



## Find concentrations and dwelling structures. The interpretaion of Final Palaeolithic find scatters

Frank Gelhausen, Jan F. Kegler, Stefan Wenzel

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# Mesolithic Horizons

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on the Mesolithic in Europe, Belfast 2005

*Edited by*  
*Sinéad McCartan, Rick Schulting, Graeme Warren and Peter Woodman*

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## 68. Find concentrations and dwelling structures. The interpretation of Final Palaeolithic find scatters

*Frank Gelhausen, Jan F. Kegler and Stefan Wenzel*

*At the Final Palaeolithic (Federmessergruppen) sites of Niederbieber (Area IV), Andernach-Martinsberg 3 and Berlin-Tegel IX a combination of different methods of spatial analysis reveals indications of a former separation of the main accumulations of finds from the surrounding area. All three find scatters are very dense and show a marked sudden decrease at their edges. The distribution of larger objects and refitting lines between artefacts respect the edges of the find scatters. In some cases, certain finds, such as unburned larger bone fragments or larger stones, are not found within the artefact find scatter. We interpret these as indications of a formerly effective limitation of the find concentrations that show the former presence of dwelling structures.*

Keywords: Allerød Interstadial, Final Palaeolithic, Federmessergruppen, settlement structures, dwellings, mapping of artefact density, density contour lines/isopachs, refitting.

### **Introduction**

Only very few Mesolithic dwellings are preserved as evident features and even outstanding discoveries such as Ulkestrup I and Ulkestrup II (Andersen, Jørgensen and Richter 1982; Grøn 2003) have been questioned as to their character as dwellings (Bokelmann 1986, 150; Stapert 2002, 231). With regard to their size and their artefact density these settlement structures correspond to evident dwelling structures of the Magdalenian and the early phase of the Final Palaeolithic, which are characterized by floors made of slabs of schist (Bosinski 1979; Street 1995) or by stones in peripheral positions used as weights (Jöris and Terberger 2001). In this paper we will discuss the artefact distribution of three sites from the Allerød (Figure 68.1), which are noticeable by the form of their outline and by their density of finds. We would like to present considerations for the evaluation of the borders of the find concentrations and for the question of a former separation of their interiors from the areas outside. This could also be of significance for the interpretation of Mesolithic find scatters.

Fundamental considerations for the evaluation of latent settlement structures have been discussed by Leroi-Gourhan and Brézillon (1972) in the context of the analysis of the Magdalenian site of Pincevent. On the basis of mapping and the refitting of finds it was possible to reconstruct activities and work areas. Furthermore, the position of the walls of a dwelling can be detected by finds trapped within the walls (Leroi-Gourhan 1984, fig. 27). Under the influence of the work of Leroi-Gourhan, dwellings were sought in the find-

poor area behind the fireplaces and their adjacent waste zones (e.g. Bolus 1992; Bokelmann 1989, 18; Vermeersch 1987). However, the evident dwelling structures mentioned above are in fact characterized by large quantities of internal finds, in particular the trapezoid tents of Etiollés W11 and of Le Closeau, locus 46 (Jöris and Terberger 2001).

On the basis of the criticism by Binford (1983) of Leroi-Gourhan's concepts, Stapert (1992) tried to develop a method to distinguish find concentrations derived from former dwelling locations from those concentrations which reflect open-air camp sites. Stapert's 'ring and sector method' divides the area around a central fireplace into radial sectors and circular zones. It examines the frequency of artefacts according to distance classes relative to the fireplace. If the fireplace were in a dwelling, a zone with few finds would be expected between the fireplace and the former wall. At the wall the number of artefacts would increase before reducing again in quantity outside. A bimodal distribution of the find frequencies is the result. In contrast to this, around an outdoor hearth the number of finds does not increase again beyond the waste zone around the hearth, but falls steadily towards the periphery, leading to a unimodal distribution of the find density.

In its basic principle, Stapert's method is unsuitable for demonstrating dwellings that do not have a circular ground plan, since these cannot meaningfully be analysed by circular zones. However, individual latent Allerød and Holocene dwellings were detected by the 'ring and sector' method, for example Rekem 10 (De Bie and Caspar 2000),

Andernach-Martinsberg 2 (Stapert and Street 1997), and Siebenlinden 1-I (Kind 2003).

