,b) and Watson and White (1985), respectively. Parts 3 and 4 include geologic and hydrogeologic controls on the development of caves and karst (7 papers) and theoretical fundamentals of speleogenetic processes (15 papers). Part 5 includes 27 papers related to cave development in various geologic and hydrologic settings. Speleogenesis of many of the largest cave systems in the world is included in this part. Part 6 (2 papers) considers the origin of small and mid-scale features in caves (dissolutional features and breakdown). Part 7 (4 papers) considers speleogenesis in non-carbonate rocks. Finally, Part 8 (3 papers) is a brief introduction to applied speleology. The major emphasis of *Speleogenesis* (and the most comprehensive coverage) lies in the papers in Parts 3, 4, and 5.

Who should own this book? The answer is unequivocal. Anyone who has a need or desire to understand how speleogenetic processes work, including research scientists, cavers, college students, and those working in applied karst projects such as geotechnical consultants, environmental geologists and hydrologists and appropriate personnel of governmental agencies. This book should be on the shelf of anyone involved in the study and understanding of karst systems.

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