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Wesseling – A Federmessergruppen settlement on the banks of the Rhine

Wesseling – Eine Federmessergruppen-Siedlung am Ufer des Rheins

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ABSTRACT - Wesseling is one of 70 Federmessergruppen (FMG) sites known in the Rhineland. It is located on the banks of an ancient dry Rhine channel that must have been filled with water during and after the period of settlement. A high flood loam accumulated by the late glacial Rhine has covered and preserved the location. The site was discovered in 2007 and excavated in 2008. A settlement area of at least 800 m² was detected, including twelve activity zones. Additional activity zones must have been present, but were probably destroyed during the construction of a detention camp in World War II. In addition to latent structures – mostly reconstructed from artefact distribution – evident features, such as hearths and cobble pavings of different form and size, were found. Eight of the twelve activity zones consist of accumulations of stone artefacts, partially combined with hearths. Two of these zones show lithic artefacts conjoined with cobble paving. Furthermore a single hearth, a cobble paving interspersed with bones and a paving without attributed finds were documented. The function of these activity areas was not always different but in some cases identical. With the exception of one large multifunctional activity zone that appeared to have played a central role within the settlement and comprised more than 1,500 artefacts and a hearth which had been utilized for a long period of time, all of the other, significantly smaller, features can be interpreted as highly specialized short term work spaces, especially for making and repairing hunting tools (hafting and retooling areas). The refitting of artefacts from the same nodule in different areas, or plotting the same varieties of raw material, suggest the contemporaneity of all finds and features at Wesseling. Four radiocarbon dates of around 11,500 to 11,300 calBC place the settlement in the middle of the late glacial Allerød Interstadial (phase GI-1c1). The site confirms excavation evidence from the last two decades that Federmessergruppen settlements could occupy large areas and consist of several separate activity zones of different size, function and duration. With twelve such zones distributed over an area of 40 x 20 m and the possibility of additional settlement features which have been destroyed, Wesseling is one of the larger Federmessergruppen sites in central and north-west Europe.

ZUSAMMENFASSUNG - Wesseling ist einer von 70 bekannten Federmessergruppen-Fundplätzen im Rheinland. Der 2007 entdeckte und 2008 ergrabene Platz liegt an einer heute trockenen Altrheinrinne, die zur Zeit der Besiedlung noch Wasser geführt haben muss. Vom spätglazialen Rhein abgelagerte Hochflutlehme haben den Fundplatz überdeckt und konserviert. Bei den Ausgrabungen konnte ein mindestens 800 m² großes Siedlungsareal mit zwölf Aktivitätszonen erfasst werden. Weitere derartige Zonen scheinen durch die Errichtung eines Kriegsgefangenenlagers (Weltkrieg II) verloren gegangen zu sein. Neben latenten Befunden – hauptsächlich Artefaktstreuungen – wurden evidente Strukturen wie Feuerstellen und Geröllpflaster freigelegt. Von den Aktivitätsbereichen mit teils unterschiedlichen, teils identischen Tätigkeitsschwerpunkten gaben sich acht durch Akkumulationen von Steinartefakten, z.T. kombiniert mit Feuerstellen, zu erkennen. In zwei Zonen fanden sich Artefaktstreuungen zusammen mit Geröllpflastern. Weiterhin wurde eine singuläre Feuerstelle, ein mit Knochen teilweise durchsetztes Geröllpflaster sowie ein Steinpflaster fast ohne Begleitfunde dokumentiert. Mit Ausnahme einer großen, aus gut 1'500 Artefakten und einer Feuerstelle bestehenden multifunktionalen Aktivitätszone, die im Rahmen der Besiedlung von zentraler Bedeutung war, handelt es sich bei den anderen, kleineren Befunden um stärker spezialisierte und kurzfristige Werkplätze, die mehrheitlich als "hafting & retooling-areas" interpretiert werden. Zusammensetzungen von Artefakten sowie knollen- und rohmaterialgleiche Stücke in verschiedenen Zonen des Platzes legen die absolute Gleichzeitigkeit aller Befunde nahe. AMS-Daten zwischen 11'500 und 11'300 calBC weisen Wesseling in die Mitte des Allerød-Interstadials (Phase GI-1c1). Das Gesamtbefundbild in Wesseling bestätigt die in den letzten Jahren gewonnenen Erkenntnisse, wonach Federmessergruppen-Fundplätze aus mehreren separaten Aktivitätszonen von unterschiedlicher Größe, Funktion und Nutzungsdauer bestehen und große Flächen einnehmen können. Mit zwölf Zonen auf einer Fläche von 40 x 20 m und vermutlich weiteren durch Bodeneingriffe zerstörten Befunden gehört Wesseling zu den größeren Federmessergruppen-Fundstellen in Mittel- und Nordwest-Europa.

KEYWORDS - Rhineland, Allerød, Federmessergruppen, settlement site, spatial and functional organisation, activity areas, evident and latent settlement structures, lithic artefacts, raw material
 Rheinland, Allerød, Federmessergruppen, Siedlungsplatz, räumliche und funktionale Gliederung, Aktivitätszonen, evidente und latente Siedlungsstrukturen, Steinartefakte, Rohmaterial

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Introduction

Our knowledge of the Federmessergruppen in north-western Europe during the Allerød period is closely connected to excavations at prominent Rhineland sites like Niederbieber (Bolos 1992; Baales 1998, 2003; Gelhausen 2007a, 2007b), Andernach-Martinsberg (Schwabedissen 1954; Bolos 1984, 1991; Kegler 1999, 2002), Kettig (Baales 2002), Urbar (Baales et al. 1996), Bad Breisig (Waldmann et al. 2001; Baales & Jöris 2002) or Miesenheim II (Street 1986). Settlement structures as well as plant and animal remains have been exceptionally well preserved beneath several metres of tephra of the Laacher See Volcano. These findings offer windows into the past regarding the lifeways and environment of Final Palaeolithic hunter-gatherers. Due to the excellent preservation of organic materials, the sites in the central Rhine valley provide unique information not available from other regions. Approximately 250 sites are known from the Rhine-Meuse-Schelde area bordering to the northwest of the central Rhineland (Fig. 1). However, the position of these sites on aerobic loess, clay and sandy soils usually leads to the decay of organic materials. Generally only lithic artefacts are preserved, whereas bones only survive if they were burnt (e.g. Lauwerier & Deebe 2011).

According to the significant number of sites known so far, the alluvial plain between Rhine and Schelde appear to have been a favoured settlement area of the Federmessergruppen (see De Bie & Caspar 2000; Deebe & Rensink 2005; De Bie & Van Gils 2006). Such a density of sites from that period is unique in north-western and central European contexts (Fig. 1).

Some important sites in Belgium including Meer II (Van Noten 1978; Van Noten et al. 1989), Rekem (De Bie & Caspar 2000) or Lommel (Verheyleweghen 1956; Van Gils & De Bie 2004) rendered fundamental insights into Final Palaeolithic camp organisation and settlement dynamics.

In the southern Netherlands Federmessergruppen sites regularly occur on dry ridges of cover sands and sometimes on edges of terraces above small streams and silted-up channels (Deebe & Rensink 2005, 186). Some of those sites, for example Milheeze (Bohmers 1960 a, 1960 b; Arts 1988, 2012), Geldrop (Deebe 1988, 1994) or Westelbeers (Snijders 2000), have only been investigated by small scale excavations.

Excavations in the adjoining loess soils of the Lower Rhine to the east, where some 70 sites are known, have concluded that no intact find layers were preserved. Therefore, for a long time it remained unclear whether undisturbed Federmessergruppen sites were to be expected. The discovery of the Wesseling site in 2007 demonstrated the existence of well-preserved sites and showed in which areas and under which geological conditions they can be preserved (Heinen 2008; Heinen 2014; Heinen et al. 2010).

Site conditions

The Wesseling site is located between Cologne and Bonn at the southern border of the town of Wesseling, upon the western lower terrace of the Rhine which is up to 5 km wide (Fig. 2). Here, most of the flat terraces are segmented by various ancient channels of the Rhine which are remains of the late Ice Age braided river system. The site is situated at the edge of one of these palaeo-channels which is 100 m wide and 4-5 m deep and has a southwest to northeast orientation (Fig. 3). These channels seem to have formed at the end of the Oldest Dryas, when the braided stream cut into the lower terraces (Klostermann 1992, 146). Until the Allerød period, terrace edges were flooded during periods of high water. Initially sediments like sand and gravel were deposited but during the later part of the interstadial only high flood loams were deposited.

The find layer at Wesseling is deposited within the uppermost level of the clays, some 20 to 40 cm below the plough zone (Fig. 4). The vertical distribution of finds ranges from 15 to 35 cm and increases in thickness towards the channel. The finds were horizontally embedded in the sediment and showed hardly any indication of geodynamic shifting or bioturbation that might have led to a redeposition of the artefacts. Judging by the position of the finds within the high flood loam, the dwelling place must have been flooded several times after occupation. A slow current along the slip-off slope mainly led to the accumulation of sediments, resulting in the good preservation on site.

The site's setting close to a channel is typical for north-west European lowland Federmessergruppen. It can be assumed that the channel was filled with water during the settlement period; though it is still to be established whether it was connected to the river system only periodically during periods of flooding or all year around.

Discovery, Preparatory and excavation techniques

The site was discovered within the framework of an assessment of the archaeological potential of a 23-hectare field. A test trench was opened alongside the palaeo-channel revealing several blue-white patinated silex artefacts characteristic of the Federmessergruppen period in the Lower Rhine area. Due to its unique find situation within the northern Rhineland the decision to investigate a larger area was taken quickly. Targeted digging carried out in proximity to the place where the first artefacts had been found, indicated a settlement area of at least 600 m². Further excavations were conducted over an area of 1,100 m². 70 % of all the artefacts were excavated *in situ* and recorded three-dimensionally.

