

THE LATE MAGDALENIAN OF GÖNNERSDORF AND ITS HEADLESS ANTHROPOMORPHIC DEPICTIONS. ON SOCIAL COHERENCE AND THE LATE UPPER PALAEOLITHIC COLONIZATION OF CENTRAL EUROPE

Abstract

This paper presents a brief review of the present state of research on the Late Magdalenian site of Gönnersdorf. It attempts to provide an improved, synthetic and 'holistic' interpretation of the site, with a focus on its spatial data and the rich body of its 'artistic' expression. The 'Gönnersdorf-type' headless anthropomorphic depictions serve as the backbone of a diachronic and supra-regional comparison of Late Upper Palaeolithic anthropomorphic depictions. Between ~19,000 and 14,000 cal BP "headlessness" appears to have been an important subject that was shared between different Late Upper Palaeolithic societies of Europe and its neighbours. The geographic and diachronic variability and the cultural contexts of these depictions, however, imply that different worldviews and/or belief systems are reflected in the different styles of anthropomorphic representations. The observed homogenisation that accounts for the Late Magdalenian 'Gönnersdorf-type' headless anthropomorphic depictions is argued to have enhanced social interconnectedness and cohesion on supra-regional scale and that the establishment of newly organized social-cultural systems has supported the successful colonization of central Europe from ~16,000 cal BP onwards.

Keywords

Palaeolithic art, headless anthropomorphic depictions, Late Magdalenian, socio-cultural rules and regulations, base camp

PREFACE

When I first visited what is today the MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution, I got to know Elaine and Martin, who welcomed me in the castle's *Jagdhaus*. It didn't take me long to realize that both of them were essentially humanized reference books of Prehistoric archaeology, and I probably learned more from each of them than I did from university. Over the course of the past decades Elaine and Martin were deeply engaged in numerous research projects in which they addressed a plethora of topics within Pleistocene and Early Holocene archaeology. But they were always united in their joint interest in zooarchaeology and its contributions to understanding how past human groups coped with the challenges of their everyday lives and consequently managed to survive. Probably, one of the most impressive analyses Elaine and Martin jointly published is the monographic presentation of their research on "The Faunal Remains from Gönnersdorf" (Street and Turner, 2013), in which they present the results of their in-depth study of a material they began to work with shortly after they arrived in Germany. The results of this comprehensive work provide not only the raw data for an improved understanding of Late Magdalenian adaptations and lifeways, but also shed fresh light on a synthetic interpretation of the Gönnersdorf open-air site (**Fig. 1**), which is more in line with all the other evidence the site has provided us with.



Fig. 1 Gönnersdorf, showing excavated areas and trenches (grey) between modern buildings (black). Within the excavated area, arrangements of larger stones and artefical pits allow to distinguish the different concentrations (from south to north: concentrations K-I, K-SW, K-IIa, K-IIb; K-III, K-IV). Elevations are given in metres above sea-level. – (Modified from: Jöris et al., 2011; Jöris and Moseler, 2021a).

WHY GÖNNERSDORF?

The present contribution attempts to bring together the different topics the site of Gönnersdorf, excavated by Gerhard Bosinski between 1968 and 1976 over a total area of 687 m² (Bosinski, 1979), has touched upon since its discovery (Bosinski, 1969, 1975). Over the last 50 years, a number of ‘core questions’ the site seemed appropriate for addressing, have been repeatedly explored and continuously updated, corrected and refined in numerous monographs and articles.

(1) The first of these questions relates to understanding the sites’ spatial organisation and structure. At the time of its discovery, much of the research into this period was still dominated by excavations in caves and rock-shelters, and, consequently, little focus was spent on the spatial structures and features that high-resolution open-air sites could provide. But new excavation methods and standards now allowed for a new quality of documentation and analytical resolution. Bosinski’s work at Gönnersdorf was strongly influenced and guided by the methods developed and implemented during the excavation of the Magdalenian site of Pincevent in France (Leroi-Gourhan and Brézillon, 1966, 1972) that began shortly before and continued in parallel to Bosinski’s work. These efforts were targeted at understanding the socio-economic and socio-spatial organisation of Late Upper Palaeolithic hunter-gatherer lifeways and so to provide a better understanding of their “ethnologie préhistorique” (Leroi-Gourhan, 1936; cf. Valentin, 2015). Similarly, Bosinski’s work at Gönnersdorf targeted the identification of spatial units and their understanding as areas of differing activities, including potential habitation structures (Bosinski, 1969, 1979, 1981, 1988, 2007). The site’s large and artefact-dense concentrations were interpreted as ground plans of differently sized dwelling structures (e. g., Bosinski, 1979, 1981, 1988, 2007). Over the last decades, the interpretation of these structures and their temporal interrelations have repeatedly been addressed and changed; the present state of analyses and interpretation will be summarized below.

(2) The second question concerns the understanding of the rich record of ‘artistic’ expressions that Gönnersdorf has become famous for. No other Magdalenian open-air site has produced ‘artistic’ expressions in anything like a comparable amount (Bosinski and Fischer, 1974, 1980; Bosinski et al., 2001; Bosinski, 2008).

(3) The third question concerns the sites’ chronostratigraphic position and, consequently, its place within the Magdalenian demographic expansion from south-western into central Europe. Initially thought to have commenced with the beginning of the period of Late Glacial warming, i. e., the “Bölling” interstadial¹ (Brunnacker et al., 1978; Bosinski, 1981), subsequent radiocarbon dates and the ability to calibrate the radiocarbon time scale over the Glacial period that emerged in the 1990s, showed that the sustainable post-Last Glacial Maximum (LGM) re-occupation of central Europe actually commenced long before the “Bölling” interstadial (Street et al., 1994; cf. Housley et al., 1997; Stevens et al., 2009). Gönnersdorf took a prominent position in this process.

Each of these questions, however, is closely interlinked with the others and cannot be answered from studying in isolation the site’s spatial structure, ‘artistic’ record, or radiocarbon chronology. Instead, answering each of the questions requires a much deeper, more comprehensive and synthetical approach, as the site’s function(s) can only be assessed through a combination of these lines of research, and through their discussion within a widened contextual framework into which other lines of evidence from Late Upper Palaeo-

¹ With the term “Bölling” Arlette Leroi-Gourhan referred to the beginning of the Late Glacial interstadial (Brunnacker et al., 1978). In the northern half of central Europe, where the Bölling had been defined (cf. discussion in Jöris and Álvarez-Fernández,

2003), the beginning of the Late Glacial interstadial, i. e., Greenland Interstadial GI 1e (cf. Rasmussen et al., 2014), is defined as the Meiendorf interstadial (cf. Street et al., 2002).

lithic contexts will need to be included and discussed. Until now, such a holistic perspective has not been attempted for the site.

Closely connected to such a broadened contextual framework is the question to which degree the observations and interpretations made at one site can be accounted as representative, 'typical' or 'characteristic' for the entire time interval and geographical area in focus, and to which degree data from one site may be extrapolated to add to the understanding of others (e. g., Pasda, 2012; Leesch and Bullinger, 2012). Major shifts in the frames of reference and in the perspectives taken that came with the *New Archaeology* (e. g., Binford, 1983) opened up the possibility of alternative interpretations of site organisation and function, strongly focussing on the understanding of daily routines of Magdalenian hunter-gatherers in their socio-economic contexts (cf. e. g., Audouse, 1987; Valentin, 2015). Together with the observation that most of the activities at Magdalenian sites apparently took place in the immediate proximity to hearths (cf. Bullinger et al., 2006; Leesch and Bullinger, 2012; Leesch et al., 2004; Julien and Karlin, 2014; Zubrow et al., 2010; cf. Moseler, 2020) and the argument that the archaeological remains at (most) Palaeolithic sites would result from the 'palimpsest' accumulation of (distinct) "intermittent episodes of deposition resulting from high residential mobility" (Galanidou, 1997: 1), a widespread view of Magdalenian lifeways emerged that placed great emphasis on repetition of the same or similar activities which are documented at many Magdalenian sites and which, therefore, are seen to reflect culturally learned activities undertaken by the members of a certain social entity (cf. Pasda, 2012). Such patterns can appear quite alike, especially in reindeer-based economies, even between sites, and show certain analogies with the ethnographic record (cf. e. g., Julien and Karlin, 2014 and references therein). Major distinctions between different sites would in this case be less likely to be based on the natural environment and site function than they were on group size, season of occupation, and frequency and duration of each of the occupations of a specific locale. This perspective closely follows Leroi-Gourhan's "palaeo-ethnological" approach (Leroi-Gourhan, 1936; cf. Valentin, 2015), and through it, one can argue for the existence of a well-defined Magdalenian behavioural canon, which could serve as a further argument for the general applicability of conclusions made from individual sites.

The interpretation of Gönnersdorf, however, stands in stark contrast to such a 'monolithic' view of the Magdalenian, and the long time period that is covered by as the concept of the "Magdalenian" (ca. 17,500-12,000 ¹⁴C BP; i. e., ~21,000-14,000 cal BP²) and its wide geographical distribution from the Iberian Peninsula to eastern central Europe (cf. Maier, 2015), add considerable variability and complexity to this perspective. Inter-site similarities and differences can be found at varying analytical levels and at varying levels of resolution, addressing different aspects of Magdalenian lifeways that allow us to go beyond the reconstruction of domestic activities. The following synthetical approach will therefore focus not only on answering the three central questions linked to the Gönnersdorf site, i. e., its spatial interpretation, 'artistic' record, and chronology. Instead, the frame of reference will be widened by the comparative study of the Late Upper Palaeolithic headless anthropomorphic depictions at the supra-regional level, and it will dive deeper into the 'cultural history' that precedes the Late Magdalenian of Gönnersdorf to address the origins, formation and development of Late Upper Palaeolithic worldviews and belief systems as they are of relevance for understanding Gönnersdorf's site function.

² Radiocarbon dates were calibrated with the CalPal software (Weninger, 2021), using the IntCAL20 "Northern Hemisphere Radiocarbon Age Calibration Curve (0-55 cal kBP)" of Reimer et al. (2020). As the focus of this contribution is not on a detailed

chronology, calibrated dates are rounded. A more detailed discussion of chronological issues is largely based on uncalibrated radiocarbon dates.

GÖNNERSDORF RE-INTERPRETED

Elaine's and Martin's joint study of "The Faunal Remains from Gönnersdorf" reveals that the locality was used over an extended period of the year, during which at least 53 horses and numerous other animals were consumed (Street and Turner, 2013). An almost complete absence of carnivore or small mammal gnawing not only implies that the site was buried shortly after it was abandoned, but also that humans were likely present at the locale more or less continuously over the time that is represented by seasonal faunal data, i. e., discouraging these animals to scavenge from the site (Street and Turner, 2013). With regard to its main occupation phase, dating to between ~15,600 and ~16,000 cal BP (cf. Stevens et al., 2013), these data may best be read in favour of a possibly even singular, but lengthy (probably much more than half-year long) period of use. These data also match well with the results from intensive refitting studies (including knapped lithics and rocks) that were initially aimed at disentangling different phases of occupation of the site and at establishing an internal chronology for the site's different material concentrations (e. g., Eickhoff, 1989, 1990; Eickhoff and Lindenbeck, 1989; Veil, 1990; Terberger, 1997). All of the established relative-chronological sequences for the site have pointed to the more-or-less simultaneous use of these distinct zones (Sensburg, 2007, 2008, 2011; cf. Terberger, 1997), in contrast to many other broadly contemporary sites which are interpreted as palimpsests of repeated but short occupational phases, where refits document the sequential movement of material starting at one point and ending at another (e. g., Bullinger et al., 2006). At Gönnersdorf the different concentrations frequently interconnect by large number of long-distance refits. The outcome of comprehensive refitting efforts of different rock types, undertaken by David Batchelor in the 1970s and 1980s, is plotted on detailed plans archived in MONREPOS, and documents hundreds of refitted complexes. Among these are numerous cases in which refits span long distances between the concentrations, showing movement of materials repeatedly running back and forth, i. e., in two directions (Terberger, 1997). These data provide evidence for activities that were interconnected and took place in parallel, and differ from the evidence provided by most other sites that are interpreted as the result of more ephemeral, short-term and seasonally frequented locales at which a restricted range of activities were practiced, mostly focussed on the procurement of animal resources (e. g., Debout et al., 2012; Julien and Karlin, 2014; cf. Turner, 2002).

The relative degree of ("limited") "sedentism" proposed for Gönnersdorf (Street and Turner, 2013: 250) complements these observations, and explains to a large degree the site's richness (e. g., Franken and Veil, 1983) and the broad spectrum of activities that have been documented at it. Clearly, a temporally extended period of occupation of the site justified greater investment into the organisation of space and in architectural structures that the site provides (e. g., Bosinski, 1979, 2007; Terberger, 1997; Jöris and Terberger, 2001; Sensburg, 2007, 2008; Moseler, 2008, 2011; Jöris et al., 2011, 2021; Jöris and Moseler, 2021a, 2021b; Street and Turner, 2013). Evidence of periodic cleaning (Jöris and Moseler, 2021a) highlights the maintenance of the Gönnersdorf concentration K-IV light rectangular tent structure in the north of the excavated area that was composed of a structural frame of some of the largest schist plaquettes documented at the site, laid out as more-or-less even pacing (Fig. 2; Jöris and Terberger, 2001; Moseler, 2008, 2011). It is noteworthy that in contrast to the refit-patterns of the other concentrations – none of the plaquettes forming the rectangular frame of the K-IV construction could be refitted (which would imply transport of the material); as such these rocks appear to have been of static constructional importance, i. e., to provide structural stability: all rocks > 15 cm in maximum dimension appear to have been placed there deliberately. The area so enclosed was kept free of waste generated by the processing of fauna, and inside the tent's ~ 16 m² large rectangular ground plan, no large faunal elements were found at all (Jöris and Moseler, 2021a). In terms of its low density of finds, distinct architectural components, lack of pits and virtual absence of distinct find

categories, the K-IV structure differs from the site's largest and densest concentrations (K-I, K-II, K-III), the latter of which are made up of tons of gravel and rocks transported to the site (mostly from a nearby small creek) that accumulated over the entire duration of occupation.

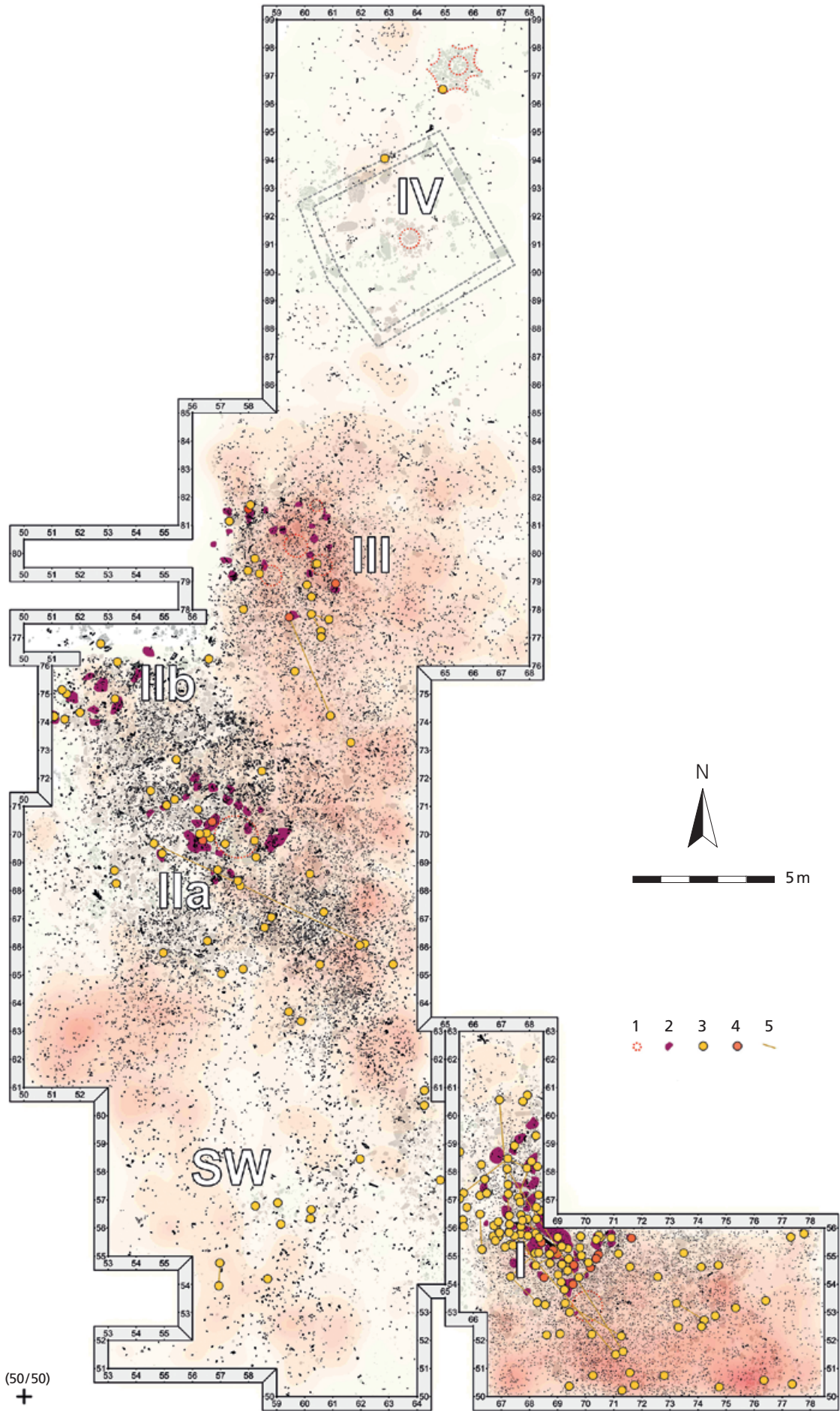
Today, the large concentrations can no longer be understood as enclosed, roof-topped constructions as they once were, but rather as areas of outdoor activities that were systematically organised spatially (Jöris et al., 2021; Sensburg, 2008). This was characterised by the constant accumulation and – over the course of occupation – re-arrangement of material over a lengthy period of time (cf. Jöris and Moseler, 2021b; Sensburg, 2007). Refits, particularly for K-II and K-III, closely link these clusters to the K-IV tent structure (Terberger, 1997). If one follows the interpretation of K-IV as a tent dedicated to resting and sleeping (hence the need to keep it clean: Jöris and Moseler, 2021a) and if one considers the immense amount of material that the large outdoor activity areas of the denser concentrations have produced, one may predict that other K-IV-like structures must have existed at the site, but which the excavations did not locate. Test *sondages* designed to establish the spatial extent of the site within the area covered by modern buildings were undertaken during the 1970s in parallel to the excavation, assessing large areas to the east and north of K-IV (Bosinski, 1979; cf. Fig. 1). As most of the test squares contained few artefacts only, excavations were never extended into these areas. However, the low densities of finds there show that the settlement area continued over a surface of at least ~400 m² or even more. The fact that no dense find scatters have been detected there, allows us to assume that at least no dense concentrations like those of K-I, K-II or K-III would be expected there. But this projection does not imply that there were no further light structures characterised by low find densities that could resemble (a) K-IV-like structure(s). Future fieldwork could target this question and test this hypothesis.

The complex spatial patterns of refitted materials at Gönnersdorf are most suggestive of activities that were sequentially linked and which accumulated in parallel over a long period of time, ultimately forming dense concentrations of material (Sensburg, 2011), rather than repetitive but temporally disconnected short-term activities that spanned a longer period (several years) of repeated but discontinuous site use, also involving the regular use of fire (Moseler, 2020). As many of the individual quotidian activities that took place at Gönnersdorf were of quite ephemeral character; we are therefore presented with palimpsests of such short-term activities. Refitting, raw-material and size-sorting studies have, however, shown that these palimpsests did not lead to a horizontal disturbance (i. e., spreading-out) of materials; instead they remained more-or-less in place, where they were constantly re-arranged and re-cycled in subsequent activities (e. g., Jöris and Moseler, 2021b; cf. Terberger, 1997). There is probably no other site of this period that reveals an equally broad spectrum of activities and/or equally intense traces of them; these include the intensive use of (non-knapped) schist, quartzite, quartz, and occasionally basalt (e. g., Batchelor, 1979; Terberger, 1997), partly as architectural elements used to structure and organise the space used (Jöris et al., 2011), or as ground stone tools used as supports or anvils for numerous tasks, including hammering, battering, chiselling, drilling, and others. Most of these traces have not yet been studied exhaustively. However, use-

Fig. 2 Composite Gönnersdorf excavation plan (modified from: Jöris and Moseler, 2021a) highlighting the different concentrations (from south to north: K-I, K-SW, K-IIa, K-IIb; K-III, K-IV with the reconstructed, ~16 m² covering quadratic ground plan of a presumably light tent-like dwelling structure). Scale: 1:200.

The plan comprises (a) distribution of deliberately placed manuports (rocks and plaquettes) shown in grey in the background of the figure, overlain by (b) the relative density of small tooth fragments from the sieving remains recorded per ¼ square metre (the more intense the red, the higher the tooth fragment density; Jöris and Moseler, 2021a) and (c) faunal remains recorded as single finds (black). Hearth structures/fireplaces (1; modified from: Moseler, 2020) and artificial pits are also shown (2).

Additionally, plaquettes engraved with 'Gönnersdorf-type' depictions found in occupation level (3) and within pits (4) are plotted (modified from: Bosinski et al., 2001); refit-lines (5) between plaquette fragments that display 'Gönnersdorf-type' depictions are also included.



wear studies on flint artefacts (Sano, 2012a, 2012b, 2021) not only reveal a broad spectrum of activities within the largest concentration (K-II), but emphasise the partly intensive and long-term use of some of the tools that were used in this area alongside numerous organic implements (Tinnés, 1994; 2001). The results of use-wear studies on Gönnersdorf K-II so-called ‘Western European’ Meuse flint show clear differences to the results from use-wear studies of the same raw material on other Late Magdalenian sites (in terms of the activities performed and especially of the intensities of these performances), which have been interpreted as characterized by more restricted task spectra than at Gönnersdorf (Sano, 2012a, 2012b). A high degree of reduction and re-cycling of the lithic material enforces this picture (cf. Franken and Veil, 1983; Veil, 1983).

