Late Glacial Hunter-Gatherers in Westphalia - The Final Paleolithic Site of Salzkotten-Thüle (District of Paderborn, North Rhine-Westphalia, Germany)

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Zusammenfassung – Der spätpaläolithische Fundplatz von Salzkotten-Thüle, Kreis Paderborn, wurde 2001 während der Ausgrabungen einer kaiserzeitlichen Siedlung des 1. Jahrhunderts n. Chr. entdeckt und ausgegraben. Das Fundspektrum setzt sich ausschließlich aus Steinobjekten zusammen, wovon ca. 80 % als Artefakte und ca. 20 % als natürliche Trümmer und Hitzetrümmer anzusprechen sind. Als Rohmaterial wurde vor allem lokal vorkommender baltischer Feuerstein (ca. 95 %) sowie in geringen Mengen Keratophyr und Kieselschiefer verwendet. Das Grundformspektrum setzt sich vor allem aus Abschlägen (ca. 50 %), Klingen/Lamellen (ca. 15 %) und artifiziellen Trümmern (ca. 5 %) zusammen. Daneben kommen 21 Kerne (< 1 %) vor. Die technologische Analyse konnte eine opportunistische Operationskette ohne klar trennbare Phasen der Kernpräparation und des Grundformabbaus rekonstruieren. Das Werkzeuginventar spiegelt derweil das typische Gerätespektrum eines Federmesserfundplatzes Nordwesteuropas wider. Kratzer dominieren dabei mit ca. 50 % der Geräte, wobei diese typischerweise an massiven Abschlägen gefertigt wurden. Ebenfalls häufig vertreten sind rückengestumpfte Formen (ca. 30 %), darunter Rückenspitzen. Stichel und Endretuschen sind nur wenige vorhanden. Hervorzuheben sind rückengestumpfte Formen mit Basisretusche, die die Frage nach dem Vorhandensein von chronologisch empfindlichen Malauriespitzen eröffnen. Gemeinsam betrachtet stellen Typologie und Technologie den Fundplatz eher in einen späten Abschnitt der Federmessergruppen, in eine Zeit zwischen der zweiten Hälfte des Allerød-Interstadials und dem Beginn der Jüngeren Dryaszeit, also zwischen ca. 11 500 und 10 800 calBC. Neben der technologischen und typologischen Analyse wurde auch eine detaillierte räumliche Analyse durchgeführt, wodurch zwei Modelle der Lagerplatzstruktur rekonstruiert werden konnten. Hierbei ist das Vorhandensein einer Behausung von großer Bedeutung für die Interpretation. Insgesamt zeigt der späte Federmesserfundplatz von Salzkotten-Thüle neben den beiden einzigen anderen ausgegrabenen Federmesserfundplätzen Westfalens – Westerkappeln und Rietberg – dass die Westfälische Tieflandsbucht während des gesamten Allerød-Interstadials ein potentielles Habitat für Jäger und Sammler darstellte.

Schlüsselwörter – Spätglazial, Spätpaläolithikum, Federmessergruppen, Azilien, Westfalen, Technologie, Typologie, räumliche Analyse

Abstract – The final Paleolithic site of Salzkotten-Thüle, district of Paderborn, was discovered and excavated in 2001 during the excavation of a Germanic settlement of the first century AD. The finds are composed of stone objects only, of which ca. 80 % can be designated as artifacts, while ca. 20 % are natural chunks and thermally altered chunks. Locally available Baltic flint was the main employed raw material (ca. 95 %), while keratophyre and siliceous schist were only used in small amounts. The technological analysis led to the reconstruction of an opportunistic reduction sequence without clearly separated stages of preparation and blank production. Meanwhile, the set of stone tools is characteristic for a northwestern European *Federmesser*-site. Both typology and technology place the site within a rather late stage of the *Federmesser*-groups between the second half of the Allerød-Interstadial and the beginning of the Younger Dryas, i. e. between ca. 11,500 and 10,800 calBC. Besides the technological and typological analysis, the examination also included a spatial analysis, which led to two different models of site structure. The existence of a dwelling is of great importance for interpretation.

