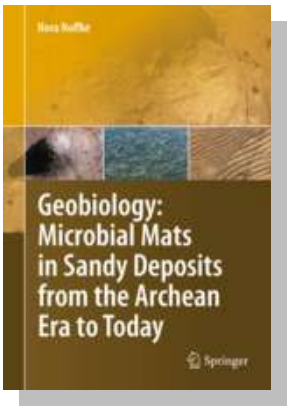

Geobiology - microbial mats in sandy deposits from the Archean era to today, by Nora Noffke, 2010. Springer-Verlag, Berlin. Hardback, xi + 194 pages. Price EUR 99.95. ISBN 978-3-642-12771-7.

Organisms played, as has become clear in the past few decades, a much greater role in sediment accumulation than was previously recognized. Although complex, multi-cellular life are almost exclusively known from the Phanerozoic and the Ediacaran, numerous traces of life are known also from Proterozoic and even Archean sediments. The sedimentary record is the net result of sediment accumulation and erosion. In clastic sediments, the role of organisms in sediment accumulation is mainly the reduction in erodibility of surficial sediments, owing to the more cohesive character that sediments can obtain as a result of the adhesive extrapolymeric substances produced by organisms. This may be the slimy material left in and on the sediment by animals burrowing into or crawling over the sediment, but more effective seems to be the activity of less complex organisms such as cyanobacteria (which are, however, a symbioses of prokaryotes rather than organisms themselves) and algae that produce biofilms. Sedimentary particles (mostly of a very small size) become adhered to these biofilms, thus covering it, after which a new biofilm may be formed on top of them, trapping new sedimentary particles, and so on.

The result are irregular structures that were previously called ‘algal mats’ but that are now commonly called ‘microbial mats’. They are in many respects comparable to stromatolites, although geochemical processes also play a role in the formation of the latter. Stromatolites are well known from calcareous sediments. Microbial mats are, however, also present in siliciclastic rocks, and the researchers involved describe deformed examples (and some other traces of life that led to deformed sediment) as ‘MISS’ (Microbially Induced Sedimentary Structures). MISS are much less well known than stromatolites, and this book - written by one of the few top researchers in this field covering both geology and biology, Prof. Nora Noffke - is therefore most welcome.

With less than 200 pages, the book is not what one would expect of either a text book for students or a reference work for specialists. The book might serve as both, however, and it will serve well. This seemingly paradoxical statement can be explained by the facts that, on the one hand, the present-day knowledge of MISS is relatively small (extremely small, for instance, if compared with stromatolites), and, on the other hand, Noffke is a skilled author who knows not only how to write a compact though well readable text, but also how to pick out the truly important items and how to avoid being lost in irrelevant details. Thus, she appears to be a gifted author.

The list of contents - which mentions, surprisingly enough, neither the short but appealing foreword by Stefan Bengtson, nor the preface by Noffke herself - gives the reader immediately insight

into the logical approach followed in the book: each chapter is subdivided in sections, which are subdivided again into subsections, which are sometimes subdivided even further into sub-subsections. This logical structure makes the book easy to use.

The first chapter (Introduction) has five sections (each divided in subsections): 'Microbial mats, stromatolites and MISS - an overview' 'The geobiological concept', 'Microbially induced sedimentary structures', Significance of MISS - status and perspectives' and 'Collection of MISS'. In my opinion, this fist chapter deals already with all aspects that sedimentologists or biologists working with MISS should know. Obviously, however, the other three chapters also comprise lot of interesting information.

Chapter 2 (Concepts) has only two sections, but these are subdivided again into subsections and sub-subsections. I consider it out of the scope of this review to go into their details, and will mention here only the two sections: 'MISS - products of life and environment' and 'Formation and preservation of MISS'. Chapter 3 (Classification) has also only two (subdivided) sections: 'The classification diagram of MISS' and 'The five categories of MISS'. Chapter 4 (Application) is composed of two sections as well: 'Ancient biofilm- and microbial mat-forming prokaryotes' and 'Geological field trip sites'. The book ends with an 8-page list of references and an 18-page (!) index which is well thought-over..

How stromatolites form is not easy to explain. For MISS, however, Noffke uses the example of a table cloth. It can be rolled up, it can be folded in different ways, and it can become wrinkled. Figure I.1 shows this; it is an example that brings MISS to life, even for scientists who never worked with this type of material. In general, the figures are well chosen. Figure I.3, for instance, provides some convincing comparisons of present-day MISS and fossil equivalents. There are 38 figures in full colour, and these figures would have been of great value, if the publisher had not chosen to print the book on paper that is absolutely unsuitable for colour printing (but very good for reading the text in a place with artificial light, such as most rooms in academia). In addition, some colour photos are printed at such a small size (2-3 cm!) that any original detail gets lost. I presume that this is partly because the author presented figures in formats that are unfortunate, but a good editor and a good publisher usually take care that the author gets the chance to re-format figures in such a way that the quality in the book is optimum. It must be mentioned in this context that the colours of the photos that are printed at a good size are also frequently not as good as they should be. If the book will ever have a second edition, the colour photos should be handled in a much better way!

So much interesting information is presented in this book that, in my opinion, a second edition should be published anyway. I'm not aware of the print run of this first edition, but the number of earth scientists working is siliciclastic deposits is without doubt orders of magnitude larger. Most of them should have access to this book, particularly if they are working in shallow-marine deposits. It is my own

experience that MISS are not always easily recognised. This book may help to avoid overlooking these features, which are of great importance for the reconstruction of depositional histories.

In summary, my conclusion is that this book is worth a purchase, and worth a second edition (especially for the siliciclastics-oriented earth scientists for whom this first edition was printed in too low numbers). But the publisher can - and should - do better when handling the author's colour figures. The book deserves this.

A.J. (Tom) van Loon
Geological Institute
Adam Mickiewicz University
Maków Polnych 16
61-606 Poznań
Poland
e-mail: tvanloon@amu.edu.pl