Middle Paleolithic Sites atop the Scoria Cones of the East Eifel Volcanic Field of the Central Rhine Valley

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ABSTRACT

While controversial from the point of view of its impact on the landscape, the large-scale mining of lava from the scoria cones of the East Eifel led to the discovery of many Middle Paleolithic find horizons within the volcanic craters atop these elevated positions. This paper summarizes the important finds from sites including Plaidter Hummerich, Schweinskopf, Tönchesberg and Wannen and discusses their chronostratigraphic and cultural stratigraphic context. Archaeologists based at the museum and research institute of Monrepos overlooking the Neuwied Basin excavated most of these sites during the 1980s as part of a major research project exploring the geology and prehistory of the East Eifel. Subsequently little field work has been conducted on the Middle Paleolithic in the region. The find horizons date to the penultimate and last glaciations and document a wealth of often ephemeral occupations in the craters of the scoria cones. In the case of Wannen, researchers discovered cranial remains of a Neanderthal associated with lithic artifacts in a loess from the penultimate glaciation. The lithic assemblages recovered from the volcanic craters document a high level of technological variability and the use of diverse local and non-local raw materials. While patterns of subsistence varied from site to site, Neanderthals often hunted equids, cervids and bovids in or near the scoria cones. Archaic hominins were likely drawn to the top of these small volcanic mountains to exploit the view they commanded over the landscape and perhaps to use the water that at times collected in these settings. Such water sources may also have attracted game to the top of the scoria cones. While these settings contain numerous Middle Paleolithic find horizons, Upper Paleolithic finds are extremely rare. We hypothesize that the many scoria cones of the Eifel that have not been subjected to large-scale mining also contain similar Middle Paleolithic find horizons, making this prominent feature of the landscape an important part of the Middle Paleolithic settlement dynamics of the region.

THE WEHRER INTERGLACIAL

The Wehrer Interglacial is characterized by the interglacial soil between the third and the second loess and corresponds to the MIS 7, i.e. 200,000-225,000 years ago. The major eruption of the Wehrer Volcano in the East

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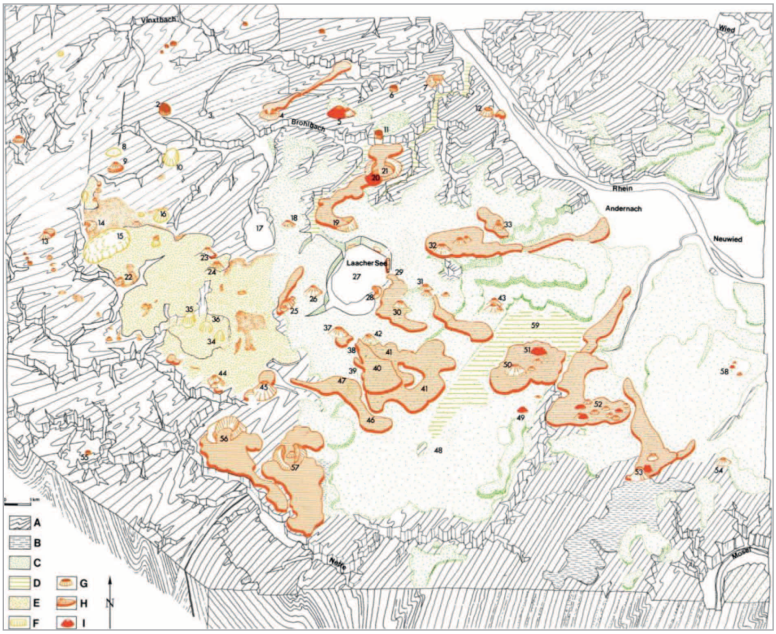


Fig. 1.
Volcanos and lava flows of the East Eifel Volcanic Field. Modified after W. Meyer 1986.
1 Teufelsberg near Oberheckenbach, 2 Steinberg near Oberdürenbach, 3 Roddermaar, 4 Bausenberg, **5 Herchenberg**, 6 Steinbergs-Kopf, 7 Leilenkopf, 8 Perlerkopf, 9 Hannebacher Ley, 10 Olbrück, **11 Kahlenberg**, 12 Hohe Buche, 13 Steinrausch, 14 BasalticPalagonittuff-Volcano, 15 Engelner Hopf, 16 Schellkopf near Brenk, 17 Wehrer Kessel, 18 Dachsbusch, 19 Veitskopf, **20 Kunkskopf**, 21 Lummerfeld, 22 Humersberg, 23 Meirother Kopf, 24 Difelder Stein, 25 Rothenberg, 26 Laacher Kopf, 27 Laacher Kessel, 28 Alte Burg, 29 Lorenzfelsen, 30 Krufter Ofen, 31 Heidekopf, **32 Nickenicher Hummerich**, 33 Nastberg, 34 Riedener Kessel, 35 Hardt near Rieden, 36 Schorenberg, 37 Thelenberg, 38 Pumice volcano near Laacher Mühle, 39 Pumice volcano Meerboden, 40 Upper lava-flow of Mendig, 41 Lower lava-flow of Mendig, 42 Wingertsberg, 43 Nickenicher Weinberg, 44 Sulzbusch, 45 Hochstein, 46 Lava-flow of Thür, 47 Pumice volcano Obermendig, 48 Pumice volcano Frauenkirch, **49 Tönchesberg**, 50 Korretsberg, **51 Plaidter Hummerich**, 52 **Wannen- and Eiterköpfe**, **53** Karmelenberg and **Schweinskopf**, 54 Birkenkopf, 55 Remmknipp, 56 Hochsimmer, 57 Ettringer Bellerberg, 58 Kärlicher Brockentuff, 59 Nettetal-Trass.
Bold-faced: Middle Paleolithic sites observed in the crater depression of scoria cones.

