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(Review) Martin Furholt, Ivan Cheben, Johannes Müller, Alena Bistáková, Maria Wunderlich and Nils Müller-Scheeßel (eds), *Archaeology in the Žitava valley I: The LBK and Želiezovce settlement site of Vrábľe* (= *Scales of Transformation in Prehistoric and Archaic Societies* 9). Leiden 2020: Sidestone Press, 546 pp.

In 2012, an important international research project called The Collaborative Research Centre, ‘Scales of Transformation: Human-Environmental Interaction in Prehistoric and Archaic Societies’ (CRC 1266) was started at Kiel University. The main assumption of this multidisciplinary project is research of socio-environmental transformations in ancient societies. The volume: “The LBK and Želiezovce settlement site of Vrábľe” is the first part presenting the results of this project. The book was created under the editorship of Martin Furholt, Ivan Cheben, Johannes Müller, Alena Bistáková, Maria Wunderlich and Nils Müller-Scheeßel. It presents LBK (Linearbandkeramik) and Želiezovce settlement materials from Vrábľe (southwest Slovakia) – being one of the largest LBK-sites in Europe.

The book is divided into six sections. The first, by Ivan Cheben and Martin Furholt, presents the history of research project at the LBK and Želiezovce settlement site of Vrábľe. The LBK settlement Vrábľe was discovered accidentally in 2009 because of investigations of the extensive geophysical prospection of the Bronze Age settlement Vrábľe ‘Fidvár’. The investigation of the Neolithic site began in 2012. Subsequently, a joint research project was established by the University of Kiel and the Archaeological Institute of the Academy of Sciences in Nitra, which was soon embedded into the newly formed CRC 1266 ‘Scales of Transformation’ project in 2016. Thanks to its inclusion in the project, it was possible to conduct interdisciplinary research, the results of which could be used to clarify the history and character of the settlement.

The second section of the work is divided into three parts that are devoted to the scientific analyses. The first on magnetic prospection by Kay Winkelmann, Jozef Bátora, Isabel

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Hohle, Johannes Kalmbach, Nils Müller-Scheeßel and Knut Rassmann presents the results of the large-scale research in 2008–2012. The magnetic prospection was conducted near Vráble on the sites of ‘Fidvár’ and Velky Lehmy and covered an area of around 150 ha, thanks to the results of the prospection revealed to the multiperiod site of Vráble ‘Fidvár’/‘Veľké Lehemy’/‘Farské’.

The next chapter in this section by Natalie Pickartz, Erica Corradini, Raphael Kahn, Diana Panning, Knut Rassmann, Nils Müller-Scheeßel, Martin Furholt, Dennis Wilken, Tina Wunderlich and Wolfgang Rabbel presents the benefits of geophysical on-site measurements in excavations. The authors prove that excavations supported by geophysical in-situ measurements (ground-penetrating radar (GPR), electromagnetic induction (EMI) and magnetic susceptibility (MS)) on an excavation planum enable us to extend the documentation of the excavated area from 2D to 3D model subsurface structures before being destroyed through excavation. Methods used in the study the – long pits accompanying houses and postholes at the LBK and Želiezovce settlement site at Vráble. The result showed that long pits have an irregular bottom, which may be due to the authors’ opinion of discontinuous construction over time. Interestingly, a comparison of archaeological documentation with EMI and GPR measurements in some cases showed that that the bottom of the long pits were deeper than excavated. The remains classified as postholes had no distinct anomalies of geophysical parameters that could be detected, which the authors explain by the excessively high level of erosion. Only a minimal volume of the posthole fill had remained on the planum.

The authors (Stefan Dreibrodt and Hans-Rudolf Bork) of the last article in this part presents the results of geomorphological and ge archaeological research. The study of the Holocene erosion history of the slopes adjacent to the LBK site of Vráble, revealed that Holocene soil erosion started after the phases of LBK land use (Lengyel, Baden). The pit fills were analyzed by laboratory methods (magnetic susceptibility, portable energy dispersive X-ray fluorescence (ped-xrf), colour-spectrometry, loss on ignitron) which show similar geochemical properties (probably local origin of the infilled material). Additionally, they were rich in organic waste, which is probably the remains of everyday waste.

