ABHANDLUNGEN DER GEOLOGISCHEN BUNDESANSTALT
Abh. Geol. B.-A. | ISSN 0378-0864 | ISBN 978-3-85316-058-9 | Band 65 | S. 231–232 | Wien, 10. 11. 2010
Fifty Years of Geological Cooperation between Austria, the Czech Republic and the Slovak Republic

Book Reviews

PŘIKYL, R. & TÖRÖK, À. [Eds.] (2010): Natural Stone Resources for Historical Monuments. – Geological Society, Spec. Publ. **333**, 237 pgs., ill., London. ISBN: 978-1-86239-291-5; £ 80.00.

Following the introduction of the Editors, Richard Přikyl from the Charles University in Prague (CZ) and Àkos Török from the Budapest University of technology and Economics (HU), the reader learns more about the structure of the book, as well as about its origin: *"This volume brings together one general introductory and twenty original research papers grouped in four sections mirroring the major aims of the volume and dominant trends in the current research field. These are: (1) decay processes, (2) performances and compatibility of natural stone, (3) properties of natural stone and (4) provenance studies and stone databases. Most of the papers were presented during the 'Natural stone resources for historical monuments' special session held under the framework of the 'Energy, Resources, Environment' program sessions on the General Assemblies of the European Geosciences Union held in Vienna (Austria) annually during 2006–2008"* (p. vii). From this point of view the book focuses on Europe: The articles cover aspects from Austria, Germany, The Czech Republic, Slovakia, Italy, England, Ireland, France, the Netherlands, Portugal and even Japan. The geographical aspect is very important for building stones, as different climatic conditions (atlantic influence in Ireland versus continental or mediterranean climate in southern Europe) cause various damages to stones.

In the introduction the editors underline the importance of the availability of traditionally used stone for architects and restorers. This received a new dimension in the late 20th and early 21st century, due to the fact, that great masses of cheap stone were and still are imported (e.g. from China, India …). As a result many local quarries of smaller dimension had to be closed; as a consequence many local stones are not available any longer. *"This lack of locally available stones is a significant drawback in monument restoration practice, since replacement stones are no longer available."* (p. 7).

Some articles deal with special forms of weathering (processes), like: *"Alveolar weathering of Cretaceous building sandstones on monuments in Saxony, Germany"* (by Heiner Siedel from Dresden [D]) or *"Black-crust growth and interaction with underlying limestone microfacies"* by Gilles Fronteau and coworkers (all from France). Four papers discuss problems with various aspects of sodium and salt crystallization, two deal with recent examples from Japan. In addition to these problems a German team from Munich examined the Teplá monastery (CZ) focussing on the effects of a fire damage in the 17th century to the trachytic building stone. Beside color changes from yellow-beige to red, minerals like goethite and limonite turned into hematite. In this context the Austrian geologist Alois Kieslinger (1900–1975) proves to be a pioneer writing two fundamental papers on fire damage (1932 and 1949).

A Spanish group of authors concentrates on weathering problems of some the widely used varieties of serpentinites from Cabo Ortegal region (Galicia, Spain) which do not meet the requirements for an ornamental stone.

Stephen Mccabe and coworkers *("A legacy of mistreatment: conceptualizing the decay of medieval sandstones in NE Ireland")* analyze the complex history of a sandstone and point out what might happen in future with this building stone considering climatic changes.

Among the wide range of building stones, a paper about tuff *("Evaluation of three Italian tuffs (Neapolitan Yellow Tuff, Tufo Romano and Tufo Etrusco) as compatible replacement stone for Römer tuff in Dutch built cultural heritage")* shows the problems of using another stone, when the original stone is no longer available.

Lisa Cooke from the UK entitles her work as: *"The 19th century Corsi collection of decorative stones: a resource for the 21st century?"* The collection consists of 1,000 polished samples (15 x 7,5 x 4 cm) of natural stone collected by Faustino Corsi (1771–1845) from 1800 to 1827. These stones might even now serve as a resource for the identification of ornamental stone used in historical buildings.

Finally two papers deal with electronic databases which offer experts from various fields information on different aspects of building and ornamental stone.

To conclude: This book illustrates a broad spectrum of aspects which should be kept in mind, when working with historical building stones. Thus geology turns out as a discipline connecting architecture, history, meteorology and many other aspects of science.

Thomas Hofmann

PEDLEY, H.M. & ROGERSON, M. [Eds.] (2010): Tufas and Speleothems: Unravelling the Microbial and Physical Controls. – Geological Society, Spec. Publ. **336**, 362 pgs., ill., London. ISBN: 978-1-86239-301-1; £ 72.00.