Keywords – Late Glacial, Final Paleolithic, Federmesser-groups, Azilian, Westphalia, Technology, Typology, spatial Analysis

Introduction

Recent archaeological research in different regions of northwestern and central Europe has shed much light on human history of the late Glacial. Especially well analyzed sites of the so called *Azilien* or *Federmesser*-groups (cf. Schwabedissen 1954) in Northern France and in the Neuwied Basin in the German Rhineland led to a better understanding of this period. In contrast, well preserved and thoroughly analyzed sites are comparably rare in the Northwestern European Plain in Germany, Belgium, and the Netherlands. This is especially the case for Westphalia.

In 2001 the remains of a final Paleolithic camp were discovered during the excavation of a pit dwelling in a settlement of the first century AD (*Römische Kaiserzeit*) in Salzkotten-Thüle, which is located near Paderborn in the west of Germany (Bérenger 2002 a; 2002 b. Westf. Mus. f. Arch. 2002; Baales 2005). During the subsequent detailed excavation of the Paleolithic remains about 3,000 stone artifacts came to light, while bones or organic remains were not preserved in the sandy layer. Unfortunately, the Germanic pit dwelling turned out to have disturbed the concentration of Paleolithic artifacts right in the center. Nevertheless, the overall distribution of artifacts reveals the shape of the Paleolithic camp and still offers excellent chances for the reconstruction of settlement patterns and processes. The stone artifact assemblage of the 2001 excavation has been analyzed in the context of an M.A. thesis (*Magisterarbeit*) at the Institute of Prehistoric Archaeology at the University of Cologne (Heidenreich 2007). The examination included typological, technological, and spatial analyses.

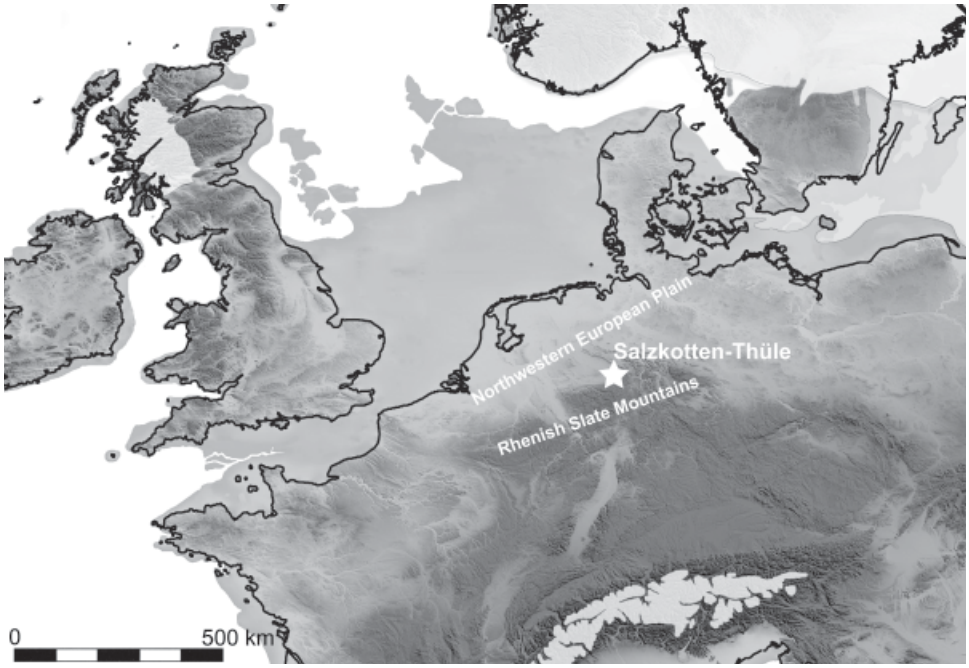


Fig. 1 Location of Salzkotten-Thüle in northwestern Europe during the Allerød-Interstadial (= Greenland Interstadial 1c-a after Björk et al. 1998, ca. 12000 – 10000 calBC). Black line marks present coastline. Map composed by Grimm 2008 after Weaver et al. 2003, Lundqvist/Wohlfarth 2001, Boulton et al. 2001, Ivy-Ochs et al. 2005, Clark et al. 2004.

