

## SUMMARY

In the present work it has been demonstrated that the find concentrations of the area 96-99 of the late Palaeolithic site Niederbieber can be interpreted as short term, relatively contemporaneous single task activity areas. These areas have generally been used for hunting preparation, food consumption and processing of usable faunal remains.

Arguments for this interpretation are based on the comparatively uniform structure of the individual concentrations, which is characterized by at least two opposing zones of maximum find density, the existence of hearths which are mainly fuelled by bones, the dominance of backed pieces within the lithic tool inventories and their general distribution in the immediate vicinity of the hearth, and the almost identical stratigraphic position of the majority of lithic artefacts.

Only the concentrations XVI and XVII A diverge from this set of characteristics in the following points: No hearth could be established and the distribution of their lithic artefacts clearly differs from all other concentrations in the main central area at Niederbieber. However, concentration XVII A clearly cannot be compared with the other concentrations because it does not form a separate concentration but represents a north-eastern scatter of material from concentration IV. Concentration XVI also differs from the general picture. Here, two opposing zones of maximum find density are weakly developed and the significantly smaller number of artefacts in comparison to the other concentrations of area 96-99 seems to indicate less intense activity in concentration XVI. Notably, the relative proportion of tools (19%) in this concentration is the highest, not only in comparison with the other concentrations at Niederbieber but also in a more general comparison of all assemblages of »Federmesser-Gruppen« in the Central Rhineland. Here, the dominance of backed pieces with 61% of the recorded tools is remarkable in contrast to the number of end-scrapers ( $n=1:3.3\%$ ) (**Tab. 13-14. 16**). Although the total number of finds is low, activity zones can also be recognised in this concentration suggestive of activities like projectile repair and/or production and the processing of animal hides, sinews, antlers and bones (**Abb. 117b**).

Despite some disturbance caused by a mechanical digger in concentration VIII the typical distribution pattern with two opposing zones of maximum find density can also be recognised there. Therefore this concentration can be compared to the other concentrations of the area 96-99 and, even though only few burnt, widely scattered lithic artefacts were found, the presence of a hearth in the low find density area between the two zones of maximum find density can probably be assumed. In the northern zone mainly unretouched blanks have been deposited, together with chipped retouch waste indicating an area of tool production. The majority of retouched artefacts were found in the south of the concentration suggesting a zone of tool use. Both zones are indicative of hunting preparation and activities carried out following the hunt (**Abb. 28**).

In contrast to the rather diffuse artefact concentrations VIII, XVI and XVII summarised above, the other concentrations of the 96-99 surface are more distinct in their spatial patterns and display several similarities with each other but also some variation. Seemingly, the concentrations with the highest (concentration IX) and the lowest (concentration X A) artefact density are very different, however, the spatial patterns of both concentrations are in fact comparable (**Abb. 30. 51**). By contrast, the activities carried out here are only partially the same. While it is probable that in concentration X A only activities related to »hafting and retooling« were carried out, in concentration IX activities which are connected with fauna processing also seem to be present, probably because the area was occupied for a longer period. This interpretation is suggested by a »tool free« zone in the south-eastern artefact scatter, which may result from cleaning of animal hides (**Abb. 35**). Later activities can be traced in the north-eastern part of the artefact concentration by an accumulation of chalcedony artefacts and a cluster of burins (**Abb. 31b. 35b. 39b**).

Concentration X, which is located close to the southeast of concentration IX, is connected to concentration IX not only by its vicinity to the latter, but also by the occurrence of Tertiary quartzite and re-fittings connecting the two concentrations. Thus, these two concentrations can be regarded as relatively contemporaneous. The spatial distribution of the lithic artefacts and the type of activities carried out are also comparable between the two concentrations. In both concentrations different zones indicate »hunting preparation« and »processing activities after the hunt« (**Abb. 49**). In the larger zone of maximum artefact density the mapping of lydite/indurated schist artefacts reveals a special knapping place of this raw material, which is also clearly zoned (**Abb. 42a**).

In contrast to the concentrations described so far the concentrations XI, XIV and XV are not dominated by one raw material, but by a heterogeneous lithic raw material spectrum (**Tab. 4. 6; Abb. 13**). In concentration XI Tertiary quartzite, chalcedony and indurated schist each represent approximately a third of the inventory. In concentration XIV chalcedony (39 %) and indurated schist (45 %) are almost equally represented, while Tertiary quartzite is underrepresented with only 9 %. Chalcedony is the dominant raw material in concentration XV, but Tertiary quartzite and, more rarely, indurated schist are also present. In concentration XV a cache of two larger pieces of chalcedony indicates that people provisioned themselves with regional raw materials and furthermore stored up these materials. The various raw materials in concentrations XI, XIV and XV cannot be distinguished stratigraphically and thus cannot clarify settlement dynamics. The distribution pattern of these concentrations corresponds to the aforementioned pattern for area 96-99. At least two zones of maximum artefact density are separated from each other by an area of low artefact density, within which burnt faunal remains and burnt lithic artefacts indicate the existence of a hearth. In the artefact concentration, especially in the vicinity of the hearth various activity zones can be noted. These activities can be characterized with the terms »hunting preparation« and »processing activities after the hunt« (**Abb. 66b. 100b. 110**).