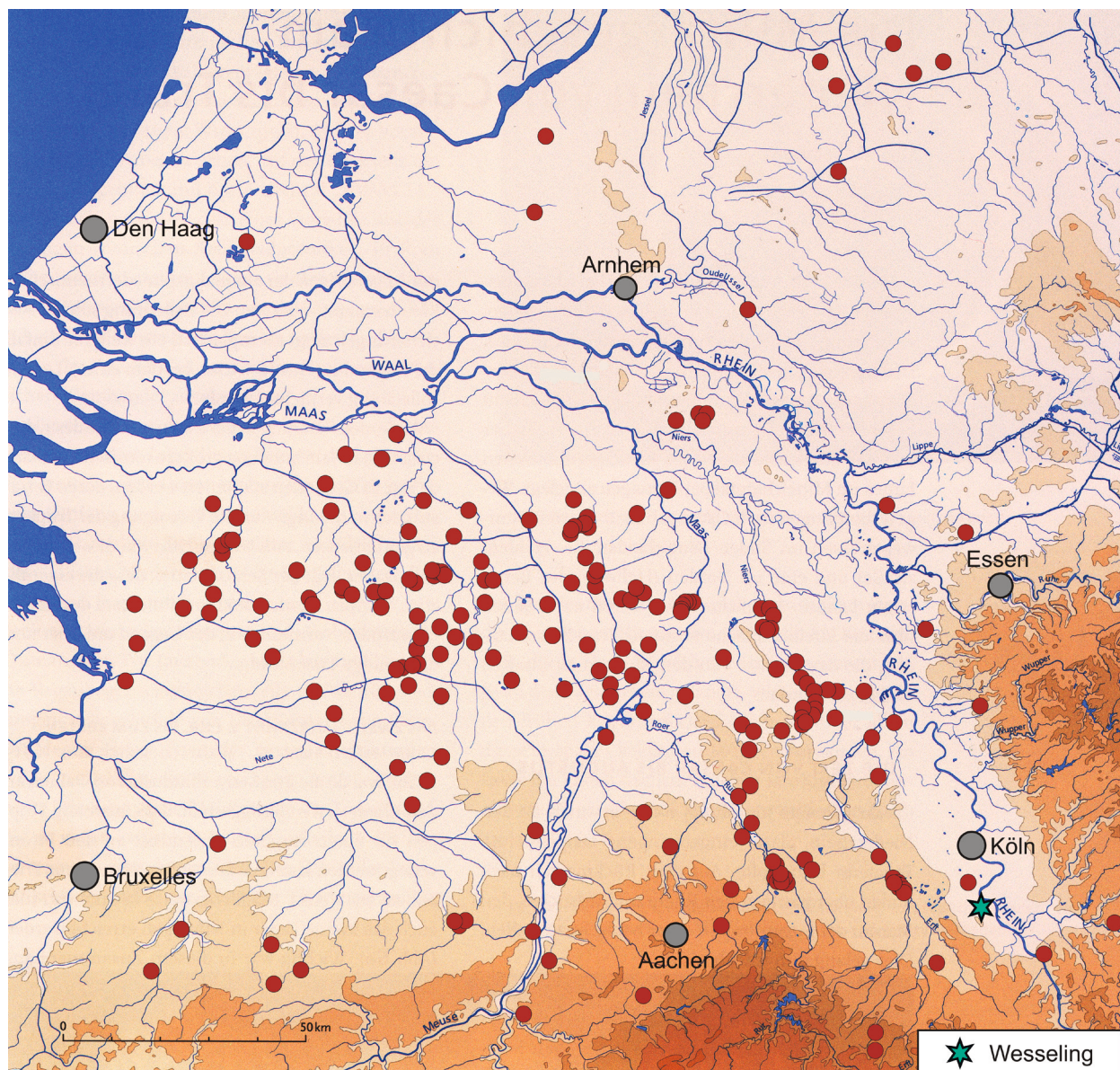


Fig. 1. The wetland plains of the Rhine-Meuse-Schelde-region have the densest distribution of Federmessergruppen sites in Central and Northwest Europe.

Abb. 1. Im wasserreichen Rhein-Maas-Schelde-Gebiet findet sich die größte Dichte an Federmessergruppen-Fundplätzen in Mittel- und Nordwesteuropa.

The remaining artefacts were recovered by wet-sieving sediments through 5 mm fine-meshed sieves.

Preliminary examinations already showed that parts of the site had been destroyed during the construction of a detention camp in World War II (Fig. 5). Fortunately, major areas of about 700 m² had been preserved.

Excavations were conducted in spring and summer of 2008, in cooperation with the Prehistory Department at Cologne University. Taking into consideration the previous unsuccessful excavations of Federmessergruppen sites along the Lower Rhine, the results of this excavation exceeded all expectations. Thousands of stone artefacts were unearthed, as well as finds and features previously unknown for Federmessergruppen.

Features

Excavations revealed latent structures, mostly in the form of artefact distributions, but also more evident findings such as hearths and flat cobble pavings (s. below). Both types of features were found individually and in combination. Overall, they represent activity zones of various occupation foci as well as identical occupation foci.

Despite large disturbances suggesting an incomplete record of the site, the distribution of finds shows a settlement area of at least 40 by 20 metres (Fig. 6). It includes at least twelve activity zones (I – XII). Eight of them can be distinguished by accumulations of stone artefacts, partially combined with hearths (I – VIII). Two zones (V, XI) show lithic artefacts combined with



Fig. 2. The lower terrace in the area of the Wesseling site is characterized by numerous ancient Rhine channels of the late Pleistocene braided river system.

Abb. 2. Die Niederterrasse im Umfeld des Fundplatzes Wesseling ist gekennzeichnet durch zahlreiche Altrheinrinnen des spätpleistozänen "braided river systems".

cobble paving. Furthermore, a single fireplace (IX), a cobble paving interspersed with bones (XII) and a paving without attributed finds (X) could be documented.

Latent Features

The following section will present the latent features, their differences in size, composition and the function of activity zones III and VII.

Zone III: Activity area III was closest to the channel than any of the other areas and was located at the transition towards the sloping bank. With more than 1'500 artefacts this area contains the largest number of finds at Wesseling. The concentration is not completely preserved at the edges. However, it seems to be a circular to slightly oval structure of about 5 or 6 m in diameter. Figure 7 shows the slightly concentric distribution pattern which is typical for flint accumulations in Palaeolithic and Mesolithic settlements. The distribution of the finds in the zone is primarily a result of intensive blank production, overprinted during a later stage of settlement activities. All characteristic pieces of the production process, such as cores, flakes, blades, chips and debitage were found here. Three

raw materials were mainly used: Tertiary quartzite (60.3 %), Vetschau/Orsbach flint (33.3 %) and Lousberg flint (5.5 %).

In the southern part of the find distribution, numerous burnt artefacts as well as a 2 m² concentration of partially red coloured, thermally fractured quartz gravel, indicate the position of a hearth (Fig. 7), which had been used over a long period of time (Fig. 8). The bulk of the burned silex is distributed to the north and northwest of the hearth, indicating repeated clearing of the hearth. Pieces of pine charcoal (*Pinus sylvestris*) were found under several of the quartz fragments and were radiocarbon dated. These samples yielded three statistically identical dates, corresponding to the period of the technocomplex (s. below).

The locally made blanks were used to fashion backed points and bladelets for projectile points, as well as typical Federmessergruppen domestic tools, including short scrapers and small burins (Fig. 9). Notched and lateral retouched pieces were produced, along with a small number of awls and truncations. Modified artefacts accumulated to the north and west of the hearth (Fig. 8), where the main activities of zone

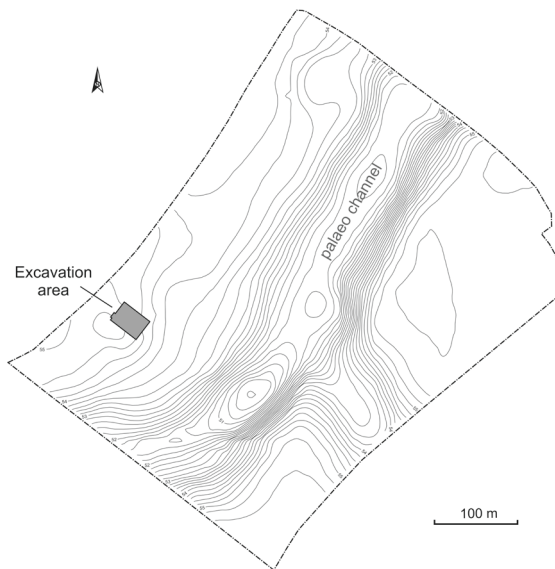


Fig. 3. The site is located some 100 m from the ancient Rhine channel, which must have been periodically full of water during the phase of settlement.

Abb. 3. Der Fundplatz liegt ca. 100 m von der Altrheinrinne entfernt, die zur Zeit der Besiedlung zumindest periodisch Wasser geführt haben muss.