Location of the site

The site is situated east of the little village Thüle, about four kilometers north of Salzkotten (district of Paderborn, North Rhine-Westphalia). Its surrounding area constitutes the very southeastern part of the Westphalian Cretacious Bay, which opens towards the Northern German Lowlands (*Norddeutsche Tiefebene*) to the northwest. The mountainous region of the Rhenish Slate Mountains (*Rheinisches Schiefergebirge*) is situated about 20 kilometers south of Thüle (**Fig. 1**).

The finds of Salzkotten-Thüle could be recovered southeast of a former dune that cannot be recognized any more today, but existed at the time the Paleolithic hunter-gatherers occupied the place (**Fig. 2;** Bérenger 2002 a). A little creek can be found about three hundred meters north of the site. As running waters of the region developed during the Allerød-Interstadial (Geol. Landesamt NRW 1995, 88), its existence during the late Glacial human occupation of the site can be assumed. Accordingly, the hunter-gatherers of Salzkotten-Thüle set up their camp in the protecting "shade" of a dune with water supply nearby.

Lithic Analysis – General preservation and raw material

The 2001 excavation yielded 2,957 stone objects with a total weight of 5,956 g, of which 2,291 specimens could be designated as artifacts. The remaining part is composed of natural and thermally altered chunks (**Fig. 3**). All in all, the assemblage is relatively small-sized. The length in knapping direction of 1,999 artifacts is between 10 and 30 mm. Only 240 pieces are completely preserved in length and width. Additionally, a very high proportion of the assemblage (n=1,526, ca. 50 %) is burnt.

The employed lithic raw material consists almost entirely of Baltic flint (**Fig. 4**), which could be collected by the hunter-gatherers in the moraines of the Northern German Lowlands. Raw pieces of very little size in the assemblage, which were surely not collected by the Paleolithic hunter-gatherers, additionally prove the existence of this material in the immediate vicinity of the site. There are also some pieces of probable different origin - namely siliceous schist (*Kieselschiefer*) and some volcanic material, most probably keratophyre. Siliceous schist could be brought to the site from the Rhenish Slate Mountains, but also from other locations. The same is true for keratophyre, whereas this material could also originate from Scandinavia and could eventually have been collected in the moraines. Unfortunately, the former residence of the hunter-gatherers of Salzkotten-Thüle cannot be derived from the employed raw material.

Blank production and typology of tools

The artificial blanks of the assemblage are dominated by flakes, blades and bladelets, and artificial chunks (**Fig. 3**)[1]. Besides, there are 21 cores (6 blade-

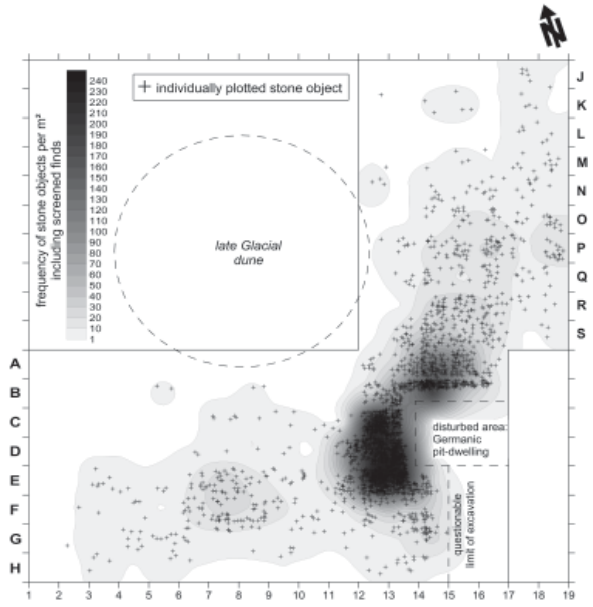


Fig. 2 Salzkotten-Thüle. Distribution of individually plotted stone objects and interpolation of all stone objects per m² including screened finds