The third section entitled “Settlement features and Human burials” consists of two chapters. The first, by Robert Staniuk, Martin Furholt, Nils Müller-Scheeßel and Ivan Cheben, presents the information on archaeological features excavated between 2012–2017 from the sites of Vráble ‘Veľké Lehemy’/‘Farské’. The data were collated and presented clearly in descriptive, table recordings and drawing form. The number of artefacts within features is included, information on relative chronological dating (based on pottery decoration) and  $^{14}\text{C}$  (Bayesian modeling) is provided.

The second part of this section is devoted to the burials and human remains from the site of Vráble. Nils Müller-Scheeßel and Zuzana Hukel’ová present a catalogue of burials and human remains with information about varieties of the modes of skeletons positions (burial practices), burial goods, sex, age, pathology, results of the analyses of stable carbon

( $\delta^{13}\text{C}$ ) and nitrogen ( $\delta^{15}\text{N}$ ) isotope ratios and  $^{14}\text{C}$ . Then the anthropological evaluation of the skeletal remains is assessed, including pathology. The analysis of the stature of adult individuals indicates that this corresponds with the values recorded for other Neolithic populations in the region. The authors also describe pathological lesions and developmental anomalies and their impact on burial practices.

The work's fourth section presents the chronological analyses. The text by Ivan Cheben, Alena Bistáková, Bastian Wolthoff, Wiebke Mainusch, Nils Müller-Scheeßel, and Martin Furholt is devoted to chronological analyses of the ceramic material from the LBK and Želiezovce settlement site of Vráble. The typochronological analysis of the pottery material was based on qualitative comparison with existing chronologies (qualitative analysis) and research on the motifs and decorative techniques. Based on Juraj Pavúk's (1994) recording system, they were catalogued with motifs and decorative techniques on sherds. Then, the decorative elements were quantitatively analyzed using correspondence analysis (CA). The CA of decorative techniques showed a chronologically significant pattern of changes. Interestingly, the CA of decorative motifs showed their diversity on a smaller scale: to the yard or region of the site.

In the article entitled "Radiocarbon dating at the LBK and Želiezovce settlement site of Vráble" (by Robert Staniuk, Maria Wunderlich, John Meadows, Nils Müller-Scheeßel, Martin Furholt and Ivan Cheben) the dating programme and Bayesian modelling developed for the 'Veľké Lehemby'/'Farské' settlement complex at Vráble is presented. The authors described the method of sampling of archaeological features, their selection of  $^{14}\text{C}$ , and methodology behind the dating programme as an outline of the developed models.

The fifth section is entitled "Material culture, plants and animal data". In the first part, Ivan Cheben and Alena Bistáková present a description of the technological and typological features of the pottery materials excavated from the Vráble 'Veľké Lehemby'/'Farské' site. They note that the inventory represents the younger LBK style, the Želiezovce style, and some objects also contain Bükk and Lengyel style pottery, which is typical for south-western Slovakia. The settlement areas in Vráble are marked by common technology, and a uniform set of vessel shapes, but as noted above, the decorative motifs are more specific to different areas on the site.

The second chapter by Michal Cheben, Pavla Hršelová, Maria Wunderlich and Kata Szilágyi present the lithic material from Vráble, consisting of chipped and ground stone tools and debitage. The analysis shows that different varieties of raw materials and types of tools were used within the settlement. The distribution patterns of stone artefacts at the site and the causes that may be responsible for them are also discussed.

The next chapter (by Rebekka Eckelmann) presents the analysis results of bone tools discovered at Vráble. Rebecca Eckelmann shows the assemblage of bone tools from this site is comparable to those found in other LBK contexts. She sees the need for further research on this category of archaeological sources, among other things, to better understand the function of bone objects.