To evaluate those find concentrations that are neither round, nor include a central fireplace, we have combined well-known methods for analysing settlement structures in the examination of three Allerød sites (Gelhausen *et al.* 2004, Figure 68.1). Our investigation is based on following considerations and observations:

1. A sudden change from high to lower find density at the edge of a find concentration points to a former delimitation. A rising number of finds directly inside the border of a concentration of artefacts, connected with a clear decrease in exterior finds, both stipulated by Stapert (1992) for proof of the barrier effect, represents only a special case as an indication of the delimitation of a settlement structure. Whether a find concentration is clearly limited can be demonstrated particularly clearly if one represents the find quantity per unit of area (here in quarters of a square metre) by isopachs (find density lines).
2. If the connecting lines of refitted artefacts often run along the border of a concentration, or terminate there, where a clear decrease in find numbers is registered, this is likewise an indication of an obstacle for human activities related to the transport of objects, preventing a diffuse distribution of the finds.
3. In evident dwelling structures retouched artefacts are essentially limited to the concentration. Cores are found more at the edge of the concentration, or beyond it. In some cases tools also group together at the edge of the find concentration.
4. Larger boulders and faunal remains lie at the edge of a concentration, or outside it, so that the area of the main find concentration is, to a large extent, void of these types of finds.

### **Niederbieber. Area IV**

The Late Palaeolithic site of Niederbieber (Neuwied Basin, Rhineland-Palatinate, Germany) (Figure 68.1) is, with an excavated surface of more than 930m<sup>2</sup>, one of the most intensively examined sites of the Federmessergruppen in central Europe (e.g. Bolus 1992; Baales 2001; 2002). The find concentration at Niederbieber IV is one of 17 of different shape and density (Gelhausen 2007) excavated since 1980. Niederbieber IV reveals a central hearth, rendered visible not only by burnt artefacts but also because of changes in the colour of the underlying sediment. Until recently Concentration IV was considered to have been the result of open-air activities. A significant argument for this interpretation came from Stapert's 'ring and sector' method (Stapert 1992), since the lithics displayed a unimodal distribution. In this paper, a new spatial analysis of Niederbieber IV suggests that all the recognized features, in fact, point to activities within a dwelling.

The 46m<sup>2</sup> surface area of Niederbieber IV was excavated between 1982 and 1984, and analysed by Winter (1986; 1987) and Bolus (1992). In Area IV, 2088 stone artefacts

(>1cm) were plotted in three dimensions, and 16,827 chips were counted per 0.25m<sup>2</sup> and analysed using isopachs. Additionally faunal remains and larger pebbles were three-dimensionally plotted and analysed.

The distribution pattern displayed by the artefacts shows an almost square shape, measuring *c.* 4 × 4.5m, with a marked, sudden decrease at the edges (Figure 68.2a). The highest density of artefacts is directly south and north of the hearth, with 822 and 782 pieces per 0.25m<sup>2</sup>. Most of the retouched tools lie within the surface displayed by the isopachs. Only a few pieces are scattered to the north-east and south-west. The cores tend rather towards the edges of the concentration. Pebbles (>5cm) are limited to two areas at the south-west and north-east of the excavation area. In addition, some pebbles are positioned in a way that suggests a 'ring of stones' (perhaps stone weights) around the concentration. Nine of these pebbles were classified as retouching tools with clear scar fields on their surfaces.

Faunal remains are distributed in two larger zones at the south-west and north-east of the excavation. They almost align with the distribution of the pebbles but they