Eifel Volcanic Field (Fig. 1) falls within this period; We thus propose using the term Wehrer Interglacial when referring to the period (Bosinski 2008).

The MIS 7 is divided into a short warm period (7e) followed by a cold phase (7d) and a longer moderate period (7c, 7a) which is further subdivided by a short cold period (7b) (Fig. 2). This climatic evolution is cyclical and is repeated, for example, in the MIS 9a-e and MIS 5a-e.

Based on radiometric dating, the eruption of the Wehrer Volcano took place during MIS 7c. Pumice from the Wehrer Volcano (the Huettenberg Tephra) has been dated by ^{40}AR/ ^{39}AR to 215,000 +/- 4000 (v.d. Bogaard and Schmincke 1990).

The Wehrer Volcano was situated in the present-day Wehrer Basin, several kilometers west of Maria Laach, a lake in a volcanic crater (Fig. 1, 17). In contrast to Maria Laach, the Wehrer Kessel had an outlet to the Brohl Valley and is well-drained and suitable for settlement.

After the eruption of the Wehrer Volcano, and probably linked to this major explosion, many scoria cones developed in the area (Fig. 1), such as the Karmelenberg group, Schweinskopf, the Wannen group, Eiterköpfe, the Tönchesberg group, as well as Korretsberg and Plaidter Hummerich.

An interglacial soil and the Huettenberg pumice occur under these scoria cones. This situation has been observed under the Wannen volcanos, Eiterköpfe, and Plaidter Hummerich. The ^{40}AR / ^{39}AR laser dates are in concordance with this stratigraphy, with a date of 221,000 ± 6,000 for Schweinskopf, 235,000 ± 35,000 for the Wannen volcano, 202,000 ± 14,000 for Tönchesberg, and 207,000 ± 14,000 for Plaidter Hummerich.

The vegetation of the Wehrer Interglacial is at times preserved under the scoria cones. As early as 1856, a leaf-bearing tuff was identified in a trench (Bianchi Stollen) in Plaidter Hummerich, below the basalt lava and a black tuff. In 1942, R. Kräusel and H. Weyland (1942: 28) published a revised list of the plants identified in this tuff: fiddlehead fern (*Struthiopteris filicastrum*), Cyperaceae, Gramineae, lily of the valley (*Convalaria majalis*), willow (*Salix viminalis*), hazel (*Corylus avellano*), soapwort (*Saponaria officialis*), medlar (*Mesplius germanica*), hackberry (*Prunus pardus*), linden (*Tilia europaea*), bedstraw (*Gallum mollugo*).

Under the Bausenberg scoria in the Brohl Valley, numerous imprints of leaves and grasses, as well as cavities left by trunks and branches, have been preserved in the volcanic ash (Noll 1975). The vegetation is that of an interglacial deciduous forest, with linden (*Tilia* sp.), poplar (*Populus* sp.), elm (*Ulmus* sp.), hornbeam (*Carpinus* sp.), cornelian cherry (*Cornus* sp.), and lily of the valley (*Convellaria majalis*).

The imprints and cavities of plants from the Nickenicher Sattel, dated to 207,000 +/- 21,000, are also characteristic of the vegetation of the Wehrer Interglacial: linden (*Tilia cordata*), hazel (*Corylus avellana*), European larch (*Larix decidua*), and common dogwood (*Cornus sanguinea*) (Pastoors 2000: 150).

The scoria cones and their lava flows effectively covered and sealed the surface of the Wehrer Interglacial, and it is probably only a matter of time before we discover archaeological sites on this surface. To date, however, no sites from this interglacial are known either here or in the Rhine Valley.

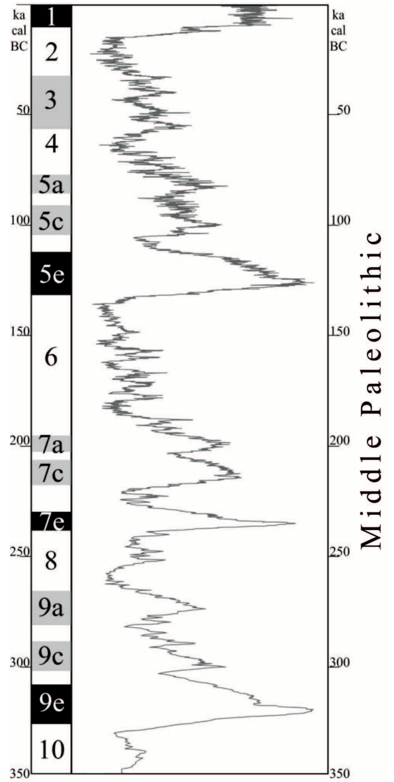


Fig. 2.
The climatic evolution of the last 300,000 years (MIS 1-9) (after J.-R. Petit, J. Jouzel et al. 1999, modified by O. Jöris).

THE SEDIMENTS IN THE CRATER DEPRESSIONS OF THE SCORIA CONES

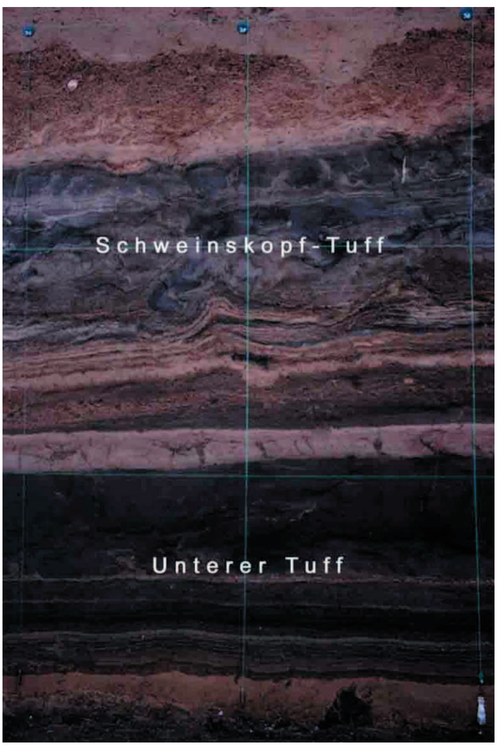
The generally small scoria cones of the East Eifel, seldom more than 100 m high, were created by lava fountains. The molten magma cooled in the air and fell to the surface. Often the volcanos emitted lava flows that flowed downslope to the Rhine Valley (Fig. 1).