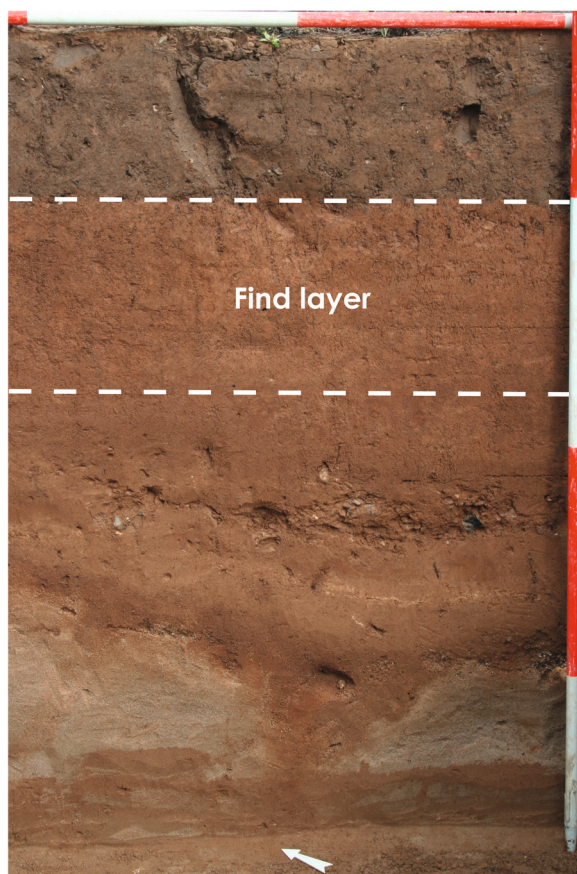


Fig. 4. The 20 – 40 cm thick find layer is located directly below the plough zone.

Abb. 4. Die 20 – 40 cm starke Fundschicht befindet sich unmittelbar unterhalb des Pflughorizonts.

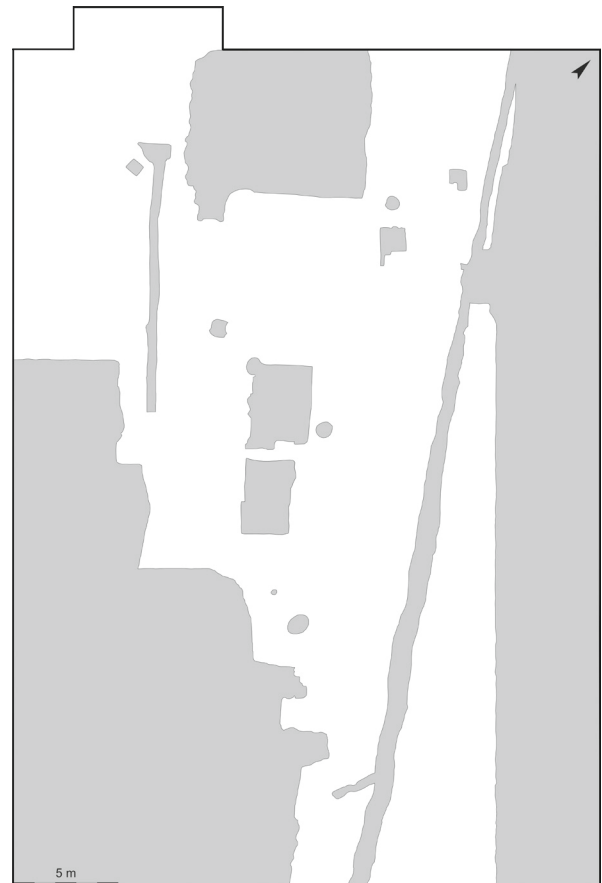


Fig. 5. The excavation area was greatly disturbed by construction of a detention camp in World War 2. (Disturbances = grey areas).

Abb. 5. Das Grabungsareal war durch die Errichtung eines Kriegsgefangenenlagers im Weltkrieg II großflächig gestört (Störungen = graue Flächen).

III took place. 26 of a total of 30 scrapers were discovered around the hearth, demonstrating a special focus in this area of the settlement. Burins are relatively rare in the assemblage ($n=5$). However, eleven burin spalls hint at the existence of additional burins which were probably produced and sharpened or used around here. Several modified artefacts and modification debitage from unique raw materials, including backed points, scrapers, burins and burin spalls, can be regarded as a basic tool kit brought to the site from a previous occupation.

Zone III has nine different tool types and thus shows the greatest diversity in tools of the twelve activity areas. Most of the usual camp tasks were conducted here. None of the other zones at Wesseling has produced comparable evidence of multi-functionality. If the stage of diversity in the tool inventory is considered as a measure of the length of time work areas were utilised or their inter-chronological position (cf. Richter 1990), this area might have been the longest used activity zone at Wesseling. Despite its location at the periphery of the site, it must have been of central importance within the settlement.

Zone VII: A very different kind of activity area is

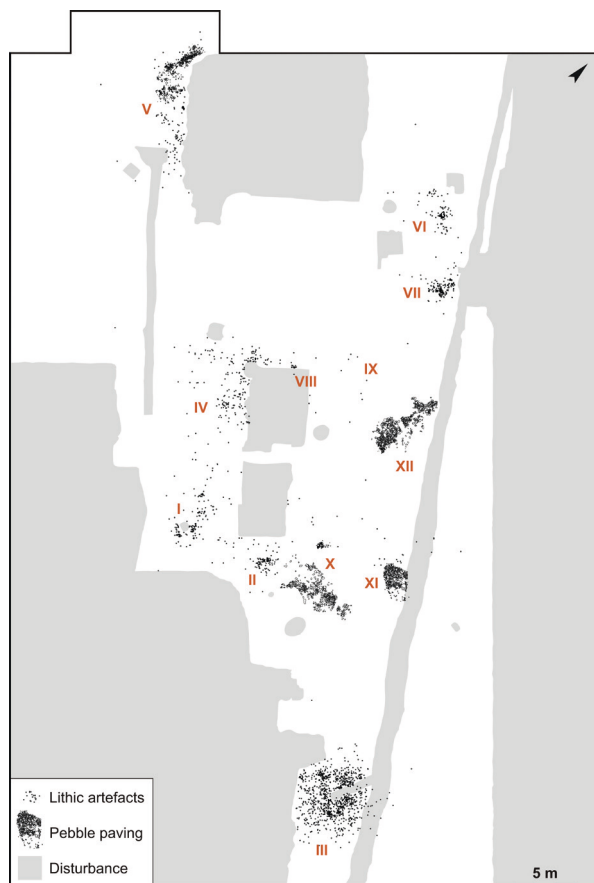


Fig. 6. Distribution map of all finds and features at Wesseling.

Abb. 6. Verteilungsplan aller Funde und Befunde in Wesseling.

represented by zone VII, located approximately 20 m to the northwest. It is considerably smaller, having a diameter of barely 2 m. Find distribution is made up of almost 200 artefacts, with an anvil like stone of 3.5 kg at its centre (Fig. 10). Flakes and modified products which are all extremely small were found on either side of the anvil. Only one core was recovered. However, blank production was carried out at a certain level, mainly using Meuse gravel flint (61.3 %), Vetschau/Orsbach flint (21.8 %) and Meuse flint found as Tertiary beach pebbles ("Maasei-Flint"; 12.6 %).

Some of the lithic artefacts were found clustered together at the southern side of the large stone. This small concentration marks a drop zone, suggesting a person sitting and knapping flint to the south of the stone facing north. The activity area includes a hearth, indicated by burnt silex situated some 0.7 m to the north of the stone, within reach of the knapper (Fig. 10). This small activity zone produced sixteen modified pieces and just as much modification debitage. Fragments of backed points and bladelets, as well as 'Krukowski microburins', were laid to the south of the stone, indicating the production of points (Fig. 11). To the north of the hearth, only burins and burin spalls were found.

The structure demonstrates the production or repair of arrows as well as the intensive use, making or

re-sharpening of burins on site. The latter might have also been used in the context of hafting and retooling procedures, perhaps for fettling arrow shafts or removing the remains of pitch from arrows which had already been used and needed to be renewed. In contrast to the large zone III, zone VII is a highly specialized short-term activity area for a few processes of working, conducted here a few times.

Evident features

Some of the most remarkable features at Wesseling are four differently shaped and sized stone pavings. Three of them (zone X–XII) are located at the centre of the site and one (zone V) at the north-western boundary of the excavation (Fig. 6). These pavings are either more or less regular in shape or amorphous and up to 3.5 m in length and 1.7 m in width. They are made of hundreds or more than a thousand differently shaped river cobbles. They contained medium and large sized gravels, but also huge pieces of gravel, measuring up to 30 cm in length (Fig. 12). Where larger sized gravel had been utilised, the stone pavings comprised only a single layer of stones. In other pavings, two and, more rarely, three layers could be observed. So far, stone pavements of similar size have not been observed in the Final Palaeolithic. Just a small round gravel layer of 0.33 m in diameter is known from the Epigravettian period at the Italian site of Riparo Tagliente (Guerreschi 1996, 62). The function of the stone layers has not been fully resolved. The lack of detectable evidence of heat means the pavings were not utilised as hearths. At least two pavings were associated with tools, blanks and debitage (zones V and XI) indicating they may have functioned as work areas or platforms. The pavings might have possibly been covered with grass or leaves to protect against the dampness of the high flood loam.

In particular, the paving of activity zone XI is assumed to be a work zone or a sitting area. Its north-eastern border area is impaired. However, its other boundaries are distinct and form a trapezoid or rectangular shape (Fig. 13). The paving is between 1.5 and 2 m² in area.

A small number of different types of artefacts were found in close spatial association, approximately 1.5 m, directly at the western and north-western edge of the paving (Fig. 14). The occurrence of only a few silex blanks makes preform production rather unlikely. Instead, two burins, two closely associated scrapers, one truncated flake and a flake with use-wear imply other activities, which were not performed intensively or very often at this place. The exact function of two grinding or rubbing stones (see below), each found roughly a metre to the north and west of the paving respectively, remains unclear.