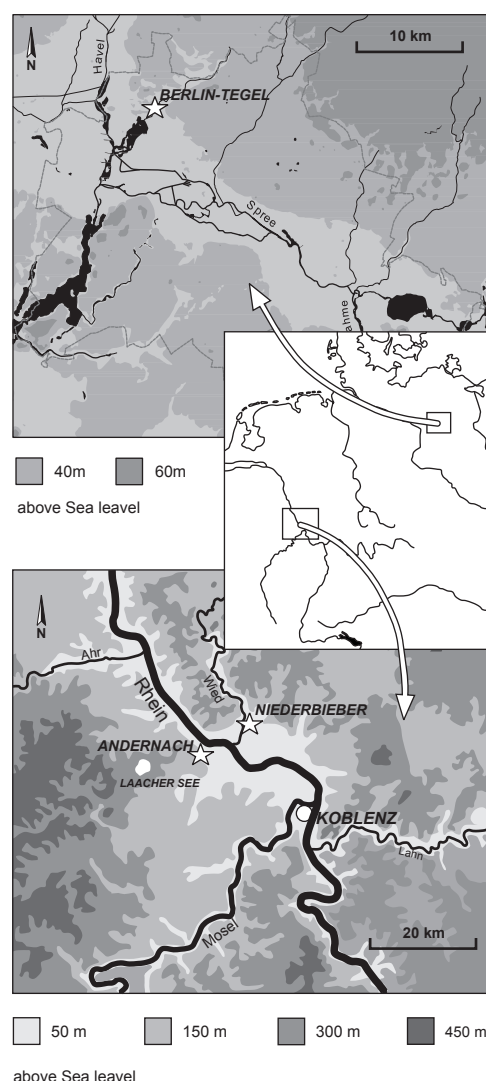


Figure 68.1. Locations of the sites at Niederbieber and Andernach (Middle Rhine Valley) and Berlin-Tegel.