After the eruption, steep-sided craters were left at the summits of the volcanos; over time these evolved, through lava slippage, weathering, and loess deposition, to form sheltered basins surrounded by the crater walls. It is likely that water collected at the base of these crater depressions, resulting in the creation of ponds or small lakes (Bosinski, Kröger et al. 1986; Bosinski 1986).

Since most of the East Eifel scoria cones originated in the Wehrer Interglacial (MIS 7), the in-filling of the craters started with the loess from the penultimate glaciation (MIS 6). The craters at times became so filled with this loess that there was no room for later sediments.

There are several volcanic tuffs in the loess of the penultimate glaciation (Fig. 3). In the crater depressions of Schweinskopf, Wannen, and Tönchesberg there are two basanitic ashes, dated to 200,000 years, which probably originated from the somewhat younger Plaidter Hummerich. The younger of these ashes at Schweinskopf, but also at Eiterkopfe, Wannen, and Tönchesberg, was influenced by permafrost phenomena, namely cryoturbation, solifluction, and ice wedges.

Fig. 3.
Schweinskopf. Volcanic tuffs in the penultimate loess of the crater depression.



At Plaidter Hummerich, we find a further volcanic sediment in the upper part of the penultimate loess. This *Kretzer Tuff*, a green-grayish layer with rounded pumice grains, was deposited during an as yet unidentified eruption. This tuff has produced three dates: 207,000 ± 4000; 203,000 ± 2000; 164,000 ± 7000 (Singhvi, Sauer et al. 1986), of which the youngest fits well with the $^{40}AR/^{39}AR$-date of 207,000 ± 14,000 for Plaidter Hummerich and the tuff's stratigraphical position in the upper part of the penultimate loess.

Sediments from the last interglacial and the first part of the last glaciation are known from the craters of Plaidter Hummerich and Tönchesberg (Conard 1992; Frechen 1994). At Tönchesberg, above the reddish-brown interglacial soil, we find a black humus deposit containing the important Tönchesberg 2B archaeological layer (Fig. 4). The Blake Event, a magnetic oscillation that occurred 108,000–114,000 years ago, also falls within this level. The humus belongs to the MIS 5a moderate climatic oscillation, which is subdivided by interstadials 24 and 23 in the GISP2 ice core. The black humus containing the Tönchesberg 2B finds may belong to