At Gönnersdorf the large concentrations were apparently areas that were communally used for most of the daily activities of the groups that came together here (Jöris et al., 2021; Sensburg, 2007, 2008, 2011; cf. Moseler, 2020). According to the exogenous raw materials that dominate the Gönnersdorf lithic assem-

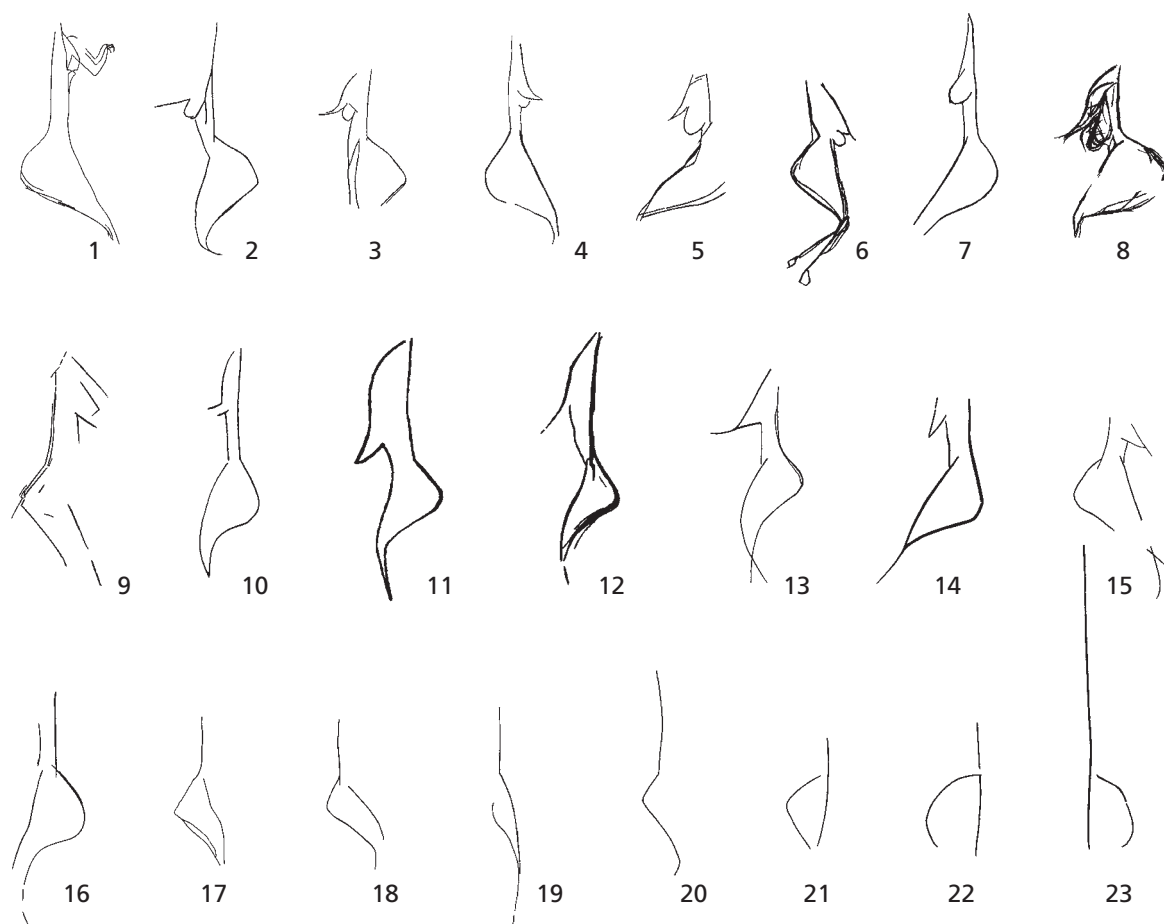


Fig. 3 Different levels of abstraction of the ‘Gönnersdorf-type’ engravings from the open-air site of Gönnersdorf (not to scale, but for better comparability adjusted to similar torso size; after: Gaudzinski-Windheuser and Jöris, 2015; cf. Bosinski et al. 2001). – Top row: the most complete depictions with arms and breasts (**1-6, 8**) and breasts only (**7**). Figure no. after: Bosinski et al. (2001): **1** 59.1; **2** no. 80.1; **3** no. 1.1; **4** no. 206.1; **5** no. 184.2; **6** no. 73.2; **7** no. 206.2; **8** no. 203. – Middle row: more simplified depictions with arms only (**9-15**). Figure no. after: Bosinski et al. (2001): **9** no. 204.2; **10** no. 65.1; **11** no. 65.3; **12** no. 180.2; **13** no. 205A.1; **14** no. 86.1; **15** no. 46. – Bottom row: extremely simplified depictions without arms or breasts (**16-23**). Figure no. after: Bosinski et al. (2001): **16** no. 202.1; **17** no. 43.1; **18** no. 68.5; **19** no. 72.6; **20** no. 72.7; **21** no. 72.5; **22** no. 53.3; **23** no. 213.2.



Fig. 4 Gönnersdorf. Headless anthropomorphic engravings of four hatched figures of 'Gönnersdorf-type', all facing towards the right and in alignment. Note: the second figure from the right seems to carry a smaller figure on its back. – (Photo: Volker Iserhardt, RGZM; after: Gaudzinski-Windheuser and Jöris, 2015; cf. Bosinski et al., 2001: plaquette no. 87, the so called "Strickvenüsse"). – Width = 8.5 cm.

blage (Floss, 1994), different groups from different regions, each about a hundred kilometres or more distant, met here, and spent a lengthy part of the year together (Street et al., 2006; Jöris et al., 2011): "Taken together, all this evidence reinforces an interpretation of Gönnersdorf as a base camp at which the full range of domestic and social activities was carried out" (Street and Turner, 2013: 250), as was previously proposed by Gerhard Bosinski (1975, 1988). However, not "all people would necessarily have been present [at Gönnersdorf] all the time or at the same time" (Street and Turner, 2013: 250). The large, communally used concentrations are also those places where almost all of the depicted animals and anthropomorphs cluster (Figs. 2-4). The site's rich body of such 'artistic' expressions underlines its particular importance among the Late Magdalenian sites of the wider region. The numerous ($n \approx 249$) naturalistic depictions of animals (Bosinski and Fischer, 1980; Bosinski and Bosinski, 1991; Bosinski, 2008) and the schematic representations of 'Gönnersdorf-type' anthropomorphic depictions ($n \approx 423$), generally interpreted to represent females (Bosinski and Fischer, 1974; Höck, 1995; Bosinski et al., 2001; Bosinski, 2011a, 2011b), may have played a significant role in Late Magdalenian communication networks (Gamble, 1982; cf. Gaudzinski-Windheuser and Jöris, 2015). The 'artistic' expressions at Gönnersdorf are spatially embedded within the remains of quotidian activities. Whatever the specific messages communicated *via* these depictions was, the transfer of information involving them appears to have taken place in communally used, 'public' areas of quotidian use (cf. Gaudzinski-Windheuser, 2015, 2021). The recognition of such communal or public areas is of great relevance in the context of the spatial organisation of sites such as Gönnersdorf, as they define the socio-spatial (built) environments in which a society's sets of rules and regulations do not only become most

visible through constant re-iteration through practice, but likely where the validity of these sets of rules and regulations are also questioned, newly negotiated, altered or conserved when agreed upon; in short, where the rules and regulations that underpin societies are negotiated.

Overall, the combined Gönnersdorf data highlight the site's importance as a meeting point at supra-regional scale (Street et al., 2006). This is further indicated by the presence of other materials imported to the site over large distances, e.g., personal ornaments made of Mediterranean shells (Álvarez-Fernández, 2009), presumably indicative of social networks that spanned distances of hundreds of kilometres (e.g., Bosinski, 2007). Some of the highly dynamic and naturalistic depictions of animals include species which most likely no longer lived in the region at the time the site was occupied (cf. Stevens et al., 2009; Street et al., 2012), such as mammoths and several taxa of seals (Bosinski and Bosinski, 1991). This implies that at least a few individuals with detailed knowledge of such animals must have travelled over long distances to reach the German central Rhineland, where they shared information on those animals.

Comparable finds and features have been recorded from the Magdalenian site of Andernach-Martinsberg³, at about 2 km distance to the south-west and just in sight of Gönnersdorf, on the opposite bank of the River Rhine (Bosinski, 2007; Street et al., 2006). As at Gönnersdorf, evidence for long-distance imports of materials to the site is abundant, including, among other examples, a whale bone, probably a projectile fore-shaft which hints at parallels with Late Magdalenian sites in the Pyrenees (Langley and Street, 2013). The Andernach specimen may have been exchanged over this long distance, just as may have been the case with the shell ornaments of "49 specimens of *Homalopoma sanguineum*, a Mediterranean marine gastropod" (Street, 2021), found next to the whale bone in a small pit. The close spatial association with an engraved schist plaquette depicting a seal (Street, 2021) may, on the other hand, suggest that the whale bone artefact and the gastropod ornaments were brought to Andernach by (an) individual(s) travelling this long distance, who were familiar with these animals.

The accumulated evidence of Gönnersdorf and Andernach-Martinsberg emphasises the sites' central position within Late Magdalenian supra-regional social networks (Street et al., 2006). Dating to ca. 15,600–16,000 cal BP (cf. Stevens et al., 2013), i.e., within Greenland Stadial GS 2.1a (cf. Rasmussen et al., 2014), the two sites are statistically indistinguishable in age, with most plausible radiocarbon dates ranging from ca. 12,990 ± 55 ¹⁴C BP (OxA-V-2223-42) to 13,270 ± 55 ¹⁴C BP (OxA-V-2223-39) (Stevens et al., 2013). Technologically and typologically they are indistinguishable, placing them into an Early Upper Magdalenian according to recent French terminology (cf. Langlais et al., 2015b, 2017; ~"Magdalenian V"). The sites display many more extremely close similarities, e.g., their organic tool types (Bosinski, 2007; Tinnes, 1994) and in the technical details that characterize the reduction of so-called "Palaeozoic Quartzite" (Heuschen, 1997; cf. Street et al., 2006). In fact, both sites appear so alike that one may easily argue that at one point during the Magdalenian Gönnersdorf was chosen as a meeting point of Late Magdalenian communities, but shortly – probably only a few years – thereafter Andernach took on the same purpose, or the other way around. But the great number of 'artistic' depictions – particularly at Gönnersdorf – highlights the sites' special position in the Late Magdalenian oikumene, which is further mirrored in their incomparably high frequency of personal ornamentation (cf. Schwendler, 2012). In fact, in comparison to other Magdalenian sites, the rich Gönnersdorf body of depictions is paralleled only by the famous rock- and cave-art sites, rather than by any other open-air locality.

³ The Late Magdalenian site of Andernach-Martinsberg is in many ways much like Gönnersdorf (Bosinski, 2007). The differences in the numbers and frequencies of certain find categories (i.e. quan-

titative data) are best explained by the much more fragmented and discontinuous areas of excavation at the Martinsberg site, rather than to a qualitatively different archaeological record.

LATE UPPER PALAEOLITHIC HEADLESS ANTHROPOMORPHIC DEPICTIONS

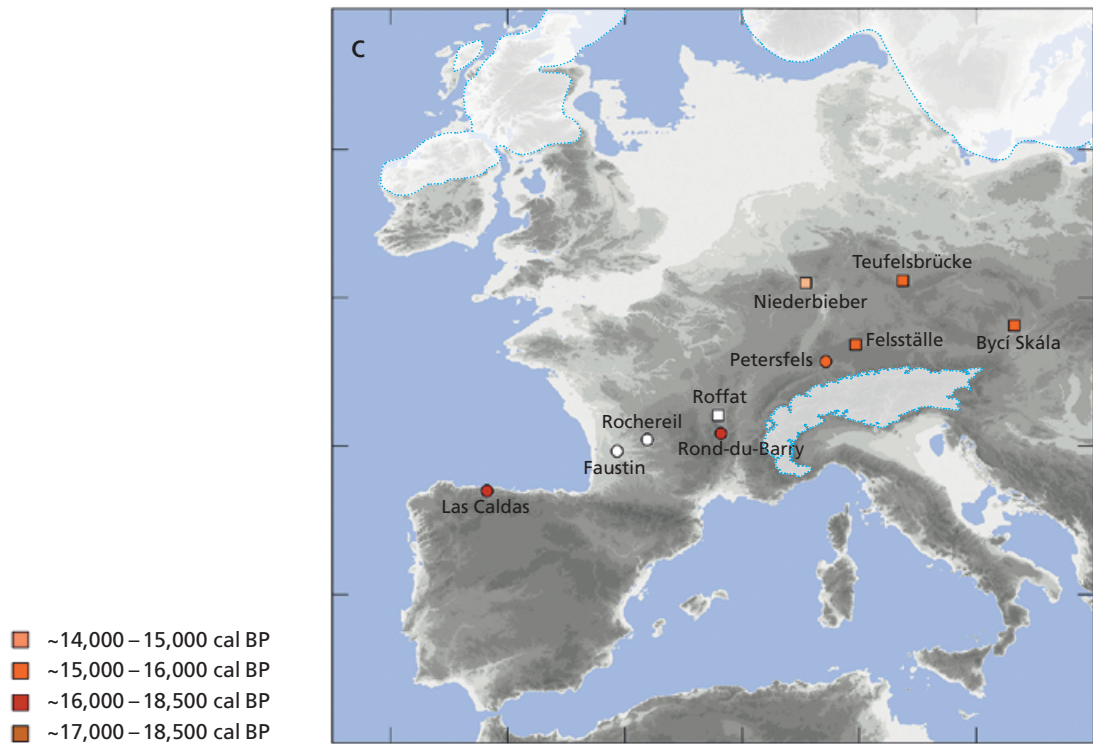
In the Late Upper Palaeolithic of Europe and north-eastern Africa, headless anthropomorphic depictions comprise a rich category of the ‘artistic’ record. In Europe they outnumber by far other more realistic (or complete) anthropomorphic/human depictions (e.g., Duhard, 1993, 1996). In their overall design they strongly contrast with the depictions of the preceding Mid-Upper Palaeolithic “Willendorf-style” which often possess heads, occasionally faces, and frequently hairstyles/hats and other details that can be interpreted as depictions of specific individuals (Gaudzinski-Windheuser and Jöris, 2015; cf. Bourrillon et al., 2012). Beginning ~ 19,000-18,000 cal BP, and continuing until ~ 14,000 cal BP, “headlessness” appears as a prominent characteristic of European anthropomorphic/human depictions (Fig. 5; cf. Tab. 1), and one may ask whether or not their penecontemporaneous continental-wide appearance may be (1) simply coincidental, (2) interpreted as a reflection of similar or convergent worldviews or belief systems and/or (3) best explained by high levels of supra-regional interconnectedness and the related transmission of ideas. In

	L. Basse and Abri Bourdois	Gö-type engravings	Gö-type figurines	Mezin female figurines (dwelling 2)	Mezin female figurines (dwelling 3)	Mezin male figurines (dwelling 2)	Mezhyrich female figurines
functions in ... view							
	frontal	profile	profile (frontal)	(profile) frontal	(profile) frontal	(profile) frontal	frontal
HEAD							
	no	no	no	no	no	no	no
UPPER TORSO							
neck	no	no	no	vertical lines	vertical lines (n = 1)	vertical lines	no
front							
thoracic cage	no	no	no	chevrons	chevrons	chevrons	horizontal lines
arms	no	frequently	no	no	no	no	no
breasts	no	occasionally	occasionally (sometimes pairs of breasts)	no	no	no	no
side	no	rarely geometrically ornamented (n = 2)	rarely geometrically ornamented (n = 1)	geometrically ornamented	geometrically ornamented	geometrically ornamented	no
back	no	–	no	geometrically ornamented	geometrically ornamented	geometrically ornamented	no
LOWER TORSO							
front							
hips/buttocks	no	pronounced	pronounced	pronounced	pronounced	weak	no
pubic region	pubic triangle engraved	no	no	pubic triangle engraved	pubic triangle engraved	no	pubic triangle engraved
side	no	rarely geometrically ornamented (n = 2)	no	geometrically ornamented	geometrically ornamented	no	no
back	no	–	no	geometrically ornamented	geometrically ornamented	no	no
FEET							
	no	n = 2	no	no	no	no	no

Tab. 1 Major stylistic characteristics of Late Upper Palaeolithic headless anthropomorphic representations.



Fig. 5 Spatio-temporal context of Late Upper Palaeolithic headless anthropomorphic depictions, dating between ~ 19,000-13,000 cal BP. **a** depictions in rock art (mostly engraved, but in few cases engraved and painted); **b** engravings on stone palquettes and blocks; **c** engravings on pebbles (**c-1**: quadrats) and bones (**c-2**: circles); **d** figurines (plastically sculpted). Maps (modified from Gaudzinski-Windheuser and Jöris, 2015), showing coastlines, lowered for ca. -60m compared to present-day sea level, the Northern European ice sheets at ca. 16,000 cal BP (after Hughes et al., 2016) and the Alpine ice shield at around the Last Glacial Maximum (LGM). Site references: see appendix.



order to better understand the contexts of 'Gönnersdorf-type' headless anthropomorphic depictions, which make up the largest amount of Late Upper Palaeolithic anthropomorphic representations, this record will be reviewed and discussed below.

The 'Gönnersdorf-type' headless anthropomorphic depictions

'Gönnersdorf-type' depictions (Gaudzinski-Windheuser and Jöris, 2015), as they were named by Gerhard Bosinski (Bosinski, 2007: *Gönnersdorf-Typ*), are highly schematic, abstract and, in a way, standardised anthropomorphic representations that are generally interpreted as depicting females (cf. Lorblanchet and Welté, 1987, 1990: *Lalinde/Gönnersdorf type*; Delluc and Delluc, 1995: *figurations féminines schématiques*; cf. Bourrillon et al., 2012: *Groupe A*). Although mostly engraved they also appear frequently as 3-dimensionally carved figurines. Engravings are to be found on plaquettes and pebbles, on bone and in parietal art (Fig. 5). The basic shape of 'Gönnersdorf-type' depictions resembles the human body in profile view or in sagittal section (cf. Rosenfeld, 1977). The primary elements shared in these depictions form the trunk, composed of the lower body which is depicted in more-or-less triangular shape, interpreted as representing pronounced buttocks or wide hips, and the upper body which, in the case of the engravings, is usually indicated by one or two more-or-less parallel lines only (Fig. 3). In varying levels of detail other attributes may add to the primary shape of the torso: arms are the next-most frequently shown trait (depicted mainly by converging lines), and – in even fewer cases – breasts (mostly round) that may be depicted below the arms (Bosinski et al., 2001). Some of the 'Gönnersdorf-type' depictions take the form of carved ivory statuettes, a few of which possess pairs of breasts (Höck, 1995). The combination of buttocks and breasts makes it clear that females are depicted, although in a very generic and abbreviated manner. Although this interpretation seems to apply to the majority of 'Gönnersdorf-type' anthropomorphic representations, it is unclear whether it can be extended to depictions that lack clear female attributes (cf. discussion in: Floss et al., 2021).

The general absence of the head is most characteristic of all 'Gönnersdorf-type' depictions (e.g., Bosinski, 2011a, 2011b; Bosinski et al., 2001; Cluzel and Cleyet-Merle, 2011; Höck, 1995). Additionally, only a very few depictions at Gönnersdorf include feet (Bosinski et al., 2001: plaquette 73). Given that most of the 'Gönnersdorf-type' depictions are in fact engravings, any such details as heads and feet could easily have been added, if they were desired; we can therefore conclude that their omission was deliberate. In terms of the characteristics listed above, 'Gönnersdorf-type' depictions can, therefore, be clearly distinguished from other styles of Upper Palaeolithic (female) anthropomorphic representations (Bourrillon et al., 2012; cf. Duhard, 1993; Gaudzinski-Windheuser and Jöris, 2015).

Gönnersdorf alone has produced a total of almost 450 anthropomorphic representations of this type, of which some 423 are engraved on schist plaquettes (with 'Gönnersdorf-type' depictions being presented on ~ 185 plaquette surfaces), sometimes in scenic arrangement in pairs or in small groups (Bosinski and Fischer, 1974; Bosinski et al., 2001; Bosinski, 2011a). In one case amounting to 22 figures, they have been arranged successively in different groups, with the largest group in this arrangement composed of 17 figures (Bosinski et al., 2001: plaquette 65). About 20 'Gönnersdorf-type' depictions are known from Andernach-Martinsberg (Bosinski, 1994), and in addition to these a number of figurines were made on ivory, schist or other stones (Höck, 1995). It should be emphasised that these numbers are approximations only, given that a certain number of the simplest and most abstract depictions may or may not be included in this category; when depictions possess all stylistic elements, i.e., hips, arms and breasts, the depicted motif appears beyond any doubt to represent a 'Gönnersdorf-type' depiction, but especially when extreme schematic depictions (alike Fig. 3: bottom line) are overlain or underlain by other engraved lines, their recognition and interpretation

is difficult. Some of the simplest depictions attributed to the 'Gönnersdorf-type' (e. g., **Fig. 3: 21-23**) are almost indistinguishable from the 'claviform signs' of franco-cantabrian cave art (e. g., Fuentes et al., 2019) – the latter, however, are usually viewed upside-down when compared to 'Gönnersdorf-type' depictions. In some of the 'Gönnersdorf-type' depictions, it seems that the engraver's tool slipped somewhat, resulting in body proportions that diverge from the 'standard', e. g., hip-to-back angles (Bosinski et al., 2001), and which, therefore, makes it unclear whether they are attributable to the canon.

The same difficulties arise when such simple and schematic motifs are composed of a few lines only, including a certain amount of depictions at several other sites where depictions appear restricted to the torso, which is engraved as a (sometimes elongated) double S-shaped figure. With this in mind, one has to acknowledge that the evidence at some sites that are often referred to for comparison (cf. Bosinski et al., 2001; Bosinski, 2011a, 2011b; Gaudzinski-Windheuser and Jöris, 2015; Rios-Garaizar et al., 2015), may not be as clear as is usually assumed. This is more problematic when unambiguous 'Gönnersdorf-type' anthropomorphic depictions are otherwise not present at such sites where similar examples have been said to exist (e. g., Pettitt, 2007; Mussi and De Marco, 2008).

Even though a few depictions may have been over-interpreted, therefore, their uniquely high number at Gönnersdorf (cf. Schwendler, 2012) and their spatial 'omnipresence' in the site's larger concentrations (**Fig. 2**; Bosinski et al., 2001) enhances the interpretation that the site may have served, among other functions (see above), as a meeting point for different foraging groups: a context in which the 'Gönnersdorf-type' anthropomorphic representations may have had a particular importance for social scaffolding (Gaudzinski-Windheuser and Jöris, 2015) and the implementation of rules and regulations. Here, they appear to have been embedded into quotidian activities within communally-used space, from which one can infer that 'Gönnersdorf-type' depictions played a role in the public, everyday transmission of social rules and regulations. The existence of some scenic depictions, interpreted as reflecting dance (Bosinski et al., 2001; cf. Gaudzinski-Windheuser and Jöris, 2015), may hint at their use in festival and/or ritual contexts.

Chronology and context of the 'Gönnersdorf-type' headless anthropomorphic depictions in central Europe

The degree of abstraction and schematisation and the relative standardisation of 'Gönnersdorf-type' anthropomorphic representations suggests that they functioned as symbols of (a) socially shared idea(s) (Gaudzinski-Windheuser and Jöris, 2015; cf. Bourrillon et al., 2012). The complete lack of any obvious individual traits on the 'Gönnersdorf-type' anthropomorphic representations, in particular their "headlessness", reinforces the notion that this symbol carried no information on specific individuals, but rather concerned the gender-related role(s) of females in Late Magdalenian societies (cf. Gaudzinski-Windheuser and Jöris, 2015). Given this degree of abstraction, one may infer that the full meaning of this symbol could only be discerned by those individuals who were socialized within the Magdalenian groups that employed this symbol. Beginning with this assumption, one may further infer that 'Gönnersdorf-type' anthropomorphic representations may have served their purpose(s) only within a relatively short period of time, i. e., while the symbol was 'current' and socially transmitted from one generation to the next through teaching and social learning (cf. Nishiaki and Jöris, 2019; Jöris, 2018). Such transmission forms the baseline for the establishment and implementation of rules and regulations that derive from socio-cultural contexts.

Interestingly, within central Europe, 'Gönnersdorf-type' anthropomorphic representations are closely linked with the Late Magdalenian (e. g., Bosinski et al., 2001; Fiedorczuk et al., 2007; Leesch et al., 2004) which equates to the Early Upper Magdalenian of south-western France (Langlais et al., 2015b, 2017), within which

they correlate specifically to a phase during which *Lacan* type burins were produced across central Europe (Street et al., 2012; cf. Połtowicz-Bobak, 2012). When radiocarbon dates are available for these sites, they compare closely to the dates established for Gönnersdorf and Andernach or date slightly younger (Street et al., 2012; Stevens et al., 2013; cf. e.g., Fiedorczuk et al., 2007), falling into the major phase of the Late Glacial population expansion that commenced ~16,000 cal BP or shortly before (cf. Fig. 10). At this time, central Europe was rapidly and more sustainably re-occupied after sporadic earlier attempts (e.g., Street and Terberger, 1999; Terberger and Street, 2002; Street et al., 2009; Miller, 2012; Bobak and Połtowicz-Bobak, 2014; Maier, 2015, 2017; Pasda, 2017; Wiśniewski et al., 2017; Maier et al., 2020; Jöris and Street, 2021). Even in the eastern extremity of central Europe the south-eastern Polish site of Wilczyce produced 'Gönnersdorf-type' anthropomorphic flint figurines that had been intentionally shaped by retouch (Fiedorczuk et al., 2007), dated at its oldest to 13,180 ± 60 ¹⁴C BP (OxA-16728; on a tooth pendant derived from a perinatal baby burial: Irish et al., 2008); the chronology is similar to that of Gönnersdorf and Andernach.

