

LEO KLINKE, Wahrnehmung vergangener Landschaften. Studien zur Entwicklung einer Kulturlandschaft im nördlichen Münsterland vom Spätneolithikum bis ins Spätmittelalter aus emischer Perspektive. Veröffentlichungen der Altertumskommission für Westfalen, Landschaftsverband Westfalen-Lippe Volume 23. Aschendorff Verlag, Münster 2023. € 39.00. ISBN 978-3-402-15011-5. 302 pages with 216 figures.

This publication is based on Leo Klinke's dissertation, submitted to the University of Münster in 2020/21, supervised by Ralf Gleser and Michael M. Rind. The research was conducted as part of the project "Megalithik in Westfalen", led by the *Altertumskommission für Westfalen*, where the author worked as a volunteer and research assistant. The study takes a diachronic approach to explore the development of the cultural landscape, synthesising and evaluating geological, climatological, archaeological and archaeobotanical data from a 6.25 km² study area within the Osnabrücker Hügelland between Lotte-Wersen and Westerkappeln in Westphalia and southern Lower Saxony.

Recent developments in landscape archaeology advocate for a holistic approach that moves beyond the traditional separation of archaeological relics and the surrounding natural environment and are often based on post-processual thinking (BERNBECK 1997; GRAMSCH 2003; DONEUS 2013; KNOPF 2013). L. Klinke's work from 2023 on the "Perception of Past Landscapes" can also be categorised under these approaches, seeking to bridge the divide between "physical structure" and "archaeological legacy" in the archaeological observation. Additionally, the book endeavours to reconstruct the perception of prehistoric individuals and groups of their surrounding environment, offering readers an emic viewpoint (p. 3). To this end, a theory and methodology for the "archaeological landscape perception" is developed. It is based on a tripartite division into objectifiable biological processes (visual system), intersubjective (generally comprehensible) and subjective (emotional) factors. The key concept is the "archaeological landscape" (p. 5). This term refers to the interrelationship between the archaeological monument and the surrounding natural area as interdependent processes that lead from a natural to a cultural landscape. The "archaeological perception of landscape" (pp. 24–26) is determined by visual stimuli, human actions and the surrounding space in close interaction. Klinke illustrates the connections and dependencies of the individual elements of perception – such as the physical (perceptual space) and the cognitive-psychological elements (space of thought, experience, imagination according to N. HARTMANN [1950]) – graphically in connection with the archaeological facts and working methods as well as the resulting socio-cultural interpretations with an archaeological "bathtub model" (Wannenmodell, p. 25 fig. 27). While the study ambitiously aims to reconstruct past cognitive perceptions of archaeological relics within their geographical environment through the actors of that time, their intentions and the changes of perception over time is restricted to visual sense alone. It is the only sense that is linked to the surviving archaeological monuments; however, it only represents a part of the sensory spectrum of perception.

The 300-page publication comprises eleven chapters, the last two of which contain an English translation of the summary (pp. 253–256) and the bibliography (pp. 257–300). The remaining 251 pages are divided into nine chapters dealing with theory and method (pp. 5–26), the collection of data (pp. 27–54), the prospection of new landscape data (pp. 55–87), the reconstruction of the cultural landscape (pp. 89–128), various analyses (pp. 129–194), the interpretation of the results (pp. 195–232) and their significance for research (pp. 233–246) and the conclusion (pp. 247–251). The methods used are explained in basic articles. This takes up a large amount of space (approx. 25 pages or 10 %) within the publication and contributes to a textbook-like character in some sections. The text is structured along the methods under consideration, thus sometimes divides facts, analysis, and results referring to one feature in separate passages. For example, information from the megalithic tomb "Große Sloopsteene" can be found in over ten paragraphs, possibly a consequence

of the “holistic approach”. In contrast, time horizons are used to structure the text in chapter 7. This, supplemented by a methods chapter with references to the practical applications, could have been an alternative to the method-based division. In any case, the inclusion of a keyword index would enhance the text’s accessibility, allowing readers to locate relevant passages more efficiently.