One of the distinct verifiable activities is the reduction of a haematite nodule, of which several flakes were found at the northern edge of the cobble layer. The haematite pieces show no hints of alteration



Fig. 7. Distribution map of all lithic artefacts in activity area III (hearth reconstructed).

Abb. 7. Verteilungsplan aller Steinartefakte in Aktivitätszone III (Feuerstelle rekonstruiert).

or use and thus cannot be connected to the rubbing stones which bear no traces of red pigment.

The nature of workspace XI is hard to grasp. It seems as if several activities have taken place here over a short period of time. The presence of burins, scrapers and probably grinding/rubbing stones

suggests the preparation of organic materials. However, as organic remains are absent at the site, this kind of activity can only be postulated. The debitage of the haematite nodule is the only clearly visible process, but its purpose must be left open to interpretation.

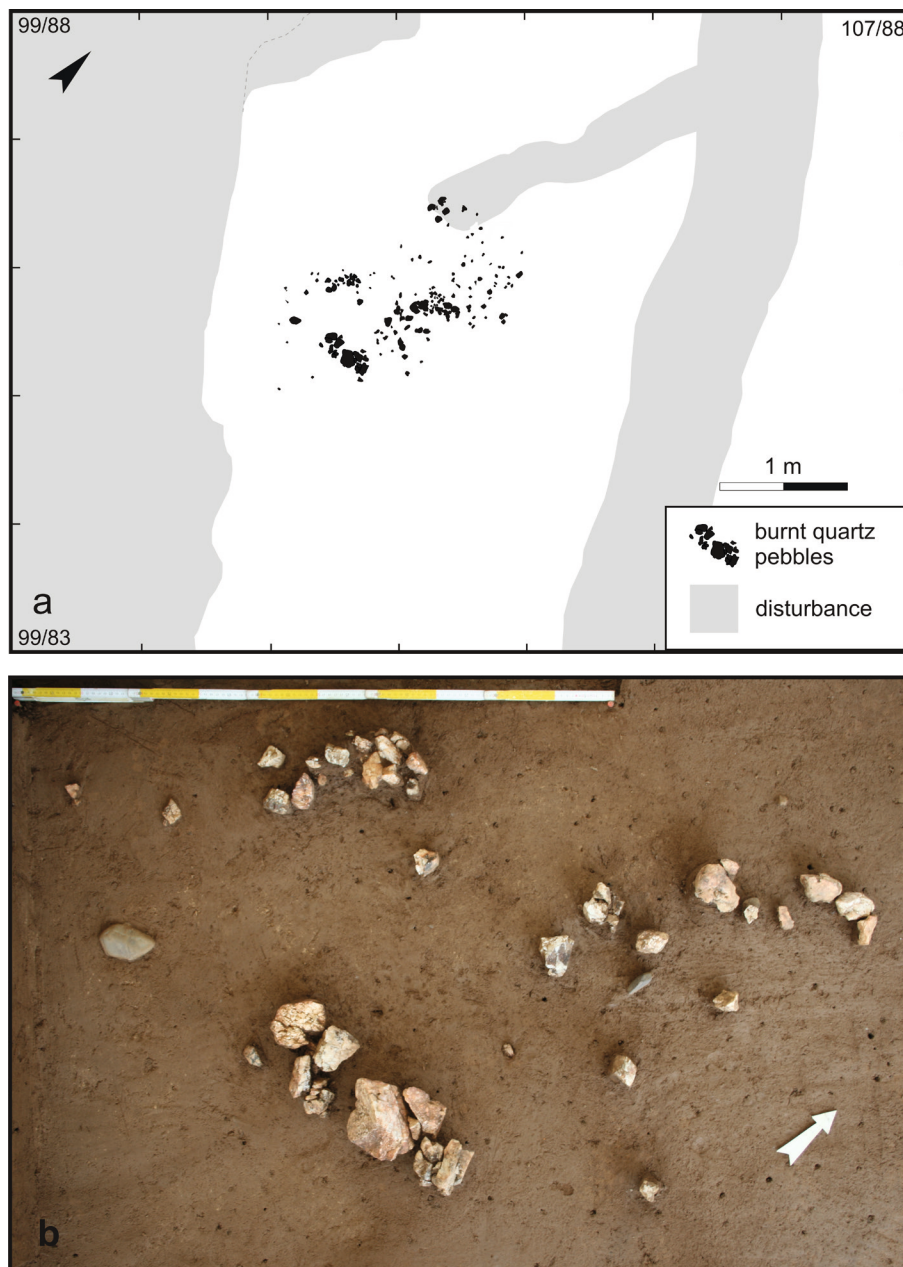


Fig. 8. The location of the long term hearth in activity area III was primarily identified by burnt and thermally shattered quartz cobbles (weight > 10 kg). a: Distribution map of all thermally shattered quartz debitage. b: Larger quartz debitage *in situ*.

Abb. 8. Die Position der lange Zeit genutzten Feuerstelle in Aktivitätszone III zeichnete sich vor allem durch verbrannte und zerplatzte Quarzgerölle (Gewicht > 10 kg) ab. a: Verteilungsplan aller feuerbeeinflussten Quarztrümmer. b: Große Quarztrümmer *in situ*.

Finds

At Wesseling, as at most Palaeolithic sites, stone artefacts are dominant compared to other find categories. In total, there are 2,856 silex artefacts and 36 of other rocks.

Silex artefacts

In comparison to other extensive and subdivided sites, e.g. Rekem (De Bie & Caspar 2000), Meer II (Van Noten 1978; Van Noten et al. 1989), Reichwalde

(Vollbrecht 2005) or Niederbieber (Bulus 1992; Baales 1998, 2003; Gelhausen 2007a), the number of lithic artefacts is small. This difference is so striking, that it must be assumed that some of the former silex materials are missing. This could explain the low refit rate among flaked artefacts. Construction of the war detention camp might have been the cause of destruction of an unknown number of find concentrations.

The silex assemblage contains target flakes and debitage, typically arising in blank production, as well

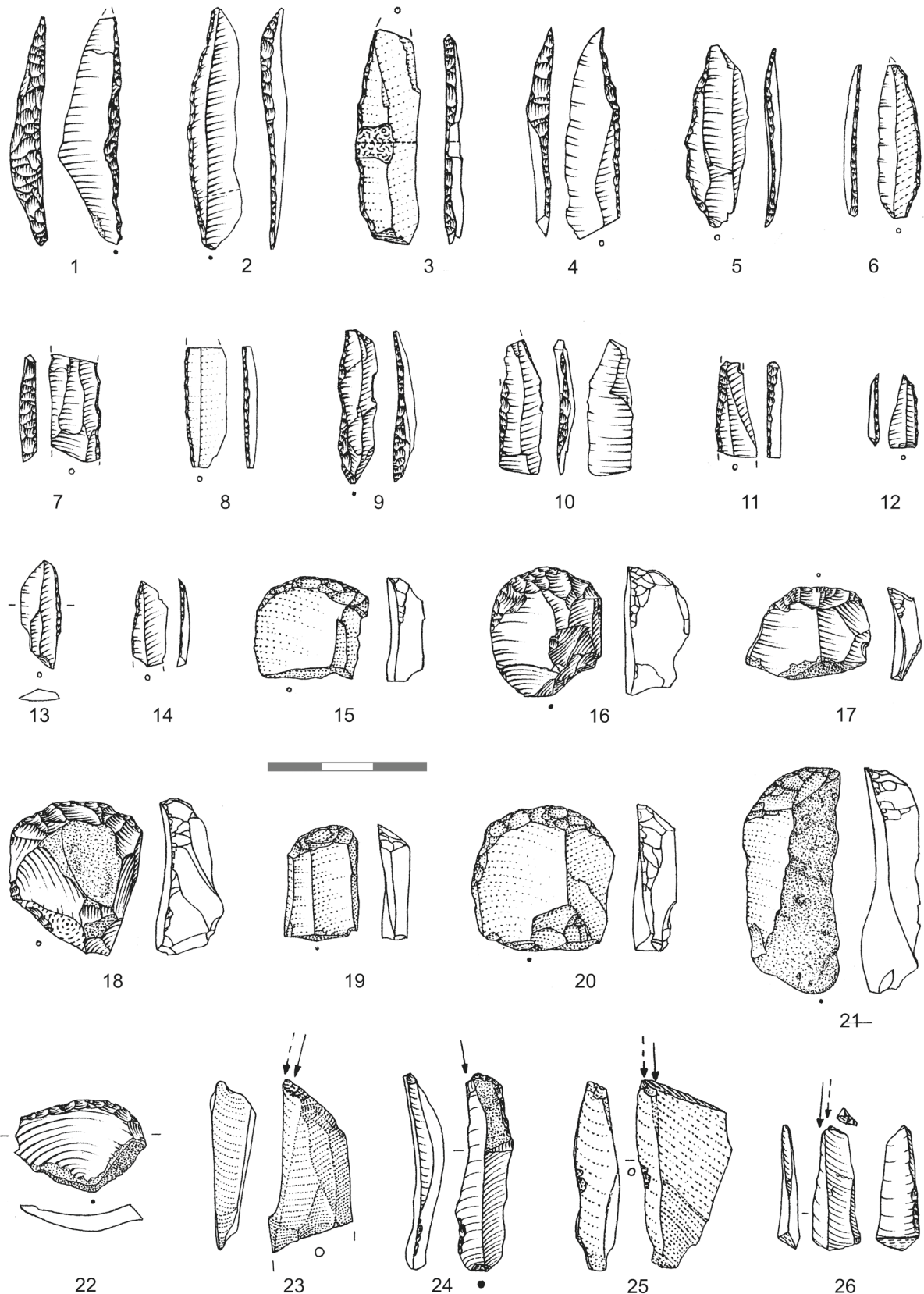


Fig. 9. Tools from activity area III. 1 – 7 backed points (partly fragmented), 8 – 14 backed bladelets (partly fragmented), 15 – 22 scrapers, 23 – 26 burins.