blank	n	%
flake	1540	52,08
flake	1531	51,78
preparation flake	7	0,24
core tablet	2	0,07
laminar flake	64	2,16
blade/bladelet	455	15,39
blade/bladelet	432	14,61
primary crested blade	22	0,74
secondary crested blade	1	0,03
artificial chunk	142	4,80
core	21	0,71
bladelet core	15	0,51
flake core	6	0,20
artifact < 10 mm	66	2,23
burin spall	3	0,10
thermally altered chunk	331	11,19
natural chunk	335	11,33
natural chunk	325	10,99
natural chunk < 10 mm	4	0,14
frost sherd	6	0,20
total	2957	100,00

Fig. 3 Salzkotten-Thüle. Quantities and percentages of blanks.

let cores and 15 flake cores), that make up less than 1 % of the total assemblage (**Fig. 5**). The technological analysis led to the reconstruction of an opportunistic reduction sequence without clearly separated stages of preparation and blank production (**Fig. 6**). Rather thick flakes for the production of end scrapers and burins as well as blades and bladelets for the production of backed laminar pieces were repeatedly produced during the knapping process, while cores were prepared just as needed.

The 2001 excavation yielded 121 artifacts with intentional retouches and additionally 3 projectile insets without intentional retouch. These specimens can be designated as projectile components according to impact fractures (**Fig. 5, 8-10**). Also, there is a splintered piece, so that all in all 125 artifacts can be designated as tools (**Fig. 7**). Scrapers dominate the tool assemblage with nearly 50 %, while backed laminar pieces make up about 30 % (including backed points). The backed laminar pieces are in a very fragmented state, which does in most cases not allow a designation as either backed point or backed bladelet. Burins and truncations are present in small numbers only.

The typology of tools corresponds to the typical set of a northwestern European *Federmesser*-site of the Allerød period (ca. 12,000 to 10,800 calBC). Here it is important to mention that the scrapers have mainly been produced on rather thick flakes (**Fig. 5, 12-14**), while scrapers on blades do only represent a small amount (**Fig. 5, 15; Fig. 7**). Also important is the appearance of specimens with basal retouch among the backed laminar pieces (**Fig. 5, 5-7**), that raise the question of the presence of Malaurie-points (cf. Célérier 1979). One backed point with impact fracture ("step terminating bending fracture" and "spin off" after Fischer/Hansen/Rasmussen 1984) and a marginal basal retouch can – indeed – not be designated as a typical Malaurie-point (**Fig. 5, 5**); however, it is indicated by the backed laminar pieces with basal retouch that this point type might have been present on the site.

Chronological position

The chronological position of Salzkotten-Thüle can only be set on the basis of lithic analysis. As no organic remains were preserved, no samples could be

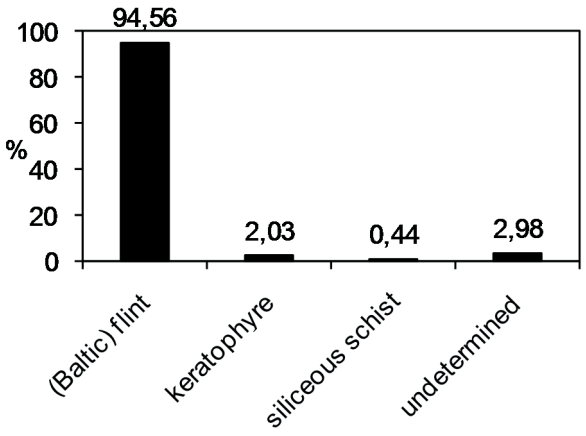


Fig. 4 Salzkotten-Thüle. Employed raw material.

collected for absolute dating. The stone tools allow to view the site in the context of the final Paleolithic *Federmesser*-groups (cf. Schwabedissen 1954), according to the characteristic tools described above.