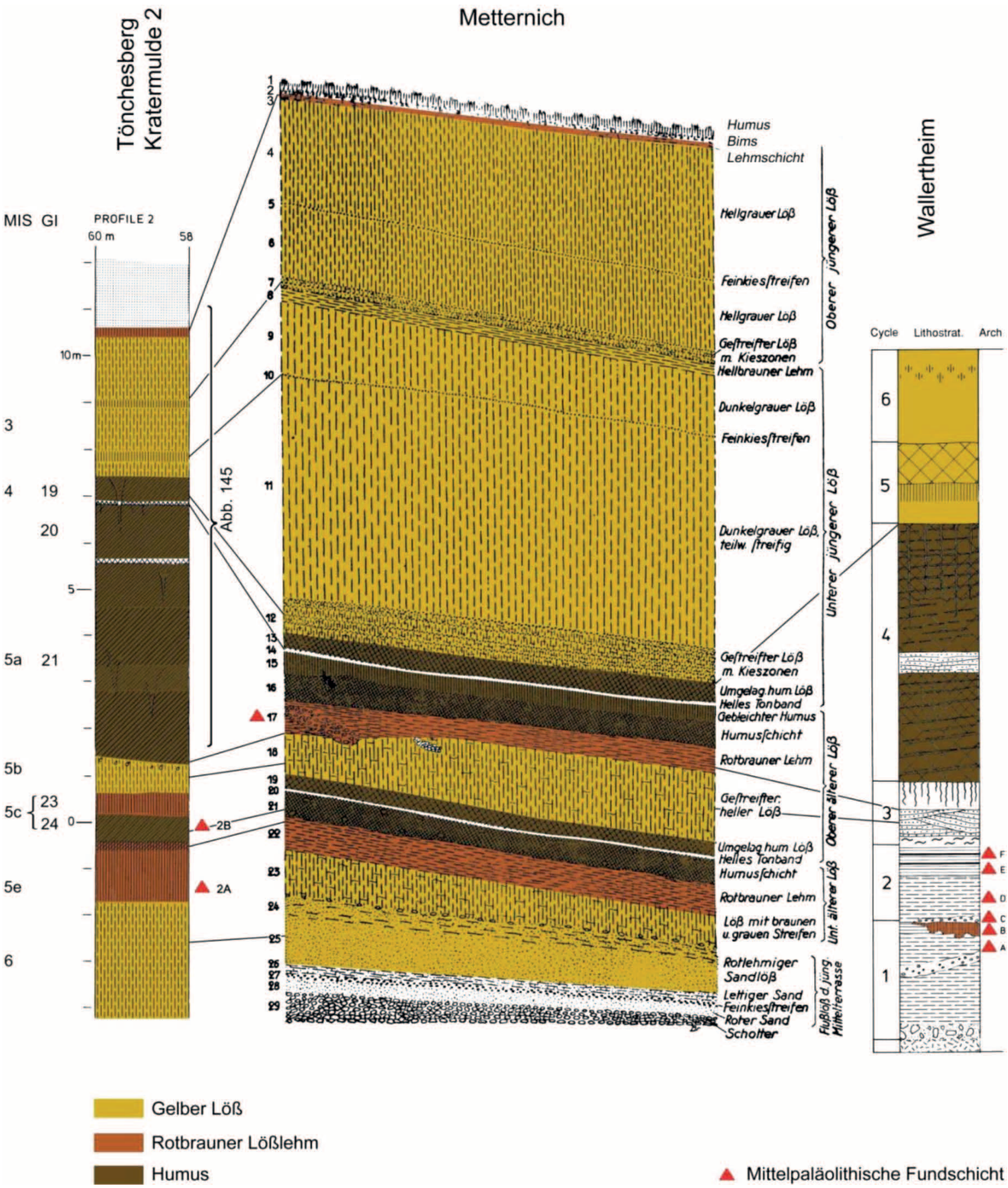


Fig. 4.
Comparision of the sections from Tönchesberg 2, Metternich and Wallertheim (after G. Bosinski 2008).

interstadial 24 (Amersfoort), while the reddish-brown soil above probably belongs to interstadial 23 (Brörup) (cf. Bosinski 2008: 148–151).

At Tönchesberg, and also in the very similar section from Metternich near Koblenz, a striped loess, which could belong to the colder MIS 5b period, occurs above this soil. Above this is a substantial humus layer belonging to the MIS 5a interstadial (ice core interstadial 21), which seems to correspond to the Odderade interstadial; this interstadial lasted 11,000 years (83,000–72,000) and was almost as long as the last interglacial (MIS 5e).

The upper part of the thick humus layer in the Tönchesberg crater is subdivided by two bands of light loess, which seem to correspond to especially cold periods close to the first cold maximum.

The uppermost layer consists of yellow loess from the second part of the last glaciation.

ARCHAEOLOGICAL FINDS IN THE VOLCANIC CRATERS OF THE EAST EIFEL

These depressions provided good conditions for establishing settlements as they are sheltered by the surrounding crater wall. In addition, the dark lava stored solar energy, thus creating a favorable micro-climate. Another advantage was the wide view from the crater wall into the open landscape.

It is the rule, and not the exception, that Middle Paleolithic sites have been identified in all of the accessible scoria cones of the East Eifel (Fig. 1). Due to the relatively quick sedimentation of the crater depressions, the sites were quickly buried and are therefore better preserved than in other locations.

In general, Middle Paleolithic sites tend to be located away from raw material sources, and this is particularly evident in the case of the sites in the crater depressions. The only available material is scoria which is nearly useless for manufacturing tools. All raw material for manufacturing stone artifacts had to be transported from the lowlands, along a long and sometimes difficult route. The climb up to Plaidter Hummerich—and we remember it well—was particularly arduous. The ascent to the other volcanos was also far from straightforward and probably meant that Paleolithic people had to decide carefully which raw materials, and how much of them, to transport.

We know that the occupants of the settlements not only transported a number of finished tools, but also carried raw material for tool production with them (Fig. 5). They lugged heavy quartz and quartzite pebbles to the sites in order to work them there. The fact that we found blocks of raw material on site indicates that the inhabitants were accumulating stocks for long-term use. Some find horizons also contain heavy anvils that Neanderthals carried up to the depression.

It is not likely that raw material was worked using a classic Levallois technique, as this would have involved significant waste and would only have been practicable at sources of raw materials. In the absence of abundant raw materials, the shapes of the blocks of quartz and quartzite material, including the presence of suitably angled striking platforms and of ridges that could be used as guides, determined the technique used for the removal of flakes. Refitted flakes from the Schweinskopf cone illustrate this approach (Schäfer 1990a-b).

Knappers, however, did not entirely abandon the Levallois technique, as is shown by the working of a small quartzite pebble (Fig. 6). The rounded