Abb. 9. Geräte aus Aktivitätszone III. 1 – 7 Rückenspitzen (-fragmente), 8 – 14 Rückenmesser (-fragmente), 15 – 22 Kratzer, 23 – 26 Stichel.

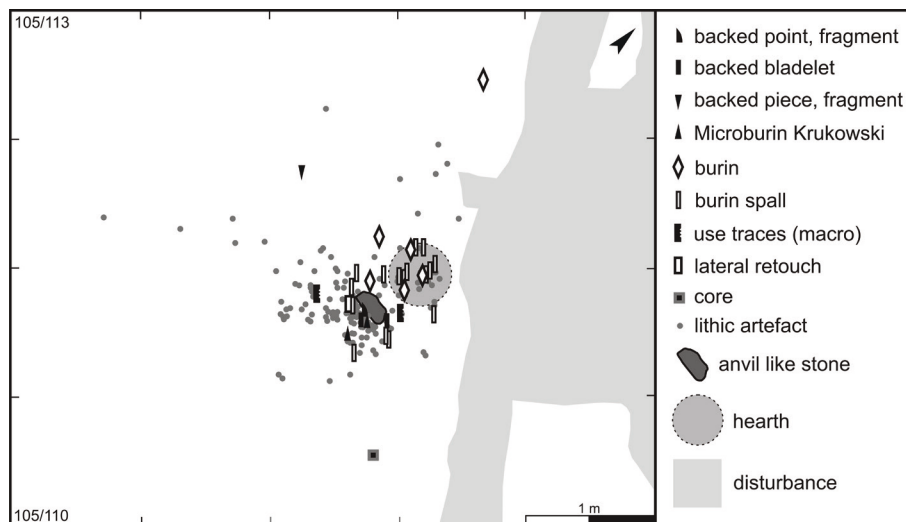


Fig. 10. Distribution map of all lithic artefacts in activity area VII (hearth reconstructed).

Abb. 10. Verteilungsplan aller Steinartefakte in Aktivitätszone VII (Feuerstelle rekonstruiert).

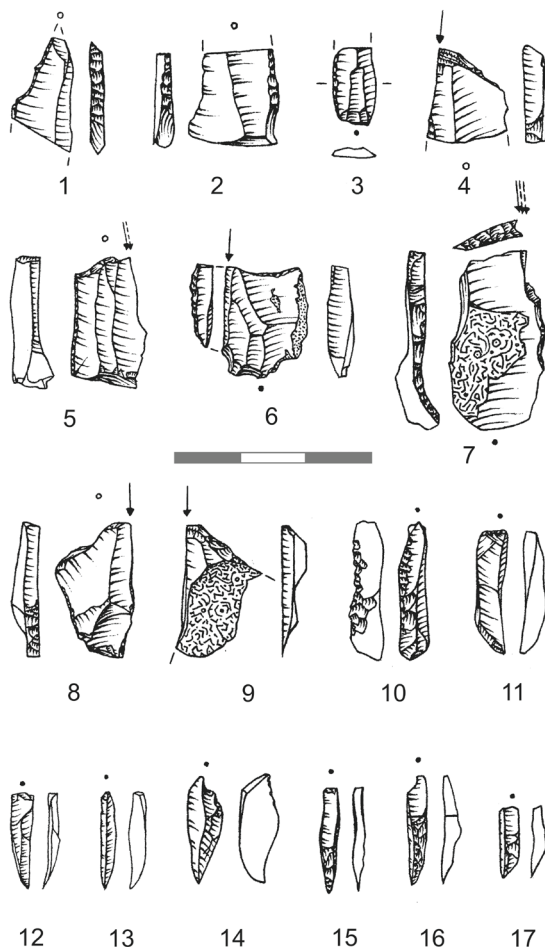


Fig. 11. Tools and modification debitage from activity area VII. 1 backed point (fragment), 2 backed piece (fragment), 3 backed bladelet (fragment), 4 – 9 burins (partly fragmented), 10 – 17 burin spalls.

Abb. 11. Geräte und Modifikationsabfälle aus Aktivitätszone VII. 1 Rückenspitzen (-fragment), 2 rückenretuschiertes Fragment, 3 Rückenmesser (-fragment), 4 – 9 Stichel (teilweise fragmentiert), 10 – 17 Stichellamellen.

as characteristic tools of northwest European Federmessergruppen. Of 2,679 unmodified artefacts 33 are cores, 50 modification discard, 476 blades/blade fragments, 1,198 flakes/flake fragments, 742 chips and 180 debitage. The ratio of modified artefacts (6.2 %) is slightly heightened, probably due to the coarse sieve mesh of 0.5 mm used in wet sieving. Among the modified pieces 46 show use traces (macro), 30 are scrapers; 23 are burins and backed points respectively; there are 20 backed bladelets, 18 lateral retouched pieces, six truncations, four drills and three notched pieces.

The backed points are fragmented, in different stages of production and show a large formal variety. Besides typical Federmessergruppen forms, there are straight and slightly angled backed points (Fig. 9). This variety is also reflected in the backed bladelets. The assemblage contains massive and large specimens of up to 4 cm in length along with remarkably small ones less than 2 cm in length and half a centimetre in width with marginal lateral retouch. Very typical for this period are the generally short scrapers and the small, roughly made burins (Fig. 9).

Silex raw materials

Different types of flint, Tertiary quartzite and chalcedony were used for tool production. Only one backed bladelet is made of black lydite. Flint dominates, representing 60 % of the raw materials, followed by Tertiary quartzite (33 %) and chalcedony (7 %). Both quartzite and chalcedony most likely come from one single deposit. In contrast, the flint comes from a variety of sources. A large part is derived from the region of Aachen. Vetschau/Orsbach, Lousberg and, possibly Simpelveld flint, have been identified. A smaller part is made up of different varieties of Meuse gravel flint which can be found in the Jülicher Börde or further west in hydrologically exposed Meuse terraces.

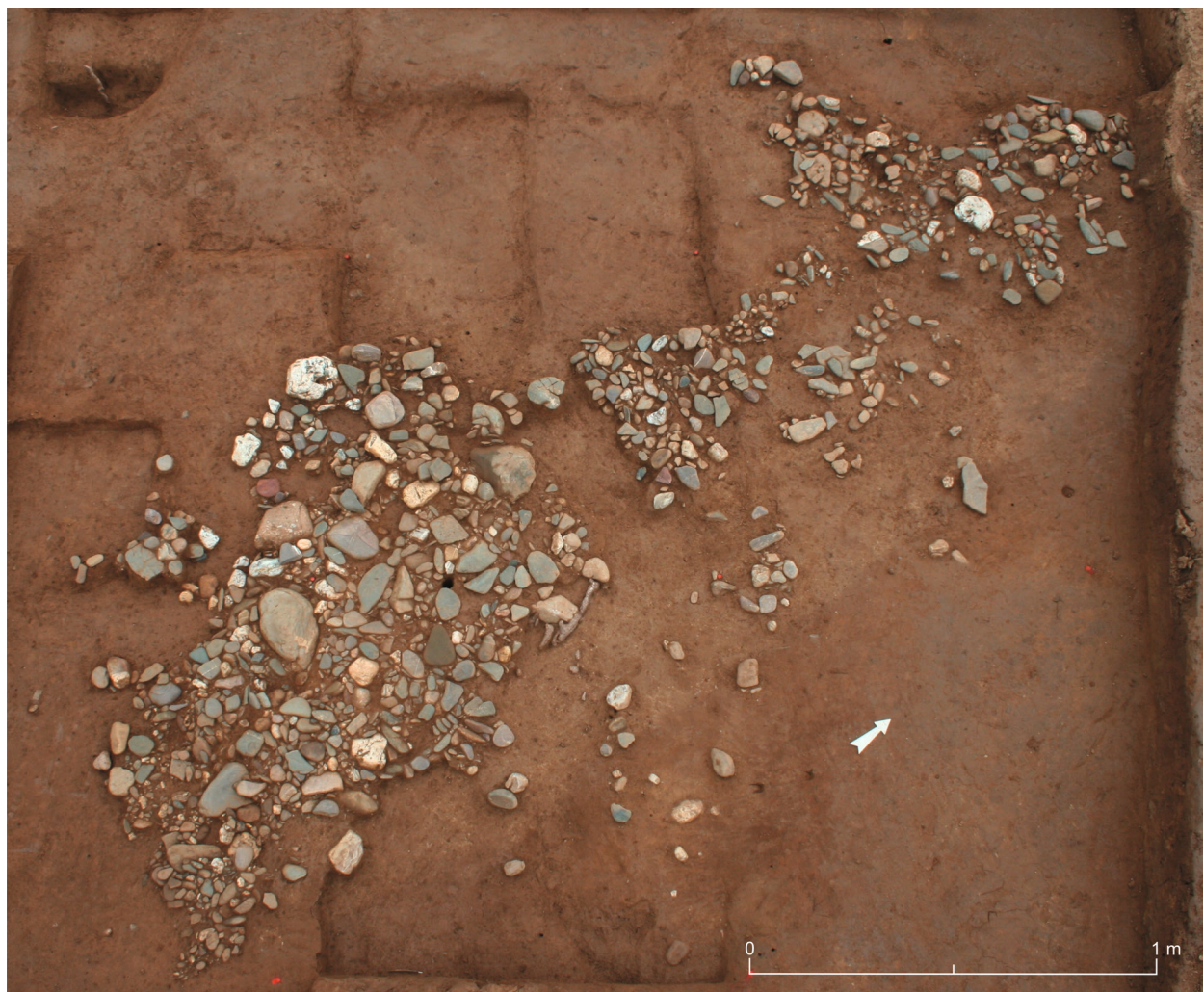


Fig. 12. Large cobble paving in activity area XII.