As direct dates for 'Gönnersdorf-type' anthropomorphic representations do not exist, more precise age estimates of the length of time during which these symbols were implemented are difficult to establish. In the south-western part of Gönnersdorf, a few 'Gönnersdorf-type' anthropomorphic representations were associated with a small cluster of schist plaquettes, labelled Gönnersdorf-SW (Fig. 2; cf. Buschkämper, 1993). Here, atypical narrow-backed points and *Lacan* type burins, all made of Baltic flint, were found in close spatial association with red deer and elk bones, indicating a younger occupation of the site at a time when the region was beginning to reforest at the onset of the Late Glacial interstadial complex (Street and Turner, 2013: Plan 40). A radiocarbon date measured on one of the elk remains (Street and Terberger, 2004; cf. Street et al., 2012) places this younger occupation into the very beginning of Greenland Interstadial (GI) 1e, roughly 14,700-14,500 cal BP (cf. Fig. 10; Rasmussen et al., 2014). Although the presence of 'Gönnersdorf-type' anthropomorphic representations at Gönnersdorf-SW could be explained as due to potential re-use of material from other (and older) concentrations of the site, such an age would be roughly in accordance with age estimates for depictions of "Birds/Ladies" from Church Hole Cave in Creswell Crags (UK) further to the north-west, that – although not corresponding absolutely – are broadly similar to the 'Gönnersdorf-type' depictions (Pettitt, 2007; Pike et al., 2007). Similarly, several engravings in the Grotte de Gouy in northern France resemble the 'Gönnersdorf type' depictions (Martin, 2007). The lithic industry of this site, which includes bi-points and other backed points (Bordes et al., 1974), hints at a Final Magdalenian/Azilian/*Federmesser* context, matching a radiocarbon date from the site very closely (~14,000 cal BP: Martin, 2007), chronologically close to the age of several 'Gönnersdorf type' figurines (and a potential engraving) from the Final Magdalenian/Azilian of the Petersfels in southern Germany (Bosinski, 2011b, Bosinski et al., 2001). The age estimates available for Gönnersdorf-SW, Church Hole and Gouy (representing the north-westernmost appearances of this type of depiction) and those of the Petersfels all fall into the transition to and early phases of the Late Glacial interstadial complex (from shortly before GI 1e until GI 1d or, possibly, early GI 1c₃). This is of interest, as it is to the same period that several of the Late/Final Magdalenian sites of the Paris Basin belong, which have so far provided no convincing evidence for 'Gönnersdorf-type' anthropomorphic representations at all (cf. Debout et al., 2012). This may account for the comparably scarce archaeological evidence from the earlier stage of the Late Magdalenian (i.e., ~16,000-15,000 cal BP) in the Paris region.

Of even younger age is a sandstone arrow shaft smoother from the Late Palaeolithic *Federmesser* site of Neuwied-Niederbieber, only a few kilometres to the north-east of Gönnersdorf (Gelhausen, 2011). A series of more-or-less parallel incisions on one side of the object appears to resemble a series of 'Gönnersdorf-type' depictions (Loftus, 1982). Consequently, the find has been interpreted as reflecting a certain regional continuity from the Late Magdalenian to the Curved-Backed Point industries (*Federmessergruppen*)

of the Late Glacial Allerød interstadial (GI 1c-b; i. e., ~ 14,000-13,000 cal BP). However, assuming that such shaft smoothers were used in pairs, as is implied from younger contexts (Henry, 1976; Meier-Arendt, 1975), the incisions could – in an alternative interpretation – relate to marks made when fixing a twine around a pair of shaft smoothers to facilitate their use.

To summarise the chronological evidence from central and north-western Europe, one has to conclude that ‘Gönnersdorf-type’ anthropomorphic representations date within the range ~ 16,000-14,000 cal BP, and probably persisted until shortly thereafter. Despite the questionable evidence from the Niederbieber shaft smoother that may hint at a certain cultural continuity from the Magdalenian to the succeeding *Feder-messergruppen*, the period of ‘Gönnersdorf-type’ anthropomorphic representations ends ~ 14,000 cal BP, roughly at a time that ancient DNA studies signal a major population-turnover in Europe (Posth et al., 2016; cf. Bortolini et al., 2020, for discussion).

‘Gönnersdorf-type’ headless anthropomorphic depictions of south-western Europe

Search for the ‘stylistic predecessors’ and (socio-cultural) origins of ‘Gönnersdorf-type’ anthropomorphic depictions requires a closer look into the record of the Magdalenian ‘homeland’ of south-western Europe. Unless one assumes an extremely rapid, *quasi* simultaneous spread of this type of depiction (which would lie beyond the chronometric resolution of the radiocarbon dating method), one would assume to find evidence in the south-west of Europe predating the central European record.

The south-west of Europe provides, on one hand, numerous Late Pleistocene sites that are listed as possessing headless anthropomorphic depictions (Duhard, 1993), most of which have been assigned to the ‘Gönnersdorf-type’ (Fig. 5; cf. Bosinski et al., 2001; Bosinski, 2011a, 2011b; Duhard, 1993; Ladier et al., 2005; Mussi and De Marco, 2008; Rios-Garaizar et al., 2015; Sentis, 2005). On the other hand have most of these sites produced far fewer depictions than are known from central Europe, and many of the specimens discussed do not convincingly represent anthropomorphs. Due to their simplistic style or representation, the latter accounts for several engravings in parietal art contexts (e. g., Garate, 2004; cf. Mussi and De Marco, 2008).

By contrast, more convincing examples are the engraved plaquettes or blocks found in rock-shelters or near to cave entrances, such as those reported from La Roche de Lalinde (Leroi-Gourhan, 1971; Bosinski et al., 2001), Gare de la Couze (Bordes et al., 1963), Abri Fontalès (Lorblanchet and Welté, 1987), Abri Murat (Lorblanchet and Welté, 1987) and Grotte du Courbet near Bruniquel (Alaux, 1972; Welté and Cook, 1993); these are the closest parallels to ‘Gönnersdorf-type’ depictions. Stratigraphically, and on the basis of the typology of associated finds, the engraved plaquettes or blocks from these sites can be dated to the later phases of the Magdalenian (“*Magdalénien supérieur/recent/final*”; cf. Cluzel and Cleyet-Merle, 2011), or, if more specific information is available, to the onset of the Late Upper Magdalenian (Langlais et al., 2015b, 2017; i. e., ~ “Magdalenian VI”; cf. Bordes et al., 1963; Alaux, 1972; Bosinski et al., 2011), chronologically a little younger than Gönnersdorf and Andernach. Radiocarbon samples from Fontalès, Abri Murat, Gare de la Couze, and Abri Faustin produced dates between $13,140 \pm 120$ ^{14}C BP (GifA 96327) and ~ 12,300 ^{14}C BP (Langlais et al., 2012; Drucker et al., 2011; Barashay-Szmidt et al., 2016) for layers that have provided ‘Gönnersdorf-type’ anthropomorphic depictions, corresponding to the second half of GS-2.1a, ~ 15,900-14,500 cal BP, i. e., of roughly equal age to the central European evidence (Fig. 10).

Nevertheless, radiocarbon dates from the Middle to Late Magdalenian of Courbet appear a little older, ranging between $13,380 \pm 120$ ^{14}C BP and $13,490 \pm 260$ ^{14}C BP (Ladier and Welté, 1999; Ladier et al., 2005), but these statistically overlap with the oldest radiocarbon dates for horse remains from Gönnersdorf (OxA-V-2223-39: $13,270 \pm 55$ ^{14}C BP) and Andernach-Martinsberg (OxA-10651: $13,270 \pm 180$ ^{14}C BP and

OxA-10492: $13,500 \pm 90$ ^{14}C BP; cf. Stevens et al., 2009). A further engraving quite similar to 'Gönnersdorf-type' depictions is reported from La Magdeleine-la-Plaine (Ladier, 2001), the Middle Magdalenian archaeological context of which is dated to $13,680 \pm 130$ ^{14}C BP (GifA 96345: Ladier et al., 2005). In northern Spain, the Middle Magdalenian levels of Las Caldas Cave in Asturias yielded a plaquette (level VI) and a bone (level VII) on which each a 'Gönnersdorf-type' anthropomorphic depiction was engraved (Corchón Rodríguez, 1990; Fortea et al., 1990; cf. Corchón Rodríguez and Ortega Martínez, 2017; Corchón Rodríguez and Rivero Vilá, 2017). The radiocarbon chronology of the sequence indicates an age of $\sim 13,650$ ^{14}C BP for these finds (Corchón Rodríguez, 1995, 2017) similar to the proposed age of La Magdeleine-la-Plaine. As with Gönnersdorf and Andernach, all of these contexts also contain harpoons (for the chronology of Magdalenian organic projectiles, cf. Pétilion, 2016).

This is not the case for the large engraved limestone-"venuses block" from the cave of Arlanpe in northern Spain (Rios-Garaizar et al., 2015). Although at first sight this block seems to include a 'Gönnersdorf-type' depiction, similarities are difficult to establish due to the relatively few lines of which the double S-shaped motif is composed. The situation is even further complicated as the block was not discovered entirely *in situ*, as a Roman pit had been excavated into the cave sediments and exposed the "venuses block" and we do not know if by so-doing they disturbed its original position. Establishment of a solid age estimate for the presumable Middle Magdalenian context of the Arlanpe "venuses block" appears, therefore, fairly difficult (Rios-Garaizar et al., 2015). Of the two radiocarbon dates available for level I to which the "venuses block" most likely should be assigned, the younger, obtained from an anthropogenically-fractured herbivore bone and which is closest linked to the archaeology, comes from the base of level I and dated to $14,150 \pm 60$ ^{14}C BP (Beta-287336); the other measurement, derived from a bone that displays no human modification, dated to $15,100 \pm 60$ ^{14}C BP (Beta-316472: Rios-Garaizar et al., 2015). The top of level I may, however, be much younger than this.

The engraved plaquette from the Early Middle Magdalenian site of Moulin-Neuf in the Gironde may be of roughly comparable age or older (Sécher and Caux, 2017; Langlais et al., 2015b, 2017). This is also included among the headless anthropomorphic depictions of the Late Upper Palaeolithic (Ladier et al., 2005). In this case it remains unclear whether or not an anthropomorph is depicted at all; the figure is of a 'compressed' double S-shape, and, if it is justifiable to compare it to 'Gönnersdorf-type' anthropomorphic depictions at all, one may interpret it as representing the lower part of the torso only. Radiocarbon dates for it range from $\sim 14,200$ ^{14}C BP (Ladier et al., 2005) to $\sim 15,400$ ^{14}C BP (Barshay-Szmidt et al., 2016).

The Middle Magdalenian site of La Marche, famous for its highly naturalistic and often caricature-like depictions of humans (Pales and Tassin de Saint Péreuse, 1976; Airvaux and Pradel, 1984; Mélard, 2008) also provides a few examples of anthropomorphic depictions that closely resemble the 'Gönnersdorf-type' (Mélard, 2008: planche 12; planche 35). Dating to around $14,250$ ^{14}C BP (Orsay-3780: $14,240 \pm 85$ ^{14}C BP; and: Ly 2100: $14,280 \pm 160$ ^{14}C BP; Pradel, 1980; cf. Barshay-Szmidt et al., 2016) the site belongs to the same age range as Arlanpe and overlaps with the younger age estimates for Moulin-Neuf. The greater majority of the female depictions from La Marche are engraved on limestone blocks in profile view (Pales and Tassin de Saint Péreuse, 1976; Mélard, 2008), a perspective in which the outline of the body closely resembles the shape of the female torso that is also captured in engravings of 'Gönnersdorf-type' headless anthropomorphs. In this context, therefore, one may view the complete depictions of females at the site as potential blue-prints – probably stylistic predecessors – for the more abstract 'Gönnersdorf-type' depictions that developed later.

With regard to parietal examples of 'Gönnersdorf-type' anthropomorphic depictions, one such, in the cave of Gourdan in the Pyrenees, "has been attributed to the Middle or Upper Magdalenian by stylistic comparison [...] and the associated archaeological context has yielded two dates between 14,400 and 13,200

[¹⁴C] BP [...], that is, within the temporal range of the Middle Magdalenian" (Rios-Garaizar et al., 2015: 334). Age estimates for parietal examples can only be ascertained indirectly, as the rock-art may – at best – be linked on stylistic grounds to archaeological layers that contain radiocarbon-dated material. The oldest radiocarbon date from the lowest (Mid-) Magdalenian level at the site of Les Combarelles in the Dordogne, a cave which also produced a series of 'Gönnersdorf-type' parietal engravings (Archambeau and Archambeau, 1991), dates to $13,680 \pm 210$ ¹⁴C BP (Ly 3202), but most other dates from the site are significantly younger (cf. Cluzel and Cleyet-Merle, 2011). Furthermore, in both Gourdan and in Les Combarelles the precise relationship between the parietal engravings and the dated archaeological levels remains unclear, but at least in the case of Les Combarelles its age ranges are in accord with the age estimates for other south-western European sites that have produced 'Gönnersdorf-type' headless anthropomorphic depictions and that post-date ca. 13,650-13,680 ¹⁴C BP (~ 16,500 cal BP).

To summarise, 'Gönnersdorf-type' anthropomorphic depictions can occasionally be found in south-western Europe probably from as early as ca. 16,500 cal BP onwards, but more solid evidence for the appearance of the 'Gönnersdorf-type' depictions which are stylistically almost identical to the depictions at the eponymous site in the German central Rhineland is only available from ca. 16,000 cal BP onwards, i.e., quasi simultaneous with the central European evidence. Considering the finds from Arlanpe, Moulin-Neuf and La Marche, potential double S-shaped 'predecessors' of the 'Gönnersdorf-type' headless anthropomorphic depictions may even date as old as ~ 17,000-18,000 cal BP (Rios-Garaizar et al., 2015). However, the poor contextual dating evidence for these south-western European examples must be viewed with some caution, given the contextual problems these often multi-layered stratigraphic sequences of caves and rock-shelters with much more complicated site formation processes have in comparison to single-layered open-air sites. It should furthermore be emphasised that 'Gönnersdorf-type' depictions are comparably rare in number among south-western European sites, where the possibly early candidates are mostly depicted in a very rudimentary style – often reduced to a double S-shape of the torso. Finally, their occasional appearance in rock-art, sometimes engraved deep in caves on the cave walls, emphasises the different contexts into which the south-western European depictions seem to be embedded (Bosinski et al., 2001).

Late Upper Palaeolithic ('Gönnersdorf-type') headless anthropomorphic depictions outside Europe

Geographically distinct from the European record of 'Gönnersdorf-type' headless anthropomorphic depictions, a small series of rock-shelters in Egypt have yielded engraved depictions of anthropomorphs (Huyge, 2015). Of special interest here are several headless specimens from the rock-shelter of Qurta II in Upper Egypt, that very closely resemble 'Gönnersdorf-type' depictions (Ucko and Rosenfeld, 1972; Huyge, 2009, 2015). The panel QII.3.1 at Qurta comprises two clusters of depictions: one cluster of four (QII.3.1.6-9), and another of two (QII.3.1.4-5) 'Gönnersdorf-type' depictions, all facing to the right (**Fig. 6: 2**). The one furthest to the right in the cluster of four (QII.3.1.9) seems to depict "rudimentary arms and/or breasts", similar to the more detailed 'Gönnersdorf-type' depictions (Huyge, 2015: 420; cf. Ucko and Rosenfeld, 1972). Other anthropomorphic, potentially "human" depictions come from Qurta I (QI.1.1.16) and Abu Tanqura Bahari 11 at el-Hosh (ATB11.4.6-7) on the other side of the River Nile. These depictions differ in their body proportions from the 'Gönnersdorf-type' depictions of Qurta II due to their more elongated upper torsos. Whereas the Qurta I specimen seems to display a head, the two anthropomorphic depictions in panel ATB11.4 at el-Hosh do not preserve heads (**Fig. 6: 1**). It may be the case, however, that heads were originally depicted but were subsequently removed by the picked depiction of a bovid superimposed on the

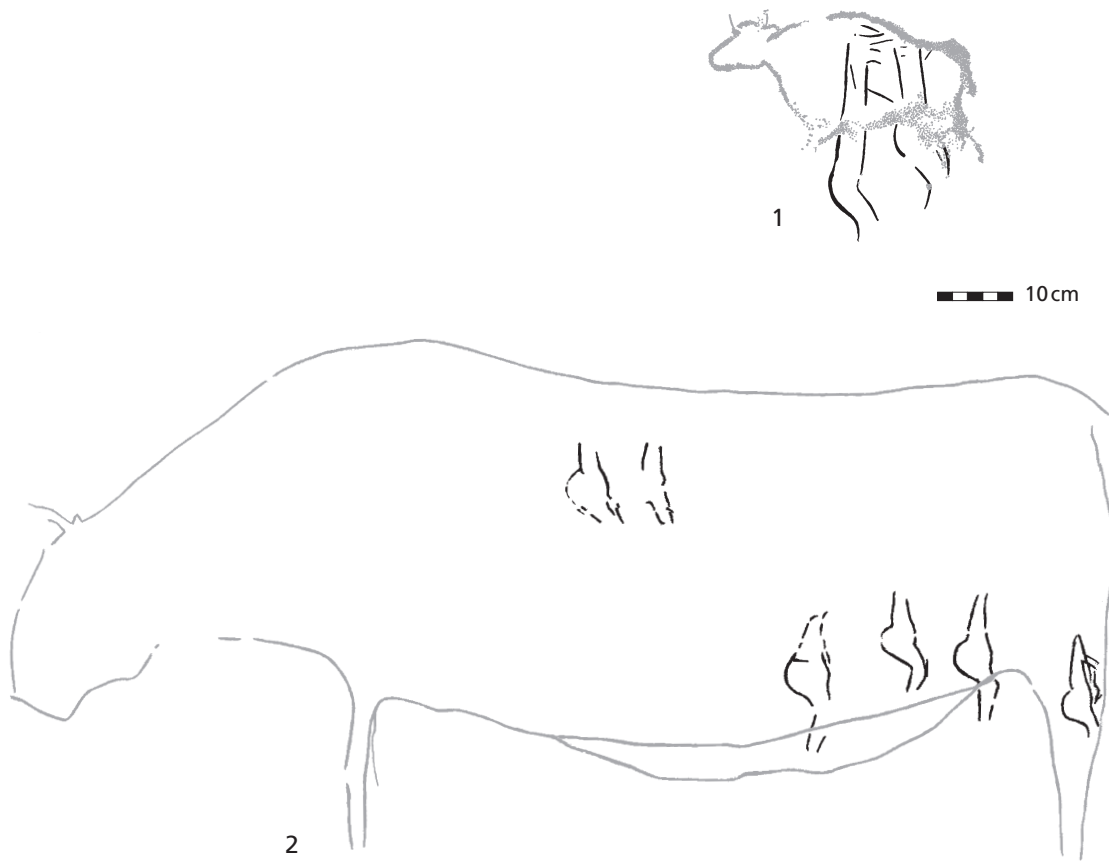


Fig. 6 Upper Egypt. Depictions of bovids superimposed upon headless anthropomorphic depictions from the rock-shelters of Qurta II (2) and Abu Tanqura Bahari (ATB) 11 at el-Hosh (1). – (Redrawn and modified by G. Rutkowski and N. Viehöver from: Huyge, 2015).

anthropomorphic depictions (Huyge, 2015). Two further headless depictions have been published from a rock-shelter further north on the Sinai peninsula, where, due to an emphasis on large, round breasts and strongly protruding buttocks these have been interpreted as female (Zboray, 2012).

The age of these depictions is difficult to establish. In general it is believed that the Upper Egyptian depictions can be tied to the so-called Ballanan-Silsilian industry which is represented by several sites in the region (Huyge, 2015). Radiometric age estimates for this, however, are highly inconsistent and rely on a few available dates only. In general, an age of roughly 19,000-18,000 cal BP is expected for the industry (i. e., ~ 16,000-15,000 ^{14}C BP; cf. Schild and Wendorf, 2010), but considerably younger dates also exist (cf. Vermeersch, 1992). At Qurta II, panel QII.3.1, an engraving of a bovid is superimposed upon the 'Gönnersdorf-type' headless depictions; this also occurs to the anthropomorphic depictions of ATB11.4.6-7 at el-Hosh. Therefore, at both sites the anthropomorphic depictions pre-date the engraving of bovids. Assuming that the bovids were depicted in the same period, which one may argue for, the OSL dating evidence from panel QII.4.2 at Qurta would be of relevance, as, here, the engraving of a bovid was buried below eolian sands. The OSL dates calculated from these sands provide a *terminus ante quem* of 16 ± 2 ka BP and 17 ± 2 ka BP for immediately below or near the base of the buried depiction, and 13 ± 1 ka BP and 10 ± 1 ka BP for its top, i. e., the back line of the engraved bovid (Huyge et al., 2011, 2012), implying an age of at least 13 ka BP, but likely closer to 16 ka BP. Radiocarbon dated faunal remains from the 16 ± 2 ka BP OSL-dated level, i. e.,

the base of the panel, result in calibrated ages of ~ 14,000 cal BP (KIA-41532: 12,130 ± 45 ¹⁴C BP) for a bird bone sample and some (not reservoir-corrected) 12,750-12,600 cal BP (KIA-40546: 10,585 ± 50 ¹⁴C BP) for fishbone sampled from the same layer (Dee et al., 2010).

Taking the dating evidence from the Qurtā II rock-shelter overall, an age of around 14,000 cal BP or slightly older seems to be most plausible for the site's 'Gönnersdorf-type' depictions (cf. **Fig. 10**), which is of interest given that it is in agreement with the younger range of dates for 'Gönnersdorf-type' depictions in north- and south-western Europe (see above). Claims that state that the headless anthropomorphic depictions of Upper Egypt could pre-date the European record of 'Gönnersdorf-type' depictions (Huyge, 2015), however, require more solid data and are currently premature; their relation to the European headless anthropomorphic depictions of 'Gönnersdorf-type' remains unanswered.

Headless anthropomorphic depictions in the Late Upper Palaeolithic of eastern Europe

Further to the east of the easternmost appearance of 'Gönnersdorf-type' depictions (i.e., Wilczyce in south-eastern Poland; Fiedorczuk et al., 2007), headless anthropomorphic depictions are found in the eastern European steppes of modern Ukraine and western Russia. Notably, these include several ivory figurines and fragments of potential figurines from the Epigravettian site of Mezin in Ukraine (Iakovleva, 2009; Bosinski, 2011b), some of which closely resemble the 'Gönnersdorf-type' figurines (**Fig. 5**). But other headless anthropomorphic ivory figurines of different shapes are additionally reported from Mezin (Chovkopllass, 1965) and Mezhyrich (Pidoplichko, 1976; Abramova, 1995), which – together with several other sites such as Dobranichivka, classified as Epigravettian – are well-known for their mammoth bone concentrations which are most often interpreted as dwelling structures (e.g., Pidoplichko, 1998; Gladkih et al., 1984; Iakovleva, 2015; for a counter-position cf. Khlopachev and Gavrilov, 2019).

The site of Mezin produced a total of 18 headless anthropomorphic figurines of ivory (**Fig. 7**; Chovkopllass, 1965; cf. Iakovleva, 2009, 2015), of which 16 are interpreted as female representations and two that are of a more elongated phallic shape (**Fig. 8**). At least three headless female figurines derive from Mezhyrich, of which one is made on a flat bone (**Fig. 9**; Abramova, 1966; cf.; Iakovleva, 2009, 2015). Although these depictions share their "headlessness" and abstractness and to a certain degree, their overall shapes (at least in case of representations interpreted as female) differ from those of 'Gönnersdorf-type' in several details (**Table 1**). The Mezin and Mezhyrich figurines are in fact of great morphological diversity, and it appears that different styles of representations relate to different concentrations/dwellings (**Figs. 7-8**; Chovkopllass, 1965; Iakovleva, 2009, 2015).