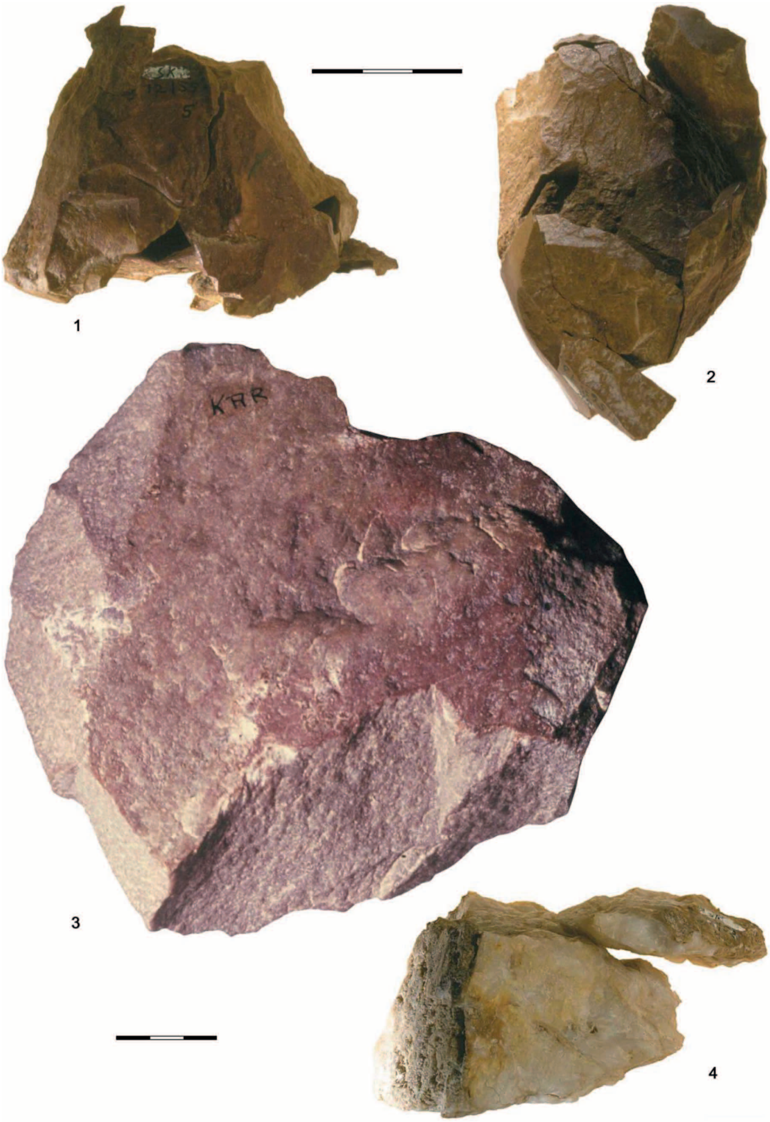


Fig. 5.
Schweinskopf. Refitted artifacts from quartzite (1-2) and quartz (4), and quartzite with flake-negatives (3).

pebble surface was already at the right angle, and the preparation of the lower face was unnecessary. The working face was vaulted, and the form of the future flake determined. To obtain this flake, a special striking platform was prepared. Fortunately, the flat, oval Levallois flake was left at the site and could be refitted to the core, allowing us to confirm the process used in its production.

The quartz and quartzite artifacts from the volcanic craters are mostly flakes. It is rare to find retouched tools made from these raw materials. A few simple sidescrapers and transversal scrapers have been found at Schweinskopf (Schäfer 1990a, 2003) and at Wannen (Justus 2000).

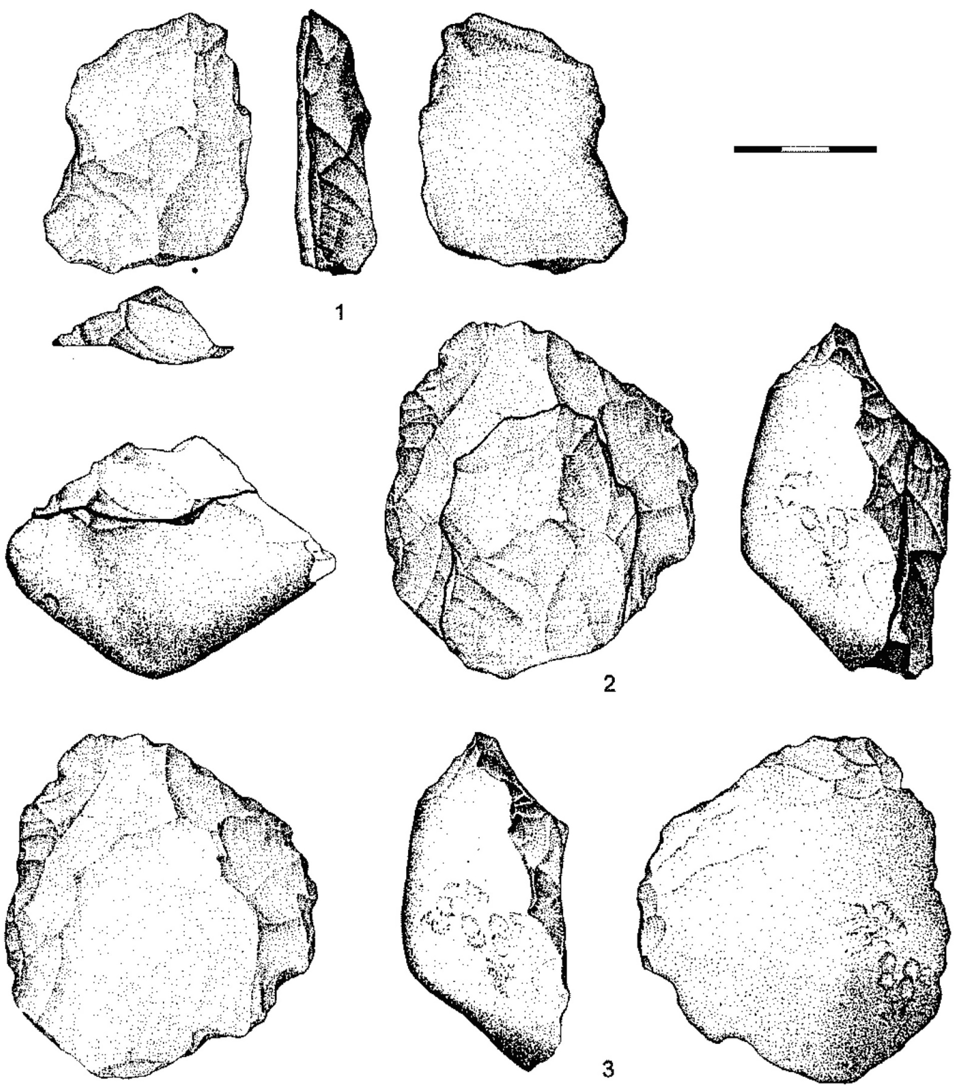


Fig. 6.
Schweinskopf, level 4. Levallois core with refitted Levallois flake (after Schäfer 1990a).

In addition, flakes with partly retouched, denticulated or notched edges have been found at Tönchesberg (Tö 1A; Conard 1992, 1996, 2001) and Kunkskopf (Pastoors 2000).

In marked contrast to these are the artifacts that were not produced on site. These are predominantly retouched tools (Fig. 7). The only artifact of siliceous slate from Schweinskopf is a double sidescraper (Fig. 7, 1). The same is true concerning the artifacts manufactured from Meuse flint. From Schweinskopf we have an elongated, triangular, bifacially worked tool, a fragment of a similar tool, and a regular Levallois flake with use wear along the edges (Fig. 7, 2-4).