Abb. 12. Großes Geröllpflaster in Aktivitätszone XII.

To a certain extent Meuse flint reworked into Tertiary beach deposits was also used, from sources prevalent to the west and north of Wesseling. A single core is made of Baltic flint; the southernmost occurrence of this type of flint is the end moraine at Krefeld.

In contrast to flint, sources of Tertiary quartzite and chalcedony can be found to the east and southeast of the site. Possible quartzite sources are numerous in the regions to the west and east of the Rhine and material could also have been retrieved from Rhine gravels. The chalcedony originates from a deposit at Bonn-Muffendorf. This material shows distinctive inclusions of fossil gastropods.

Raw material use at Wesseling is comparable to that of the Central Rhineland, where the materials occur in different proportions at almost every Federmessergruppen site (Floss 1994; Baales 2002; Baales & Jöris 2002; Gelhausen 2007a). In this respect the site differs from other Final Palaeolithic localities further to the north, where Tertiary quartzite and chalcedony become less common with increasing distance from their original source. At sites in the

northern Lower Rhine these raw materials are hardly found at all. Here, Aachen chalk flint and Meuse flint dominate the inventories. Further to the north and northeast, Baltic flint becomes increasingly common.

Silex working

The presence of an almost 8 cm long plunging blade of Tertiary quartzite and a largely refitted flint nodule (Fig. 15) indicate that at least part of the raw material arrived on site as fist sized components. However, several cores on Meuse flint Tertiary pebbles demonstrate that small nodules of just about 4 cm in size, were worked too. Almost all cores show negatives of blades or blade-like flakes. Elongated preforms were the production goal, as was usual for north western and central European Federmessergruppen. Blanks were produced on one or two opposing striking platforms, regularly using one flaking surface. Close to 93 % of the blades from Wesseling are up to 50 mm long. In this respect, they are characteristic of the Federmessergruppen south of the primary Baltic flint distribution, where longer blades are significantly



Fig. 13. Small cobble paving in activity area XI, which has been interpreted as a work area or seating place.

Abb. 13. Kleines, als Sitz- bzw. Arbeitsplatz genutztes Geröllpflaster in Aktivitätszone XI.

more frequent due to the traits of the raw material (Heinen 2005, 68 ff.).

Artefacts of other rocks

Among the more remarkable stone artefacts are an arrow shaft smoother made of sandstone (Fig. 16) and ten partially preserved grinding/rubbing slabs made of quartzitic sandstone (Fig. 17), plus a dozen hammerstones and percussors (Fig. 18) and two retouchers. The arrow shaft smoother was found at the southern border of activity zone V, a place which focused around the production and repair of arrows.

All of the grinding/rubbing slabs are smaller than the size of a palm and less than finger-thin, and were located at the centre of the settlement, in zones I, IV and XI. Two types of slabs are documented, those with a flat working surface, and those with concave surfaces. In both cases, the quartzitic granulation is smoothed due to intensive use. Considering their frequent appearance, they must have had a significant meaning in local tasks. However, neither the analysis of use-wear traces nor analogies from past or contemporary parallels have produced evidence as to how these objects were utilised. Slabs with a flat surface might have been rubbed against each other, maybe to shred

or pulverize materials. Concave pieces rather indicate intensive rubbing and grinding of harder objects, such as bone and antler.

Lignite artefacts

At various locations on site, small objects of lignite with modified edges were encountered that so far have no comparisons within the Final Palaeolithic. Usually they are flat, 2 to 5 cm in size and often of strikingly geometric shape (Fig. 19). There are round, oval, square, rectangular, triangular, roughly trapezoid and polygonal pieces. Several of them have just one straight or bow shaped rim. The latter can likely be seen as preforms or half-finished objects. Thousands of tiny lignite chips demonstrate that these objects were produced on site. Concentrations of hundreds of waste chips presumably indicate production centres.

To date there are no clues as to the function of the lignite objects. Given the geometric shape and a certain similarity to Upper Palaeolithic jet trinkets and objects of art, one is inclined to define these finds as art or adornment. Apart from the likeliness of this interpretation, these objects offer insight into previously unknown spheres of activity of Allerød hunter-gatherers.

Organic finds

As has been stated before, Palaeolithic plant and animal remains only survive in the wet-dry and aerobic loess, loams and sands of the northwest European lowlands when they are burnt. This also applies to Wesseling, where organic matter occurred only as charcoal and tiny calcined bone fragments usually in or close to the hearths.

Unexpectedly, zone XII had a better, carbonate rich environment that rendered bone preservation possible. Within and under the cobble paving a larger quantity of unburnt faunal remains was unearthed (Fig. 20). Their consistency was very similar to that of the surrounding sediment which meant only a few of the up to 25 cm long bones could be lifted. Others were only documented graphically. The bulk of the bones was found below the gravel, indicating that the paving might have covered the debris of hunting and butchery. Both burnt and unburnt bone fragments were not suitable for determination.

Dating

From a typological and technological point of view there is no ambiguity regarding the chronological position of the site. The occurrence of Federmesser-like backed points and small backed bladelets, short scrapers and roughly made burins, in combination with a simple blank production for manufacturing small blades, place Wesseling within the sphere of the Federmessergruppen during the Allerød period.

This is confirmed by four AMS-dates on pine

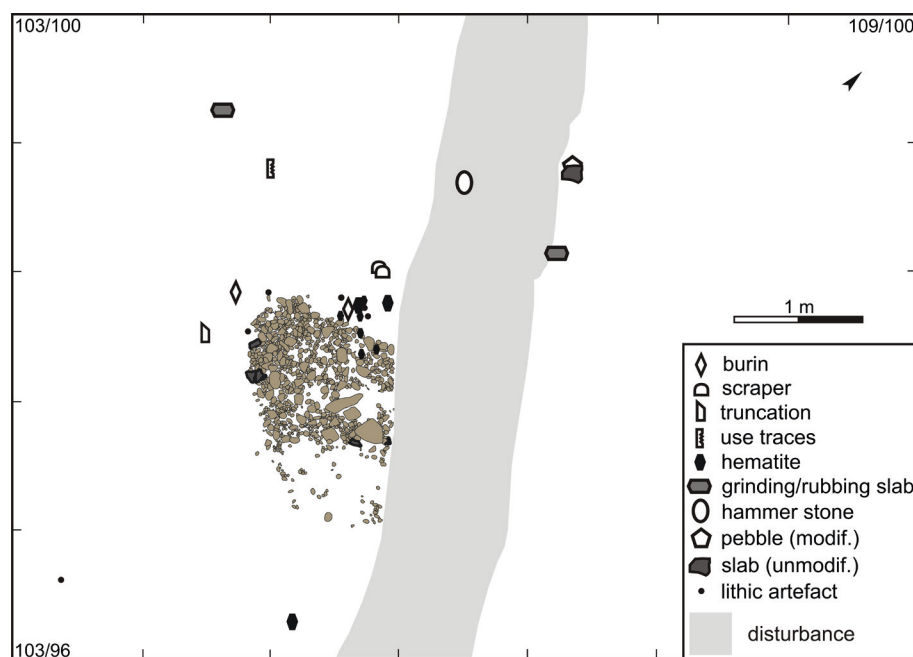


Fig. 14. Flint- and solid rock tools as well as pieces of a fractured nodule of haematite in the immediate vicinity of the cobble paving in activity area XI. modif. = modified; unmodif. = unmodified.

Abb. 14. Silex- und Felsgesteingeräte sowie Teile einer zerschlagenen Hämatitknolle im nahen Umfeld des Geröllpflasters in Aktivitätszone XI.

charcoal which statistically emerge at an identical age (Fig. 21). Three of the samples derive from a hearth in activity zone III, the fourth from the fireplace in zone IX which is 22 m away from zone III. An averaged date for activity zone III amounts to 11'472 – 11'326 calBC (Erl-15503/-04/-05; 1 sigma). With a time span of 11'453 – 11'322 calBC (Erl-15506; 1 sigma) the age of

zone IX is identical to that of zone III.

Wesseling thus dates to the late glacial Interstadial (phase GI-1c1) making it a little older than the Central Rhineland Federmessergruppen sites Niederbieber, Kettig, Andernach or Urbar, located circa 50 km to the south. These sites are usually associated with the late Allerød phase GI-1b, prior to the eruption of the Laacher Volcano (Baales 2002, 45). In addition, the Belgian site of Rekem which is located 90 km to the west is apparently a little younger than Wesseling (De Bie & Caspar 2000, 41).



Fig. 15. An almost completely refitted core from activity area VI showing debitage from two opposing striking platforms.

Abb. 15. Ein weitgehend zusammengesetzter Kern aus der Aktivitätszone VI zeigt den Abbau von zwei gegenüberliegenden Schlagflächen.



Fig. 16. Shaft smoother from the southern edge of activity area V.