The study area is well described by thematic maps and diagrams on topography, geology, natural environment, vegetation, soil quality, climate, vegetation and research history. Furthermore, the archaeological data basis is explained in detail, even the classification of the site files of the *Landschaftsverband Westfalen-Lippe* (LWL) Office for the Preservation of Archaeological Monuments is included. It comprises two late Neolithic megalithic graves, two burial mound fields dating from the late Neolithic period up to the Iron Age, “Celtic Fields” from the same period, a part of a late medieval defence system (*Landwehr*), modern vaults, several open-air spots with Neolithic and Metal Age finds and nearly 600 remains of trackways, but no direct evidence of settlements had been identified. In total, 28 archaeological sites (traces are grouped together) are mapped. Their chronologically differentiated distribution is illustrated in a dedicated map, with additional detailed representations of Metal Age burial mound clusters (pp. 39 figs 44, 45;; 43 fig. 49). Research on a local scale is complemented by detailed studies on the reconstruction of the former ground surface and archaeological monuments. The reconstructed topography of the area shows no major anomalies and only slight differences in height of a maximum of 24 m. “Werser Holz” to the north, “Rother Berg” to the east, the significantly lower “Gabelin” hilltops to the south-west and a southern fen structure the area. Brown earth is the predominant of the six soil types with over 60 %, followed by gley and podsol.

The results of the vegetation-historical (pp. 71–83) and climatological research (pp. 83–87) allow their subsumption in general climatic curves only. The chronological reassessment of elm decline, which is set to begin earlier than generally assumed for the region (p. 195), is an exception. Overall, the study area is too small and the data situation too limited to deal with issues of settlement structure, the spatial relationship of graves to settlements or demographic issues. Despite these constraints, the author tries to obtain as much information as possible on the microscale through extensive analytical efforts.

The author organises cultural-historical and botanical-climatological data into time segments of different lengths (pp. 195–232). The archaeological classification is based schematically on existing ground monuments. The oldest Late Neolithic segment comprises the construction of the two megalithic tombs of the Funnel Beaker Culture and the duration of their occupation (3350–2850 calBC). The Metal Age segment begins with the indirect typological dating of a flint blade from grave G24 in the Westphalian occupation phase III after 2350 calBC and ends around 420 calBC based on various criteria. The final segment focuses on the late medieval segment dating between 1250 and 1450 calAD, the period in which the *Landwehr* was built and used. This results in 500 years for the Late Neolithic, 1900 years for the Metal Age and 200 years for the Late Middle Ages. Although archaeological site density per year remains consistent in all periods (0.02–0.03), the marked disparities in temporal duration inherently limit the cross-period comparability.

Various prospections carried out in and around the study area supplement the available data (pp. 55–87). These include airborne laser scans (ALS data), magnetometer investigations, geological drill core and soil profile analyses, groundwater influence maps, pollen profiles, tree ring curves and ice cores. In some cases, various other methods are discussed and their rejection justified (e.g. maps of potential natural vegetation and speleothems). The ALS-data is particularly intensively discussed (pp. 55–62). The technology, increasing stages of accuracy with successive aerial surveys, combination of digital elevation and surface models, necessary filter settings for the best recognition of archaeological objects and different shading methods for the best representation are explained and their application for surface reconstruction is justified and documented.

A theoretical part on digital reconstructions, their visualisation, the models derived from them, the requirements regarding their authenticity, and the standard for the accompanying documentation introduces the topic (pp. 92–97). Case studies from the research area are presented, separated according to different detail levels (Level of Detail [LoD] 0–4). The high-resolution reconstruction (LoD 4) is described using the example of the megalithic tomb (pp. 98–106), supplemented by a virtual reality (VR) application focused on the same monument (pp. 126–128). Here, virtual reality is understood as a step in the analysis that goes further than the high-resolution reconstruction with LoD4. The other reconstructions (burial mounds = LoD 2, *Landwehr* = LoD 1, vegetation = LoD 0) are at lower levels of detail. The descriptions of the reconstructions of the archaeological monuments, especially the megalithic tomb, are very well done and a highlight of the publication.

