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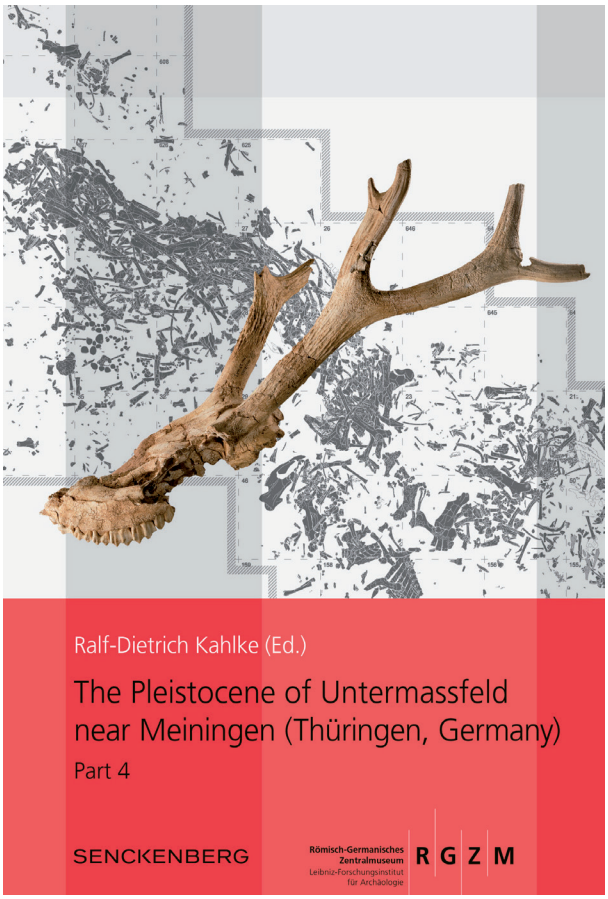
Book Review

Ralf-Dietrich Kahlke (ed.) 2020. *The Pleistocene of Untermassfeld near Meiningen (Thüringen, Germany). Part 4*. Monographien des Römisch-Germanischen Zentralmuseums Mainz, Volume 40, 4, pages I-XII, 1031-1324, 1 foldout (ISBN 978-3-88467-324-9). 90.00 €

Around one million years ago (late Early Pleistocene), a major faunal turnover occurred in Europe, linked to the onset of increased climatic instability: the transition between Villafranchian and Galerian faunas. Few palaeontological sites in Europe documents this biological event, highlighting over all of them the site of Untermassfeld, near Meiningen (Thuringia, Germany), which provided an amazing fossil record, either in abundance, diversity, and good preservation (Kahlke, 2004, 2006, 2007). This exceptional assemblage comprises an interesting and unusual faunal composition which is markedly different from those of the previous Villafranchian and of the subsequent Galerian communities, representing a distinct faunal episode, the Epivillafranchian biochron (Kahlke, 2004, 2006, 2007; Belluci et al., 2015).



The site of Untermassfeld has been annually excavated since its discovery, in 1978, until 2019, involving a total amount of 127 months of field work. A huge assemblage of more than 18,000 palaeontological finds was recovered, comprising mostly large mammal remains and, as a lesser extent, microvertebrates (small mammals, birds, reptiles, amphibians and fishes) and molluscs (Kahlke, 2006). Excavation, fossil preparation and research works have been brilliantly directed by Prof. Dr. Ralf-Dietrich Kahlke, Head of the Quaternary Paleontology Division and of the Quaternary Large Mammal Section of the Senckenberg Research Institute in Weimar, who leads a research team constituted by a large international group covering the most diverse specialities. Fossils were meticulously and beautifully prepared by high-qualified experts in the laboratories of the Senckenberg Research Station of Quaternary Palaeontology, in Weimar, where they are now stored and curated.

The origin of the palaeontological site is related to natural processes, without any evidence of human activity. Fossil accumulations come from sedimentary deposits formed during brief riverine high-flood events leeside of a clastic mudflow fan. In the low-energy area, isolated bones as well as partial skeletons of hundreds of predominantly mammal individuals were accumulated during these events (Kahlke, 2006) and excellently preserved due to a subsequent carbonate impregnation of the embedding fluviatile sands.