From the Wannen Volcano we have a point with convex edges (*racloir convergent*), two pointed scrapers, and the fragment of a simple sidescraper, in addition to 6 small flakes (chips) made from Meuse flint (Fig. 7, 5-6).

The situation at Plaidter Hummerich is similar, with finished tools made of flint, siliceous slate, calcedony, and quartzite (Fig. 16).

The site of Kunkskopf has produced a retouched point and a fragment of a retouched tool made from Meuse flint. Herschenberg has produced a regularly retouched simple sidescraper, and a small flint flake was found at Nickenicher Sattel. The retouched tools of Meuse flint were brought on site as finished tools. The small flint flakes found at the Wannen Volcano and the Nickenicher Sattel seem to be the result of the re-sharpening of imported tools.

Clearly people brought finished tools to the site from elsewhere. These tools were probably hafted as points or knives and formed part of the toolkit. At the new site the tools were re-sharpened or changed. This explains why we rarely find quartz or quartzite tools that were worked on site; such tools often replaced the worn out tools and were taken away when Neanderthals moved on.

In this regard, the quality of the raw material was not a decisive factor. Of course, the Meuse flint is easier to work than the quartz of the Middle Rhine region, but this was not why flint was transported. It was usual to have finished tools ready for use, and these were then changed or re-sharpened at the new site. If these thoughts are correct, then we should also be able to find tools made from Middle Rhine quartz and quartzite in the Meuse region.

This typical Middle Paleolithic behavior provides clues to the size of the region used by the human groups. If the raw material for the tools occurs only in a determined region – as in the case of Meuse flint – this would indicate that people were present in the region. The people who left their tools of Meuse flint on the East Eifel scoria cones were, thus, present sometime earlier in the Meuse region, around Aachen or Maastricht, a distance of about 100 km from the East Eifel.

If we accept that Middle Paleolithic people did not roam aimlessly but rather occupied a settlement region in which they moved about on a seasonal basis, depending on the availability of game and plants, we can extrapolate the extent of their group territory.

It is difficult to say whether the sites in the crater depressions were hunting camps or more long-term settlements. For example, the main find layer (Level 4) at Schweinskopf contained the bones of horse, woolly rhino, reindeer, and deer. In addition, mammoth, bison, wild ass, and giant deer are represented by isolated bones (Schäfer 1990a, 2003). The many bones from various parts of woolly rhino carcasses indicate the presence of at least four complete animals. The presence of heavy carcass parts suggests that we are dealing with a hunting location. But horse, reindeer, and deer are often only represented by limb bones, which suggest the transportation of meat to a settlement site.

