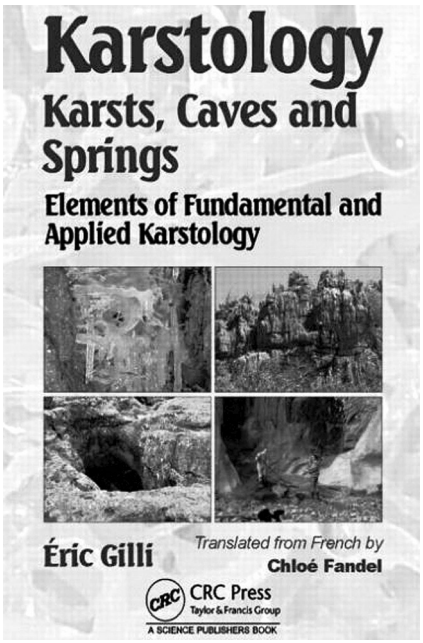
Geologos 24, 2 (2018): 171–172
doi: 10.2478/logos-2018-0016

GEOLOGOS

Book reviews

Karstology. Karsts, caves and springs. Elements of fundamental and applied karstology, by E. Gilli, 2015 (translated from French by C. Fandel). CRC Press/Taylor & Francis Group, Boca Raton. 244 pages. E-book: price £37.79 GBP, ISBN 9781482243161.



The present tome offers explanations of karst landscapes on the basis of scientific research over 30 years. It presents a history of karstology, aquifers and their characterisation, water supply management, coastal and submarine karsts, evolution of karst and palaeokarst, palaeontology, tourism and oil and mineral reserves. All issues presented are illustrated by numerous examples from field studies, a significant portion of which comes from France.

The book consists of a preface, four parts and separate chapters. The first one, containing four chapters, is introductory in nature. It presents the physical characteristics of karst regions. The first chapter discusses basic karst terminology, characteristics of karst landscapes, global distribution of karst and selected characteristics of karst regions in Slovenia and France. The second chapter presents a historical overview of karst research, including contributions from speleology and French karstology. The next two chapters describe the environments of carbonate rocks (limestones, chalk, dolostones) and physico-chemical processes that govern limestone dissolution (including water cycle, CO_2 cycle and carbonate cycle).

The second part, characterised by surface karst and endokarst, consists of six chapters. The first two of these describe of the morphology (surface components of karst – epikarst, karst corridors dolines, poljes, tufa, travertine and others) and the regionalisation of karst landscape types (from karst in cold regions to karst in tropical regions), with an emphasis on the role of climate. The next chapter refers to speleogenesis and endokarst – from the processes of limestone dissolution through infiltration of aggressive water to the creation of large-sized caves and underground sediments. Chapter 8 describes consistently the effects of karstification of rock massive in the form of evolution of karst landscapes (with variations in climate and palaeographical evolution), polyphase karst and palaeokarsts. Attention is also paid to non-press areas representing parakarsts and pseudokarsts. The closing portion of the second part is chapter 10 which is entitled, 'Speleology and study of the endokarst', and refers to endokarst in speleology research methodology.

The third part characterises karst aquifers, presents structure and hydrogeological features of a karst aquifer, circulation conditions (separately, circulation in hydrothermal systems) and quality of karst groundwater, water use and management. Amongst modern research tools, attention is drawn to tracer tests in karst systems and modelling outflows. Presented separately are coastal and submarine karst aquifers, i.e., recognition and management.

The following five chapters of the book (15–18, 20) are distributed thematically. Chapter 15 ('Development in karst regions') presents engineering problems in karst environments: those caused by anomalies or cavities below ground, karstic subsidence and drawndown as well as those caused by the hydrological workings of karst systems, which can lead to water inflows during civil engineering projects (amongst others, aquifer contamination, leaking dams and flooding in urban areas). It deals

with preliminary reconnaissance work in karst environments and, in particular, with methods of geophysical detection.

Chapter 16 presents problems of tourism in karst areas, from characteristics of tourist regions to developing caves for tourism. Geological aspects are presented in chapter 17 ('Mineral resources'), while geothermal aspects are treated in chapter 18 ('Hydrothermal and geothermal processes') and subjects covered chapter 20 are geodesy and mechanics in karst massifs (rock deformations).

The fourth part includes the study of palaeoenvironments and palaeontology, archaeology and biology of the karstic environment. There are various issues, such as methods (Dating methods in karstology), archives (Records of deformations, Conserving environments, Phosphorites) and genetics (Isolation and genetic divergence).

The conclusion emphasises the necessity of interdisciplinary research in the karstology of surface and underground elements, taking into account the carbonate cycle, as well as the necessity of co-operation of the karst community. The author lists unexplored research fields, reflected in current research (including the maximum depth at which karstification can occur, the form and evolution of subterranean speleothems, as well as the modelling of speleogenesis and karst systems) and in the long term (including hydrothermal karst, deep karst and submarine karst, estimating and modelling cavities and resources they contain such as water, petroleum, etc.).

The present book outlines comprehensive knowledge of the karst environment, presented (as the author intended) according to a specific key. From a natural point of view, some thematic issues are relatively dispersed and interwoven with anthropogenic issues such as tourism, speleology and others. The dispersion of the material is particularly visible in the field of hydrogeology. In the title of the book, there is no mention of karst aquifers. In addition to the partial characterisation of karst aquifers (in the first part, the process of limestone dissolution is presented, and in chapters 5, 7 and 18, this is characterised successively as springs, vauclusian springs, hot springs (and hydrothermal processes), subchapter 17.2.3 discusses the triple porosity of carbonate rocks and other examples.

In all, there are 178 illustrations and 15 tables, which support the reader in his/her understanding of terms used in karstology, speleology, geology and hydrogeological background in karst areas. Of these 163 are black and white and 16 full colour; all of them are of high quality. A list of 220 references concludes the tome.

This book is addressed to professionals with a background in karstology, geology and hydrogeology, and to students of earth sciences and managers working in karst environments. The text is written in such a way as to make it easily understandable and to allow readers to familiarise themselves with karstological, speleological and hydrogeological terms and engineering methods in karst environments.

Jacek Różkowski
University of Silesia, Katowice
e-mail: jacek.rozkowski@gmail.com