The chapter by Rebekka Eckelmann, Ulrich Schmölcke and Cheryl A. Makarewicz is devoted to zooarchaeological analyses of fauna recovered from Vráble ‘Velké Lehemby’/‘Farské’. The authors describe the modes and types of animal husbandry. The analysis results show a predominance of remains of domestic animals with a small share of remains of wild ungulate animals. It seems interesting to note that animal husbandry systems at Vráble focused on the exploitation of pigs differently than at other LBK sites in Europe.

In the article entitled “Archaeobotanical remains from the LBK and Želiezovce settlement site of Vráble” (by Dragana Filipović, Helmut Kroll and Wiebke Kirleis) archaeobotanical data was presented for Vráble. The collated data were used by the authors for reconstruction of the plant-growing and consumption habits and how the surrounding landscape had been used. The typical LBK crop spectrum (einkorn and emmer as the most prominent components) and typical model of the nature and scale of farming at LBK was documented at Vráble.

Tim M. Schroedter presents in his article the anthracological data (wood charcoal) to get insight into the wood vegetation in the vicinity of the site. In his opinion, the small number of taxa at this site indicates a high degree of selection in firewood economy.

The next chapter by Frank Schlütz, is devoted to the analysis of snail shells. The research results help in the reconstruction of former environmental conditions. They point towards a landscape of open grasslands around Vráble.

The last article by Rosalind E. Gillis and Cheryl A. Makarewicz, is devoted to stable isotopic analyses of samples of human and animal bones and of cereal grains from the LBK site of Vráble. They provide important information about the human or animal diet in prehistoric times. Analyses showed that animal products played a minor role in the diet of LBK farmers at Vráble.

The last part of the monograph is entitled “Synthesis”. Here, Johannes Müller, Nils Müller-Scheeßel, Ivan Cheben, Maria Wunderlich and Martin Furholt deal with the reconstruction of the demographic development of the Vráble site. The magnetic plans of the entire site and the data from the excavations and extensive coring programs were developed into a chronological model. Additionally, based on  $^{14}\text{C}$  dates and the orientation of houses showed a gradual change in their orientation towards the left of  $13^\circ$  per 100 years. Using statistical, archaeological, and anthropological data, they estimated the average number of inhabitants of the settlement and change in this number over time. The data obtained became the basis for the reconstruction of social and economic processes and strategies in the history of the Vráble settlement.

The second chapter by Martin Furholt, Rebekka Eckelmann, Dragana Filipovic, Rosalind E. Gillis and Johannes Müller devoted to reconstructing the subsistence strategies at Vráble and discuss their social implications. For this purpose, they use data from the results of zooarchaeological, archaeobotanical, and stable isotope analyses together with demographic patterns. The authors also describe possible reasons for the settlement’s decline. They look for them in exclusionary strategies (enclosure construction activities).

The last part of the discussed book (by Maria Wunderlich, Johannes Müller, Ivan Čeban, Alena Bistáková, Martin Furholt and Nils Müller-Scheeßel), presents a synthesis of the socio-political developments of the communities at the Neolithic site of Vráble 'Veľké Lehemby'. Using available data, they reconstructed a model of the political economy of the LBK and Želiezovce settlement site. They point to the simultaneous existence of an exclusionary and communal strategy as an important element of this system. In their opinion, this could indicate the existence of social tensions, conflicts and social inequalities (*e.g.*, diverse burial rites). Ultimately, the intensification of these processes contributed to the abandonment of the settlement.

In conclusion, this book is a valuable resource for anyone interested in archaeology, going beyond basic research on archaeological material (*e.g.*, specialist analyses, use of interdisciplinary research methods, attempt to synthesize data) can be a model for researchers of various periods. This case study of a settlement at Vráble provides important information to the studies upon the LBK and socio-environmental changes in this society.

## References

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