A generalised reconstruction of the vegetation is reduced to the tree species recorded in the pollen profiles. Despite methodological concerns raised elsewhere regarding count values (p. 79), these data – combined with newly calibrated radiocarbon dates of the linked pollen profiles – are applied and combined with seven habitat types derived from hydrological, pedological, and partially reconstructed topographical data. Classified by pollen zones, the analyses interpolate forest cover types and species ratios, with results in tables and maps (pp. 117–123 figs 112–121). A stronger colour differentiation of the locations and schematic filling patterns for the tree communities would have led to a better perception of the results than the different shades of green for locations and tree pictograms for the tree communities. While aesthetically appealing, it makes a quick overview difficult.

The description of the vegetation history is based on pollen profiles from the immediate vicinity of the study area. Klinker recalibrated and standardised the available radiocarbon dates and placed the profiles in chronological relation to each other to cover the entire archaeologically documented period. Pollen zones and their representation in the profiles are examined in detail (pp. 72–83), although analyses of charred and other plant remains were unattainable given the limited study area. A reconstruction based solely on palynological data can lead to erroneous interpretations, as an example from the Rhineland shows (MEURERS-BALKE et al. 1999, 27). The results obtained here should therefore be treated with appropriate caution. The reconstructed climate curve (p. 86 fig. 86) is correlated with the pollen diagrams as regional elements. However, this linkage of the study area with the climate curve is rough, as the curve is mainly based on Greenland ice core drillings and tree ring curves from southern Germany. Pollen profiles serve as regional indicators of climatic conditions (pp. 85–87). Unfortunately, the approximate position of the pollen zones is not shown in figure 86, which would have enhanced comprehension.

The Least-Cost-Path (LCP) investigations (pp. 132–136) are based on the terrain heights and slope inclinations derived from the reconstructed terrain model and use the archaeological objects in the study area and from the adjacent neighbourhood as starting points (pp. 134–135 figs 126, 127). At this point, it would have been interesting to directly compare the calculated course of possible paths with the actual existing paths. Other starting points (e.g. Iron Age settlements outside the working area) and cost factors (e.g. accessibility of soil types in combination with groundwater levels and seasons) are not used for LCP analysis. The investigation of the road tracks (pp. 136–155) is a focal point of the publication. One of the problems with the routes found in the study area is the lack of chronological references that would allow them to be assigned to the specific time segments. Applying a method based on a Harris-Matrix (pp. 140–141 fig. 131), the author defines six directional groups of path sections, assigning them to nine stratigraphic levels, which he can partly relate to the archaeological objects present in the area. In combination with historical maps and archive data (e.g. pp. 147 and 148 fig. 140), the courses of individual paths or routes and their con-

nections, some of which have been altered by more recent earth works, are discussed here. Visibility analyses are another focus of the investigation (pp. 158–194). Preparatory procedures include the reconstruction of the terrain surface (pp. 162–164) and the chronologically differentiated estimation of body and viewing heights (pp. 164–166). The fact that the different body heights of men and women are averaged do not, in the reviewer's understanding, correspond to the author's emic approach. Especially since the gender differences are sometimes greater than those between the individual time segments. Visibility lines based on grave monuments (LoS [fig. 160]), various types of visibility maps (binary [pp. 168–169 figs 161, 162], depth Below Horizon [pp. 162–163 figs 155, 156; pp. 171–173 figs 163–167], Cumulative viewsheds [pp. 174–175 figs 168, 169; pp. 220 fig. 208], Higushi viewsheds [p. 186 fig. 186]) and projective and reflexive prominence maps (pp. 193–194 figs 193, 194) are calculated. Cumulative and Higushi viewsheds for selected paths (pp. 180–183 figs 174–181; pp. 187–192 figs 187–192; pp. 230–231 figs 213, 214) show very informative abstract visibility zones along them and the archaeological monuments. A schematic distinction is made between near, middle and far distance ranges (p. 184 fig. 183). Depending on the chronologically differentiated eye height and the standardised widths of the dominant tree species, the distances for the interesting close range between 630 m (Late Neolithic) and 1000 m (Metal Age) to just under 1600 m (Late Middle Ages). If the monument height is used instead of the tree width, the values are significantly lower (close range 91.7–166.2 m). Perspective views of the megalithic tomb "Große Sloopsteene" (p. 172 figs 165; p. 173 fig. 167) and visual prominence maps (pp. 193–194 figs 193, 194) complete the chapter.