Schematised and anonymized anatomy

As with 'Gönnersdorf-type' depictions, the headless female figurines of Mezin are characterised by pronounced buttocks/hips opposite to a relatively flat-fronted torso. With this shape and viewed from the side, they resemble 'Gönnersdorf-type' depictions, and, more specifically, the 'Gönnersdorf-type' figurines (Iakovleva, 2009). Whereas the latter were designed to function in side/sagittal view (Gaudzinski-Windheuser and Jöris, 2015), the Mezin figurines display most relevant details on their front (Chovkopllass, 1965; Iakovleva, 2009, 2015): among these, the lower part of the torso displays on its flat frontal face an engraved triangle, interpreted as the female pubic triangle (**Fig. 7**). The upper part of the figurines' torso is also engraved on the frontal aspect. It is on this frontal aspect that most differences appear between the figurines

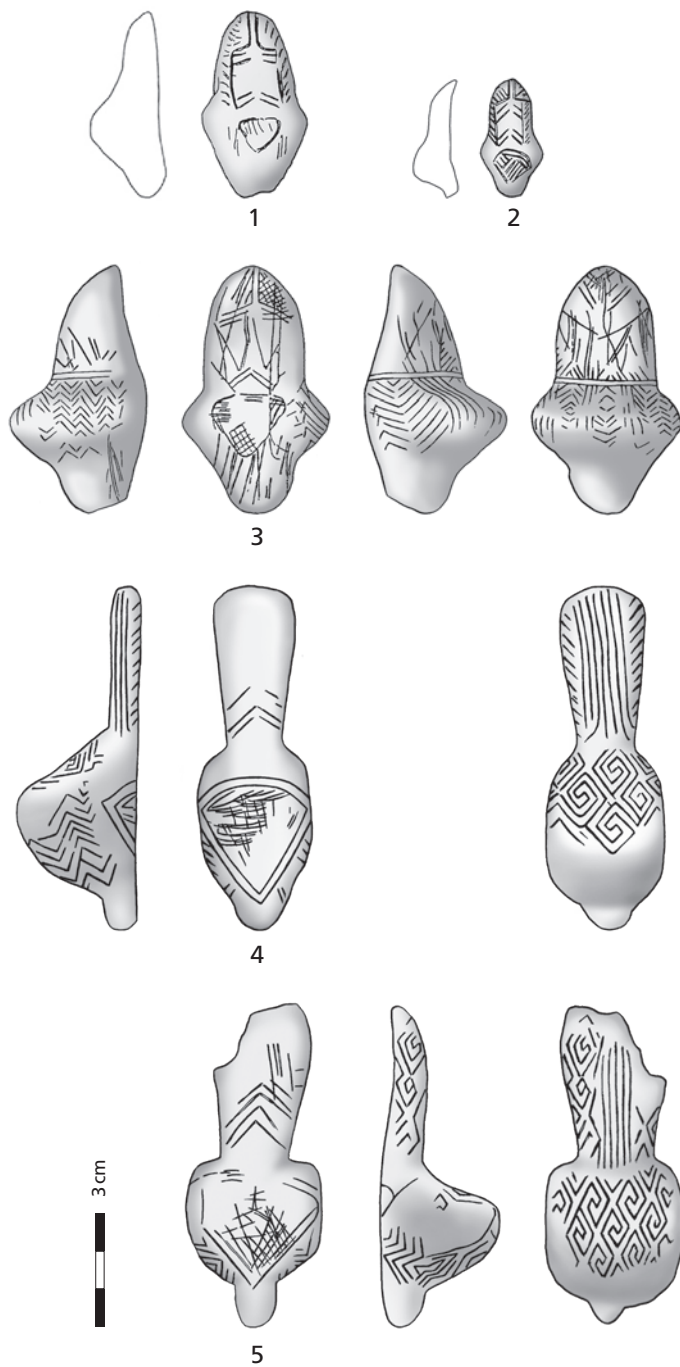


Fig. 7 Mezin. Headless anthropomorphic ivory figurines, interpreted as female, from dwelling 2 (**1-3**) and dwelling 3 (**4-5**). – (Redrawn and modified by G. Rutkowski and N. Viehöver from: Chovkopllass, 1965).

from the different dwellings; those from dwelling 2 possess engravings that form an elongated trapezoidal box, filled with pairs of chevrons, which seem to represent the thoracic cage. This impression is enhanced by two vertical lines on top of this box, most likely to be interpreted as the neck, ending at the top of the figurine where the head would be placed if the figurines weren't depicted headless. Given this, the front of the headless female figurines from Mezin-dwelling 2, appear to display – although in strongly schematized form – detailed human anatomy; breasts, however, are lacking. The slightly larger female figurines from Mezin's dwelling 3 are quite similar to those from dwelling 2 (Chovkopllass, 1965); their upper torso, however, is shown in a more simple and abstract manner, displaying sets of chevrons (i. e., 'ribs'), with additional lines that may resemble the neck, displayed on a single figure only. The rear side of the upper torso of the

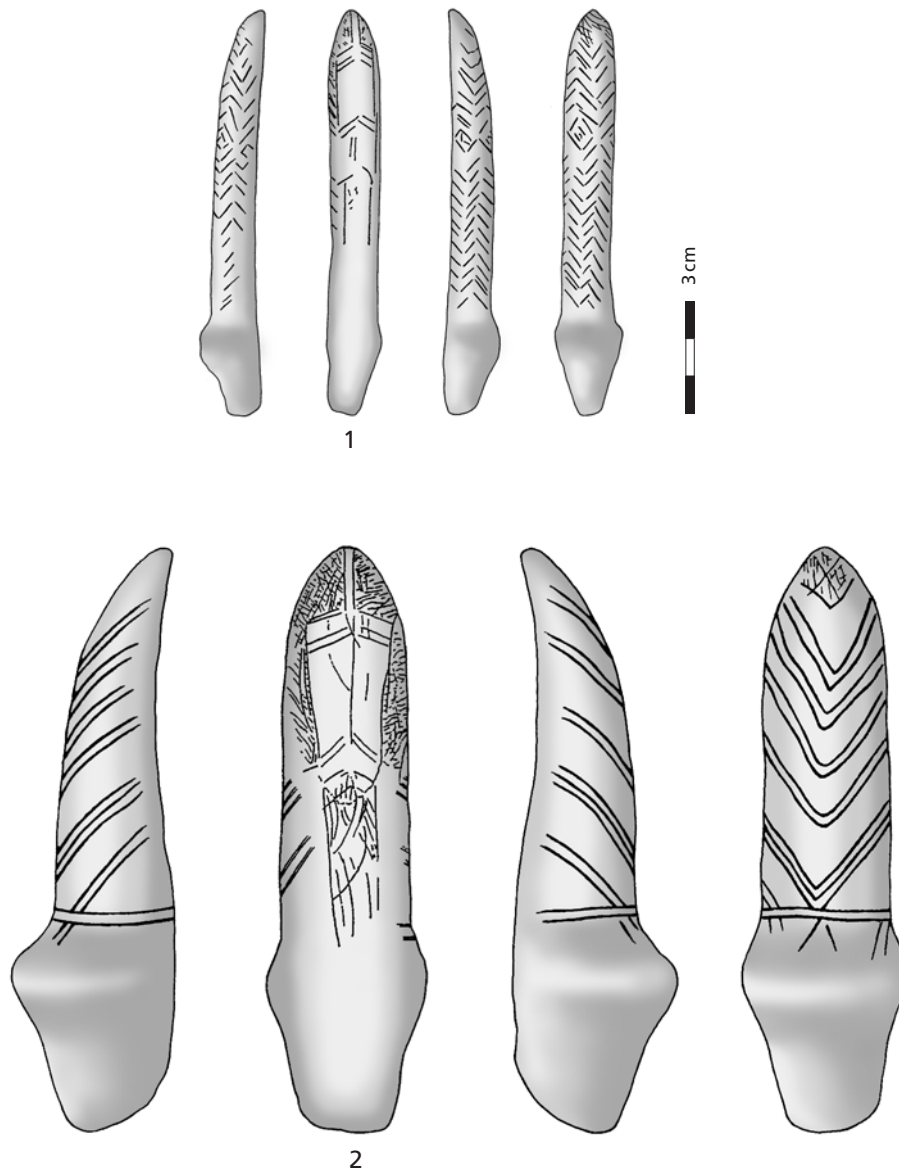


Fig. 8 Mezin. Headless anthropomorphic ivory figurines, interpreted as male, from dwelling 2. – (Redrawn and modified by G. Rutkowski and N. Viehöver from: Chovkopllass, 1965).

two larger figurines from dwelling 3 display long, parallel and vertically running engravings: perhaps they depict long hair or the spinal column? Aside from these details, the back and sides of the dwelling 2 and 3 figurines are ornamented with geometrical patterns (zig-zag lines and ‘angular meanders’; Chovkopllass, 1965; Iakovleva, 2009, 2015).

The Mezhyrich headless female figurines appear to be much more schematic in form (Fig. 9; Abramova, 1995; cf. Iakovleva, 2009). Most characteristic is the pubic triangle engraved on their flat front in the lowest part of the lower torso. Additionally, a specimen from dwelling 2 displays sets of parallel lines running horizontally across its upper torso. The site of Dobranichivka produced a few amber figurines and possible fragments of such that are of a shape that resembles that of the headless anthropomorphic ivory figurines from

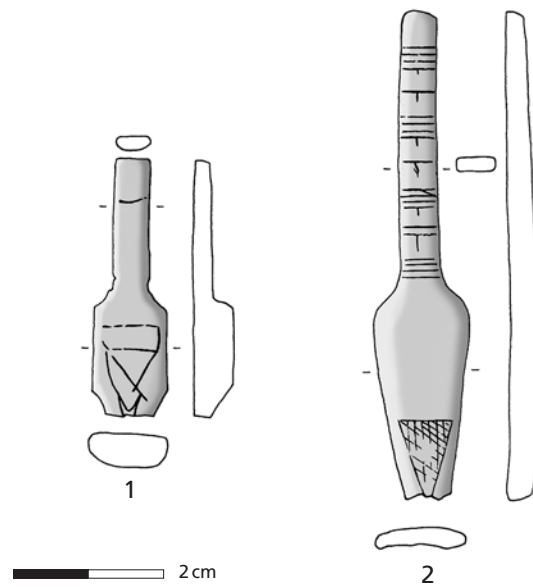


Fig. 9 Mezhyrich. Headless anthropomorphic figurines, interpreted as female, from dwelling 1 (1) and dwelling 2 (2). – (Redrawn and modified by G. Rutkowski and N. Viehöver from: Abramova, 1995; Iakovleva, 2009).

Mezhyrich (Iakovleva, 2009). Due to their poor surface preservation, however, it cannot be said whether or not they once bore engraved ornamentation. In addition to the headless depictions, Mezhyrich also produced at least one highly schematic anthropomorphic figurine that possesses a small face (Abramova, 1995; Iakovleva, 2015). The examples from Mezhyrich are particularly flat, and other attributes that characterize the Mezin figurines and/or ‘Gönnersdorf-type’ depictions, like pronounced buttock, are absent (Iakovleva, 2009, 2015).

Mezin-dwelling 2 also produced two headless anthropomorphic figurines of generally more phallic shape (Fig. 8; Chovkoplass, 1965). Both are characterised by a more elongated upper torso, but display the same stylistic design of the thoracic cage and the indication of the neck as the female figurines from the same dwelling structure (Table 1). Their hips are, however, less pronounced, and their pubic regions remain blank. With their overall phallic shape and the absence of any female characteristics, i.e., less pronounced hips and absence of the pubic triangle, it is likely that these represent male counterparts (Iakovleva, 2009, 2015). Their backs and sides are ornamented with zig-zag or double-zig-zag patterns.

Interpretation and age

Similar to the ‘Gönnersdorf-type’ anthropomorphic representations, the headless anthropomorphic figurines of Late Upper Palaeolithic eastern Europe are also highly schematic and abstract, although – by their stylistical conventions of representation – depict far more anatomical detail, allowing the viewer to clearly distinguish between female and male figurines. A similar distinction cannot be made amongst the ‘Gönnersdorf-type’ depictions, as sexual attributes are largely absent. With these, aside from the depictions with breasts, only the shape of the hips indicate that in the overwhelming majority of cases it is females that are represented (see above). Another difference between the eastern and central European examples lies in the

comparably large stylistic diversity of the headless anthropomorphic figurines of the Late Epigravettian of eastern Europe that differ in the proportion of the torso and in ornamentation between sites and dwellings, as described above (cf. Iakovleva, 2009, 2015).

Given the characteristic features of the anthropomorphic figurines of the Late Epigravettian of eastern Europe, the lack of clear individual traits and especially their “headlessness”, one may conclude by analogy with the interpretation of ‘Gönnersdorf-type’ depictions that the eastern European figurines also served as symbols, probably encoding gender-differentiated social roles in the Epigravettian of the region. The comparably large variability between the figurines from different sites and dwellings implies that other levels of social differentiation, such as e. g., household, lineage or kin, may additionally be encoded.

The similarities between the eastern European headless anthropomorphic figurines and the ‘Gönnersdorf-type’ depictions are all the more interesting as the eastern European examples seem to pre-date the latter (Iakovleva, 2005; Iakovleva and Djindjian, 2005; Haesaerts et al., 2015; Gavrilov, 2021; cf. Marquer et al., 2012). Combined radiometric and stratigraphic evidence (Haesaerts et al., 2015), indicates an age of ~18,300-17,400 cal BP (~15,050-14,300 ¹⁴C BP) for the multiple occupation phases of the site of Mezhyrich (cf. Soffer et al., 1997). This interval is in agreement with the radiocarbon dating evidence for other Epigravettian sites from this period in the Dnepr and Desna region of Ukraine and western Russia that produced mammoth bone concentrations (Iakovleva, 2005; Iakovleva and Djindjian, 2005; Gavrilov, 2021). This includes the site of Mezin, which produced dates of 15,100 ± 200 ¹⁴C BP (OxA-719; Iakovleva and Djindjian, 2005) and 14,560 ± 90 ¹⁴C BP (GrA-22499; Haesaerts et al., 2015). The site of Dobranichivka may be slightly younger, with dates of ~14,100 ¹⁴C BP (GrA-22472: 14,355 ± 90 ¹⁴C BP, and OxA-12108: 13,990 ± 90 ¹⁴C BP, on the same bone; Haesaerts et al., 2015) and 12,700 ± 200 ¹⁴C BP (OxA-700; Iakovleva and Djindjian, 2005). From the archaeological contexts provided by these sites, however, age estimates based on radiocarbon dates significantly younger than ~14,000 ¹⁴C BP should be viewed with scepticism (Iakovleva and Djindjian, 2005). On the other hand, the few dates available from Mezin that fit into the above interval may still overestimate the age of the archaeological occupation as the dated bones derive from bone concentrations that consist of collected subfossil material that has been piled up at the site.

“HEADLESSNESS” IN THE EUROPEAN LATE UPPER PALAEOLITHIC ANTHROPOMORPHIC DEPICTIONS: CHRONOLOGICAL TRENDS AND GEOGRAPHIC SCALES

The headless anthropomorphic depictions of ‘Gönnersdorf-type’ and those of the eastern European Late Epigravettian can be compared with a few further anthropomorphic depictions from the Late Upper Palaeolithic of south-western Europe. Viewed in chronological order, such comparison sheds new light on the understanding of the supra-regional homogeneity of ‘Gönnersdorf-type’ depictions, and contributes to the overall interpretation of the eponymous site.

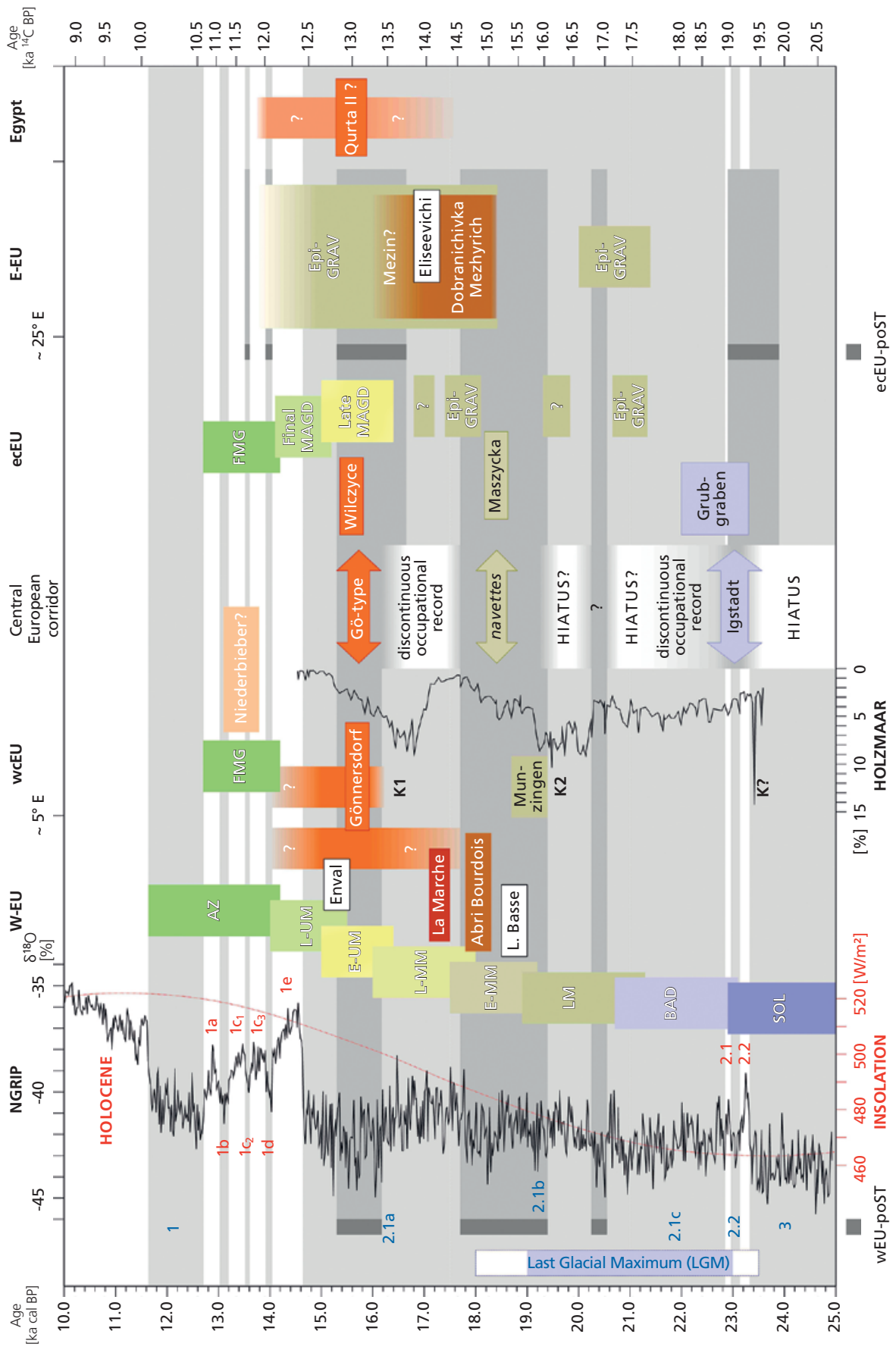
East-west temporary interconnectedness ~ 19,000-17,500 cal BP

Due to its early discovery in 1864 the most famous Palaeolithic human depiction is the *Vénus impudique* (‘immodest Venus’), a headless ivory figurine from Laugerie Basse in the Dordogne (e. g., Delporte, 1979, 1993a, 1993b), that dates to the Middle Magdalenian (Fig. 10). The figurine’s head appears to have been

broken off; its feet are also lacking, the latter at least probably broken off during their archaeological discovery. Additionally, its arms and breasts are missing, but in this case as they were never carved as elements of the figurine's design. The figurine is meant to be viewed from the front, where its deeply incised vaginal opening is visible. Another small figurine depicting a female torso, made of stone, is reported from the Late Magdalenian of the site of Enval (Bourdelle et al., 1971). The figure's head has been broken off; but, similar to the Laugerie Basse figurine, the missing breasts, arms and feet were never carved in the first place. Radiocarbon dates obtained on samples from the layers below (Delpech, 1998), suggest an age of ~ 15,500 cal BP or slightly younger can be assumed for the Enval figurine. Of similar style when compared with Laugerie-Basse and Enval, but of Early Middle Magdalenian age is the monumental "*panneau des Vénus*" bas-relief of Abri Bourdois at Roc-aux-Sorciers in L'Angles-sur-l'Anglin (Vienne), composed of at least three female torsos and a fourth one aside, all of which lack heads, breasts, arms and feet, but which display deeply incised vaginal openings (de Saint-Mathurin and Garrod, 1949; Iakovleva and Pinçon, 1996, 1997, 1999). This is an interesting parallel to the more-or-less contemporaneous headless anthropomorphic figurines of Mezhyrich discussed above (Fig. 9); they were also intended to be viewed from the front, lack heads, breasts, arms and feet, but show engraved pubic triangles. The Dobranichivka amber figurines closely match the overall shape of the headless figurines from Mezhyrich (Iakovleva, 2009). The Mezin figurines are very similar to those from Mezhyrich, but they are much more strongly ornamented, and more strongly emphasise the typical profile characteristic of 'Gönnersdorf-type' depictions that appeared in central Europe from ~ 16,000 cal BP on.

It is surely unlikely that similarities in the appearance and amount of principle stylistic elements shared by the *Vénus impudique*, the plastically sculptured females in the frieze at Abri Bourdois ("*Panneau des Vénus*") and the headless anthropomorphic figurines of Mezhyrich is simply coincidence. The same principle – designed to be viewed from the front, lacking heads, breasts, arms and feet, but showing the female pubic region – is realised also at a small series of six Middle Magdalenian sites of south-western France, most of them assigned to the *Magdalénien à pointes de Lussac-Angles facies* (Abri Bourdois, les Fadets, Montgaudier, l'Abri Gaudry, Grottes du Chaffaud, La Marche), where horse incisors were also found engraved with a pubic triangle (Mazière and Buret, 2010; Airvaux, J., 2011). Their overall shape is similar to that of the ivory

Fig. 10 Chronology of Late Upper Palaeolithic headless anthropomorphic depictions (orange; Gö = Gönnersdorf) in the context of different palaeoclimate and archaeological records for western Europe (W-EU), western central Europe (wcEU: ~ 5-15° E), eastern central Europe (ecEU: ~ 15-25° E), eastern Europe (E-EU), and Egypt (left timescale: ka cal BP; right timescale: approx. ka ¹⁴C uncal BP; cf. Reimer et al., 2020). Greenland NGRIP δ¹⁸O [‰] isotope record (Rasmussen et al., 2014) with Greenland Stadials (GS: blue) and Greenland Interstadials (GI: red); summer insolation [W/m²] in June at 60°N (Berger and Loutre, 1991); the Last Glacial Maximum (LGM) follows the definition of Mix et al. (2001) as the period of maximum global ice volume and lowest sea levels during the last Glacial cycle, i. e., ~ 23,000-19,000 cal BP (LGM light-blue), and spanning from the northern hemispheric summer insolation minimum at ca. 23,500 cal BP (Berger and Loutre, 1991) and the timing of Heinrich Event H2 until ca. 18,000 cal BP (LGM white), when the Fennoscandian Ice Shield started to slowly retreat after its maximum advance during the Brandenburg glacial stage (Hughes et al., 2016). Holzmaar carbonate contents [%] in lacustrine clastic varves with carbonate peaks K1, K2 and K? (data from Brauer, 1994; Zolitschka et al., 2000, modified), indicative of calcareous dust flux and increased aeolian activity (i. e., loess deposition) in western central Europe (Zolitschka et al., 2015); periods of the presence of saiga antelopes (poSt: dark grey) in western Europe (wEU-poSt) and eastern central Europe (ecEU-poSt) with wEU-poSt data compiled from Langlais et al. (2015a), Barashay-Szmidt et al. (2016) and Nadachowski et al. (2016) for directly ¹⁴C-dated samples of *Saiga tatarica* and Bosinski (2009) for contextual age-estimates from the 'artistic' record, and ecEU-poSt data compiled from Nadachowski et al. (2016) for directly ¹⁴C-dated samples of *Saiga tatarica* and Kozłowski et al. (2017) for contextual age-estimates from Maszycka cave. The archaeostratigraphic record is shown schematically for France, central and eastern Europe, covering the Solutrean (SOL), Badegoulian (BAD), Lower Magdalenian (LM), Early Middle Magdalenian (E-MM), Late Middle Magdalenian (L-MM), Early Upper Magdalenian (E-UM)/Late Magdalenian (Late MAGD), Late Upper Magdalenian (L-UM)/Final Magdalenian (Final MAGD) to the Azilian (AZ)/*Federmessergruppen* (FMG), following data compilations from Ducasse et al. (2021; cf. Ducasse, 2012) for the SOL to BAD, from BAD to E-MM (Ducasse and Langlais, 2007) and from Langlais et al. (2015a, 2015b) for the E-MM to L-UM sequences, and from Wiśniewski et al. (2017) and Nerudová et al. (2019) for the Epigravettian (Epi-GRAV) of eastern central and from Gavrillov (2021) for eastern Europe. For further references: see text.



figurines from Mezhyrich (see above; cf. Chovkoplav, 1965; Iakovleva, 2009, 2015). In their overall characteristics the engraved horse incisors seem to represent a 'special' regional variant (cf. Fuentes et al., 2019) of a theme that appeared at this time in western and in eastern Europe. During this time interval, however, in western Europe spanned by the Lower and Middle Magdalenian, there is limited evidence for human presence in central Europe and hence, to bridge the east and the west, a topic currently discussed intensively (Fig. 10; cf. e. g., Maier et al., 2020; Maier, 2017; Pasda, 2017; Wiśniewski et al., 2017). Particularly prominent in this discussion is the cave of Maszycka in southern Poland, dated to ~ 18,600-18,000 cal BP (Kozłowski et al., 2012, 2017), with an industry that is characteristic of the *Magdalénien à navettes* comparing in many details to French sites attributed to this 'facies' (Allain et al., 1985; Bourdier et al., 2017a). The lithic raw materials used at Maszycka do, indeed, not only link ~ 600 km to the west to southern Germany ("*Plattensilex*"), i. e., half way towards France, but also some 300-400 km to the sources of so-called Volhynian flint in western Ukraine (Kozłowski et al., 2017), showing that central Europe at this time must have formed a corridor for the long-distance transmission of people and ideas.