If Malaurie-points have actually been present in Salzkotten-Thüle, this would place the site within a rather late period of the *Federmesser*-groups, as this point type usually appears on sites dated to the late Allerød (e. g. Bodu 2000; Bodu/Valentin 1997; Baales/Jöris 2001). On the basis of the technological analysis such a chronological position can indeed be verified. The lack of a distinct separation between phases of core preparation and blank production as it could be reconstructed for Salzkotten-Thüle (see above; **Fig. 6**) corresponds to late *Federmesser*-sites of Northern France (Bodu/Valentin 1997).

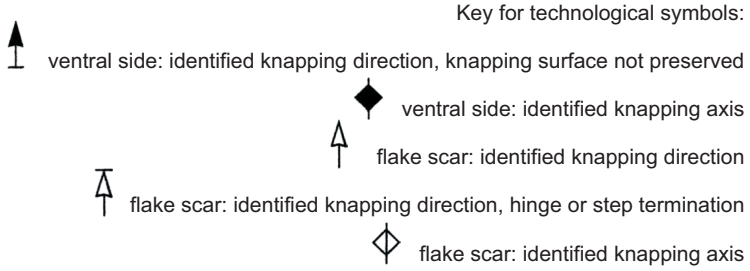
Eventually, due to typological and technological characteristics in comparison to other *Federmesser*-sites, the site of Salzkotten-Thüle can most probably be dated to a time between the middle of the Allerød and the beginning of the Younger Dryas, i.e. a time period between ca. 11,500 and 10,800 calBC (cf. Bodu 1995; Bodu 1998; Célérier 1979; Coudret/Fagnart 1997; Fagnart 1997; Baales/Jöris 2001; Waldmann/Jöris/Baales 2001).