While the concentrations described so far can generally be interpreted as »open air sites«, three further concentrations in the area 96-99 display similar features indicative of the presence of dwelling structures. These are concentration XII, XIII and XVIII. Two zones of maximum density also exist within these artefact accumulations, which are all clearly dominated by a single raw material. The areas with low artefact density are again marked by the presence of burnt faunal remains and burnt lithic artefacts indicative of hearths.

A special feature is a hearth (F1) in concentration XIII located outside the artefact scatter around which activities outside the dwelling structure have taken place (**Abb. 90**). At the north-western limit of concentration XII a special scatter possibly represents the seated position of a flint knapper (**Abb. 69a. 76b**). The activities conducted within the dwelling structures can be considered as identical to each other. These artefact concentrations all display indications of activities connected to hunting preparation (hafting and retooling) and of processing activities following hunting episodes (processing of usable faunal remains).

The patterns described above can also be found in the concentrations V, VI and VII, which were excavated before 1996 and exhibit comparable spatial patterns, artefact assemblages and structures (**Pläne 7-15**). In these concentrations the backed pieces are the dominant tool class. Similar activities as in the areas 96-99 can therefore be assumed to have been performed there (cf. Husmann 1988; 1989; Thomas 1990; Freericks 1989; 1991; Korn 1993). The two concentrations I and IV represent exceptional cases. Besides having an evident hearth structure in the centre of the concentrations, the artefact assemblages are clearly larger than in the other concentrations of the main internal excavation area (**Pläne.1-6**). These two concentrations also contain a higher number of lithic tools (cf. **Tab. 13-14**). In contrast to the other concentrations of the main excavation area the spatial patterns of concentrations I and IV are blurred and unclear due to intensive occupation and consequently the zones of maximum artefact concentration are hard to identify (**Pläne 1. 4**). Furthermore, with over 97 % (concentration I) and almost 92 % (concentration IV)

chalcedony is the dominant lithic raw material (**Tab. 3**). The exceptional position of these two concentrations is further emphasised by the assumption that both concentrations presumably accumulated within a dwelling (Gelhausen et al. 2004a; 2004b).

Study of settlement duration indicates that the concentrations of the main inner excavation area represent relatively short episodes. Common to all the concentrations are the comparably even spatial patterning of the lithic artefacts, the clearly distinct locations of the lithic scatters and the evident decrease of artefact density at the limits of each concentration. This pattern, which is reflected on all concentrations of the area 96-99, is a clear indication for hardly disturbed or blurred remains of activity areas used for a relatively short time.

The homogeneous picture of the concentrations of the area 96-99 is further sustained by the proportions of modified lithic artefacts as well as their horizontal patterning. The backed pieces can generally be found in the immediate surrounding of the hearths, which have been identified by the accumulation of burnt finds. This distribution pattern and the dominance of these tools among the modified artefacts suggest activity zones associated with »hafting and retooling«. Beside these conclusions obtained directly from the archaeological remains, the results of archaeological experiments also support a relatively short occupation period.

A method proposed by J. Richter (1990) to test archaeological material for settlement duration was applied to the assemblages of area 96-99, but failed to deliver adequate results. Values calculated using an index of specialization would suggest that the artefact concentrations result from a longer occupation of the main Niederbieber excavation area. This result is however contradicted by the results from the analysis of the archaeological remains.

The vertical distribution of all lithic artefacts, both > 1 cm and < 1 cm, indicates a single settlement event within the main internal excavation area of Niederbieber, because the majority of both classes of lithic artefacts were found in the excavation level b (**Tab. 28-29**). Only a few pieces of chalcedony in concentration IX and area VI might represent later singular episodes.

Beside the similar spatial patterning and the main occurrence of the lithic artefacts within level b, the relatively contemporaneity of the concentrations of the main excavation area is further supported by several significant refittings, which connect the concentrations of the main excavation areas with one another.

Models of the spatial behaviour of the »Federmesser-Gruppen« in the Central Rhineland as well as of the reconstruction of settlement dynamics on the promontory at Niederbieber are oriented towards the size of the occupied territory, which is estimated by the distances to the resources of the exogenous raw materials. The size of this territory is in accordance with that of regions used by modern hunter-gatherer groups. In this territory a settlement system of »home ranges« with base camps occupied for longer periods (Kettig?) and relatively briefly used, single-activity hunting camps (Niederbieber) is conceivable.

A comparative study of the concentrations at Niederbieber with further sites from this period in Central Europe reveals that comparable spatial patterns of the lithic artefacts and similar tool inventories can also be found outside the Central Rhineland. These display a relatively high uniformity in their spatial structuring as well as in the function of the analysed concentrations, which emphasises the shared cultural identity of the Central European »Federmesser-Gruppen« (cf. most recently Kegler 2007).

(Translated by Sonja B. Grimm and Martin Street).