



Journal of Sedimentary Research

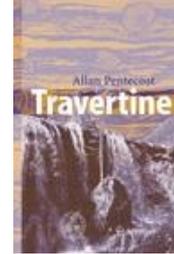
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Travertine, by Allen Pentecost, 2005. Springer-Verlag, Tiergartenstrasse 17, D-69121 Heidelberg, Germany. Hardcover, 446 pp., 204 ill. Price EUR 96.25. ISBN: 1-4020-3523-3



This is the first book devoted entirely to travertine, but since the definition of travertine varies widely in the literature, you may be wondering what exactly is covered in this book? Some authors use the term “travertine” to only describe hydrothermal calcium-carbonate deposits. Pentecost, however, focuses on the process of formation and suggests “travertine” should be an all encompassing term for deposits that are principally formed through the loss of carbon-dioxide gas from a calcium-bicarbonate solution leading to calcium-carbonate deposition. This is certainly fortunate for the purchaser of this book, as what follows is an in-depth analysis and review of all aspects of travertine: origins, formation, composition, flora and fauna, occurrence and utilisation; the book also covers related deposits. Well known deposits such as “tufa” and “speleothem” are expertly covered; categorised by Pentecost as being “meteogene” travertine (CO₂ sourced from the soil and atmosphere). Pentecost uses the term “thermogene” travertine for deposits where the bulk of the CO₂ originates from thermal processes within or even below the Earth’s crust.

Thus, travertine can form from a range of CO₂ sources and in a wide variety of depositional settings, producing many weird and wonderful shapes and structures at micro and macro scale. This variety is perhaps reflected by the use of eight chapters to cover the chemical, mineralogical, morphological and biological properties of travertines, and the chemistry of their source waters; providing an expert critical appraisal of current models of travertine formation. I was a little confused, however, that Pentecost deals with the chemical properties of travertine-depositing water (Chapters 5 and 6) after covering travertine fabrics and morphology (Chapters 3 and 4). Surely these should be dealt with the other-way-round in terms of process.

Pentecost has obviously gone to great lengths to include and review anything ever written about travertine (from year 1546 to recent research, and many foreign language texts) and related deposits, and his clear enjoyment in doing so is reflected by his enthusiastic descriptions and insight into all the wonderful forms and uses of travertine.

He not only discusses in detail how it forms, but produces useful accounts on its use in palaeoclimate studies from the Archaean to the Pliocene and throughout the Quaternary; the methods used for dating are explained, and a chapter on stable isotopes is included. In addition, Pentecost discusses modern deposits of travertine and recent large-scale anthropogenic impacts such as deforestation and future conservation issues. He also covers possible evidence for extraterrestrial life contained in meteoric travertine and the potential for travertines and life elsewhere in our Solar System.

Such is the thoroughness of this book that a chapter has even been devoted to similar forms of sediment not actually classified as travertine. This includes lake marls, calcrete and beachrock, but even extends to industrial deposits and how scaling may be removed from wells, pipes and boilers! But Pentecost does not finish there; he completes the book with a review of our utilisation of travertine in construction, art, tourism, agriculture and medicine. So, as it states on

the book cover, this is clearly an excellent explanatory and literary resource for carbonate sedimentologists, hydrobiologists, palaeoclimatologists, physical geographers, water-treatment engineers, astrobiologists, architects and sculptors. It really is everything you wanted to know about travertine, and more!

The book contains seventeen chapters that are mostly self-contained, although I think the book's clarity and structure would have benefited by the chapters being organised into four parts, thus: Part I containing Introduction and Classification (Chapters 1 and 2); Part II containing Chapters 3-10 on Properties, Formation and Deposition; Part III consisting of Chapters 11-14 on Palaeoclimatic Indicators; and Part IV containing Chapters 15-17 on Related Deposits and Human Utilisation.

Although the front cover is a little dull, the book is generally well presented with a consistent format and the nice use of figures and tables. There are twenty-two excellent photo plates, three of which are in colour that illustrate well the various and many beautiful forms of travertine. However, the photo plates are all placed in a section at the end of the book, and may have been better served dispersed within the book to break up the text more. A few small grammatical and typo errors also occur within the book but these are all minor comments on what is an excellent resource.

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