Given the paucity of archaeological sites in central Europe that correspond to the Lower and Middle Magdalenian and which could, therefore, provide evidence for the interconnectedness of western and eastern European populations, the presence of saiga antelope (*Saiga tatarica*) could serve as a useful proxy for punctuated or comparably short periods of presence in western Europe, during oscillations of extremely dry climate when saiga habitats expanded from western central Asia to the Atlantic coasts of France (Nadachowski et al., 2016). The presence of saiga in the hunted fauna (e. g., Maier et al., 2020), at best directly dated by radiocarbon (e. g., Nadachowski et al., 2016; Barashay-Szmidt et al., 2016; Langlais et al., 2015a) or its presence in the 'artistic' record (Bosinski, 2009) during the period discussed, help to compile a record of pulses of saiga antelopes' westward expansions in periods in which central Europe was (principally) habitable (cf. Maier et al., 2020). Interestingly, the period ~ 19,000-18,000 cal BP represents such a period of saiga expansion (Fig. 10), with evidence in eastern central Europe at Maszycka, although not directly dated (Kozłowski et al., 2017), and at a series of Early and Middle Magdalenian sites in the west (Costamagno, 2000; Barashay-Szmidt et al., 2016; Nadachowski et al., 2016) among which the site of Moulin-Neuf, discussed above (Costamagno, 2000), is most relevant here.

In France, the Middle Magdalenian record appears as a complex 'mosaic' which – amongst other aspects that led to the distinction of the two facies named above, i. e., the *Magdalénien à pointes de Lussac-Angles* and the *Magdalénien à navettes* – is comprised of a rich 'artistic' record of fascinating diversity (see Bourdier et al., 2017a). In terms of 'artistic' expression, the *Magdalénien à pointes de Lussac-Angles* is largely characterized by numerous, mainly realistic depictions of animals and humans, whereas figurative art remains scarce in the *Magdalénien à navettes* sites, the few examples that do exist being of highly schematised style (e. g., Bourdier et al., 2017b; Fuentes et al., 2017, 2019). Much of the current discussion of the two facies, in which human/anthropomorphic depictions also figure (Fuentes et al., 2017), centres on understanding their spatio-temporal relationship (e. g., Langlais et al., 2017) and the question whether or not, and if so to what degree, they represent different "graphic traditions" (Bourdier et al., 2017b: 103) and have to be interpreted as expressions of regionally differentiated socio-cultural (group) identities (e. g., Fuentes, 2013).

Without the need to dive deeper into this discussion, it is worth noting that the great diversity observed within the Early Middle Magdalenian of south-western Europe, including that of 'artistic' expressions, is paralleled in the technological diversity of the Epigravettian of eastern Europe (e. g., Gavrillov, 2021), including the stylistic diversity of headless anthropomorphic depictions visible at Mezhyrich and Mezin. As has already been described, besides the similarities of the headless anthropomorphic depictions of the latter two sites, strong stylistic dissimilarities exist in terms of the overall design of the figurines and their

level of abstractness, although the sites are assumed to be of comparable age and are located in certain regional proximity. Even at an intra-site level, stylistic differences have been highlighted between different dwellings and between the different themes addressed (Tab. 1; Fig. 7; Fig. 9; Chovkoplass, 1965; Iakovleva, 2009, 2015): only dwelling 2 of Mezin, for example, provided presumably male ivory figurines (Fig. 8), whereas potential gender-related distinctions do not otherwise manifest at the site. At the same time, the variability between individual figurines remains comparably high in terms of body proportions and details of ornamentation. To a certain degree this diversity seems to correspond to the variability among Middle Magdalenian depictions of humans (and human body parts) and anthropomorphic depictions which represent humans at different levels of completeness and abstraction, although individual elements remain visible (cf. Fuentes et al., 2017). For the ~18,500-17,500 cal BP interval, this may be read in a way that comparably high levels of probably household-, lineage- or kin- (i.e., dwelling-related) and regional-based identities were expressed in human and anthropomorphic representations that were depicted 'atop of' a general worldview expressed in abstract, often fragmented and – and especially in the east of Europe – headless, illustrations, representing potential common denominators within supra-regionally interconnected worldviews or belief systems. The establishment of such supra-regional interconnections seems to relate to a period immediately following the *Magdalénian à navettes* in a later half or a phase during which saiga antelopes expanded from the east to the west, indicative for an 'active' central European corridor.

Anthropomorphic depictions ~ 17,500-16,000 cal BP

With the end of the saiga phase, i.e., after ~18,000 cal BP, the cultural developments of western and eastern Europe appear to have become markedly disconnected. This seems to relate to the discontinuous archaeological record of much of central Europe (Jöris and Street, 2021; cf. recent discussions in Maier et al., 2020; Wiśniewski et al., 2017; cf. Nerudová et al., 2019), and it is likely that the area was totally abandoned by humans – at least gradually over the course of several phases (Fig. 10).

Whereas the trend of geometric ornamentation that characterises the Epigravettian of Ukraine and western Russia, seems to have continued (e.g., Iakovleva, 2016; cf. Borić and Cristiani, 2016; Mărgărit, 2010, for the Balkans), (headless) anthropomorphic depictions, however, seemed to have ceased after ~17,000 cal BP (cf. Iakovleva, 2009, 2015, Iakovleva and Djindjian, 2005). But, as noted above, the site of Mezin could even be much younger than generally assumed, given its poor state of dating, and the overall stylistic 'habitus' of headless anthropomorphic depictions that appear stylistically 'intermediate' (Tab. 1), as they show similarities to both, the Mezhyrich figurines and those of the 'Gönnersdorf-type'.

There is only one more eastern European site of relevance here for the period ~17,500-16,000 cal BP: Eliseevichi 1 in the upper Desna valley in the Bryansk province of Russia. This produced a ~15 cm large headless ivory figurine with large breasts and massive legs, yet lacking arms. Its chest is ornamented by horizontal lines (Abramova, 1966, 1995), resembling the ornamentation of one of the headless anthropomorphic figurines from Mezhyrich. The figure's head has been broken off, but was present when the figure was carved. It was found together with other small, three-dimensionally carved limestone figurines depicting animals, which have otherwise no parallels in the Desna region (Sablin and Khlopachev, 2002, and references therein).

In France, at around the same time, the site of La Marche, attributed to the *Magdalénien à pointes de Lussac-Angles*, is key to this discussion (see above). Many of the human depictions engraved on its limestone blocks possess heads, which are depicted in a level of detail that one can be sure that specific individuals

are depicted in 'portrait' style (Pales and Tassin de Saint Péreuse, 1976; Mélard, 2008). Some of the depictions lack heads or are broken at the point where the heads would be expected; it cannot be said for sure whether or not the part of the plaquette that once displayed the head was broken off intentionally, as has been argued for many of the figurines assigned to the preceding Mid-Upper Palaeolithic "Willendorf-style" (e.g., Guthrie, 2005; Verpoorte, 2001; cf. Gaudzinski-Windheuser and Jöris, 2015). As argued above, the depiction of females in lateral view at La Marche closely resembles the double S-shape of the female torso in lateral view. Given this, a few female body outlines of headless depictions from La Marche (Mélard, 2008: planche 12; planche 35) appear quite similar to some of the pre-16,000 cal BP headless anthropomorphic depictions from Middle Magdalenian contexts (e.g., Moulin-Neuf, Arlanpe; cf. discussion above) that are frequently attributed to the 'Gönnersdorf-type'. This interpretation can be questioned, however, on the grounds of the rudimentary level of detail in their creation, and one can alternatively interpret those double S-shaped depictions of presumable female torsos as potential stylistic predecessors of the succeeding, more schematised depictions of 'Gönnersdorf-type' that appeared ~ 16,500 cal BP and which had become dominant from ~ 16,000 cal BP onwards.

New standards on supra-regional scale ~ 16,000-15,000 cal BP

From around the Late Middle Magdalenian to the Early Late Magdalenian transition around ~ 16,500 cal BP, there is growing evidence in south-western Europe for headless anthropomorphic depictions of 'Gönnersdorf-type', and from ~ 16,000 cal BP 'Gönnersdorf-type' headless anthropomorphic depictions became more standardised (Bosinski et al., 2001). With this "formal homogenization" the typical 'Gönnersdorf-type' of headless anthropomorphic depictions spread rapidly across Europe (cf. Bourrillon et al., 2012; Fuentes et al., 2019), reaching as far as eastern central Europe (**Fig. 10**; Wilczyce in south-eastern Poland: Fiedorczuk et al., 2007).

This eastward dispersal of headless anthropomorphic depictions of 'Gönnersdorf-type' appears to have been extremely rapid, and seems to have been linked, once again, to the re-opening of a corridor through central Europe through which saiga antelope habitats expanded in the opposite direction towards the west (Bosinski, 2009; cf. Maier et al., 2020; Nadachowski et al., 2016). Additional arguments for the re-activation of this corridor have been forwarded on the basis of stylistic reasoning (Bosinski et al., 2001) as some of the central European 'Gönnersdorf-type' headless anthropomorphic depictions are decorated with geometric patterns (e.g., Gönnersdorf plaquette no. 87: **Fig. 4**; and a pair of angles, or chevrons, engraved into the side of the large 'Gönnersdorf-type' ivory sculpture no. An2/11 from Andernach-Martinsberg: Höck, 1995), a design that resembles ornaments typical for the eastern European Epigravettian and reminds us, more specifically, of the geometrically decorated figurines from Mezin (Chovkoplass, 1965; Iakovleva, 2009).

The potential stylistic influences from the east also seem to be reflected in the decision to carve three-dimensional figurines, mostly in ivory. The Mezin sculptures also appear technically, and in terms of their profile view, as potential predecessors for 'Gönnersdorf-type' figurines (cf. Iakovleva, 2009). This, again, hints at the idea outlined above, that present age estimates for the site of Mezin may overestimate its real age. From around ~ 16,000 cal BP onwards, the combined evidence hints at strong levels of supra-regional interconnectedness between the west and the east of Europe. It seems that during this time the idea to carve female figurines spreads westwards, while the idea of engraving depictions of comparable profile view, spreads eastwards. In central Europe both these trends overlapped and merged (**Fig. 5: d**), and it is here that 'Gönnersdorf-type' depictions appear to have become most standardized.

'GÖNNERSDORF-TYPE' DEPICTIONS AND THE SOCIAL FOUNDATIONS OF THE LATE GLACIAL EXPANSION

In central Europe, the geographical spread of 'Gönnersdorf-type' anthropomorphic representations ~ 16,000-14,000 cal BP coincides with the most dynamic and unprecedentedly-rapid phase of Late Glacial human range expansion into the northerly parts of Europe which appears to be linked with the beginning of the Late Magdalenian (Street et al., 2009; cf. Housley et al., 1997). Besides the required adaptive demands (cf. Burke et al., 2017; cf. Baales and Jöris, 2006), on a meta-population level, the greatest challenge had been the establishment of a population size viable enough to survive in the newly occupied regions of central Europe, involving the constant founding and establishment of new social entities and associated networks ensuring successful interconnection of individuals and groups over large distances. With regard to the latter, and for the Late Magdalenian expansion to succeed, it has been argued that newly established supra-regional social (and communication) networks were further required to inter-connect the (presumably small) 'pioneering' groups at the front of the expansion with the populations in the Magdalenian 'homelands' of south-western Europe (for further details see: Gaudzinski-Windheuser and Jöris, 2015). Such supra-regional large-scale social networks would have been required to connect individuals over much larger geographical scales than would have been the case within the seasonal migration ranges of specific foraging groups. Only through the implementation of sets of socio-cultural rules and regulations that – among other issues – organised partnership, kin and – above all – residence would have facilitated the establishment of such networks and enabled the relocation of at least some individuals over large distances between different groups. Such supra-regional and large-scale social networks must have focussed intently on the mandatory functioning of certain individuals. "Thus, the individual sphere must have been subordinate for the group and was presumably reflected in the absence of depictions of individuals" (Gaudzinski-Windheuser and Jöris, 2015: 312). It may have been the case that the establishment and maintenance of such large-scale social networks belonged to the realm of the 'female sphere', for which 'Gönnersdorf-type' anthropomorphic depictions may have served as symbols in support of a communal identity or of communal worldviews, which could be communicated over large distances across Europe (Gaudzinski-Windheuser and Jöris, 2015; cf. Wobst 1977). Following these arguments, it was most likely due to the implementation of such sets of rules and regulations and a concept of communal identity underlying Late Magdalenian social organization that this phase of the Late Glacial Expansion finally succeeded. The resulting social networks would not only have established a viable meta-population over central Europe, but also reduced Magdalenian population densities and potentially associated population pressures within the 'homeland' regions, where groups had lived for several millennia in an Ice Age refugium at levels probably close to the limits of the region's carrying capacity (cf. Burke et al., 2017). Following this line of argument, one could furthermore conclude that the Late Magdalenian expansion succeeded due to the 'culturally planned' spread of humans over such a vast area; it is, therefore, the result of a planned, rule-driven 'colonization' governed by social rules on partnership, kin and residence, rather than a gradual and comparably slow 'dispersal' of a population due to its more-or-less continuous adaptation to new environmental conditions. The latter mode of dispersal may have applied to earlier (i. e., pre-16,000 cal BP) attempts to re-settle central Europe after the LGM which had, however, failed to establish viable populations over the longer term (Street et al., 2009; cf. e. g., Street and Terberger, 1999; Terberger and Street, 2002; Maier et al., 2020; Wiśniewski et al., 2017).

In parallel with the Late Magdalenian dispersal, 'Gönnersdorf-type' depictions left the context of deep caves (Bosinski et al., 2001) and came mostly to be found in both open-air sites, and if in rock-shelters in or near the daylight zone (e. g., La Roche de Lalinde: Leroi-Gourhan, 1971; Bosinski et al., 2001; Gare de la Couze:

Bordes et al., 1963; Abri Fontalès: Lorblanchet and Welté, 1987; Abri Murat: Lorblanchet and Welté, 1987). These observations support the notion that the transmission of the 'Gönnersdorf-type' symbol's content(s) took place in the public (rather than a personal or private; cf. Gaudzinski-Windheuser, 2015) sphere, and, according to the spatial data available (Bosinski et al., 2001), was embedded within everyday activities. This overall 'presence' and 'publicity', and the increased stylistical formalisation of 'Gönnersdorf-type' depictions, enhanced their saliency and recognisability at a supra-regional scale, fostered the understanding and acceptance of the symbol's content and, in combination, may have been beneficial for the establishment of large-scale networks which resulted in the enhancement of social cohesion spanning large geographical areas by interlinking different groups (that otherwise relied on different regional economies) and individuals from far distant regions. Spanning large distances, the supra-regional social webs established during this time led to increased frequencies of human-human interactions, which are seen as a motor for the development of common identity and a sense of belonging (Bird-David, 2017). Associated mating systems and residence rules in support of densely woven geographically well-interconnected social webs would have allowed the successful establishment of a viable meta-population that – from ~16,000 cal BP onward – built the base for the more sustainable resettlement of central – and subsequently, northern – Europe (e.g., Street et al., 2009).

GÖNNERSDORF SITE FUNCTION

A low-level persistence of regional stylistic variability reveals, however, that regional social networks were not replaced, but instead that a social ('ideological': see below) super-structure was added on top of these. Whereas 'Gönnersdorf-type' ivory figurines are to be found predominantly at the northern margin of the Magdalenian oikumene, similar figurines made of jet, for example, are restricted to a few sites in southern central Europe, i.e., Monruz and Petersfels (**Fig. 5: d**). The latter type of figurine has a more double S-shaped outline, similar to an ivory statuette from Pekárna Cave in Moravia. Such regional patterns (which are to certain degree also reflected in lithic raw material provisioning patterns; e.g., Floss, 1994; Street et al., 2006; Maier, 2015, 2017) indicate the maintenance of regional social networks, styles and, likely, identities. These may have functioned on subordinate levels under the umbrella of an overarching 'metaphysical' or 'ideological' system of beliefs that served to enhance social cohesion. Transmission of the 'ideological' underpinnings of this social super-structure presumably required regular meetings or aggregations (*sensu* Conkey et al., 1980) at places where different – most likely neighbouring – foraging groups would have met to spend a certain and possibly extended time of the year together and to which a certain number of individuals from far distant regions would have joined (Langley and Street, 2013; Street and Turner, 2013). In this context 'Gönnersdorf-type' female depictions may have served as a symbol that was implemented to support the social inter-connectedness of Late Magdalenian groups and individuals. The reason why a symbol for the social role of females had been chosen for this task may be because women had been largely constituting and maintaining the supra-regional Late Magdalenian social web (Gaudzinski-Windheuser and Jöris, 2015). Implementation of rites, rituals and festivals would have fuelled the establishment and maintenance of such supra-regional social webs, reiterating the shared rules, regulations and concepts on which the 'ideological' super-structure was built upon. From the discussion above, the site of Gönnersdorf provides all the evidence in favour of an interpretation of the site as exactly such a nexus point. At the same time, this contextualisation emphasises that Gönnersdorf cannot be considered as an "average" Magdalenian site (*contra* discussion in Pasda, 2012), but that it complements to the majority of Magdalenian sites of different function by serving, amongst others, aspects of the social structuring of Late Magdalenian societies.

With the implementation of an 'ideological' super-structure and its associated rules and regulations on top of the regional social networks on which the economies of foraging groups were regularly running, this super-structure tier of social ties would have allowed for more complex land-use strategies, including supra-regional alliances which were based on increased levels of interdependencies and systems of support that allowed for increased levels of inter-group reciprocity and insured against periodic scarcities (cf. Minc and Smith, 1989). In this context, the 'ideological' umbrella that is most likely expressed in 'Gönnersdorf-type' depictions would have not only enhanced new levels of social interconnectedness and coherence but would have additionally been of immediate economic benefit, allowing the establishment of a viable meta-population in central Europe from the Late Magdalenian onwards (cf. Kretschmer, 2015; Tallavaara et al., 2015). This is not only evidenced by the significant increase of Late Magdalenian sites in central Europe (Street et al., 2009; Maier, 2015), but also by the Gönnersdorf seasonal zooarchaeological evidence (Street and Turner, 2013) that shows that Late Magdalenians had established economic systems which allowed not only to overcome the glacial winters with reduced levels of biomass production (cf. Burke et al., 2017), but also to sustain year-round economies in central Europe, with the latter feeding positively back to the persistency of established social webs and to the successful colonisation of central Europe.

DISCUSSION

The Late Upper Palaeolithic non-naturalistic record of depictions, including 'signs' and 'symbols' and other abstract forms of 'artistic' expressions, is most generally interpreted in relation to the reconstruction or definition of regional ([palaeo-]"ethnic") identities (Leroi-Gourhan, 1981) or (their) "symbolic territories" (Fuentes et al., 2019). Conclusions of wider relevance for the understanding of the social and 'ideological' changes or changes in mentalities, worldviews and belief systems underlying the Late Upper Palaeolithic record of artistic expressions have rarely been considered (e.g., Leroi-Gourhan, 1971; Lorblanchet, 1989). On the contrary, the present interpretative trends for this rich (but poorly dated) record (see papers in Lorblanchet and Bahn, 1993) focus less on stylistic tendencies and their implications than on the recognition of geographical differences (cf. discussion in Pigeaud, 2007).

However, in an attempt to widen the perspective from the Late Upper Palaeolithic anthropomorphic depictions discussed above, a range of observations and inferences may be made in comparison to other themes present in Late Upper Palaeolithic art. Such comparison may not only highlight, but also help to contextualise and partly explain some of the major differences in the spatio-temporal and stylistic patterning of cultural changes observed in Late Upper Palaeolithic 'art history'. The coarse-grained view taken here attempts to go beyond highly focussed evidence and benefits from the wide geographical scope and the diachronic perspective that has been addressed above.

The interval of ~ 16,000 to 15,000 cal BP, i. e., the Late Magdalenian period during which 'Gönnersdorf-type' headless anthropomorphic depictions spread across much of Europe, can be understood further by considering wider data. Besides representations of 'Gönnersdorf-type', only few human or anthropomorphic illustrations are known from the period, as is the case for the entire Late Upper Palaeolithic (e.g., Duhard, 1993, 1996; Cohen, 2003; Bourrillon et al., 2012; Gaudzinski-Windheuser and Jöris, 2015). This stands in stark contrast to the far richer body of animal depictions. In the Middle Magdalenian facies à *pointes de Lussac-Angles* and in Upper/Late Magdalenian contexts, animals are depicted in high degrees of detail (e.g., Bourdier et al., 2017b; Bosinski and Fischer, 1980; Bosinski, 2008; Pigeaud, 2007). When depictions were engraved, in particular when they do not cover very large surfaces, they often appear highly naturalis-

tic or realistic, and in some cases at Gönnersdorf and many other sites dating to the ~ 16,000-15,000 cal BP interval, they reveal a particular concern with highlighting the animals' individuality in an extremely dynamic manner, including their individual expressions and behaviours (cf. Bosinski, 2007, 2008).

Thanks to the great numbers of schematic anthropomorphic (Bosinski and Fischer, 1974; Höck, 1995; Bosinski et al., 2001; Bosinski, 2011a, 2011b) and naturalistic animal depictions (Bosinski and Fischer, 1980; Bosinski, 2008), the Gönnersdorf site exemplifies the strong dichotomic separation of the way humans (or symbols of their social roles) were depicted on the one hand, and how animals were represented on the other. Whatever the underpinning worldviews or belief systems underlying this stylistic distinction contained in detail (cf. discussion in Lorblanchet, 1989), the notable dichotomy most likely reflects a conceptual or ideological differentiation between the animal world and the human sphere. In contrast to the depictions of animals, Late Magdalenian representations of humans/anthropomorphs generally lack individual traits. Within the human realm, the scarcity of representations interpreted as male, highlights another dualism – likely at a different conceptual level. Those concepts that placed little emphasis on the individual's sphere may probably have been beneficial in enhancing social coherence on a supra-regional scale (Gaudzinski-Windheuser and Jöris, 2015: 312), which is possibly reflected in the comparably high levels of standardisation and the restricted Late Magdalenian canon of objects of personal adornment (Álvarez Fernandez, 2006); in short, signalling coherence and membership of a certain group or entity was more important than displaying any form of individuality. The general scarcity of burials known from this period may be interpreted likewise (Pettitt, 2010).