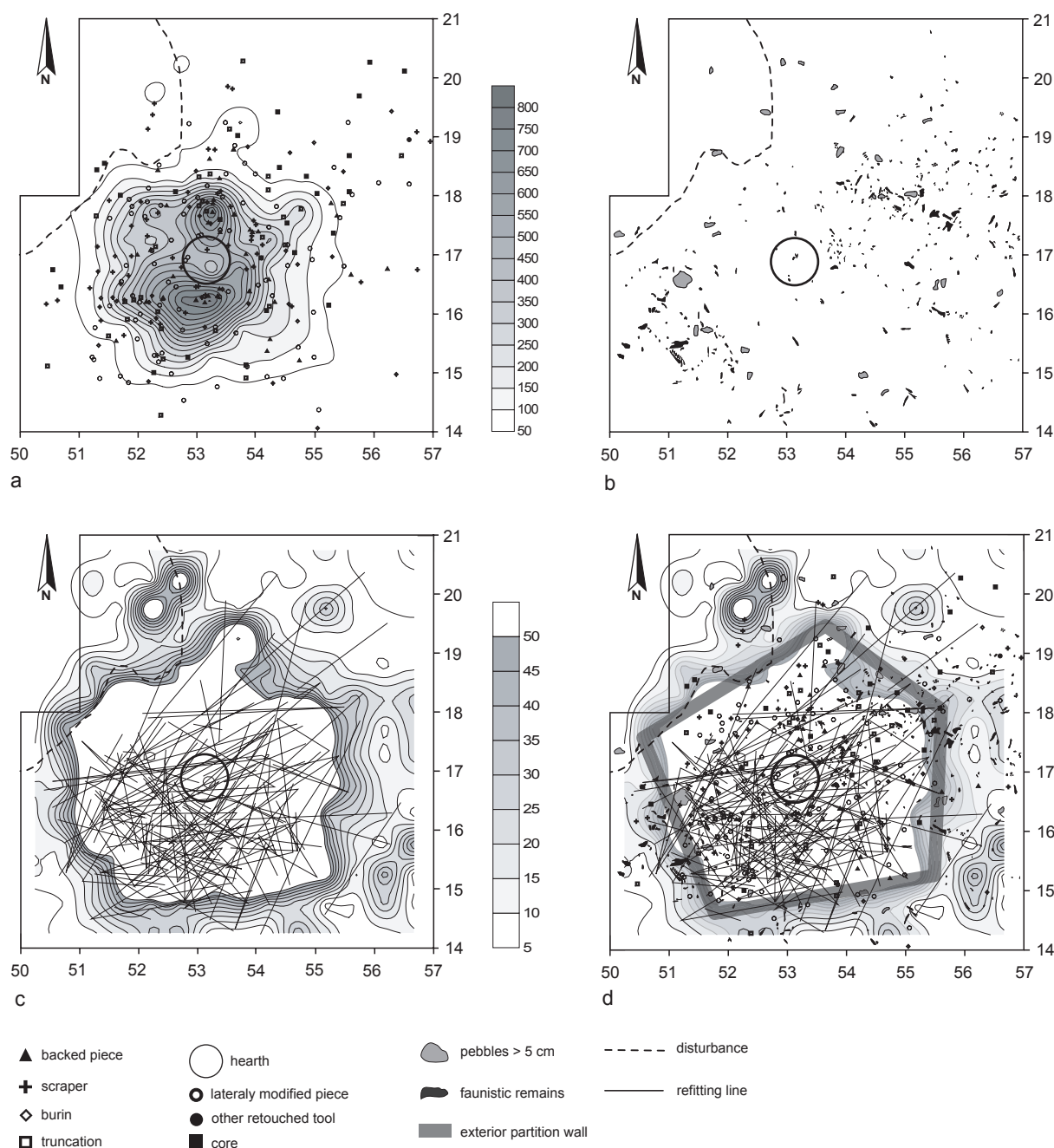


Figure 68.2. Niederbieber IV. A) Isopach distribution of the lithic finds <1cm recovered using wet sieving per 0.25m<sup>2</sup>. Distribution of retouched tools and cores. B) Distribution of faunal remains and pebbles >5cm. C) Isopach distribution of lithic finds <1cm recovered using wet sieving, limited at 50 pieces per 0.25m<sup>2</sup>. Conjoining lines of all included pieces. D) Suggested exterior partition wall.

are slightly more diffuse. In any event, they are distributed outside the find concentration shown by the isopachs (Figure 68.2b). Refitting lines of the lithics show that activities have obviously taken place within the find scatter. They often run along the edges of the concentration, ending there and demarcating its boundary.

The arguments specified previously permit a reconstruction of the features of Niederbieber IV as a polygonal floor plan of a former dwelling. Particularly remarkable is the relatively sudden change from high to low find density at the edges of the find scatter; the heavier objects, such

as cores and pebbles, are mostly deposited here. The conjoining lines also point to a barrier at the edges of the find scatter (Figure 68.2c). It seems clear that all the activities took place within the find concentration. This interpretation is also supported by the distribution of the retouched tools, which are mainly deposited inside the concentration. Overall, the recorded artefacts show that a wall or a barrier prevented their wider distribution.

In summary, the spatial analysis of Niederbieber IV suggests a former dwelling structure with a polygonal floor plan (Figure 68.2d).



### ***Andernach-Martinsberg 3. The upper find horizon***

Between 1994 and 1996 a surface area of 113m<sup>2</sup> was examined on the Martinsberg, in the city of Andernach (Rhineland-Palatinate, Germany) (Figure 68.1), and a Federmessergruppen lithic concentration was documented (Kegler 2002). In this find horizon, 2417 chalcedony artefacts (>1cm) were plotted in three dimensions, and about 14,614 pieces (<1cm) were recovered by wet sieving. Additionally, 535 bone fragments (>3cm) were three-dimensionally plotted. Three basalt blocks, c. 25cm in diameter and found at the north-west end of the concentration, are the only larger objects; they can probably be connected with different working areas rather than the deliberations on dwelling structures presented here.

During the excavation two hearths were documented, each about 50cm in diameter: a southern fireplace within the main concentration of the chalcedony artefacts, and a further one north-west of the main concentration. A special feature is a small, circular pit c. 10cm in diameter in square 28/19. This probable 'posthole' has a cylindrical form and a convex base. At the bottom of this feature were found some charcoal pieces, a bone fragment, a flat plaque of quartzitic schist, as well as some lithic chips.

Mapping all the individually measured stone artefacts of the dominant raw material, chalcedony, shows a north-northwest oriented, rectangular concentration. At first view it seems to be very compact, covering c. 3 × 3m around the central fireplace (Figure 68.3a).

The bone fragments are concentrated directly adjacent to the fireplaces, as well as being dispersed randomly over the entire excavation area. The combination of the distribution of the bones and the stone artefacts clearly show a pattern. Between the main concentration of stone artefacts and the exterior spread of the bones is a zone with noticeably fewer finds, approximately half a metre in width. This find-poor area could have resulted from a kind of barrier between the main stone artefact concentration and the areas lying outside its western and the eastern edges (Figure 68.3b). In the south, this border cannot be traced with the same clarity, because of the use of different excavation techniques, but mapping the find densities of stone artefacts with isopachs makes very clear that their distribution was not substantially influenced in this area.

The impression of a closely defined spread of stone artefacts is confirmed by mapping all 17,031 chalcedony artefacts (single finds and finds recovered, partly, by wet sieving) by density isopachs. Their distribution corresponds to a north-north-west oriented form, as long as it is wide, with a length of c. 4.5m along the sides. At the edges of the feature the find distribution is remarkable: to the south, the west, and the east of the main concentration, the number of pieces decreases from more than 50 artefacts per 0.25m<sup>2</sup> to less than 5 pieces over a distance of only 30cm (Figure 68.3c). This reduction is clearly shown by the isopachs, the lines of which are very close to each other. In the northern area – within the area of the exterior fireplace – the isopachs enclose the working area in front

of the main distribution. Here, such a clear decrease in find density cannot be observed.