Abb. 16. Pfeilschaftglätter vom Südrand der Aktivitätszone V.

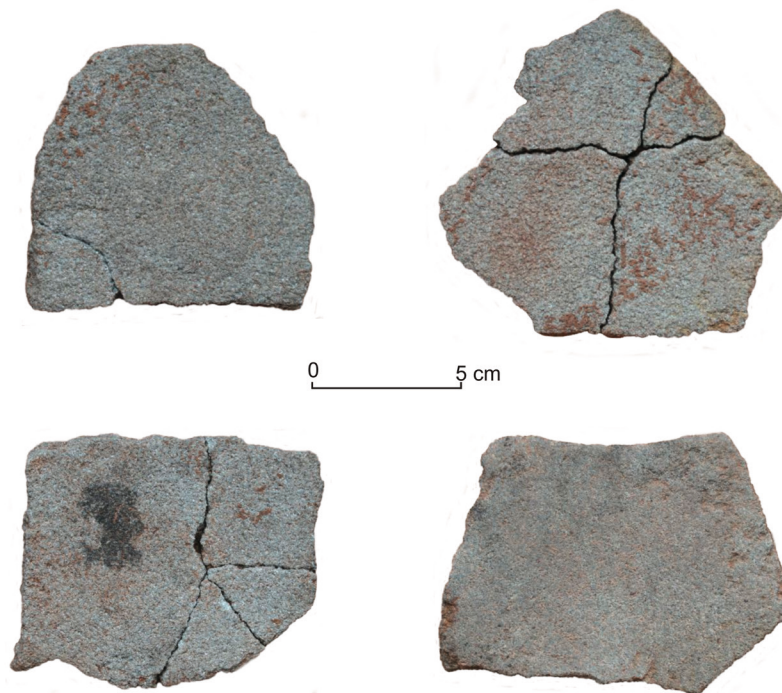


Fig. 17. Ten partially fragmented grinding and rubbing slabs were detected at the center of the settlement area.

Abb. 17. Im zentralen Bereich des Siedlungsareals fanden sich zehn z.T. fragmentarisch erhaltene Reib- und Schleifplatten.

Conclusion

Excavations at Wesseling have, for the first time, enabled the study of a largely intact Final Palaeolithic settlement site within the lower Rhine lowlands. Its location next to a former river channel is quite typical within the settlement pattern of Federmessergruppen-groups of the northwest European lowlands.

Sites like Meer-Meirberg, Lommel-Maatheide (De Bie & Van Gils 2006) and Arendonk-Korhaan (Van Gils et al. 2009) in Belgium, Milheeze (Arts 2012) and Doetinchem-Dichteren (Niekus et al. 1998) in the Netherlands or Saleux (Coudret & Fagnart 2004) in northern France can be found in similar locations. Numerous sites in the Lower Rhine region are located on terraces above back waters that dried out during



Fig. 18. A percussor of solid rock displaying concave (flakes??) on both long edges, suggesting that it was used for working (cracking) roundish objects like bones.

Abb. 18. Ein als Schlägel genutztes Geröll weist an beiden Längskanten konkave Ausbrüche auf. Sie legen nahe, dass es zum Bearbeiten (Aufschlagen) von rundlichen Gegenständen wie Knochen genutzt wurde.



Fig. 19. Numerous flat, geometrically formed lignite objects, between 2-5 cm in size, were revealed in the settlement area.

Abb. 19. Innerhalb des Siedlungsareals kamen zahlreiche flache, geometrisch geformte Braunkohle-Artefakte von 2 – 5 cm Größe zum Vorschein.

the early Holocene. More than two dozen surface sites in the area prove the regular occupation of terrace edges along rivers like the Niers (Heinen 2006) and Erft.

With twelve activity zones within an area of 40 x 20 m and probable further structures having been destroyed during ground disturbance in World War 2, Wesseling can easily be added to the group of larger Federmessergruppen sites of Central and North-western Europe. The site confirms the evidence from excavations over the last two decades, showing that Final Palaeolithic settlements could be of enormous size. Dimensions of more than 2,000 m² are documented for Niederbieber (Bolos 1992; Baales 1998, 2003; Gelhausen 2007a) and Reichwalde (Vollbrecht 2005), as well as 1600 m² for Rekem (De Bie & Caspar 2000). Having been partially destroyed by sand mining, the station Meer II was very likely larger than its excavated 300 m² (Van Noten 1978; Van Noten et al. 1989). All these places are composed of a large number of activity zones which can predominantly be connected by refits between lithic artefacts, and which can be considered contemporaneous.

At Wesseling, the evidence also points to a single phase of occupation. Ten of the twelve activity zones are directly connected by refitted artefacts, or the distribution of pieces from the same nodule or the same type of raw material, occurring in different areas

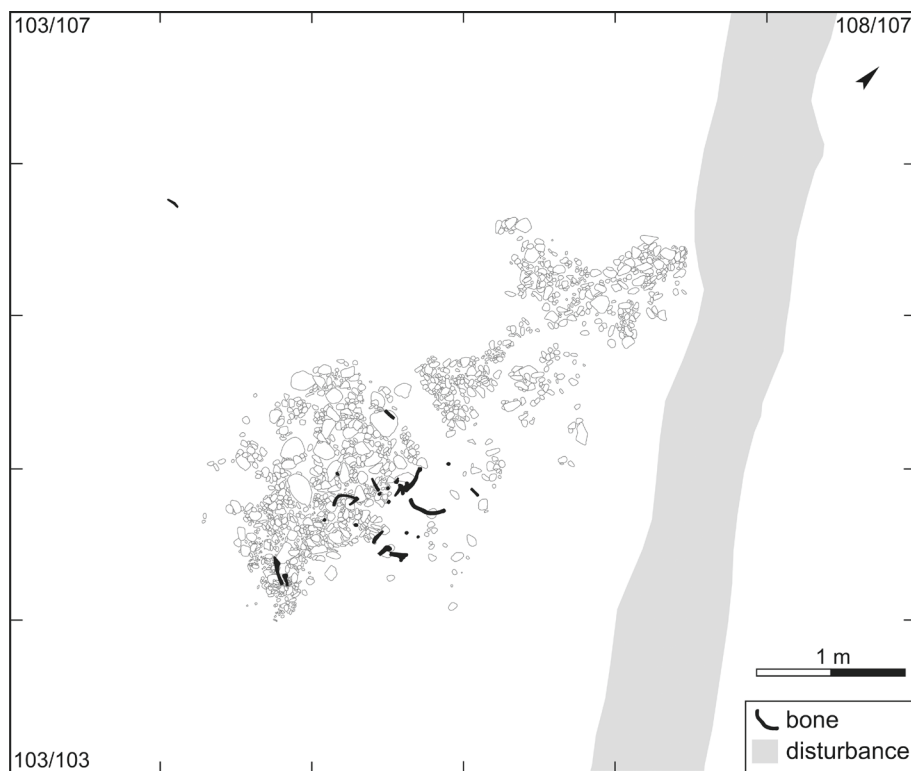


Fig. 20. Several poorly preserved animal bones were recovered within and below the cobble paving in activity zone XII.

Abb. 20. Zwischen und unter den Geröllen des Pflasters in Aktivitätszone XII wurde eine Reihe von schlecht erhaltenen Knochen freigelegt.

Laboratory-No.	Sample	Sample-No.	Date BP	Date calBC 1 sigma
Erl-15503	charcoal	1004-8a	11'503 ± 72	11'470 – 11'334
Erl-15504	charcoal	1004-8b	11'563 ± 70	11'517 – 11'360
Erl-15505	charcoal	1004-8c	11'435 ± 70	11'430 – 11'284
Erl-15506	charcoal	1005-7	11'478 ± 68	11'453 – 11'322

Fig. 21. Wesseling. Radiocarbon dates. Sample-No. 1004-8a/b/c derives from the hearth in zone III; sample-No. 1005-7 from the hearth in zone IX. Calibration with IntCal09 (see Reimer et al. 2009. IntCal09 and Marine09 radiocarbon age calibration curves, 0–50,000 years cal BP. Radiocarbon 51 (4): 1111–1150.)

Abb. 21. Wesseling. AMS-Daten. Proben Nr. 1004-8a/b/c stammen aus der Feuerstelle in Zone III; Probe Nr. 1005-7 aus der Feuerstelle in Zone IX. Kalibration mit IntCal09 (siehe Reimer et al. 2009. IntCal09 and Marine09 radiocarbon age calibration curves, 0–50,000 years cal BP. Radiocarbon 51 (4): 1111–1150.)

(Fig. 22). The probability of only single phase of occupation is supported by the identical radiocarbon dates from zones III and IX.

With regards to structure and organisation, the Wesseling encampment shows distinct similarities to other extensive Federmessergruppen sites. There are larger activity zones with a multitude of artefacts and a highly diverse tool inventory, showing a broad spectrum of activities and a continuous utilization during the occupation of the site. There are also small areas restricted to a few square metres of find accumulation, representing short term workspaces, especially for producing and repairing hunting tools.

As seen at recent and sub-recent hunter-gatherer camps (Anderson 2006; Porr 1997; Kohl-Larsen 1958), more extensive and long-term Federmessergruppen sites also seem to have been composed of larger multi-functional common areas and smaller specific task zones. The former might have been reoccupied and visited by different people for various activities, such as consuming food, conversation or cultivation of contacts throughout the site. Central in meaning, but not necessarily in location, were long-term maintained hearths used for regular meetings. This behaviour can still be observed today in camps of the Evenki, indigenous Siberians, where there is always a central hearth at which everyone congregates, to repair objects, eat and swap ideas (Anderson 2006). At Wesseling, the large zone III can be interpreted as a one of these shared spaces. Many tools, made from unique raw materials were associated with basic equipment brought to the site. For this and other reasons, one would like to imagine the settlement of the site originating at zone III and spreading from there onto the surrounding terrain. The other small, strongly specialized workspaces embody short-term episodes within this settling period, successively established and abandoned during the stay.