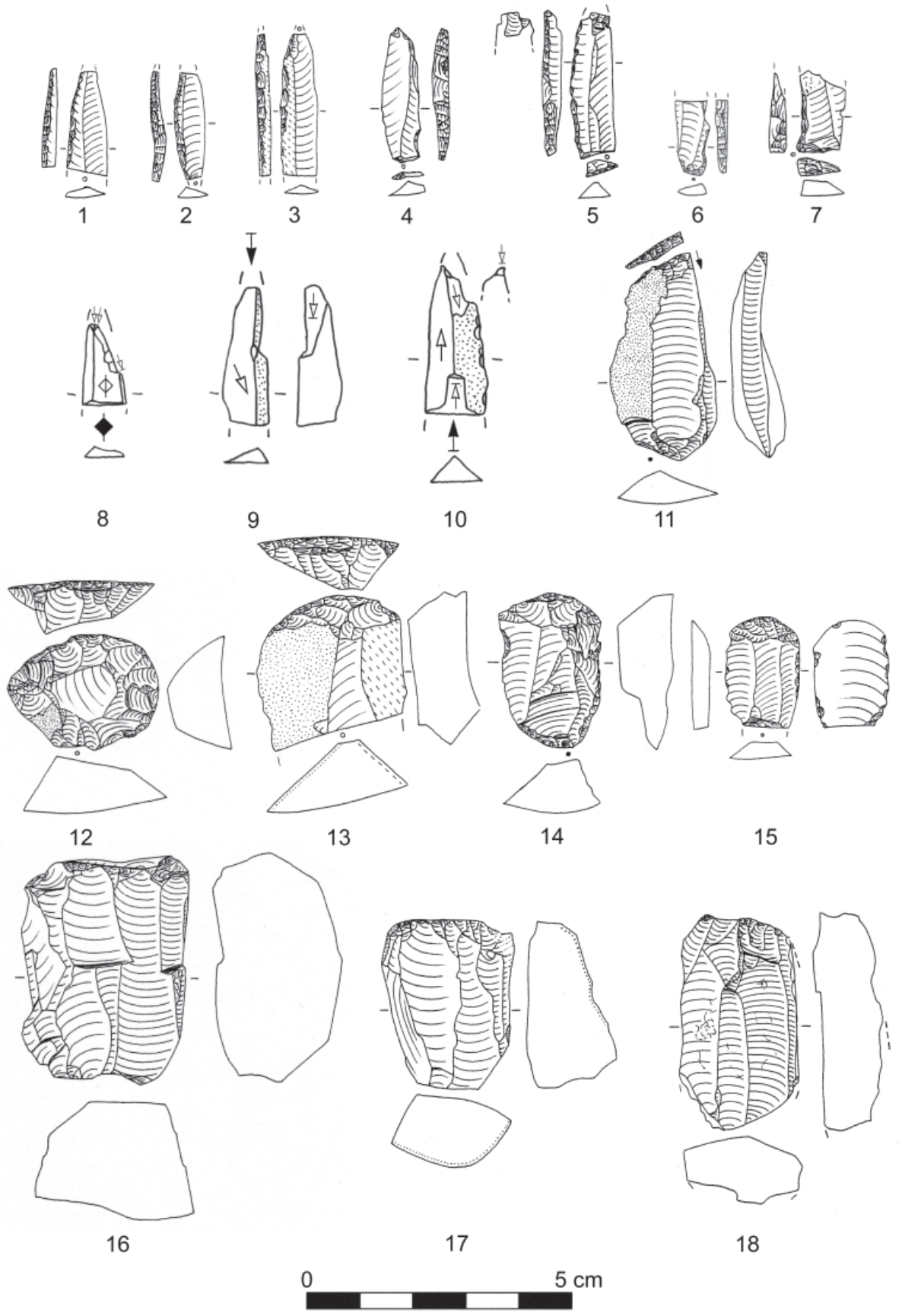
Spatial analysis

As a great amount of artifacts (ca. 2,400 of the almost 3,000 recorded specimens) were individually plotted during excavation, the site of Salzkotten-Thüle was very well suited for a detailed investigation of site structure (cf. Heidenreich 2009). Accordingly, different areas of activity could be reconstructed on the basis of certain distribution patterns.

In general, the distribution of stone objects shows a main concentration in the southeast with a clear limit of artifact concentration in the west and a rather unclear limit in the north (**Fig. 2**). An additional small concentration can be found in the western part of the site. Fireplaces can be reconstructed in the center of each concentration according to the distribution of burnt artifacts. Mapping out different types of artifacts (e.g. tools, cores, blanks with cortex) shows significant differences between the main and the small concentration (Heidenreich 2009). Eventually, the site can be separated in a main area of activity in the east with obviously "trampled" pieces in the north and a special task area in the west, which was used after the initial phases of the stay. The whole process of knapping from core preparation to blank and tool production took place in the main area of activity. Special tasks such as butchering and hide scraping could be recognized after use wear analyses of selected scrapers from the small concentration (Sano 2007). Hide scraping could also be detected in the main concentration. If such activities can actually have taken place in the main area of activity, depends on the existence and location of a dwelling, especially because of available space. The significant limit of artifact concentration between the two activity areas indicates a considerable barrier, which can

Fig. 5 (rechts) Salzkotten-Thüle. Stone artifacts. 1-4 backed points; 5 backed point with marginal basal retouch and impact fracture; 6-7 backed laminar pieces with basal retouch; 8-10 non-retouched point with impact fracture; 11 burin on truncation; 12-15 scraper (12-14 on flake, 15 on blade); 16-18 bladelet cores.
Drawings by A. Müller, Außenstelle Olpe of the Westfälisches Amt für Bodendenkmalpflege (1-7, 11-18) and S. M. Heidenreich (8-10).

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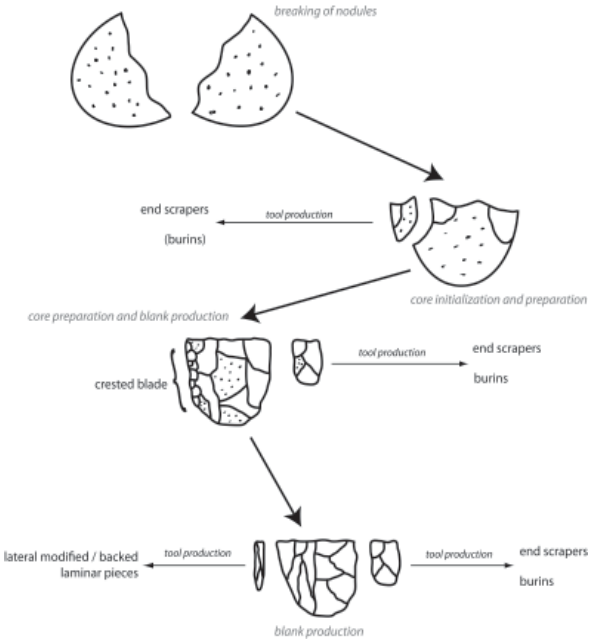