Appendix: Site reference list to Fig. 5

Note: Asterixes in the site reference lists below refer to sites that have yielded potential anthropomorphic depictions. The attribution of some of them to the 'Gönnersdorf-type', however, is regarded here as probable, but unclear (*) or doubtful (**).

a Spain: Cueva de Ardales* (Malaga; Ramos Muños et al., 2002), Cueva del Linar* (Cantabria; Muños Fernandez and San Miquel Llamosas, 1991), Arenaza* (Basque; Garate, 2004); **France:** Gourdan (Haute-Garonne; Fritz et al., 1996), Grotte de Pestillac (Lot; Sentis, 2000), Grotte Carriot (Lot; Lorblanchet and Welté, 1987), Abri Lagrave* (Lot; Ipiens et al., 2000), Les Combarelles (Dordogne; Capitan et al., 1924; Archambeau and Archambeau, 1991), Grotte Saint-Cirq* (Dordogne; Delluc and Delluc, 1982), Grotte de Commarque (Dordogne; Delluc and Delluc, 1981), Vielmoily II* (Dordogne; Delluc and Delluc, 1987), Grotte de Fronsac (Dordogne; Delluc et al., 1994), La Font-Bargeix* (Dordogne; Barrière et al., 1990), Villars* (Dordogne; Delluc and Delluc, 1991), Grotte du Planchard (Ardèche; Bosinski et al., 2001), Grotte des Deux-Ouvertures* (Ardèche; Gély and Porte, 1996), Abri Bourdois, Angles-sur-l'Anglin (Vienne; de Saint-Mathurin and Garrod, 1949), Grotte Margot* (Mayenne; Pigeaud et al., 2010), Grotte de Gouy (Seine-Maritime; Martin, 2007); **British Isles:** Church Hole* (Nottinghamshire; Pettitt, 2007); **Italy:** Grotta Romanelli** (Apulia; Mussi and De Marco, 2008); **Egypt:** Sinai shelter

(Sinai; Zboray, 2012); Abu Tanqura Bahari (ATB) 11 at el-Hosh* (Upper Egypt; Huyge, 2015), Qurta II (Upper Egypt; Huyge, 2015).

b Spain: Las Caldas (Asturias; Corchón Rodríguez, 1990), Arlanpe (Basque, Rios-Garaizar et al., 2015); **France:** Grotte du Courbet near Bruniquel (Tarn; Alaux, 1972; Welté and Cook, 1993), Abri Fontalès (Tarn-et-Garonne; Lorblanchet and Welté, 1987), Magdeleine-la-Plaine* (Tarn; Ladier, 2001), Abri Murat (Lot; Lorblanchet and Welté, 1987), La Roche de Lalinde (Dordogne; Leroi-Gourhan, 1971, Bosinski et al., 2001), Gare de Couze (Dordogne; Bordes et al., 1963), Moulin-Neuf* (Gironde; Ladier et al., 2005), La Marche (Vienne; Pales and Tassin de Saint Péreuse, 1976; Mélard, 2008), Roc-aux-Sorciers (Vienne; Sentis, 2005); **Germany:** And. Andernach-Martinsberg (Rheinland-Pfalz; Bosinski, 1994), Gö. Gönnersdorf (Rheinland-Pfalz; Bosinski et al., 2001), Hohlenstein near Ederheim (Bayern; Bosinski, 1982), Obere Klause (Bayern; Floss et al., 2015), Oelknitz (Thüringen; Gaudzinski-Windheuser, 2013).

c-1 engravings on pebbles (quadrats). **France:** La Goutte Rofat near Villerest (Loire; Bosinski et al., 2001; cf. Larue et al., 1955, 1956); **Germany:** Niederbieber* (Rheinland-Pfalz; Loftus, 1982), Felsställe near Mühlen* (Baden-Württemberg; Kind, 1987), Teufelsbrücke near Saalfeld (Thüringen; Wüst, 1998); **Czech Republic:** Býčí Skála* (Moravia; Valoch, 1978).

c-2 engravings on bones (circles). **Spain:** Las Caldas (Asturias);

Corchón Rodríguez, 1990; Fortea et al., 1990); *France*: Abri Faustin (Gironde; Lenoir, 1995), Grotte Rochereil* (Dordogne; Delluc and Delluc, 1991), Rond du Barry* (Haute-Loire; de Bayle de Hermens, 1972); *Germany*: Petersfels* (Baden-Württemberg; Albrecht and Berke, 1980; Bosinski, 2011b).

d *France*: Grotte du Courbet* (Tarn; Ladier, 1987), Abri Fontalès (Tarn-et-Garonne; Lorblanchet and Welté, 1987), Laugerie-Basse (Dordogne; Delporte, 1979), Enval (Puy-de-Dôme; Bourdelle et al., 1971); *Belgium*: Mégarnie (Höck, 1995); *Switzerland*: Monruz (canton de Neuchâtel; Bullinger, 2006); *Germany*: And. Andernach-Martinsberg (Rhein-

land-Pfalz; Höck, 1995), Gö. Gönnersdorf (Rheinland-Pfalz; Bosinski et al., 2001; Höck, 1995), Petersfels near Bittelbrunn (Baden-Württemberg; Bosinski, 1982; Höck, 1995), Waldstetten (Baden-Württemberg; Floss et al., 2021), Nebra (Sachsen-Anhalt; Mania, 1999), Garsitz, Bärenkeller** (Thüringen; Bosinski, 1982), Oelknitz (Thüringen; Gaudzinski-Windheuser, 2013); *Czech Republic*: Pekárna (Moravia; Absolon, 1949); *Poland*: Wilczyce (Fiedorczuk et al., 2007); *Ukraine*: Mezhyrich (Pidoplichko, 1976; Abramova, 1995; Iakovleva, 2009), Dobranichivka (Iakovleva, 2009), Mezin (Chovkoplask, 1965; Iakovleva, 2009); *Russia*: Eliseevichi 1 (Bryansk; Abramova, 1966; Iakovleva, 2009).

Acknowledgements

My thanks go to Martin and Elaine: needless to emphasize this in a *Festschrift* dedicated to the two of them. But in this case, I want to add further thanks, as their research so significantly shaped the MONREPOS research topic “Rules and Regulations in context” within our research field of “Becoming Human”. Many of Elaine’s and Martin’s different projects related, in one way or another, back to Gönnersdorf. Similar questions of “increased sedentism” Elaine recently addressed in Taforalt (cf. Barton et al., 2019).

This contribution was a much welcome opportunity to present a wrap-up of the contents of this research topic. It combines the contents of presentations I gave in 2015 at a meeting organised by the Eurasian Department of the DAI in Berlin on “Prehistoric Networks in the longue durée:

Palaeolithic Innovations enabling the Neolithic Revolution” and in 2017 at an international workshop and conference in Ekaterinburg on the “Great Shigir idol in the context of North Eurasia Stone Age art”. It is also meant as a contribution to the Top-level Research Area “40.000 Years of Human Challenges: Perception, Conceptualization and Coping in Premodern Societies (Challenges)” at Johannes-Gutenberg University Mainz.

My thanks go to Sabine Gaudzinski-Windheuser for valuable comments on an earlier version of this contribution. I am very grateful to Paul Pettitt, Durham University (UK), for significant improvements to the English text at different stages of its production, and to Gabriele Rutkowski and Nicole Viehöver for all the energy, patience and care with the artworks.

REFERENCES

- Abramova, Z.A., 1966. *Izobraženija čeloveska v paleolitičeskom iskustve Evrazii*. Nauka, Leningrad. (in Russian).
- Abramova, Z.A., 1995. *L’art paléolithique d’Europe orientale et de Sibérie*. Jérôme Millon, Grenoble.
- Absolon, K., 1949. The dilluvial anthropomorphic statuettes and drawings, especially the so-called Venus statuettes, discovered in Moravia: A comparative study. *Atribus Asiae* 12, 201-220.
- Audouze, F., 1987. Des modèles et des faits: les modèles de A. Leroi-Gourhan et de L. Binford confrontés aux résultats récents. In: Société préhistorique française (Ed.), *Études et Travaux. Hommage de la SPF à André Leroi-Gourhan*. *Bulletin de la Société préhistorique française* 84, Paris, pp. 343-352.
- Airvaux, J., 2011. Les incisives de chevaux gravées du Magdalénien moyen de Lussac-Angles, *Bulletin Préhistorique du Sud-Ouest* 19-20, 137-195.
- Airvaux, J., Pradel, L., 1984. Gravure d’une tête humaine de face dans le Magdalénien III de la Marche, commune de Lussac-les-Châteaux (Vienne). *Bulletin de la Société préhistorique française* 81, 214-215.
- Alaux, J.-P., 1972. Gravure féminine sur plaquette calcaire du Magdalénien supérieur de la grotte du Courbet (commune de Penne-Tarn). *Bulletin de la Société préhistorique française* 69, 109-112.
- Albrecht, G., Berke, H., 1980. Neue „Venus“-Gravierungen auf einem Knochenfragment aus dem Magdalénien vom Petersfels. *Archäologisches Korrespondenzblatt* 10, 111-115.
- Allain, J., Desbrosse, R., Kozłowski, J., Rigaud, A., Jeannet, M., Leroi-Gourhan, A., 1985. Le Magdalénien à navettes. *Gallia Préhistoire* 24, 37-124.
- Álvarez-Fernandez, E., 2006. *Los objetos de adorno-colgantes del Paleolítico superior y del Mesolítico en la Cornisa Cantábrica y en el Valle del Ebro: una visión europea*. Ediciones Universidad de Salamanca, Salamanca.
- Álvarez-Fernández, E., 2009. Magdalenian Personal Ornaments on the Move: a Review of the Current Evidence in Central Europa. *Zephyrus* 63, 45-59.
- Archambeau, M., Archambeau, C., 1991. Les figurations humaines pariétales de la Grotte des Combarelles. *Gallia Préhistoire* 33, 53-81.

- Baales, M., Jöris, O., 2006. Wandel von Klima und Umwelt an Mittelrhein und Mosel gegen Ende der letzten Eiszeit. Zur Chronologie und Lebensweise später Jäger und Sammler im nördlichen Rheinland-Pfalz. *Berichte zur Archäologie an Mittelrhein und Mosel* 10, 9-43.
- Barrière, C., Carcauzon, C., Delluc, B., Delluc, G., 1990. La grotte ornée de la Font-Bargeix (Champeau et La Chapelle-Pommier, Dordogne). *Travaux de l'Institut d'Art Préhistorique* 32, 9-47.
- Barshay-Szmidt, C., Costamagno, S., Henry-Gambier, D., Laroulandie, V., Petillon, J.-M., Boudadi-Maligne, M., Kuntz, D., Langlais, M., Mallye, J.-B., 2016. New extensive focused AMS ¹⁴C dating of the Middle and Upper Magdalenian of the western Aquitaine/Pyrenean region of France (ca. 19-14 ka cal BP): Proposing a new model for its chronological phases and for the timing of occupation. *Quaternary International* 414, 62-91.
- Barton, R.N.E., Bouzzougar, A., Collcutt, S.N., Humphrey, L.T. (Eds.) 2019. *Cementries and Sedentism in the Later Stone Age of NW Africa: Excavations at Grotte des Pigeons, Taforalt, Morocco*. Monographien des Römisch-Germanischen Zentralmuseums 147. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Batchelor, D., 1979. The use of quartz and quartzite as cooking stones. In: Bosinski, G. (Ed.), *Die Ausgrabungen in Gönnersdorf 1968-1976 und die Siedlungsbefunde der Grabung 1968*. Der Magdalénien-Fundplatz Gönnersdorf 3. Franz Steiner Verlag, Wiesbaden, pp. 154-165.
- Berger, A., Loutre, M.F., 1991. Insolation values for the climate of the last 10 million years. *Quaternary Science Reviews* 10, 297-317.
- Binford, K., 1983. *In Pursuit of the Past*. Thames and Hudson, New York.
- Bird-David, N., 2017. Before Nation: Scale-Blind Anthropology and Foragers' Worlds of Relatives. *Current Anthropology* 58, 209-226.
- Bobak, D., Połtowicz-Bobak, M., 2014. Bayesian age modelling of the Magdalenian settlement in the territory of present-day Poland. *Recherches Archéologiques Nouvelle Serie* 5-6, 2013-2014, 51-67.
- Bordes, F., Fitte, P., Laurent, P., 1963. Gravure féminine du Magdalénien VI de la Gare de Couze (Dordogne). *L'Anthropologie* 67, 269-281.
- Bordes, F., Graindor, M.-J., Martin, Y., Martin, P., 1974. L'industrie de la grotte ornée de Gouy (Seine-Maritime). *Bulletin de la Société préhistorique française* 71, 115-118.
- Borić, D., Cristiani, E., 2016. Social Networks and Connectivity among the Palaeolithic and Mesolithic Foragers of the Balkans and Italy. In: Krauss, R., Floss, H. (Eds.), *Southeast Europe before Neolithisation*. Proceedings of the International Workshop within the Collaborative Research Centres sfb 1070 "RessourcenKulturen", Schloss Hohentübingen, 9th of May 2014. RessourcenKulturen Band 1, Universität Tübingen, Tübingen, pp. 73-112.
- Bortolini, W., Pagani, L., Oxilia, G., Posth, C., Fontana, F., Badino, F., Sauppe, T., Montinaro, F., Margaritora, D., Romandini, M., Lugli, F., Papini, A., Boggioni, M., Perrini, N., Oxilia, A., Aiese Cigliano, R., Barcelona, R., Visentin, D., Fasser, N., Arrighi, S., Figus, C., Marciani, G., Silvestrini, S., Bernardini, F., Menghi Sartorio, J.S., Fiorenza, L., Moggi Cecchi, J., Tuniz, C., Kivisild, T., Gianfrancesco, F., Peresani, M., Scheib, C.L., Talamo, S., D'Esposito, M., Benazzi, S., 2020. Early Alpine occupation backdates westward human migration in Late Glacial Europe. *Current Biology* 31, 1-10, <https://doi.org/10.1016/j.cub.2021.03.078>.
- Bosinski, G., 1969. Der Magdalénien-Fundplatz Feldkirchen-Gönnersdorf, Kr. Neuwied. *Germania* 47, 1-38.
- Bosinski, G., 1975. Der Magdalénien-Fundplatz Gönnersdorf. In: *Ausgrabungen in Deutschland*. Monographien des Römisch-Germanischen Zentralmuseums 1, Mainz, pp. 42-63.
- Bosinski, G., 1979. *Die Ausgrabungen in Gönnersdorf 1968-1976 und die Siedlungsbefunde der Grabung 1968*. Der Magdalénien-Fundplatz Gönnersdorf 3. Franz Steiner Verlag, Wiesbaden.
- Bosinski, G., 1981. *Gönnersdorf. Eiszeitjäger am Mittelrhein*. Schriftenreihe der Bezirksregierung Koblenz 2. Selbstverlag des Landesmuseums Koblenz, Koblenz.
- Bosinski, G., 1982. *Die Kunst der Eiszeit in Deutschland und der Schweiz*. Kataloge Vor- und Frühgeschichtlicher Altertümer 20. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Bosinski, G., 1988. Upper and Final Palaeolithic settlement patterns in the Rhineland, West Germany. In: Dibble, H., Montet-White, A. (Eds.), *Upper Pleistocene Prehistory of Western Eurasia*. Colloquium Philadelphia 1987. University Museum Monograph 54, Philadelphia, pp. 375-386.
- Bosinski, G., 1994. Die Gravierungen des Magdalénien-Fundplatzes Andernach-Martinsberg. *Jahrbuch des Römisch-Germanischen Zentralmuseums* 41, 19-58.
- Bosinski, G., 2007. *Gönnersdorf und Andernach-Martinsberg. Späteiszeitliche Siedlungsplätze am Mittelrhein*. Archäologie an Mittelrhein und Mosel 19. Gesellschaft für Archäologie an Mittelrhein und Mosel e.V., Koblenz.
- Bosinski, G., 2008. *Tierdarstellungen von Gönnersdorf. Nachträge zu Mammut und Pferd sowie die übrigen Tierdarstellungen*. Monographien der Römisch-Germanischen Zentralmuseums Band 72 / Der Magdalénien-Fundplatz Gönnersdorf 9. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Bosinski, G., 2009. Les saïgas dans l'art magdalénien. *L'Anthropologie* 113, 662-678.
- Bosinski, G., 2011a. *Femmes sans tête. Une icône culturelle dans l'Europe de la fin de l'ère glaciaire*. Errance, Paris.
- Bosinski, G., 2011b. Les figurations féminines de la fin des temps glaciaires. In: Cluzel, J.-P., Cleyet-Merle, J.-J. (Eds.), *Mille et une femmes de la fin des temps glaciaires*. Grand Palais, Paris, pp. 49-67.
- Bosinski, G., Bosinski, H., 1991. Robbendarstellungen von Gönnersdorf. In: Aktas, A., Boenigk, W. (Eds.), *Festschrift Karl Brunnacker*. Sonderveröffentlichungen des Geologischen Instituts Köln, Köln, pp. 81-87.
- Bosinski, G., d'Errico, F., Schiller, P., 2001. *Die gravierten Frauendarstellungen von Gönnersdorf*. Der Magdalénien-Fundplatz Gönnersdorf 8. Franz Steiner Verlag, Stuttgart.
- Bosinski, G., Fischer, G., 1974. *Die Menschendarstellungen von Gönnersdorf. Ausgrabung 1968*. Der Magdalénien-Fundplatz Gönnersdorf 1. Franz Steiner Verlag, Wiesbaden.
- Bosinski, G., Fischer, G., 1980. *Mammut- und Pferdedarstellungen von Gönnersdorf*. Der Magdalénien-Fundplatz Gönnersdorf 5. Franz Steiner Verlag, Wiesbaden.
- Bourdelle, Y., Delporte, H., Virmont, J., 1971. Le gisement magdalénien et la vénus d'Enval, commune de Vic-le-Comte (Puy-de-Dôme). *L'Anthropologie* 75, 119-128.

- Bourdier, C., Chehmana, L., Malgarini, R., Połtowicz-Bobak, M. (Eds.), 2017a. *L'essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris.
- Bourdier, C., Bosselin, B., Gaussein, P., Paillet, P., Pinçon, G., 2017b. Regards croisés sur la représentation animalière des faciès du Magdalénien à pointes de Lussac-Angles et à navettes: choix thématiques et formels. In: Bourdier, C., Chehmana, L., Malgarini, R., Połtowicz-Bobak, M. (Eds.), *L'essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris, pp. 103-118.
- Bourrillon, R., Fritz, C., Sauvet, G., 2012. La thématique féminine au cours du Paléolithique supérieur européen: permanences et variations formelles. *Bulletin de la Société préhistorique française* 109, 85-103.
- Brauer, A., 1994. *Weichselzeitliche Seesedimente des Holzmaars – Warvenchronologie des Hochglazials und Nachweis von Klimaschwankungen*. Dokumenta naturae 85, München.
- Brunnacker, K., Koči, A., Leroi-Gourhan, A., Puissegur, J.J., 1978. Stratigraphie im Bereich der Gönnersdorfer Siedlung. In: Brunnacker, K. (Ed.), *Geowissenschaftliche Untersuchungen in Gönnersdorf*. Der Magdalénien-Fundplatz Gönnersdorf 4. Franz Steiner Verlag, Wiesbaden, pp. 35-64.
- Bullinger, J., 2006. Le jais. In: Bullinger, J., Leesch, D., Plumettaz, N. (Eds.), *Le site magdalénien de Monruz, 1. Premiers éléments pour l'analyse d'un habitat de plain air*. Archéologique neuchâteloise 33. Service et musée cantonal d'archéologie de Neuchâtel, Hauterive, pp. 158-164.
- Bullinger, J., Leesch, D., Plumettaz, N. (Eds.) 2006, *Le site magdalénien de Monruz, 1. Premiers éléments pour l'analyse d'un habitat de plain air*. Archéologique neuchâteloise 33. Service et musée cantonal d'archéologie de Neuchâtel, Hauterive.
- Burke, A., Kageyama, M., Latombe, G., Fasel, M., Vrac, M., Ramstein, G., James, P.M.A., 2017. Risky business: The impact of climate and climate variability on human population dynamics in Western Europe during the Last Glacial Maximum. *Quaternary Science Reviews* 164, 217-229.
- Buschkämper, T., 1993. *Die Befunde im Südwestteil der Gönnersdorfer Grabungsfläche*. Unpublished M.A.-thesis. University of Cologne, Köln.
- Capitan, L., Breuil, H., Peyrony, D., 1924. *Les Combarelles aux Eyzies (Dordogne)*. Masson, Paris.
- Chovkoplass, I.G., 1965. *Mezinskaja stojanka*. Isdatelstvo "Naukova Dumka", Kiev. (in Russian).
- Cluzel, J.-P., Cleyet-Merle, J.-J. (Eds.), 2011. *Mille et une femmes de la fin des temps glaciaires*. Grand Palais, Paris.
- Cohen, C., 2003. *La femme des origines. Images de la femme dans la préhistoire occidentale*. Herscher, Paris.
- Conkey, M.W., Beltrán, A., Clark, G.A., González Echegaray, J., Guenther, M.G., Hahn, J., Hayden, B., Paddayya, K., Straus, L.G., Valoch, K., 1980. The Identification of Prehistoric Hunter-Gatherer Aggregation Sites: The Case of Altamira [and Comments and Reply]. *Current Anthropology* 21, 609-630.
- Corchón Rodríguez, M.S., 1990. Iconografía de las representaciones antropomorfas paleolíticas a propósito de la "Venus" magdaleniense de Las Caldas (Asturias). *Zephyrus* 43, 17-37.
- Corchón Rodríguez, M.S., 1995. Reflexiones acerca de la cronología del Magdaleniense Cantábrico. Las dataciones 14C de la cueva de Las Caldas (Asturias. España). *Zephyrus* XLVIII, 3-19.
- Corchón Rodríguez, M.S., 2017. El yacimiento de Las Caldas en el contexto del Valle de Nalón (17,000-11,500 BP). In: Corchón Rodríguez, M.S. (Ed.), *La cueva de Las Caldas (Priorio, Oviedo). Ocupaciones magdalenienses en el Valle del Nalón*. Ediciones Universidad Salamanca, Salamanca, pp. 21-34.
- Corchón Rodríguez, M.S., Ortega Martínez, P., 2017. Las industrias líticas óseas (17,000-14,500 BP). Tipología, tecnología y materias primas. In: Corchón Rodríguez, M.S. (Ed.), *La cueva de Las Caldas (Priorio, Oviedo). Ocupaciones magdalenienses en el Valle del Nalón*. Ediciones Universidad Salamanca, Salamanca, pp. 247-255.
- Corchón Rodríguez, M.S., Rivero Vilá, O., 2017. Catálogo de Arte Mueble. In: Corchón Rodríguez, M.S. (Ed.), *La cueva de Las Caldas (Priorio, Oviedo). Ocupaciones magdalenienses en el Valle del Nalón*. Ediciones Universidad Salamanca, Salamanca, pp. 577-820.
- Costamagno, S., 2000. Stratégies d'approvisionnement et traitement des carcasses au Magdalénien: l'exemple de Moulin-Neuf (Gironde). *Paléo* 12, 77-95.
- de Bayle de Hermens, R., 1972. Le Magdalénien final de la Grotte du Rond du Barry, commune de Polignac (Haute-Loire). *Congrès Préhistorique de France (Auvergne) 1969, CR XIX^e session*, Paris, pp. 37-57.
- Debout, G., Olive, M., Bignon, O., Bodu, P., Chehmana, L., Valentin, B., 2012. The Magdalenian in the Paris Basin: new results. *Quaternary International* 272-273, 176-190.
- Dee, M.W., Brock, F., Harris, S.A., Bronk Ramsey, C., Shortland, A.J., Higham, T.F.G., Rowland, J.M., 2010. Investigating the likelihood of a reservoir offset in the radiocarbon record for ancient Egypt. *Journal of Archaeological Science* 37, 687-693.
- Delluc, B., Delluc, G., 1981. La grotte ornée de Commarque à Sireuil (Dordogne). *Gallia Préhistoire* 24, 2-97.
- Delluc, B., Delluc, G., 1982. Les trois figures humaines de la grotte de Saint-Cirq (Dordogne). *Ars Praehistorica* 1, 147-150.
- Delluc, B., Delluc, G., 1987. Quelques gravures paléolithique de la Petite Beune (Grottes de Sous-Grand-Lac, de Vielmouly II et du Charretou). In: *Actes du XXXIX^e congrès d'études régionales de Sarlat 1986*. Bulletin de la Société historique et archéologique du Périgord, supplément CXIV, Perigeux, pp. 163-184.
- Delluc, B., Delluc, G., 1991. Les représentations humains préhistoriques du Haut Périgord: Villars, le Fourneau de Diable et Roche-reuil. *Bulletin de la Société historique et archéologique du Périgord* 118, 9-27.
- Delluc, B., Delluc, G., 1995. Les figures féminines schématiques du Périgord. *L'Anthropologie* 99, 236-257.
- Delluc, B., Delluc, G., Carcauzon, C., Galinat, B., Rossy Delluc, S., 1994. La grotte ornée de Fronsac (Vieux-Mareuil, Dordogne). Inventaire des oeuvres. In: *La vie préhistorique*. Société Préhistorique française, Dijon, pp. 416-421.
- Delpech, F., 1998. Note sur la faune magdalénienne de l'Abri Durif à Enval (Vic-le-Comte, Puy de Dôme). *Paléo* 10, 303-309.

