BOOK REVIEW

BUATOIS, L. & MANGANO, M. G. 2011. *Ichnology: Organism-Substrate Interactions in Space and Time*. xii + 358 pp. Cambridge University Press. Price £50.00, US$82.00 (HB). ISBN 9780521855556.
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This is a remarkable book written by two acclaimed ichnologists one of whom, Luis Buatois, is actually the President of the International Ichnological Association. In this treatise, the authors deal with all aspects of ichnology, but mainly concentrate on relations between invertebrate trace fossils and depositional environments. It will be of most use to sedimentologists because of its value for environmental reconstructions. On the other hand, it will be less attractive for the vertebrate trace fossil specialist.

The book (358 pages, 222 figures) is of high quality and well illustrated. The rich text includes many references. It ends with an extended bibliography (50 pages) and an index. All of the figures are in colour. Line illustrations are mostly original and well drawn. Photographs, which are very useful in ichnology, are very abundant. Unfortunately, some of them are of medium quality and presentation of the scale is not homogeneous. But this is a minor shortcoming compared to the great richness of iconography.

The first part deals with conceptual tools and methods. The basics of ichnology are considered: characteristics, taphonomy, ethology, taxonomy and palaeobiology of trace fossils. Methods in systematic ichnology are well presented but without clues for identification of the most common ichnotaxa. For the non-specialist, common ichnogenera are abundantly illustrated at full length in the book and the index is very useful to find the text and the pictures related to them. The ichnofacies model is then considered. The absence of a more detailed presentation of the original model of A. Seilacher is perhaps regrettable because ichnofacies represent a notion which is not always clearly understood. All of the more recent and less well known ichnofacies described in continental environments are investigated. Lastly, the different methods used for the modern ichnofabric approach are presented.

The second part deals with spatial trends of trace fossils. It begins with palaeoecological considerations where the different parameters controlling the nature and the distribution of biogenic traces are analyzed: hydrodynamic energy, substrate, oxygenation, salinity, sedimentation rate, food supply, bathymetry, water turbidity and water table. The scheme 6.2 is surprising because *Chondrites* is probably not a good example of a burrow indicating a firm-ground. Main depositional environments are then considered in detail, mainly marine, but also continental. This part, which is well documented and well illustrated, will certainly be highly appreciated by sedimentologists.

The third part deals with trace fossils through time. It is first shown that trace fossils are very useful in sequence stratigraphy mainly because they characterize discontinuities well. On the other hand, the use of trace fossils in biostratigraphy is of lesser importance but effective in some cases, mainly for Precambrian and Palaeozoic times. An attractive and original paragraph deals with trace fossils and evolutionary palaeoecology showing the evolution of animal-substrate interactions through time. Here, interesting data are given about the colonization of different environments by animals. A last short paragraph considers ichnology in palaeoanthropology and archaeology.

Treatises on ichnology are rare and the publication of this book is certainly a significant event for the diffusion of this young discipline of Earth Sciences. It is as important as the books of Bromley (1996), Seilacher (2007) or Gérard & Bromley (2008). It must be read by sedimentologists and ichnologists.

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References

BROMLEY, R. G. 1996. *Trace Fossils: Biology, Taphonomy and Applications*, 2nd ed. Chapman & Hall, 384 pp.
SEILACHER, A. 2007. *Trace Fossil Analysis*. Springer, 226 pp.
GÉRARD, J. R. F. & BROMLEY, R. G. (2008). *Ichnofabrics in Clastic Sediments: Applications to Sedimentological Core Studies*. J. R. F. Gérard ed., 97 pp.