The interpretation of the results (pp. 195–232), differentiated according to the time segments, is based on the archaeological features present in the working area. Archaeologically unrepresented periods are categorised as transitional phases, while climate and vegetation are summarised and indications of anthropogenic influence or utilisation in the pollen spectra, which lead to the interpretations in regard of economic conditions. Data gathered outside the research area (e. g. on slash-and-burn agriculture and the use of the hook plough in the Late Neolithic) are included (pp. 195–207). Extended discussions of landscape structure (pp. 198–204; 212–218; 226–229) integrate prior analytical results into a cohesive cultural landscape model. Considerations on the visual perception by contemporary users of the landscape and the socio-cultural and symbolic content are compiled based on this reconstruction (pp. 205–207; 218–221; 229–232).

The author uses a biblical topos (Genesis 1, 28) to describe the ongoing and intensifying development from natural to cultural landscape and postulates, for example, a transition from a phase of simply utilising the natural environment to a phase of its domination by prehistoric man in the Late Neolithic (p. 198). Since the terms utilisation and domination are not further defined, the meaning of the statement remains vague. Forest grazing and intensive livestock farming alone lead to a significant change in the vegetation and the landscape; the author cites examples, such as the emergence of heathland (p. 196 and p. 197 fig. 195) and the decline of elm because of pest infestation and cutting (p. 196). Klinke, however, only considers the construction of the megalithic tombs as an actual indicator of the transformation of a natural landscape into a cultural landscape (p. 198). Based on our current understanding of the significance of architecture, the author is certainly right. Whether this corresponds to an emic Late Neolithic view is probably not easy to decide.

The significance of the work for landscape archaeological research lies above all in the attempt to combine methods of the New Archaeology with topics of the Post-processual Archaeology into an extended landscape archaeological approach. The absence of olfactory, acoustic and seasonal elements in the perception raises the question of whether "approaching an emic perspective" is fundamentally possible. This is because the "experience of the landscape" by its prehistoric inhabitants is not only characterised by the topographical and visual conditions, but also by the specific seasonal

circumstances. The olfaction of a plant community (e.g. bog, lime blossom, etc.) and the sound of the seasonal fauna also may have played its part. The reconstruction of the megalithic tomb comes close to this goal and is a successful endeavour in all respects.

While the vegetation history reconstruction reflects great and commendable effort, its reliance on incomplete plant remains and regional tree ring curves data, undermines its robustness. The pathway archaeology component is innovative in its approach to chronological organisation as well as the applications and interpretations of the Visibility analyses, with minor limitations. Considering results of recent research from the Netherlands on “Celtic Fields”, the here proposed dating method based on size ratios is not tenable. There is evidence of long temporal continuities of the structures from the Bronze Age up to the Roman period (ARNOLDUSSEN 2018, 18 and fig. 10), which means that the ramparts were in place at some sites over the entire period of use. The size ratio would therefore no longer be chronologically significant and not an argument for further interpretations.

The study excels in showcasing the potential of integrating GIS-based methods with analytical tools like the Harris matrix to address novel research questions. A different study-area or a broader data set could have better utilised the potential of the research approach, but whether the model can be transferred to other areas or scales must first be proven by additional studies.

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