Excavation results over past years have increasingly revealed the dynamic nature of Final Palaeolithic settlement sites. The longer the stay, the larger the number of activity zones, leading to a gradual extension of the borders of the site. Large scale excavations are indispensable to grasp the nature of such a development. After decades of incomplete

excavations of Final Palaeolithic camp sites, leading to the assumption that these sites were small in size, we now see, on the contrary, that long term Federmessergruppen stations could have been up to several thousand square meters in size.

Beyond apparent similarities with other Federmessergruppen sites, Wesseling presents differences, in the form of previously unknown evident structures and several activities which have only been demonstrated here. The stone pavements made of cobbles that likely came from the ancient Rhine channel close by, are unique. Their function is not easily determinable and only for the paving of zone XI has a function as a sitting or work space been confirmed. Hints of functions other than those belonging to the known spectrum of activities at other Federmessergruppen sites are provided by the grinding/rubbing slabs and lignite objects. They enrich the known array of activities in Allerød settlements by enhancing the previously manifested monochrome picture with so far unknown aspects. The finds are still difficult to interpret, and up to now it is unknown whether the lignite pieces truly fall into the sphere of art and adornment or are simply the result of intensive grinding and rubbing for another purpose.

At Wesseling six out of twelve zones (III-V, VII, IX, XI) have differently sized hearths, confirmed by burnt bone, quartz cobbles, silex artefacts and charcoal. The hearths were usually located within or alongside artefact distributions and, in only one case in activity zone IX, were hardly any artefacts found.

It is difficult to define the timespan of residence at Wesseling more precisely. It is rendered difficult by the incomplete survival of the site. Everything points to the existence of further activity zones destroyed by large-scale disturbances. It is likely that this large (at least 800 m²) site, was even more extensive and might have had more than twelve zones. Federmessergruppen sites of similar size whose activity zones can be connected through artefact refitting have been termed residential camps (e.g. De Bie & Caspar 2000, 280 ff.). Wesseling seems to be one of them. In addition to the usual activities known from various Federmessergruppen settlements, activities at

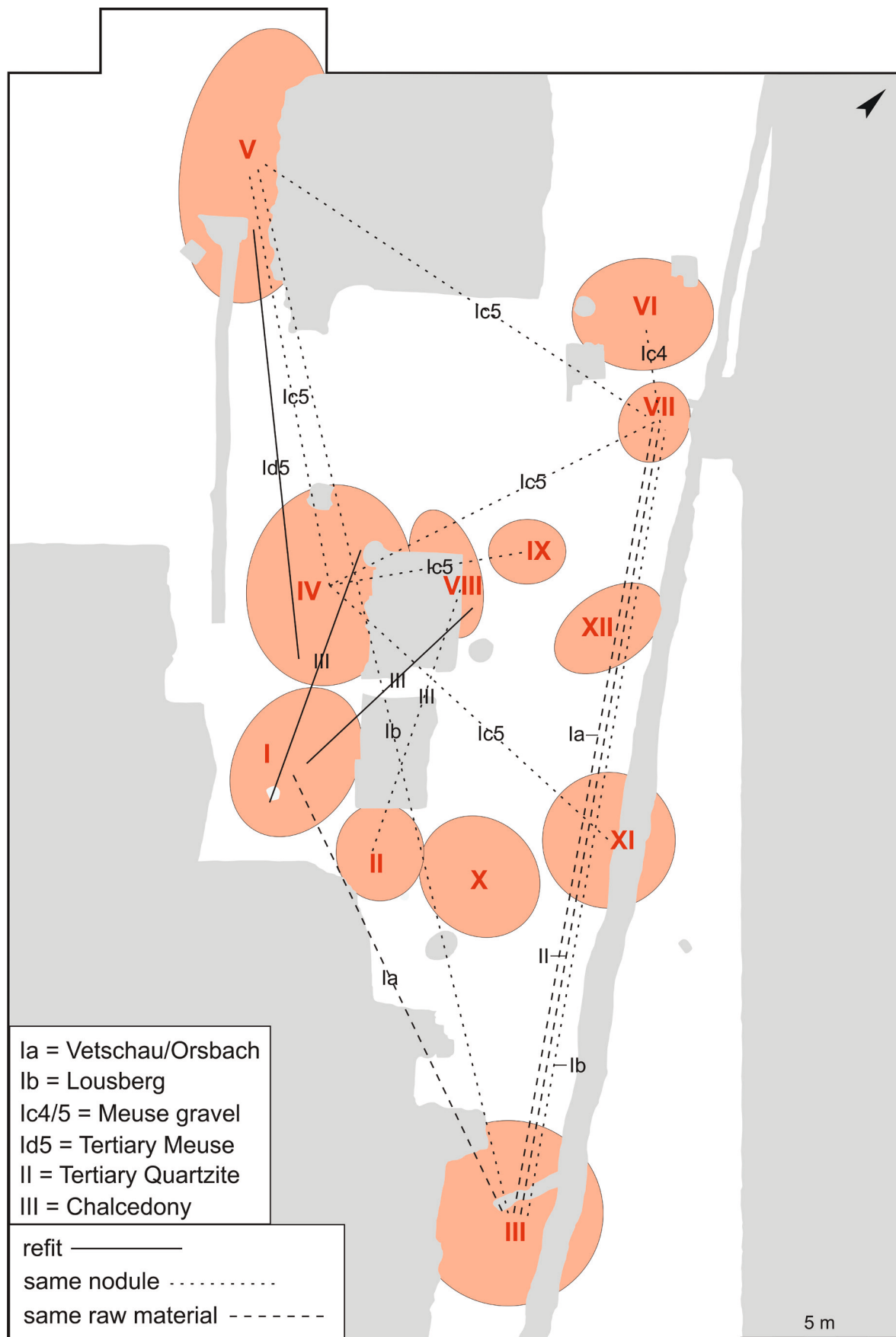


Fig. 22. Connections between ten of the twelve activity zones were established by the presence of pieces of the same nodule or the same raw materials in the different zones.

Abb. 22. Zehn der zwölf Aktivitätsbereiche lassen sich vor allem anhand von in verschiedenen Zonen vertretenen knollen- oder rohmaterialgleichen Artefakten miteinander verbinden.

Wesseling had been conducted and space had been utilised in a way that is not typical for short-term hunting or transit camps. The intensive production of art and adornment for example, presumably represented by the lignite objects, is generally only possible in times of leisure, when the occupants of the site are not preoccupied with essential activities. Cobble pavings would also have only been constructed in places that were intended to be occupied for a long period.

An intensely discussed question for Upper and Final Palaeolithic sites deals with the locations of the dwellings that would have existed in all long-term camps and base camps. This cannot be answered for certain concerning the Wesseling site. Contrary to the frequently expressed assumption that huts and tents are indicated by a dense find distribution (e.g. Wenzel 2009, Gelhausen 2007a, 2007b, Loew 2006, De Bie & Caspar 2000), it is more likely that dwellings stood within zones containing only a few finds and maybe a hearth. It is not human nature to live on a waste dump. Apart from the possibility of huts outside the excavated areas, Wesseling offers several surfaces as possible locations. Low in finds, zones IX and XI come to mind, each yielding a hearth and only a handful of artefacts. In that case the cobble paving of zone XI had likely been within a dwelling. However, ultimately there is no real evidence for huts at the mentioned locations.

Judging from the silex raw materials used in Wesseling whose sources are largely known (see Floss 1994), the hunter-gatherer group must have stayed in different places further north and west within the Lower Rhine embayment, further southeast around Bonn and at the edge of the Central German Uplands, before erecting their camp on the banks of the Rhine channel. Knowledge of most of the sources of the raw materials allows us to sketch potential human migration routes within the Allerød landscape prior to their arrival at the Wesseling camp. One important clue is delivered by a unique core of Baltic flint which leads to the probability that the Wesseling hunter-gatherers settled within the dispersal area of the moraine which transported Baltic flint, probably around Krefeld or the Ruhr River. This singular item comes from a distance of at least 65 km away, and it is proposed that the find represents the oldest past sojourn reconstructed by raw materials. From there, the path led southwest into the Jülicher Börde, where flint could be easily collected among the terraces of the Rur, Wurm or Inde Rivers. According to the amount of Vetschau/Orsbach- and Lousberg-flint artefacts, the next secure stay was in the location of the present-day city of Aachen. Travelling east along the edge of the northern Eifel and the Zülpicher Börde, Meuse gravel flint and Meuse flint from Tertiary deposits (Maasei-Feuerstein) were both easy to find. The next traceable halt was in the area of Bonn, being represented by artefacts made of chalcedony from the Bonn-Muffendorf

deposit. From here Tertiary quartzite was also easily accessible and was intensively used at Wesseling; being collected either from Rhine gravels or from the nearby Siebengebirge (Floss 1994). In view of the range of raw materials, a camp site near Bonn was probably the last stop before traveling north and settling at Wesseling along the river front. This broadly outlined migration route of the Wesseling hunters is a good indicator of Federmessergruppen group mobility. Distances of more than 100 km between their raw material sources give an idea of the minimum size of their occupied territory, which must have stretched over several thousand square kilometres.

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