Fig. 6 Reduction sequence (Chaîne opératoire) of the (late) Federmesser-groups, reconstructed according to stone artifacts of Baltic flint from Salzkotten-Thüle.

be explained by the wall of a dwelling (Gelhausen/Kegler/Wenzel 2004). Accordingly, a possible tent was most probably set up in the area of the eastern fireplace (**Fig. 8**). Its entrance was most probably situated in the north, indicated by "trampled" artifacts. In this case, activities like butchering and hide scraping have surely not taken place within a small tent, as sufficient space is needed for these actions. Thus, the camp would have been divided into two separate activity areas (**Fig. 8**). However, a final conclusion concerning a probable tent above the main concentration is difficult because of the disturbance caused by the pit dwelling of the first century AD and because of the limits of the excavation. Alternatively, a possible tent on late Paleolithic sites could also have been put up outside the area of dense artifact distribution (cf. Bolus 1992), its position again being indicated by „trampled" artifacts (**Fig. 9**). In this case a tent might have existed in the north, at the edge of artifact distribution. Its entrance would have been in the south with an orientation towards the main activity area. The barrier of artifact distribution west of the main concentration could then be explained by a wind shade, for example. If there was no dwelling above the main concentration, all activities could have taken place in this open air area, as there would have been sufficient space (see detailed discussion in Heidenreich 2009).

tool	n	% total	% tools
backed point	**8**	**0,27**	**6,40**
backed laminar piece	**32**	**1,08**	**25,60**
scraper	**60**	**2,03**	**48,00**
scraper on flake	49	1,66	39,20
scraper on blade	11	0,37	8,80
burin	**4**	**0,14**	**3,20**
truncation	**6**	**0,20**	**4,80**
combination tool (scraper/burin)	**1**	**0,03**	**0,80**
splintered piece	**1**	**0,03**	**0,80**
point	**6**	**0,20**	**4,80**
notched/denticulated piece	**1**	**0,03**	**0,80**
other modification	**6**	**0,20**	**4,80**
total	**125**	**4,23**	**100,00**

Fig. 7 Salzkotten-Thüle.
Quantities and percentages of tools.

Conclusions

All in all, the late Paleolithic site of Salzkotten-Thüle represents a typical *Federmesser*-camp. It was put up by hunter-gatherers living in a period with a relatively mild climate – the Allerød-Interstadial. The late Glacial interstadial complex (Meiendorf ~ GI-1e / Oldest Dryas ~ GI-1d / Bølling-Older Dryas-Allerød ~ GI-1c3 – GI-1a; cf. Björck et al. 1998; Litt et al. 2007), which started at about 12 700 calBC (Jöris/Weninger 2000), had already shown its impact on the environment of central Europe. Vegetation had become quite dense compared to the preceding Pleniglacial (Litt/Stebich 1999), which also led to the disappearance of reindeer and an increase of forest animals like deer and moose (Baales 2002; Street 1986). As the resources of a local region were limited, hunter-gatherers were facing a stress situation of subsistence (Floss 1994) and had to adapt to the environmental changes. This is reflected by camps that cannot be differentiated into different types like in the preceding Magdalenian (cf. Julien 1988; Adouze 2006). The *Federmesser* landuse pattern consists of short term residential camps only, of which Salzkotten-Thüle is a typical example. All activities known from *Federmesser*-sites as derived from the tool kits can be reconstructed at this site (cf. Baales 2002; Bolus 1992; De Bie/Caspar 2000). The site of Salzkotten-Thüle therefore confirms the general concept of *Federmesser* subsistence. Meanwhile, the topic of *Federmesser* habitat sizes is still in the focus of research (e.g. Kegler 2007; Baales 2002; Newell/Constandse-Westermann 1995) and cannot be addressed here, as the archaeological record from Salzkotten-Thüle is not sufficient in this regard.