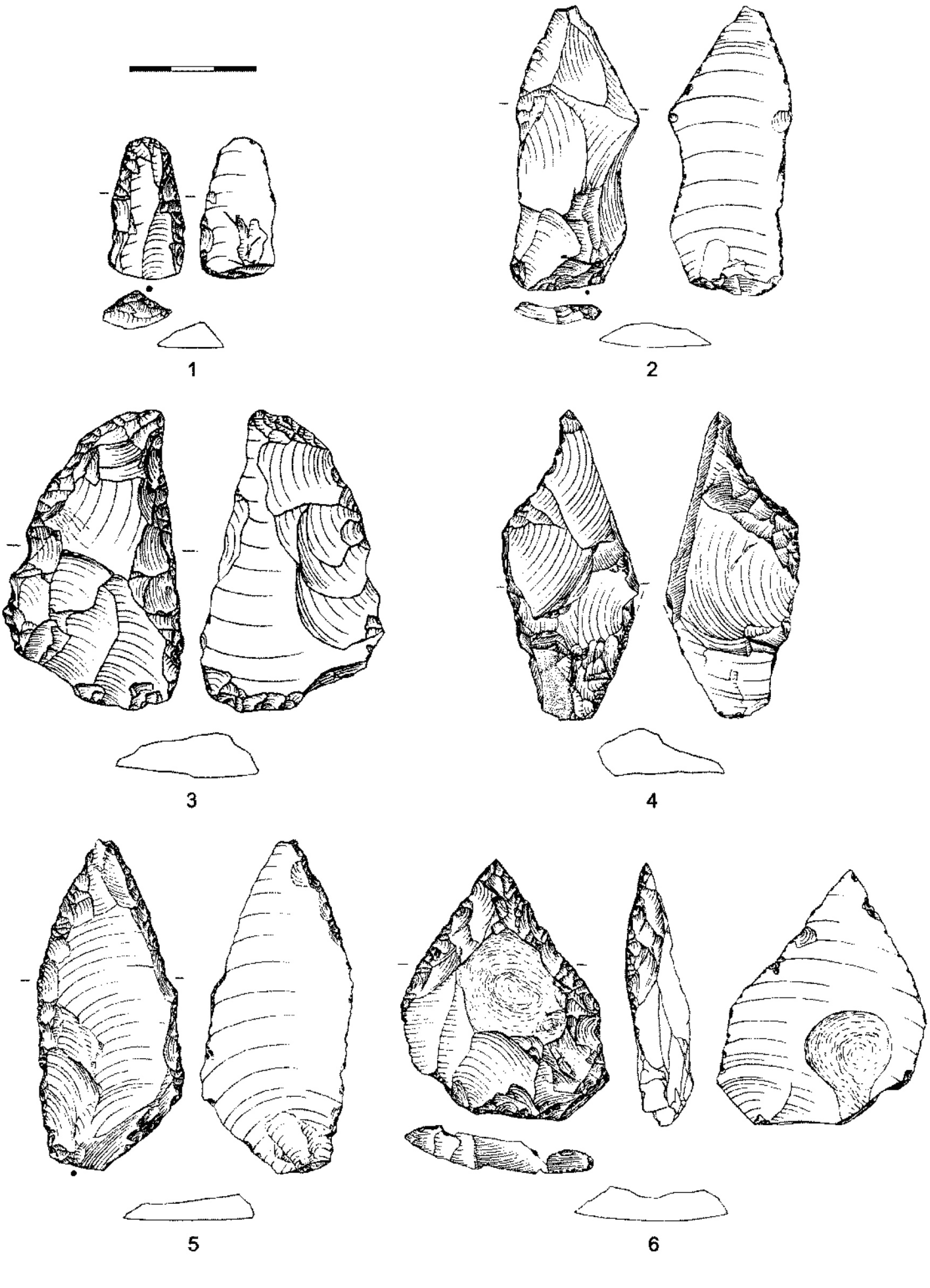


Fig. 7.
Schweinskopf (1-4) and Östlicher Wannen Volkano (5-6),
Retouched tools from siliceous slate (1) and Meuse flint (2-6)
(after Schäfer 1990a and Justus 2000).

At the eastern Wannen volcano the situation is similar (Justus 2000). In the deepest layer (Level 6) we find the same animals as at the Schweinskopf site: horse, woolly rhino, and deer dominate; reindeer, bovids, mammoth, and cave bear are represented by isolated bones. In Layer 4, woolly rhino is represented by 157 bones, making it the predominant species, which must have been hunted nearby. The importance of woolly rhino at Schweinskopf, Wannen and at other craters is especially noteworthy. It seems that this biotope was favorable for rhinos. In contrast, the bones of the other animals give the impression that meat- and marrow-bearing parts were transported to the site.

The interpretation of the sites in the scoria cones of Schweinskopf and Wannen is also made difficult by the presence of many bones from different species. It is hard to imagine that woolly rhino, horse, bovines, deer, and reindeer were all hunted at the same place. But these sites were well sheltered, and perhaps there was a pond or small lake in the crater depressions to which the different species came to drink.

At these sites animal bones are much more numerous than stone artifacts. In Levels 4 and 6 of the Wannen Volcano we found layers of bones, mostly from rhino and horse, but only a few stone artifacts (Justus 2000).

In the crater depression of the Tönchesberg Volcano, Conard analyzed two find horizons, identified over a limited area in the lower loess dating to the penultimate glaciation (Tö 1A; Conard 1992). While the lower lava loess primarily contained fragmented faunal material of a non-anthropogenic origin, the upper lava loess was characterized by the bones of deer, horse, and bovines as well as quartz cores and flakes, and one quartzite flake. Two horse teeth and one deer tooth were from animals killed in winter.

The presence of significant quantities of bones is also explained by the excellent preservation in the crater depressions. Perhaps these sites demonstrate how numerous the bones originally were at sites with poor faunal preservation.

These excavations were always limited in extent compared to the size of the crater depressions (Fig. 8). Therefore, it is difficult to interpret the general situation. Apparently the bones and stone artifacts occurred in different concentrations separated by surfaces without finds. These concentrations seem to be the result of single stays at the site, and it would be necessary to analyze them independently. Until now this was only possible in the second crater depression of Tönchesberg. At Tö2A, Conard's team excavated a circular concentration of stone artifacts in the upper part of the penultimate loess layer, on which the soil from the last interglacial formed; any bones originally present were destroyed by soil formation (decalcification). Some 90% of the 423 stone artifacts were found in a limited concentration located near the southeastern edge of the excavation. They include quartz flakes and cores which could be partly refitted. Many of the quartz cobbles showed signs of having been used as hammerstones, and a quartzite anvil was recovered from the concentration. This

Fig. 8.
Eastern side of the Wannen Volcano. Excavation 1987.

indicates that Neandeethals used bipolar technology to knapp quartz. This small concentration reflects a short episode of occupation.

Clear settlement structures are rarely observed in the scoria cones. In the deepest layer (Level 6) of the Wannen Volcano, Antje Justus discovered a circle of regular pieces of lava (Fig. 9). With an inner diameter of 0.80 m, this circle seems too big to be a hearth, yet too small to be a shelter or tent circle. Axel von Berg (2003: Fig. 3) also describes bigger oval settlement structures from the Wannen volcano site.

Finds from the penultimate glaciation came primarily from the Schweinskopf and the Wannen volcanos, but also from Töncheserg and Plaidter Hummerich, as well as from scoria cones in the Brohl Valley.

Fig. 9.
Eastern side of the Wannen Volcano, level 6. Circle of stones (after A. Justus 2000).

At the Schweinskopf cone, Jochen Schäfer found an edge-retouched quartzite artifact with the imprint of a Brachiopode (Fig. 10). It is likely that this piece was brought to the site precisely because of the fossil imprint (Schäfer 1996). The collecting and keeping of unusual objects like fossils are found at various sites. As early as 1894, Worthington Smith (1894) describes beads made from fossil balls (*Cascinopora globularis*) found at a site in Bedford (Thames) dating to the penultimate glaciation; in this case natural holes in the fossils were artificially enlarged perhaps to allow the objects to be strung as beads. The most famous example of this