- Delporte, H., 1979. *L'image de la femme dans l'art préhistorique*. Picard, Paris.
- Delporte, H., 1993a. *L'image de la femme dans l'art préhistorique*. Picard, Paris.
- Delporte, H., 1993b. Gravettian Female Figurines: A Regional Survey. In: Knecht, H., Pike-Tay, A., White, R. (Eds.), *Before Lascaux. The Complex Record of the Early Upper Palaeolithic*. CRC Press, Boca Raton, pp. 243-257.
- de Saint-Mathurin, S., Garrod, D., 1949. Les fragments de bas-reliefs découverts dans le gisement magdalénien ancien d'Angles-sur-l'Anglin (Vienne). *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*, 93, 138-142.
- Drucker, D.G., Madelaine, S., Morala, A., 2011. Les derniers rennes de Dordogne. Nouvelles données chronologiques et environnementales par l'étude isotopique du collagène (^{13}C , ^{14}C et ^{15}N). *Paléo* 22, 85-100.
- Ducasse, S., 2012. What is left of the Badegoulian "interlude"? New data on cultural evolution in southern France between 23,500 and 20,500 cal. BP. *Quaternary International* 272-273, 150-165.
- Ducasse, S., Chauvière, F.-X., Pétilion, J.-M., 2021. Breaking bad? Discarding the solutrean norms: Chronology, evolution and geographical extent of the badegoulian phenomenon in Western Europe. *Quaternary International* 581-582, 61-83 (in press).
- Ducasse, S., Langlais, M., 2007. Entre Badegoulien et Magdalénien, nos cœurs balancent... Approche critique des industries lithiques du Sud de la France et du Nord-Est espagnol entre 19000 et 16500 BP. *Bulletin de la Société préhistorique française* 104, 771-785.
- Duhard, J.-P., 1993. *Réalisme de l'image féminine paléolithique*. CNRS, Paris.
- Duhard, J.-P., 1996. *Réalisme de l'image masculine paléolithique*. Jérôme Million, Grenoble.
- Eickhoff, S., 1989. Zur Analyse der latenten Strukturen und der Siedlungsdynamik der Konzentration II von Gönnersdorf. *Jahrbuch des Römisch-Germanischen Zentralmuseums* 36, 117-158.
- Eickhoff, S., 1990. A spatial analysis of refitted flint artefacts from the Magdalenian site of Gönnersdorf, Western Germany. In: Cziesla, E., Eickhoff, S., Arts, N., Winter, D. (Eds.), *The Big Puzzle*. International symposium on refitting stone artefacts, Monrepos 1987. Studies in Modern Archaeology 1. Holos, Bonn, pp. 307-330.
- Eickhoff, S., Lindenbeck, J., 1989. Cluster und Räume. Über das räumliche Clustern von Zusammenfassungslinien am Beispiel der Fundplätze Gönnersdorf und Andernach. *Bulletin de la Société Préhistorique Luxembourgeoise* 11, 19-50.
- Fiedorczuk, J., Bratlund, B., Kolstrup, E., Schild, R., 2007. Late Magdalenian feminine flint plaquettes from Poland. *Antiquity* 81, 97-105.
- Floss, H., 1994. *Rohmaterialversorgung im Paläolithikum des Mittelrheingebietes*. Monographien des Römisch-Germanischen Zentralmuseums 21. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Floss, H., Hoyer, C.T., Huber, N., 2015. In alten Sammlungen neu entdeckt: Bemalte und gravierte Steine aus den Klausenhöhlen bei Essing im Altmühltal (Bayern). *Anthropologie* 53, 257-277.
- Floss, H., Fröhle, S., Hahn, M., Wettengl, S., 2021 (this volume). A figurine of the Gönnersdorf type from the Magdalenian open-air site Waldstetten-Schlatt and bi-gendered representations in Palaeolithic art. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *The Beef behind all possible Past! The Tandem Festschrift in Honor of Elaine Turner and Martin Street*. Monographien des Römisch-Germanischen Zentralmuseums 157. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Fortea, J., Corchon, M.-S., Gonzales Morales, M., Rodriguez Asensio, A., Hoyos, M., Laville, H., Dupré, M., Fernandez Tresguerres, J., 1990. Travaux récents dans les vallées du Nalón et du Sella (Asturies). In: Clottes, J. (Ed.), *L'art des objets au Paléolithique. Tome 1: L'art mobilier et son contexte*. Colloque internationale Foix, Le Mas-d'Azil 16-21 novembre 1987. Ministère de la culture, de la communication, des grands travaux et du bicentenaire, Paris, pp. 219-244.
- Franken, E., Veil, S. (Eds.), 1983. *Die Steinartefakte von Gönnersdorf*. Der Magdalénien-Fundplatz Gönnersdorf 7. Franz Steiner Verlag, Wiesbaden.
- Fritz, C., Tosello, G., Pinçon, G., 1996. Les gravures pariétales de la Grotte de Gourdan (Gourdan-Poligny, Haute Garonne). In: *Actes du 118^e Congrès national des sociétés savantes, Pau, 1993*. Pyrénées Préhistoriques, arts et sociétés, CTHS, Paris, pp. 381-402.
- Fuentes, O., 2013. The depiction of the individual in prehistory: human representations in Magdalenian societies. *Antiquity* 87, 985-1000.
- Fuentes, O., Lenoir, M., Martinez, M., Welté, A.-C., 2017. Les représentations humaines et leurs enjeux. Regards croisés entre le Roc-aux-Sorciers (Angles-sur-l'Anglin, Vienne) et le Roc-de-Marcamps (Prignac-de-Marcamps, Gironde). In: Bourdier, C., Chehmana, L., Malgarini, R., Połtowicz-Bobak, M. (Eds.), *L'essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris, pp. 119-138.
- Fuentes, O., Lucas, C., Robert, E., 2019. An approach to Palaeolithic networks: The question of symbolic territories and their interpretation through Magdalenian art. *Quaternary International* 503(B), 233-247.
- Galanidou, N., 1997. 'Home is where the hearth is'. *The spatial organisation of the Upper Palaeolithic rockshelter occupations at Klithi and Kastritsa in Northwest Greece*. British Archaeological Reports, International Series 687. Archaeopress, Oxford.
- Gamble, C., 1982. Interaction and Alliance in Palaeolithic Society. *MAN (New Series)* 17, 92-107.
- Garate, D., 2004. Nuevas investigaciones sobre el arte paleolítico de la cueva de Arenaza (Galdamez, Bizkaia). *MUNIBE (Antropología-Arkeologia)* 56, 3-11.
- Gaudzinski-Windheuser, S., 2013. *Raumnutzungsmuster des späten Jungpaläolithikums in Oelknitz (Thüringen)*. Monographien des Römisch-Germanischen Zentralmuseums 105. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Gaudzinski-Windheuser, S., 2015. The public and private use of space in Magdalenian societies: Evidence from Oelknitz 3, LOP (Thuringia, Germany). *Journal of Anthropological Archaeology* 40, 361-375.
- Gaudzinski-Windheuser, S., 2021 (in prep.). Leben im Regelwerk: Oelknitz / Rules and regulations at Oelknitz. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Monrepos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.

- Gaudzinski-Windheuser, S., Jöris, O., 2015. Contextualising the Female Image – Symbols for Common Ideas and Communal Identity in Upper Palaeolithic Societies. In: Coward, F., Hosfield, R., Pope, M., Wenban-Smith, F. (Eds.), *Settlement, Society and Cognition in Human Evolution. Landscapes in Mind*. Cambridge University Press, Cambridge, pp. 288-314.
- Gaudzinski-Windheuser, S., Holst, D., Jöris, O., Kindler, L., 2015. *Menschliches VERSTEHEN. Eine Einführung in die Archäologie der Menschwerdung*. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Gavrilov, K.N., 2021 (in press). The Epigravettian of Central Russian Plain. *Quaternary International* 587-588, 326-343.
- Gelhausen, F., 2011. *Siedlungsmuster der allerødzeitlichen Federmesser-Gruppen in Niederbieber, Stadt Neuwied*. Monographien des Römisch-Germanischen Zentralmuseums 90. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Gély, B., Porte, J.-L., 1996. Les gravures paléolithiques de la grotte des Deux-Ouvertures à Saint-Martin-d'Ardèche. *Bulletin de la Société préhistorique Ariège-Pyrénées* 51, 81-98.
- Gladkih, M.I., Kornietz, N.L., Soffer, O., 1984. Mammoth-Bone Dwellings on the Russian Plain. *Scientific American* 251, 164-175.
- Grimm, S., 2019. *Resilience and Reorganisation of Social Systems during the Weichselian Lateglacial in North-west Europe. An Evaluation of the Archaeological, Climatic, and Environmental Record*. Monographien des Römisch-Germanischen Zentralmuseums 128. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Guthrie, R.D., 2005. *The Nature of Paleolithic Art*. University of Chicago Press, Chicago–London.
- Haesaerts, P., Péan, S., Valladas, H., Damblon, F., Nuzhnyi, D., 2015. Contribution à la stratigraphie du site paléolithique de Mezhyrich (Ukraine). *L'Anthropologie* 119, 364-393.
- Henry, D.O., 1976. Rosh Zin: a Natufian settlement near Ein Ardat. In: Marks, A.E. (Ed.), *Prehistory and Paleoenvironments in the Central Negev, Israel. Volume I: The Avdat/Aqev Area, Part 1*. SMU Press, Dallas, pp. 317-347.
- Heuschen, W., 1997. *Die Artefakte aus paläozoischem Quarzit von Gönnersdorf und Andernach*. Unpublished M.A. Thesis, University of Cologne, Köln.
- Höck, C., 1995. Die Frauenstatuetten des Magdalénien von Gönnersdorf und Andernach. *Jahrbuch des Römisch-Germanischen Zentralmuseums* 40, 253-316.
- Housley, R.A., Gamble, C.S., Street, M., Pettitt, P., 1997. Radiocarbon evidence for the Lateglacial Human Recolonisation of Northern Europe. *Proceedings of the Prehistoric Society* 63, 25-54.
- Hughes, A.L.C., Gyllencreutz, R., Lohne, Ø.S., Mangerud, J., Svendsen, J.I., 2016. The last Eurasian ice sheets – a chronological database and time-slice reconstruction, DATED-1. *Boreas* 45, 1-45.
- Huyge, D., 2009. Late Palaeolithic and Epipalaeolithic rock art in Egypt: Qurta and el-Hosh. *Archéo-Nil* 19, 108-120.
- Huyge, D., 2015. The 'Headless Women' of Qurta (Upper Egypt): The Earliest Anthropomorphic Images in Northern-African Rock Art. In: *What Ever Happened to the People? Humans and Anthropomorphs in the Rock Art of Northern Africa*. International Conference. 17-19 September, 2015. Royal Academy for Overseas Sciences, Brussels, pp. 419-430.
- Huyge, D., Vandenberghe, D.A.G., De Dapper, M., Mees, F., Claes, W., Darnell, J.C., 2011. First evidence of Pleistocene rock art in North Africa: Securing the age of the Qurta petroglyphs (Egypt) through OSL dating. *Antiquity* 85, 1184-1193.
- Huyge, D., Vandenberghe, D.A.G., De Dapper, M., Mees, F., Claes, W., Darnell, J.C., 2012. Premiers témoignages d'un art rupestre pléistocène en Afrique du Nord: confirmation de l'âge des pétroglyphes de Qurta (Egypte) par datation OSL de leur couverture sédimentaire. In: Huyge, D., Van Noten, F., Swinne, D. (Eds.), *The signs of which times? Chronological and palaeoenvironmental issues in the rock art of northern Africa*. Royal Academy for Overseas Sciences, Brussels, pp. 257-268.
- lakovleva, L., 2005. Les parures en coquillages au Paléolithique supérieur récent dans les territoires de peuplement du bassin du Dniepr. *Archeometriai Műhely* 2005, 26-37.
- lakovleva, L., 2009. L'art mézinien en Europe orientale dans son contexte chronologique, culturel et spirituel. *L'Anthropologie* 13, 691-752.
- lakovleva, L., 2015. The architecture of mammoth bone circular dwellings of the Upper Palaeolithic settlements in Central and Eastern Europe and their sociosymbolic meanings. *Quaternary International* 359-360, 324-334.
- lakovleva, L., 2016. Mezinian landscape system (Late Upper Palaeolithic of Eastern Europe). *Quaternary International* 412, 4-15.
- lakovleva, L., Djindjian, F., 2005. New data on Mammoth bone settlements of Eastern Europe in the light of the new excavations of the Gontsy site (Ukraine). *Quaternary International* 126-128, 195-207.
- lakovleva, L., Pinçon, G., 1996. Une composition de deux bisons sculptés de la frise de l'abri Bourdois à Angles-sur-l'Anglin (Vienne). *Bulletin de la Société préhistorique française* 93, 195-200.
- lakovleva, L., Pinçon, G., 1997. *La Frise sculptée du Roc-aux-Sorciers à Angles-sur-l'Anglin (Vienne)*. Éd. R.M.N. et C.T.H.S., Paris.
- lakovleva, L., Pinçon, G., 1999. Un habitat orné en abri sous-roche au Magdalénien Moyen, Angles-sur-l'Anglin (Vienne, France). *Trabjos de Prehistoria* 56, 41-52.
- Ipiens, A., Luraine, M., Salgues, T., 2000. L'abri de Lagrave à Faycelles (Lot). Une nouvelle cavité ornée paléolithique en Quercy: Prise de date. *Préhistoire du Sud-Ouest* 7, 59-64.
- Irish, J.D., Bratlund, B., Schild, R., Kolstrup, E., Królik, H., Mañka, D., Boroń, T., 2008. A late Magdalenian perinatal human skeleton from Wilczyce, Poland. *Journal of Human Evolution* 55, 736-740.
- Jöris, O., 2018. Der Mensch und das Verhalten. In: Fink, S., Rollinger, R., (Eds.), *Oswald Spenglers Kulturmorphologie. Eine multiperspektivische Annäherung*. Universal- und kulturhistorische Studien. Studies in Universal and Cultural History. Springer VS, Wiesbaden, 1151.
- Jöris, O., Álvarez Fernández, E., 2003. Algunas precisiones sobre la terminología empleada en la segunda parte del Tardiglacial en Europa Central y el problema de su aplicación en el SW de Europa. Some Comments on the Terminology of the Late Glacial in Central Europe and the Problem of its Application to SW Europe. *Zephyrus LV(2002)*, 313-322.
- Jöris, O., Moseler, F., 2021a (in press). Zeltarchitektur vor 15.800 Jahren in Gönnersdorf/Gönnersdorf tent architecture, 15,800 years ago. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Mon-*

- repos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Jöris, O., Moseler, F., 2021b (in press). Das Schwitz- und Räucherzelt von Gönnersdorf/Gönnersdorf: a special tent for smoke and sweat. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Monrepos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Jöris, O., Street, M., 2021 (in press). Die Späteiszeitliche Expansion. Die Wiederbesiedlung Mittel- und Nordeuropas nach dem Kältemaximum der letzten Kaltzeit/Late Glacial Expansion. The Resettlement of Central and Northern Europe after the Last Glacial Maximum. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Monrepos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Jöris, O., Street, M., Turner, E., 2011. Spatial Analysis at the Magdalenian Site of Gönnersdorf (Central Rhineland, Germany) – an Introduction. In: Gaudzinski-Windheuser, S., Jöris, O., Sensburg, M., Street, M., Turner, E. (Eds.), *Site-internal spatial organization of hunter-gatherer societies: Case studies from the European Palaeolithic and Mesolithic*. RGZM – Tagungen 12. Verlag des Römisch-Germanischen Zentralmuseums, Mainz, pp. 53-80.
- Jöris, O., Street, M., Turner, E., 2021 (in press). In der eiszeitlichen Lößsteppe schien immer die Sonne – Vom Alltag in der Wohnküche: Gönnersdorf vor 15.800 Jahren/Sunshine as usual over the Ice Age loess steppe – Everyday Life in a Gönnersdorf outdoor kitchen 15,800 years ago. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Monrepos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Jöris, O., Terberger, O., 2001. Zur Rekonstruktion eines Zeltes mit trapezförmigem Grundriß am MagdalénienFundplatz Gönnersdorf/Mittelrhein – eine „Quadratur des Kreises“? *Archäologisches Korrespondenzblatt* 31, 163-172.
- Julien, M., Karlin, C. (Eds.), 2014. *Un automne à Pincevent – Le campement magdalénien du niveau IV20*. Société préhistorique française, Mémoires 57, Paris.
- Kegler, J., 2021 (this volume). Raw Material and Habitat – The Formation of Regional Habitats during the Late Glacial. Two case studies: the Neuwied Basin (Rheinland-Pfalz, Germany) and Le Mas d’Azil (Ariège, France). In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *The Beef behind all possible Pasts! The Tandem Festschrift in Honor of Elaine Tuner and Martin Street*. Monographien des Römisch-Germanischen Zentralmuseums 157. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Khlopachev, G., Gavrillov, K., 2019. Paleolithic dwellings of Anosovka-Mezin type: construction features and the issue of interpretation. *Rossiiskaia arkheologija* 4, 27-42.
- Kind, C.-J., 1987. *Das Felsställe. Eine jungpaläolithisch-frühmesolithische Abri-Station bei Ehingen-Mühlen, Alb-Donau-Kreis. Die Grabungen 1975-1980*. Forschungen und Berichte zur Vor- und Frühgeschichte Baden-Württembergs 23. Landesamt für Vor- und Frühgeschichte Baden-Württemberg, Stuttgart.
- Kozłowski, S.K., Połtowicz-Bobak, M., Bobak, D., Terberger, T., 2012. New information from Maszycka Cave and the Late Glacial recolonization of Central Europe. *Quaternary International* 272-273, 288-296.
- Kozłowski, S.K., Terberger, T., Bobak, D., Orschiedt, J., Połtowicz-Bobak, M., 2017. Eastern borders of the Magdalenian ‘à navettes’ Maszycka cave in Lesser Poland (Southern Poland). In: Bourdier, C., Chehmana, L., Malgarini, R., Połtowicz-Bobak, M. (Eds.), *L’essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris, pp. 187-205.
- Kretschmer, I., 2015. *Demographische Untersuchungen zu Bevölkerungsdichten, Mobilität und Landnutzungsmustern im späten Jungpaläolithikum*. Verlag Marie Leidorf, Rahden/Westf.
- Ladier, E., 1987. La Vénus de Courbet, *Bulletin de la Société préhistorique française* 84, 3-4.
- Ladier, E., 2001. Nouvelles figures féminines schématiques de type Lalinde-Gönnersdorf dans la vallée de l’Aveyron, *PALEO* 13, 1-16.
- Ladier, E., Welté, A.-C., 1999. Deux plaquettes gravées inédites de la grotte du Courbet au Musée d’Albi (Tarn). *PALEO* 11, 187-197.
- Ladier, E., Lenoir, M., Welté, A.-C., 2005. Relations ou convergences entre Périgord et Quercy: le cas des figures féminines schématiques de type Lalinde-Gönnersdorf dans l’art mobilier. In: Jaubert, J., Barbaza, M., (Eds.), *Territoires, déplacements, mobilité, échanges durant la Préhistoire*. Actes du 126^e Congrès National des Sociétés historiques et scientifiques, Toulouse. CTHS, Paris, pp. 397-410.
- Langlais, M., Costamagno, S., Laroulandie, V., Pétilion, J.-M., Discamps, E., Mallye, J.-B., Cochard, D., Kuntz, D., 2012. The evolution of Magdalenian societies in South-West France between 18,000 and 14,000 calBP: Changing environments, changing tool kits. *Quaternary International* 272-273, 138-149.
- Langlais, M., Laroulandie, V., Costamagno, S., Pétilion, J.-M., Mallye, J.-B., Lacrampe-Cuyaubère, F., Boudadi-Maligne, M., Barshay-Szmidt, C., Masset, C., Pubert, É., Rendu, W., Lenoir, M., 2015a. Premiers temps du Magdalénien en Gironde. Réévaluation des fouilles Trécolle à Saint-Germain-la-Rivière (France). *Bulletin de la Société préhistorique française* 112, 5-58.
- Langlais, M., Sécher, A., Caux, S., Delvigne, V., Gourc, L., Normand, C., Sánchez de la Torre, M., 2015b. Lithic tool kits: A Metronome of the evolution of the Magdalenian in southwest France (19,000-14,000 cal BP). *Quaternary International* 414, 92-107.
- Langlais, M., Pétilion, J.-M., Sécher, A., 2017. Les débuts du Magdalénien moyen dans le Sud-Ouest français. In: Bourdier, C., Chehmana, L., Malgarini, R., Połtowicz-Bobak, M. (Eds.), *L’essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris, pp. 209-234.
- Langley, M., Street, M., 2013. Long range inland-coastal networks during the Late Magdalenian: Evidence for individual acquisition of marine resources at Andernach-Martinsberg, German Central Rhineland. *Journal of Human Evolution* 64, 457-465.
- Larue, M., Combier, J., Roche, J., 1955. Les gisements périgordien et magdalénien du Saut-du-Perron (Loire). *L’Anthropologie* 59, 401-428.
- Larue, M., Combier, J., Roche, J., 1956. Les gisements périgordien et magdalénien du Saut-du-Perron (suite). *L’Anthropologie* 60, 1-21.
- Leesch, D., Bullinger, J., 2012. Identifying dwellings in Upper Palaeolithic open-air sites – The Magdalenian site at Monruz and