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The Untermassfeld fossil assemblage comprises 44 mammal species (101 taxa in total), some of them described here for the first time, as the bovid *Bison* (*Poephagus*) *menneri* and the deer *Eucladoceros giulii* (Kahlke, 2006). Large-mammal record is extraordinarily rich. The list of herbivores includes: two bovids, the cited *Bison* (*Poephagus*) *menneri* and *Bison* sp.; four deer taxa, the small roe deer *Capreolus cusanoides*, the middle-sized deer *"Pseudodama" vallonnetensis*, the large deer *Eucladoceros giulii* and the moose *Cervalces carnutorum*; a large hippo, *Hipopotamus antiquus*; one boar, *Sus scrofa priscus*; one rhinoceros, *Stephanorhinus hundsheimensis*; two equids, *Equus* (*Sussemionus*) *wuesti* and other larger equid, *Equus* sp.; and the mammoth *Mammuthus meridionalis*. The assemblage also include a rich large-carnivore record comprising: six felids, the jaguar *Panthera onca gombaszoegensis*, the cougar *Puma pardoides*, the cheetah *Acinomyx pardinensis pleistocaenicus*, the lynx *Lynx issiodorensis*, the dirk-toothed cat *Megantereon cultridens adroveri*, and the sabre-toothed cat *Homotherium crenatidens*; the giant hyena *Pachycrocuta brevirostris*; the bear *Ursus* cf. *dolinensis*; and two canids, *Canis* (*Xenocyon*) *lycaonoides* and *Canis lupus mosbachensis*. Remains of one primate species, the macaque *Macaca sylvanus*, were also recovered.

Previous results of the interdisciplinary research developed on Untermassfeld were published in three volumes of the monograph series of the Römisch-Germanischen Zentralmuseums, Mainz, released in 1997 and 2001, as well as in a number of articles, books and book chapters. The new book here presented constitutes the fourth volume of the Untermassfeld monograph and includes extensive new information and relevant updates concerning the developing of the research.

This new volume contains detailed information on the excavation and research history of Untermassfeld from 1997 to 2015. New evidences on the origin of the site allowed reconstructing a four-phase evolution in the development of the deposit. A new U-Pb dating of a travertine layer, redeposited into the fossiliferous deposit, yielded 1.14 Ma BP, slightly predating the age of the Untermassfeld fossils and supporting the previously reported magnetostratigraphic age of the site. Taphonomical analyses of the fossils allowed identifying bone modifications originated by insects. New results on the study of fish remains added two new fish species. Herpetological analysis provided 16 species (nine of amphibians and seven of reptiles), including the first record for Central Europe of Sand Boa *Eryx*. Bioclimatic analysis of this herpetological assemblage suggests slightly warmer and drier environmental conditions than those of the present day in the area. Bird fossils from Untermassfeld, while scarce and fragmentary, allowed the identification of twelve different species, some of which are environmentally indicative, suggesting presence of water bodies and woodlands in the area.

Among the large-mammal assemblage, new discoveries and interpretation of the herbivore fossils yielded interesting new results. Regarding the bovids, the description and comparative study of a nearly complete adult skull of *Bison* (*Poephagus*) *menneri* led to the conclusion that it represents a primitive yak, documenting the earliest and westernmost occurrence of this bovid. Among the cervids, detailed morphological analysis of the abundant material of *Eucladoceros giulii*, *"Pseudodama" vallonnetensis*, as well as that of the rarely recorded early form of roe deer *Capreolus cusanoides* including published and new fossils, allowed the reconstruction of their likely feeding habits. Re-examination of the hippo material allowed the identification of dental and skeletal pathology, as osteoarthritic lesions in limb-bone joints and hypoplastic enamel defects in teeth. A full description and comparative analysis of an extraordinarily well-preserved rhinoceros skull confirmed its ascription to *Stephanorhinus hundsheimensis* and yielded interesting anatomic information on this species, including the likely size of the horns. Study of new equid material revealed the presence of two different taxa, the middle-sized species *Equus* (*Sussemionus*) *wuesti* and another unidentified larger species.

Prof. Dr. Ralf-Dietrich Kahlke, the head of the Untermassfeld project, is the editor of this book and also contributes as author or co-author of a number of the chapters. Other authors include the specialists Mark Benecke, Madelaine Böhme, Nicolas Boulbes, Marzia Breda, Maia Bukhsianidze, Véra Eisenmann, Andreas Gärtner, Sabine Gaudzinki-Windheuser, Axel Gerdes, Jonas Keiler, John-Albrecht Keiler, Uwe Kierdorf, Adam Kotowski, Ulf Linnemann, Adrian M. Lister, Albrecht Manegold, and Krzysztof Stefaniak.

The book, beautifully illustrated, contains a lot of detailed descriptions and tables with biometric information, as well as exhaustive comparative analyses, making it a reference work for Quaternary mammal palaeontologists.

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Diego J. ÁLVAREZ-LAO; alvarezdiego@uniovi.es
Departamento de Geología, Área de Paleontología
Universidad de Oviedo
C/ Jesús Arias de Velasco s/n
33005 Oviedo