The distribution of retouched stone artefacts is limited to the extent of the area shown by the density lines. Small clusters, especially of backed pieces, are adjacent to the fireplaces. In a sense, the distribution of the retouched pieces underlines the limited extent of the find concentration. The distribution of the cores does not show the suggested pattern: some cores are positioned within the main concentration while some are distributed outside. Some of the cores relate to some of the 67 refits of stone artefacts, however, these refit lines show no parallel lines, reflecting the delimitations mentioned above. Yet the refits demonstrate the close connection of activities within the main concentration and between the area containing the second fireplace in the northern part (Figure 68.3c).

For the reconstruction of a possible dwelling feature the combination of different find types, and their depiction both as single finds and by isopachs, are of substantial importance. The position of boundaries west, south, and east of the main concentration permits an interpretation that the Federmessergruppen site of Andernach 3 might be a former tent location. A boundary cannot clearly be recognized in the north-west. Only by interpreting the positioning of the possible 'posthole' can an idea of how the construction was closed off be reached. The distribution of finds does not show the clear position of a wall in this area – with the exception of the location of the bone fragments – and therefore the 'posthole' might have served only as a feature for the stability of the construction. The structure was therefore closed on three sides, and occasionally open to the north-west. Since the distribution of finds in this area extends far to the north-west, the exit of the dwelling can be postulated here. The outside hearth, together with the thin spread of finds and the scatter of retouched forms, are suggestive of an open-air zone of activities (Figure 68.3d).

Taking all the evidence into account, we regard the upper find horizon of Andernach 3 as showing a polygonal structure, oriented north-west/south-east, with a central hearth (Figure 68.3d). The approximately parallel walls at the east and the west suggest several possibilities for the form of the dwelling, including a pentagonal shape, or, taking into account the possible 'posthole', a slightly oblong, hexagonal layout. The dwelling therefore encloses a surface of c. 4.5 × 4.5m, with a maximum inner surface area of 14m<sup>2</sup>.

### ***Berlin-Tegel Concentration IX***

The site of Berlin-Tegel A is situated to the north of Berlin, immediately above a small stream, the Tegeler Fließ (Figure 68.1). The site was excavated in the early 1960s under the direction of Mey and von Müller. Twenty-two concentrations of artefacts (Federmessergruppen and Ahrensburgian) were examined over a surface area of 4000m<sup>2</sup> (Probst 1989).