- its contribution to analysing palimpsests. In: Niekus, M.J.L.T., Barton, R.N.E., Street, M., Terberger, T. (Eds.), *A mind set on flint – Studies in honour of Dick Stapert*. Groningen Archaeological Studies 16. Barkhuis, Groningen, pp. 166-181.
- Leesch, D., Cattin, M.-I., Müller, W. (Eds.), 2004. *Hauterive-Champréveyres et Neuchâtel-Monruz. Témoins d'implantations magdaléniennes et aziliennes sur la rive nord du lac de Neuchâtel*. Service et musée cantonal d'archéologie de Neuchâtel, Haute-rive.
- Lenoir, M., 1995. Les figurations féminines de l'Abri Faustin (Cessac, Gironde). In: *La Dame de Brassempouy. Actes du Colloque de Brassempouy 1994*. Études et Recherches Archéologique Université Liège 74, Liège, pp. 133-137.
- Leroi-Gourhan, A., 1936. *La Civilisation du renne*. Gallimard (coll. Géographie humaine), Paris.
- Leroi-Gourhan, A., 1971. *Préhistoire de l'art occidental*. Éditions d'Art Lucien Mazenod, Paris.
- Leroi-Gourhan, A., 1981. Les signes périéaux comme 'marqueurs' ethniques. In: *Symposium Internacional Sobre Arte Prehistórico, Altamira, 1979*. Ministerio de Cultura, Dirección General de Bellas Artes, Archivos y Bibliotecas, Madrid, pp. 289-294.
- Leroi-Gourhan, A., Brézillon, M., 1966. L'habitation Magdalénienne n° 1 de Pincevent près Montereau (Seine-et-Marne). *Gallia Préhistoire* 9, 263-385.
- Leroi-Gourhan, A., Brézillon, M., 1972. *Fouilles de Pincevent, Essai d'Analyse Ethnographique d'un Habitat Magdalénien*. VII^e supplément à Gallia Préhistoire. C.N.R.S., Paris.
- Loftus, J., 1982. Ein verzierter Pfeilschaftglätter von Fläche 64/74-73/78 des späteisenzeitlichen Fundplatzes Niederbieber/Neuwieder Becken. *Archäologisches Korrespondenzblatt* 12, 313-316.
- Lorblanchet, M., 1989. From man to animal to sign in Palaeolithic art. In: Morphy, H. (Ed.), *Animals into Art*. Unwin Hyman Ltd, London–Winchester, pp. 109-143.
- Lorblanchet, M., Bahn, P.G. (Eds.) 1993. *Rock Art Studies: The post Stylistic Era or Where do we go from here?* (2nd AURA Congress). Oxbow Books, Oxford.
- Lorblanchet, M., Welté, A.-C., 1987. Les figurations féminines stylisées du Magdalénien supérieur en Quercy. *Bulletin de la Société des Études du Lot* 3, 3-57.
- Lorblanchet, M., Welté, A.-C., 1990. L'art mobilier Paléolithique du Quercy: chronologie et thèmes. In: Clottes, J. (Ed.), *L'art des objets au Paléolithique. Tome 1: L'art mobilier et son contexte*. Colloque internationale Foix, Le Mas-d'Azil 16-21 novembre 1987. Ministère de la culture, de la communication, des grands travaux et du bicentenaire, Paris, pp. 31-64.
- Maier, A., 2015. *The Central European Magdalenian. Regional Diversity and Internal Variability*. Vertebrate Paleobiology and Paleoanthropology. Springer, Dordrecht.
- Maier, A., 2017. Expansion or communication? The phenomenon of the Magdalenian à navettes from a Central European point of view. In: Bourdier, C., Chehmana, L., Malgarini, R., Połtowicz-Bobak, M. (Eds.), *L'essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris, pp. 175-186.
- Maier, A., Liebermann, C., Pfeifer, S.J., 2020. Beyond the Alps and Tatra Mountains – the 20-14ka Repopulation of the Northern Mid-latitudes as Inferred from Palimpsests Deciphered with Keys from Western and Central Europe. *Journal of Paleolithic Archaeology* 3, 398-452.
- Mania, D., 1999. *Nebra – eine jungpaläolithische Freilandstation im Saale-Unstrut-Gebiet*. Veröffentlichungen des Landesamtes für Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte 54, Landesamt für Archäologie, Halle (Saale).
- Märgärit, M., 2010. L'art mobilier paléolithique et mésolithique de Roumanie et de la République Moldova – connexions culturelles avec l'Europe Centrale et Orientale. *Annales d'Université "Valahia" Târgoviște, Section d'Archéologie et d'Histoire* XII, 117-137.
- Marquer, L., Lebreton, V., Otto, T., Valladas, H., Haesaerts, P., Messager, E., Nuzhnyi, D., Péan, S., 2012. Charcoal scarcity in Epigravettian settlements with mammoth bone dwellings: the taphonomic evidence from Mezhyrich (Ukraine). *Journal of Archaeological Science* 39, 109-120.
- Martin, Y., 2007. The Engravings of Gouy: France's Northernmost Decorated Cave. In: Pettitt, P., Bahn, P., Munoz, F.J., Ripoll, S. (Eds.), *Palaeolithic Cave Art at Creswell Crags in European Context*. Oxford University Press, Oxford, pp. 140-193.
- Mazière, G., Buret, C., 2010. Les incisives de cheval gravées de La Marche (Lussac-les-Châteaux, Vienne), Collections Péricard, Musée Sainte-Croix, Poitiers. In: Buisson-Caal, J., Primault, J. (Eds.), *Préhistoire entre Vienne et Charente: homme et sociétés du Paléolithique*. Ministère de la Culture et de la Communication, Mémoire XXXVIII, Poitiers, pp. 397-406.
- Meier-Arendt, W., 1975. *Die Hinkelstein-Gruppe. Der Übergang vom Früh- zum Mittelneolithikum in Südwestdeutschland*. Römisch-Germanische Forschungen 25. De Gruyter & Co., Berlin.
- Mélar, N., 2008. Pierres gravées de la Marche à Lussac-les-Châteaux (Vienne). Techniques, technologie et interprétations. *Gallia préhistoire* 50, 143-268.
- Miller, R., 2012. Mapping the expansion of the Northwest Magdalenian. *Quaternary International* 272-273, 209-230.
- Minc, L.D., Smith, K.P., 1989. The Spirit of Survival: Cultural Response to Resource Variability in North Alaska. In: Halstead, P., O'Shea, J. (Eds.), *Bad Year Economics*. New Directions in Archaeology. Cambridge University Press, New York, pp. 8-30.
- Mix, A.C., Bard, E., Schneider, R., 2001. Environmental processes of the ice age: land, oceans, glaciers (EPILOG). *Quaternary Science Reviews* 20, 627-657.
- Moseler, F., 2008. Die Konzentration IV von Gönnersdorf. Eine räumliche Analyse der Steinartefakte. In: Sensburg, M., Moseler, F. (Eds.), *Die Konzentrationen IIIb und IV des Magdalénien-Fundplatzes Gönnersdorf (Mittelrhein)*, Monographien des Römisch-Germanischen Zentralmuseums 73. Verlag des Römisch-Germanischen Zentralmuseums, Mainz, pp. 55-168.
- Moseler, F., 2011. Spatial analysis of concentration K-IV of the Magdalenian site of Gönnersdorf. In: Gaudzinski-Windheuser, S., Jöris, O., Sensburg, M., Street, M., Turner, E. (Eds.), *Site-internal spatial organization of hunter-gatherer societies: Case studies from the European Palaeolithic and Mesolithic*. RGZM – Tagungen 12. Verlag des Römisch-Germanischen Zentralmuseums, Mainz, pp. 103-125.
- Moseler, F., 2020. *Brandstrukturen im späten Magdalénien. Betrieb, Nutzung und Funktion*. Monographien des Römisch-Germanischen Zentralmuseums 151. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.

- Muñoz Fernandez, E., San Miquel Llamosas, C., 1991. El yacimiento en la galería de los Grabados de Cueva El Linar y su posible relación con las Manifestaciones Stísticas. Arquentas. *Arte Rupestre y Mobilar* 1, 79-88.
- Mussi, M., De Marco, A., 2008. A Gönnersdorf-style engraving in the parietal art of Grotta Romanelli (Apulia, southern Italy). *Mitteilungen der Gesellschaft für Urgeschichte* 17, 97-104.
- Nadachowski, A., Lipecki, G., Ratajczak, U., Stefaniak, K., Wojtal, P., 2016. Dispersal events of the saiga antelope (*Saiga tatarica*) in Central Europe in response to the climatic fluctuations in MIS 2 and the early part of MIS 1. *Quaternary International* 420, 357-362.
- Nerudová, Z., Hromadová, B., Neruda, P., Zelenka, F., 2019. One ring to interpret. Bone ring-type adornment from the Epigravettian site Bratčice (Moravia, Czech Republic). *Quartär* 66, 187-200.
- Nishiaki, Y., Jöris, O., 2019. Learning Behaviors Among Neanderthals and Palaeolithic Modern Humans: An Introduction. In: Nishiaki, Y., Jöris, O., (Eds.), *Learning Among Neanderthals and Palaeolithic Modern Humans. Archaeological Evidence*. Replacement of Neanderthals by Modern Humans Series. Springer Nature, Singapore. pp. 1-6.
- Pales, L., Tassin de Saint Péreuse, M., 1976. *Les gravures de La Marche. II: Les Humains*. Éd. Ophrys, Paris.
- Pasda, C., 2012. Kulturentwicklung oder kulturspezifische Lebensweise? Ein Beitrag zur Ethnographie des Paläolithikums. *Archäologisches Korrespondenzblatt* 42, 1-14.
- Pasda, C., 2017. Munzingen: a Magdalenian site in the Southern Upper Rhine plain (Germany). In: Bourdier, C., Chehmana, L., Malgarini, R., Poltowicz-Bobak, M. (Eds.), *L'essor du Magdalénien. Aspects culturels, symboliques et techniques des faciès à Navettes et à Lussac-Angles*. Actes de la séance de la Société préhistorique française de Besançon, 17-19 octobre 2013. Société préhistorique française, Paris, pp. 157-174.
- Pétillon, J.-M., 2016. Technological evolution of hunting implements among Pleistocene hunter-gatherers: Osseous projectile points in the middle and upper Magdalenian (19-14 ka cal BP). *Quaternary International* 414, 108-134.
- Pettitt, P.B., 2007. Cultural Context and Form of Some of the Creswell Images: An Interpretative Model. In: Pettitt, P., Bahn, P., Munoz, F.J., Ripoll, S. (Eds.), *Palaeolithic Cave Art at Creswell Crags in European Context*. Oxford University Press, Oxford, pp. 112-139.
- Pettitt, P.B., 2010. *The Palaeolithic origins of human burial*. Routledge, London.
- Pidoplichko, I.G., 1976. *Meziritchiskie jilicha iz kostej mamonta*. Ukrainian Academy of Sciences, Kiev. (in Russian).
- Pidoplichko, I.G., 1998. *Upper Palaeolithic dwellings of mammoth bones in the Ukraine: Kiev-Kirillovski, Gontsy, Dobranichevka, Mezin and Mezhirich*. BAR International Series 712, Hadrian Books, Oxford.
- Pigeaud, R., 2007. Determining style in Palaeolithic cave art: a new method derived from horse images. *Antiquity* 81, 409-422.
- Pigeaud, R., Hinguant, S., Rodet, J., Devière, T., Dufayet, C., Heimlich, G., Mélard, N., Betton, J.-P., Bonic, P., 2010. The Margot Cave (Mayenne): a new Palaeolithic Sanctuary in West France. In: Oosterbeek, L. (Ed.), *Proceedings of the XV World Congress (Lisbon, 4-9, September 2006)*. BAR International Series 2108. Hadrian Books, Oxford, pp. 81-92.
- Pike, A.W.G., Gilmour, M., Pettitt, P.B., 2007. Verification of the Age of the Palaeolithic Cave Art at Creswell Crags: An Interpretative Model. In: Pettitt, P., Bahn, P., Munoz, F.J., Ripoll, S. (Eds.), *Palaeolithic Cave Art at Creswell Crags in European Context*. Oxford University Press, Oxford, pp. 34-45.
- Poltowicz-Bobak, M., 2012. Observations on the late Magdalenian in Poland. *Quaternary International* 272-273, 297-307.
- Posth, C., Renaud, G., Mittnik, A., Drucker, D.G., Rougier, H., Cupillard, C., Valentin, F., Thevenet, C., Furtwängler, A., Wißing, C., Francken, M., Malina, M., Bolus, M., Lari, M., Gigli, E., Capecchi, G., Crevecoeur, I., Beauval, C., Flas, D., Germonpré, M., van der Plicht, J., Cottiaux, R., Gély, B., Ronchitelli, A., Wehrberger, K., Grigorescu, D., Svoboda, J., Semal, P., Caramelli, D., Bocherens, H., Harvati, K., Conard, N.J., Haak, W., Powell, A., Krause, J., 2016. Pleistocene Mitochondrial Genomes Suggest a Single Major Dispersal of Non-Africans and a Late Glacial Population Turnover in Europe. *Current Biology* 26, 827-833.
- Pradel, L., 1980. Datation par le radiocarbone du Magdalénien III de La Marche, commune de Lussac-les-Châteaux (Vienne). *L'Anthropologie* 84, 307-308.
- Ramos Muñoz, J., Cantalejo Duarte, P., Maura Mijares, R., Espejo Herrarias, M.d.M., Medianero Soto, J., 2002. La imagen de la mujer en las manifestaciones artísticas de la cueva de Ardales (Ardales, Málaga), Un enfoque desde las relación dialéctica producción y reproducción social. *Revista Atlántica-Mediterránea de Prehistoria y Arqueología Social* V, 87-124.
- Rasmussen, S.O., Bigler, M., Blockley, S.P., Blunier, T., Buchardt, S.L., Clausen, H.B., Cvijanovic, I., Dahl-Jensen, D., Johnsen, S.J., Fischer, H., Gkinis, V., Guillevic, M., Hoek, W.Z., Lowe, J.J., Pedro, J.B., Popp, T., Seierstad, I.K., Steffensen, J.P., Svensson, A.M., Vallelonga, P., Vinther, B.M., Walker, M.J.C., Wheatley, J.J., Winstrup, M., 2014. A stratigraphic framework for abrupt climatic changes during the Last Glacial period based on three synchronized Greenland ice-core records: refining and extending the INTIMATE event stratigraphy. *Quaternary Science Reviews* 106, 14-28.
- Reimer, P.J., Austin, W.E.N., Bard, E., Bayliss, A., Blackwell, P.G., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, R.L., Friedrich, M., Grootes, P.M., Guilderson, T.P., Hajdas, I., Heaton, T.J., Hogg, A.G., Hughen, K.A., Kromer, B., Manning, S.W., Muscheler, R., Palmer, J.G., Pearson, C., van der Plicht, J., Reimer, R.W., Richards, D.A., Scott, E.M., Southon, J.R., Turney, C.S.M., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S.M., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A., Talamo, S., 2020. The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0-55 cal kBP). *Radiocarbon* 62, 725-757.
- Rios-Garaizar, J., Garate, D., Bourrillon, R., Gomez-Olivencia, A., Karampaglidis, T., 2015. The Venuses Block from Arlanpe Cave (Northern Iberian Peninsula): Implications for the Origins and Dispersion of Gönnersdorf-Lalinde Style depictions throughout the European Magdalenian. *Oxford Journal of Archaeology* 34, 321-341.
- Rosenfeld, A., 1977. Profile Figures: Schematisation of the Human Figure in the Magdalenian Culture of Europe. In: Ucko, P.J. (Ed.), *Form in Indigenous Art*. Australian Institute of Aboriginal Studies, Canberra.

- Sablin, M.H., Khlopachev, G.A., 2002. The earliest ice age dogs: evidence from Eliseevichi I. *Current Anthropology* 43, 795-799.
- Sano, K., 2012a. *Functional Variability in the Late Upper Palaeolithic of North-Western Europe*. Universitätsforschungen zur Prähistorischen Archäologie 219. Verlag Dr. Rudolf Habelt, Bonn.
- Sano, K., 2012b. Functional variability in the Magdalenian of north-western Europe: A lithic microwear analysis of the Gönnersdorf K-II assemblage. *Quaternary International* 272-273, 264-274.
- Sano, K., 2021 (in prep.). Spurenforschung in Gönnersdorf: Geebrauchsspurenanalyse/Use-wear Analysis in Gönnersdorf. In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Monrepos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Schild, R., Wendorf, F., 2010. Late Palaeolithic hunter-gatherers in the Nile Valley of Nubia and Upper Egypt. In: Garcea, E.A.A. (Ed.), *South-Eastern Mediterranean Peoples between 130,000 and 10,000 Years Ago*. Oxbow Books, Oxford, pp. 89-125.
- Schwendler, R.H., 2012. Diversity in social organization across Magdalenian Western Europe ca. 17-12,000 BP. *Quaternary International* 272-273, 333-353.
- Sécher, A., Caux, S., 2017. Technologie lithique et circulation des matières premières au Magdalénien moyen ancien. L'exemple de Moulin-Neuf (Saint-Quentin-de-Baron, Gironde). *Bulletin de la Société préhistorique française* 114, 295-314.
- Sensburg, M., 2007. *Die räumliche Organisation der Konzentration IIa von Gönnersdorf*. Monographien des Römisch-Germanischen Zentralmuseums 69. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Sensburg, M., 2008. Die Siedlungsbefunde der Konzentration IIb von Gönnersdorf. Ein mögliches Kochgruben-Areal unter freiem Himmel. In: Sensburg, M., Moseler, F. (Eds.), *Die Konzentrationen IIb und IV des Magdalénien-Fundplatzes Gönnersdorf (Mittelrhein)*. Monographien des Römisch-Germanischen Zentralmuseums 73. Verlag des Römisch-Germanischen Zentralmuseums, Mainz, pp. 1-53.
- Sensburg, M., 2011. The relation between time and space in Gönnersdorf K-II. In: Gaudzinski-Windheuser, S., Jöris, O., Sensburg, M., Street, M., Turner, E. (Eds.), *Site-internal spatial organization of hunter-gatherer societies: Case studies from the European Palaeolithic and Mesolithic*. RGZM – Tagungen 12. Verlag des Römisch-Germanischen Zentralmuseums, Mainz, pp. 81-101.
- Sentis, J., 2000. Les gravures de la grotte de Pestillac (Montcabrier, Lot). *Préhistoire du Sud-Ouest* 7, 133-143.
- Sentis, J., 2005. Les silhouettes féminines stylisées peuvent-elles caractériser des territoires culturels? In: Jaubert, J., Barbaza, M., (Eds.), *Territoires, déplacements, mobilité, échanges durant la Préhistoire*. Actes du 126^e Congrès National des Sociétés historiques et scientifiques, Toulouse. CTHS, Paris, pp. 411-420.
- Soffer, O., Adovasio, J.M., Kornietz, N.L., Velichko, A.A., Gribchenko, Y.N., Lenz, B.R., Suntsov, V.Y., 1997. Cultural stratigraphy at Mezhirich, an Upper Palaeolithic site in Ukraine with multiple occupations. *Antiquity* 71, 48-62.
- Stevens, R.E., O'Connell, T.C., Hedges, R.E.W., Street, M., 2009. Radiocarbon and stable isotope investigations at the Central Rhineland sites of Gönnersdorf and Andernach-Martinsberg, Germany. *Journal of Human Evolution* 57, 131-148.
- Street, M., 2021 (in press). Der Heimat so nah.../Home is never far away... In: Gaudzinski-Windheuser, S., Jöris, O. (Eds.), *Monrepos forscht!* Monographien des Römisch-Germanischen Zentralmuseums. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Street, M., Baales, M., Czesla, E., Hartz, S., Heinen, M., Jöris, O., Koch, I., Pasda, C., Terberger, T., Vollbrecht, J., 2002. Final Palaeolithic and Mesolithic Research in Reunified Germany. *Journal of World Prehistory* 15, 365-453.
- Street, M., Baales, M., Weninger, B., 1994. Absolute Chronologie des späten Paläolithikums und Frühmesolithikums im nördlichen Rheinland. *Archäologisches Korrespondenzblatt* 24, 1-28.
- Street, M., Gelhausen, F., Grimm, S., Moseler, F., Niven, L., Sensburg, M., Turner, E., Wenzel, S., Jöris, O., 2006. L'occupation de bassin de Neuwied (Rhénanie centrale, Allemagne) par les Magdaléniens et les groupes à Federmesser (aziliens). *Bulletin de la Société préhistorique française* 103, 753-780.
- Street, M., Jöris, O., Sirocko, F., 2009. Das Magdalénien und der Beginn der späteiszeitlichen Expansion (16.000-14.700 BP). In: Sirocko, F. (Ed.), *Wetter, Klima, Menschheitsentwicklung. Von der Eiszeit bis ins 21. Jahrhundert*. Theiss Verlag, Stuttgart, pp. 88-92.
- Street, M., Jöris, O., Turner, E., 2012. Magdalenian settlement in the German Rhineland – An update. *Quaternary International* 272-273, 231-250.
- Street, M., Terberger, T., 1999. The Last Pleniglacial and the Human Settlement of Central Europe. New Information from the Rhineland Site Wiesbaden-Igstadt. *Antiquity* 73, 259-272.
- Street, M., Terberger, T., 2004. The radiocarbon chronology of the German Upper Palaeolithic: fifteen years of cooperation with ORAU. In: Higham, T.F.G., Bronk-Ramsey, C., Owen, D.C. (Eds.), *Radiocarbon and Archaeology*. Proceedings of the 4th Symposium, Oxford 2002. Oxford University School of Archaeology Monograph 62. Oxford University School of Archaeology, Oxford, pp. 281-302.
- Street, M., Turner, E., 2013. *The Faunal Remains from Gönnersdorf*. Monographien des Römisch-Germanischen Zentralmuseums 104. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.
- Tallavaara, M., Luoto, M., Korhonen, N., Järvinen, H., Seppä, H., 2015. Human population dynamics in Europe over the Last Glacial Maximum. *Proceedings of the National Academy of Sciences of the United States of America* 112, 8232-8237.
- Terberger, T., 1997. *Die Siedlungsbefunde des Magdalénien-Fundplatzes Gönnersdorf. Konzentrationen III und IV*. Der Magdalénien-Fundplatz Gönnersdorf 6. Franz Steiner Verlag, Stuttgart.
- Terberger, T., Street, M., 2002. Hiatus or continuity? New results for the question of pleniglacial settlement in central Europe. *Antiquity* 76, 691-698.
- Tinnes, J., 1994. *Die Geweih-, Elfenbein- und Knochenartefakte der Magdalénienfundplätze Gönnersdorf und Andernach*. Unpubl. Ph.D.-thesis, University of Cologne, Köln.
- Tinnes, J., 2001. Die Retuscheure aus Knochen der Magdalénien-Fundplätze Gönnersdorf und Andernach. In: Gehlen, B., Heinen, M., Tillmann, A. (Eds.), 2001, *Zeit-Räume. Gedenkschrift für Wolfgang Taute* 2. Archäologische Berichte 14. Verlag Dr. Rudolf Habelt, Bonn, pp. 337-347.
- Turner, E., 2002. *Solutré. An archaeozoological analysis of the Magdalenian horizon*. Monographien des Römisch-Germanischen Zentralmuseums 46. Verlag des Römisch-Germanischen Zentralmuseums, Mainz.

- Ucko, P.J., Rosenfeld, A., 1972. Anthropomorphic representations in Palaeolithic art. In: Almagro, M.B., Garcia, M.A. (Eds.), *Actas del Simposium Internacional de Arte Rupestre*. Santander Simposium 1970. Santander Simposium, Santander, pp. 149-211.
- Valentin, B. (avec coll. De Olive, M., Valla, F., Audouze, F., de Beaune, S.A., Soulier, P., Chambon, P., Body, P.) 2015. Où en est l'ethnologie préhistorique? In: Soulier, P.H. (Ed.), *André Leroi-Gourhan "l'homme, tout simplement"*. Travaux de la Maison de l'Archéologie et de l'Ethnologie, René-Ginouvès 20, Editions de Boccard, Paris, pp. 173-186.
- Valoch, K., 1978. Eine gravierte Frauendarstellung aus der Býčí-Skála-Höhle in Mähren. *Anthropologie* 16, 31-33.
- Veil, S., 1983. Die retuschierten Steinwerkzeuge und die Abfälle ihrer Herstellung. In: Franken, E., Veil, S. (Eds.), 1983. *Die Steinartefakte von Gönnersdorf*. Der Magdalénien-Fundplatz Gönnersdorf 7. Franz Steiner Verlag, Wiesbaden, pp. 171-437.
- Veil, S., 1990. A dynamic model of a Magdalenian settlement by spatial analysis of refitted artefacts. In: Czesla, E., Eickhoff, S., Arts, N., Winter, D. (Eds.), *The Big Puzzle. International symposium on refitting stone artefacts, Monrepos 1987*. Studies in Modern Archaeology 1. Holos, Bonn, pp. 45-60.
- Vermeersch, P.M., 1992. The Upper and Late Palaeolithic of Northern and Eastern Africa. In: Klees, F., Kuper, R. (Eds.), *New Light on the Northeast African Past. Current Prehistoric Research*. Africa Praehistorica 5, Heinrich-Barth-Institut, Köln, pp. 99-153.
- Verpoorte, A., 2001. *Places of Art, Traces of Fire. A contextual Approach to Anthropomorphic Figurines in the Pavlovian (Central Europe, 29-24 kyr BP)*. Archaeological Studies Leiden University 8. Faculty of Archaeology, Leiden University, Leiden.
- Welté, A.-C., Cook, J., 1993. Nouvelle gravure féminine de la grotte du Courbet (Tarn). *Bulletin de la Société préhistorique Ariège-Pyrénées* 48, 107-122.
- Weninger, B., 2021. History of CalPal 1986-2021. https://www.academia.edu/44453206/HISTORY_OF_CALPAL_1986_2021_Version_2021_3?email_work_card=view-paper.
- Wiśniewski, A., Połtowicz-Bobak, M., Bobak, D., Jary, Z., Moska, P., 2017. The Epigravettian and the Magdalenian in Poland: new chronological data and on old problem. *Geochronometria* 44, 16-29.
- Wobst, H.M., 1977. Stylistic Behaviour and Information Exchange. In: Cleland, C.E. (Ed.), *For the Editor: Research Essays in Honor of James B. Griffin. Anthropological Papers* 61. University of Michigan Press, Ann Arbor.
- Wüst, K., 1998. Die gravierten Gerölle und Plättchen des Magdalénien-Fundplatzes „Teufelsbrücke“ bei Saalfeld (Thüringen). *Alt-Thüringen* 32, 98-142.
- Zboray, A., 2012. An unpublished shelter with prehistoric engravings of a possible Late Pleistocene date in the North-central Sinai (Egypt). *Sahara* 23, 163-166.
- Zolitschka, B., Brauer, A., Stockhausen, H., Lang, A., Negendank, J.F.W., 2000. Annually dated late Weichselian continental palaeoclimate record from the Eifel, Germany. *Geology* 28, 783-786.
- Zolitschka, B., Francus, P., Ojala, A.E.K., Schimmelmann, A., 2015. Varves in lake sediments – a review. *Quaternary Science Reviews* 117, 1-41.
- Zubrow, E., Audouze, F., Enloe, J.G. (Eds.) 2010. *The Magdalenian Household: Unraveling Domesticity*. State University of New York Press, Albany NY.

Olaf Jöris

MONREPOS Archaeological Research Centre
and Museum for Human Behavioural Evolution
Römisch-Germanisches Zentralmuseum
Leibniz-Forschungsinstitut für Archäologie
Schloss Monrepos
D - 56567 Neuwied
joeris@rgzm.de

and

Johannes Gutenberg-Universität Mainz
Arbeitsbereich Vor- und Frühgeschichtliche Archäologie
des Instituts für Altertumswissenschaften
Schillerstr. 11
D - 55116 Mainz