Summing up, the hunter-gatherers of Salzkotten-Thüle probably put up a light tent and only stayed for a couple of days. They gathered Baltic flint, produced needed tools, hunted local animals and gath-

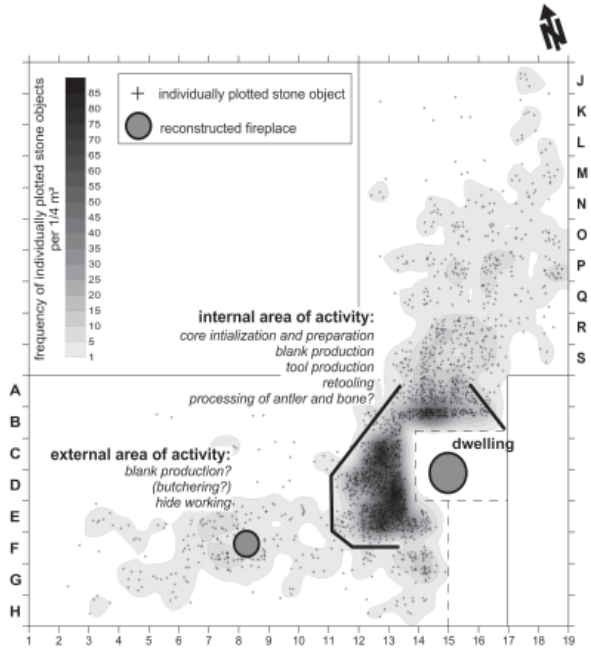

Abb. 8 Salzkotten-Thüle. Reconstruction of activity areas, model No. 1.

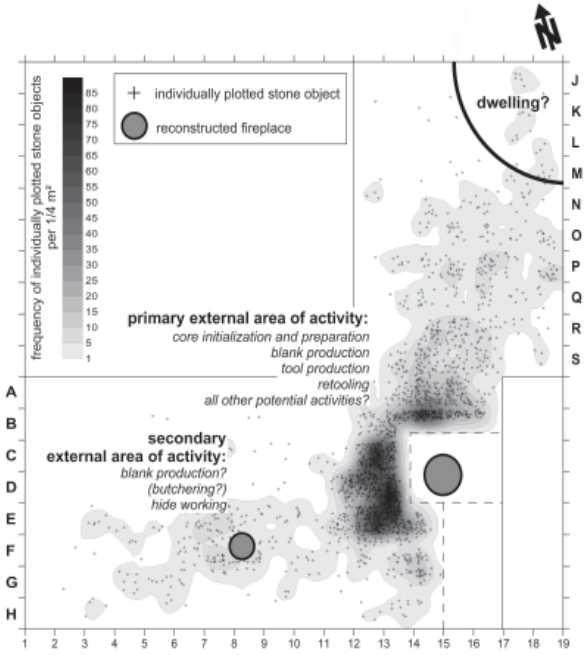

Abb. 9 Salzkotten-Thüle. Reconstruction of activity areas, model No. 2.

ered plants in the region. Perhaps they came from the southern Rhenish Slate Mountains, from where they could have brought some pieces of siliceous schist and keratophyre. After their stay they could have moved farther north into the Northern German Lowlands.

Besides Westerkappeln (Günther 1973) and the early *Federmesser*-site Rietberg (Adrian 1982; Richter 2001), Salzkotten-Thüle is the only *Federmesser*-site in Westphalia that has been analyzed in detail. As the results of this analysis speak for a late chronological position within the *Federmesser*-period, the three sites together prove that the Westphalian Cretacious Bay was a potential habitat for hunter-gatherers during the whole late Glacial Allerød-Interstadial.

Notes

[1] According to the lenght-width index of blades and bladelets a seperation of these usually distinguished blank forms is not useful for Salzkotten-Thüle.

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