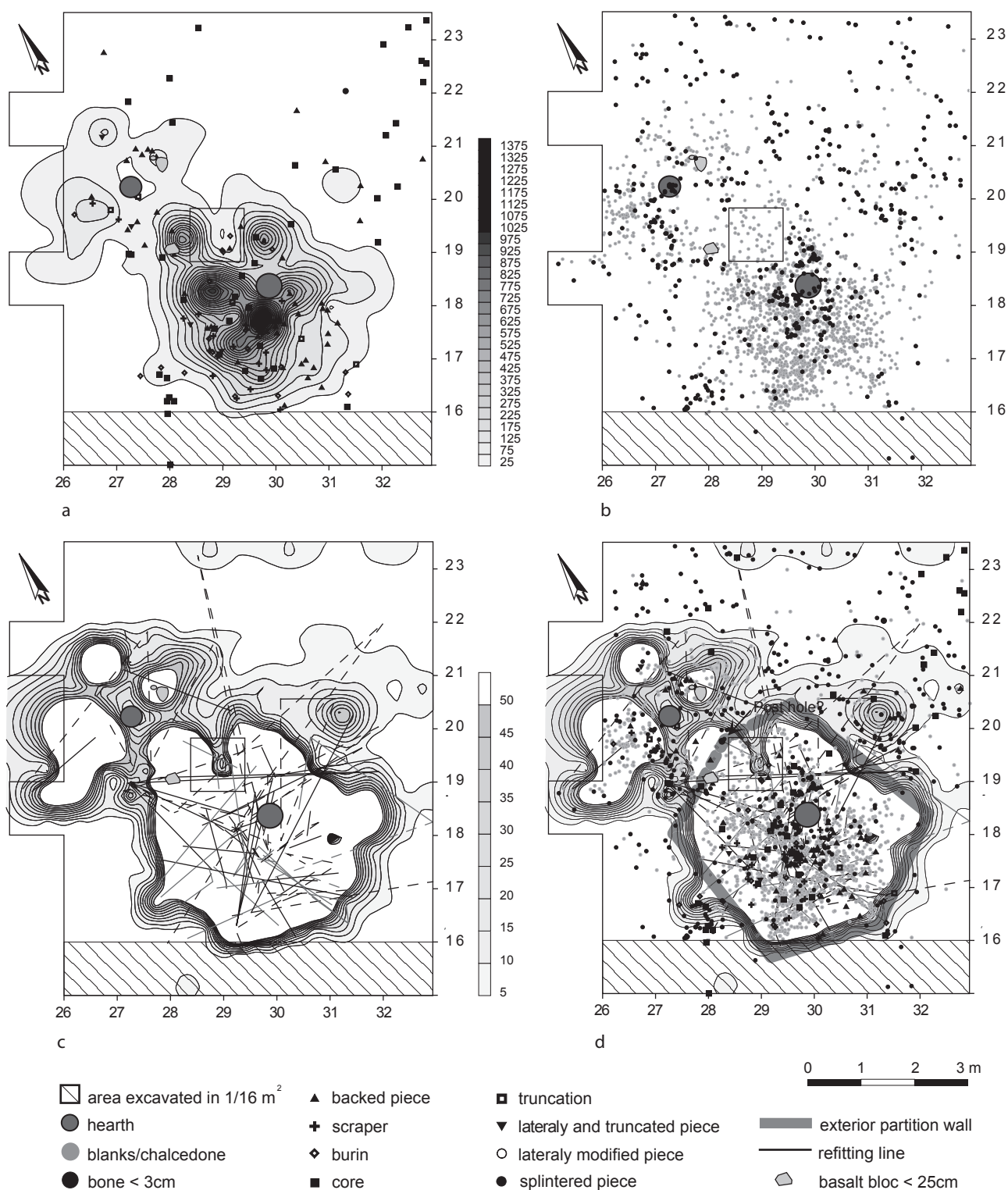
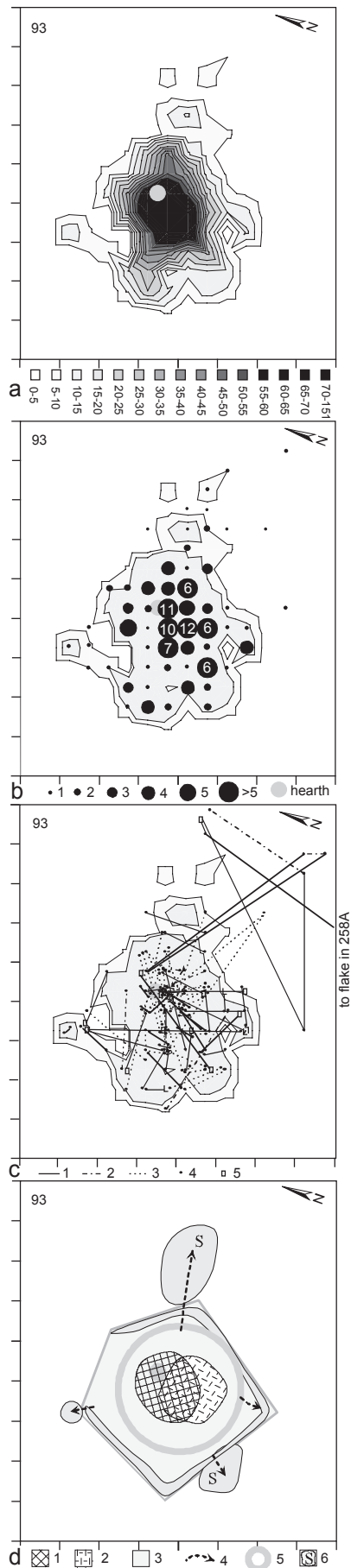


Figure 68.3. Andernach/Martinsberg 3. Upper find horizon (section of the excavated area). A) Isopach distribution of finds < 1cm recovered using wet sieving per 0.25m<sup>2</sup>. Distribution of retouched tools and cores. B) Distribution of chalcedony blanks > 1cm and bone fragments > 3cm. C) Isopach distribution of all finds recovered using wet sieving, limited at 50 pieces per 0.25m<sup>2</sup>. Conjoining lines of all included pieces. D) Suggested exterior partition wall.