"This volume was conceived at a 'Tufas and Speleothems' workshop organized around 'research in progress' which was held in the Geography Department, University of Hull, UK in May 2008. … The articles herein reflect the work of 63 specialists (principally bacteriologists, microbiologist, hydro- and geochemists and sedimentologists) based mainly in academic institutions. The remit of this volume is to develop a better understanding of the biological and chemical influences on carbonate precipitation associated principally with ambient temperature freshwater carbonates", thus the editors, H.M. Pedley and M. Rogerson explain in the introduction the origin, as well as the aim of this book.

Seventeen contributions deal with various aspects from different countries like Germany, Spain, Indonesia, Turkey, Italy, Austria, Slovakia, Poland and the UK. The first 13 papers focus on carbonate precipitation associated with microbial processes. The following four point out the necessity to consider also the hydrochemistry (of cavewaters), the geochemistry of speleothems and the physical control on depositional morphology.

To give some examples: M. Gradzinski (Poland) made a field experiment on the growth of tufa. He found out, that tufa is growing faster on a carbonate substratum, than on a copper substratum. He observed, that tufa is growing more efficient in a fast flowing regime, than in a sluggish environment and that the chemistry of the water is the most important factor for tufa growth. In addition to this outdoor experiment M. Rogerson et al. checked the *"Microbial influence on macroenvironment chemical conditions in alkaline (tufa) streams: perspectives from in vitro experiments"*.

The major part of articles deals with aspects at a rather small scale, like the contributions from Bindschedler et al. *("Calcitic nanofibres in soils and caves: a putative fungal contribution to carbonatogenesis")* or A. Pentecost *("The fractionation of phosphorus in some modern and late-Holocene calcareous tufas in North Yorkshire, UK")*. In the last contribution of this book by Ø. Hammer et al. (all from Norway) *"Travertin terracing: Patterns and mechanism"* investigations at a larger scale were made. The authors try to solve the question about the origin of large terraces, like those, well known, from Yellowstone National Park (USA) or from Pamukkale in Turkey. They conclude: *"There is probably not a single mechanism responsible for localization of precipitation at the rim in all circumstances … In spite of recent results, travertine terracing remains an intriguing problem. … In addition the accessibility of this earth-surface system, the availability of analytical and computational techniques, the cross disciplinary nature of the problem and the sheer beauty and mystique of travertine terraces all make travertine terracing an attractive area of research"*.

The mixture of high quality articles dealing with all aspects of tufas and speleothems including various disciplines, like sedimentology, geochemistry, biology and some others, makes this book with its valuable index an indispensible reference for all researchers.

Thomas Hofmann

SMITH, B.J., GOMEZ-HERAS, M., VILES, H.A. & CASSAR, J. [Eds.] (2010): Limestone in the Built Environment: Present-Day Challenges for the Preservation of the Past. – Geological Society, Spec. Publ. **331**, 257 pgs., ill., London. ISBN: 978-1-86239-294-6; £ 68.00.

Limestone has been used since ancient times as building material. Many of the important historic buildings, which are built of limestones – some of them being even part of the UNESCO World heritage list – show significant signs of decay. This fact raises not only questions of restoration and preservation, but shows also the need to make the best use of new limestones in today's buildings. To characterize limestones in all details is a fundamental requirement. Furthermore the effect of the polluted atmosphere on the surface of stones turned out to be a key question, like the question what mortars to use.

This book is a compilation of 22 papers with a strong focus on mediterranean case studies; thus, the cover shows an impressive picture of severe honeycomb weathering of Globigerina Limestone in the Cittadella walls in Rabat at Gozo, an island of Malta. J.P. Calvo and M. Regueiro give a comprehensive overview of important building stones of the region *("Carbonate rocks in the Mediterranean region – from classical to innovative uses of building stone")*. First they characterize the most important rocks, in addition they sum up the recent situation of carbonate building stones by countries starting with Italy, Spain, Greece, France concluding with Israel and the African countries (Egypt, Algeria, Tunesia and Morocco).

Additionally there are also contributions from Germany by Siegesmund et al. *("Limestones in Germany used as building stones: an overview")* and from the UK. The first one by M.J. Thornbush is entitled as *"Measurements of soiling and colour change using outdoor rephotography and image processing in Adobe Photoshop along the southern facade of the Ashmolean Museum, Oxford"*. The contribution by O. Sass and H.H. Viles *("Two-dimensional resistivity surveys of the moisture contents of historic limestone walls in Oxford, UK: implications for understanding catastrophic stone deterioration")* shows the problems with a Jurassic oolithic limestone, which was used to build Oxford. The geophysical monitoring of some selected wall sites showed complex patterns of moisture distribution.

The book summarizes many aspects of today's situation in working with (ancient) building stones. Contributions dealing with different kinds of weathering as well as restoration make this compendium important for geoscientists in their daily work in seeking answers for the preservation of our cultural heritage; which, in many cases, is built of limestones.

Thomas Hofmann