Concentration IX has an extension of 7 × 8m (Gelhausen *et al.* 2005, fig. 7), but the find density lines show clearly the prominent western part of concentration IX, in contrast to the thin spread of artefacts in the eastern sector (Figure

68.4a). Close to the area of highest find density, a hearth was indicated by the red colouration of the sand and by burnt bones and artefacts. About 80% of the stone artefacts from the entire concentration IX are burnt. They therefore



do not seem to be in primary positions but are considered as having been dispersed by settlement activities. There was an accumulation of modified tools and cores near the hearth, but considerable amounts of these artefacts were found at the edge of the actual concentration of finds (Figure 68.4b). (For the distribution of the different categories of modified tools and for the distribution of cores see Gelhausen *et al.* (2004, fig. 4c–g)). Numerous refit lines end at the border of the concentration, or run closely parallel to it (Figure 68.4c). They stress also the association of the left side of the concentration with this structure. The isopachs of find density, the distribution of larger objects at the edge of concentration IX, and the refit lines stressing this border, define a zone which was formerly limited to this space and thus suggest a dwelling. This had a trapezoidal ground plan, four metres long and no more than four metres broad, with the greatest width in its northern section (Figure 68.4d). The longitudinal axis of this structure was orientated north-north-east/south-south-west. Neither a front nor rear exit can be identified by refits of artefacts. However a small accumulation of finds located to the north-east of concentration IX might be seen as related to a tent entrance. A small cluster of artefacts (concentration X) lies on the longitudinal axis of the reconstructed dwelling and might derive from activities conducted behind the tent. This would match other better documented tent structures, which often exhibit a greater deposition of finds outside the back of the dwelling (Jöris and Terberger 2001, 168).

### Results and Outlook

The three find scatters presented here show indications of the presence of former dwellings. At the edge of the artefact concentrations a clear decrease in find density can be observed almost everywhere. Due to excavation methods this is more striking at Niederbieber IV and Andernach 3 than at Berlin-Tegel IX. Numerous connections of refitted artefacts end where the find density decreases or runs parallel to these zones. Many modified artefacts are concentrated within the find concentrations and along their

Figure 68.4. (left) Berlin-Tegel A, Concentration IX. A) Isopachs of all artefacts. B) Horizontal distribution of the modified tools (scrapers, burins, retouched flakes, borer, splintered pieces and backed pieces). C) All refit lines (1: production sequences; 2: breaks; 3: breaks of burnt artefact fragments; 4: artefacts; 5: shatter). D) Interpretation (1: zone of activity around the fireplace; 2: backward toss zone; 3: areas of cleared out material; 4: supposed direction of clearing activities; 5: find-rich zone around the central fireplace; 6: clusters of stone artefacts). (With B–C the find density lines for 5–10 artefacts and 10–15 artefacts are displayed).



edges. At Niederbieber und Andernach the concentrations are nearly void of unburned bones. At Niederbieber, larger stones are also found at the edge or outside the find concentration. The settlement structures presented here differ among themselves with regard to small-scale artefact concentrations, which indicate working areas, and in their degree of dispersion and the intensity with which the interior area of the dwellings has been used (Gelhausen *et al.* 2005). The clarity of the distribution of larger objects at the edges of these find scatters, and the number of refit lines accentuating the borders of the find concentrations, rise with the degree of dispersion of these small clusters of tools. Even if a certain 'temporal trend' is reflected by this dispersion of finds, and by the different amounts of tool types, this does not appear to be too important: if certain types of tools are less well represented the complete 'tool set' is still always present (Kegler 2002).

The dwelling features discussed in this paper are smaller than the trapezoidal dwellings of the Magdalenian and early Federmessergruppen. We were, nevertheless, able to identify some features common to both – the trapezoidal floor plan, partitioned into sectors both rich and poor in finds, and a clearly defined area with a high density of finds around the hearth. The Mesolithic dwellings of Ulkestrup II type (Grøn 1995; Wenzel 2002) also share exactly these characteristics. The dwelling structures of the Final Palaeolithic and the Mesolithic, which hardly left any evident traces, underline, in conjunction with several other arguments (e.g. Baales 2002), the high degree of mobility of Allerød and Holocene populations, and the regularity with which they moved their dwelling sites.

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