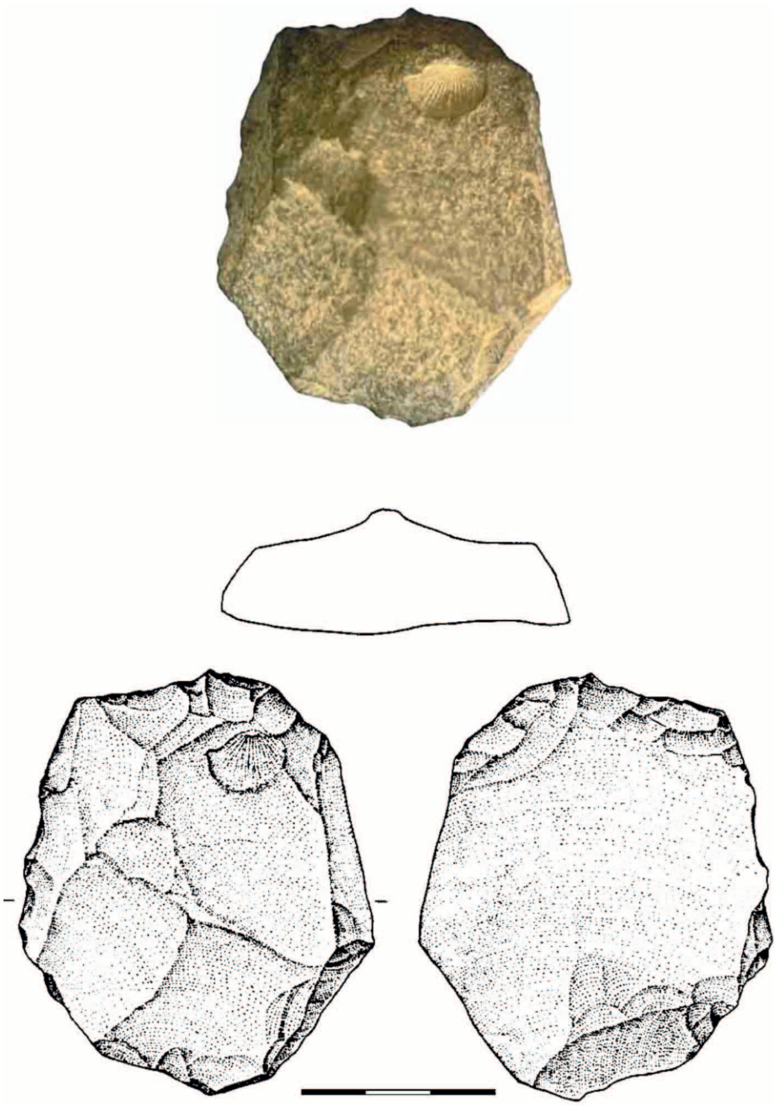


Fig. 10.
Schweinskopf. Quartzite artifact with imprint of a Brachiopode (after Schäfer 1990a).

prehistoric fascination for geological curiosities is a flint bearing the imprint of a sea urchin which was found at Saint-Just-des-Marais (Lorblanchet 1999).

Axel von Berg recovered two pieces of a human skull in the loess of the penultimate glaciation within a small, 30-m long and 15-m deep crater at the Wannen Volcano (v.Berg 1997a-b). A third fragment and three stone artifacts were found in debris in front of the crater depression (Fig. 11). The three frontal and parietal fragments fit together to form the top part of a skull; the rear part and the face are missing. The flat front and the diameter permit the skull to be classified as Neanderthal (Condemi 1997). The thickness of the skull bone and the closed sutures indicate that it is the skull of an adult male aged 30–45 years. The skull and its broken

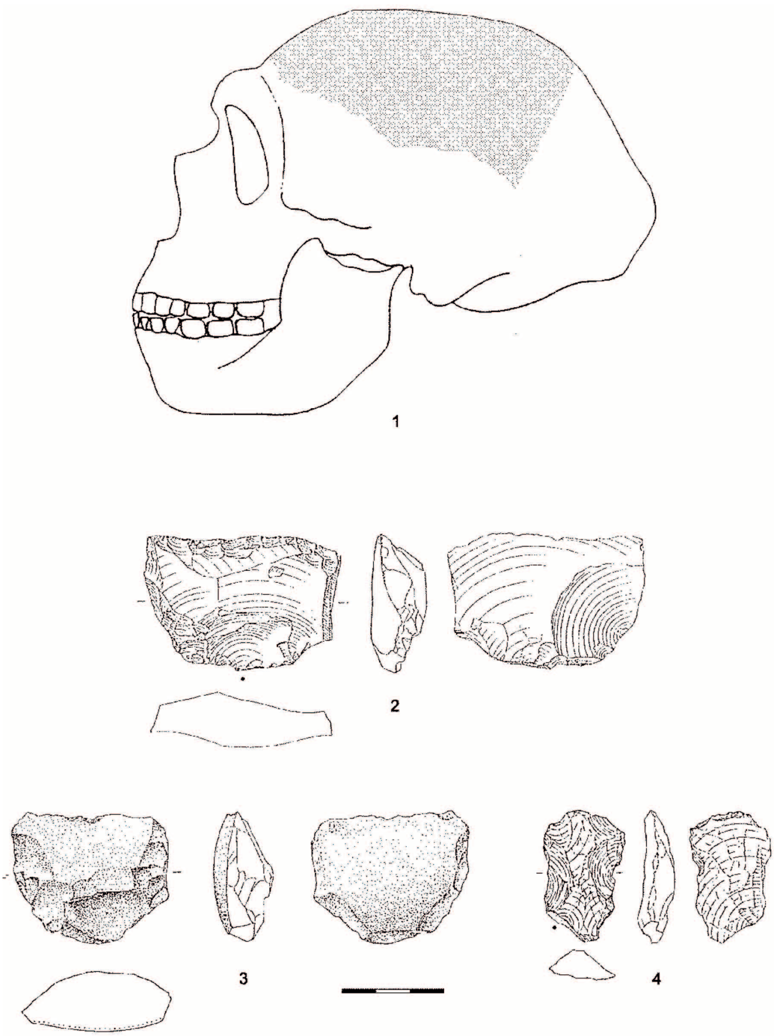


Fig. 11.
Wannen Volcano. Fragment of a human skull (1) and stone artifacts (2-4) (after A. v. Berg 1997a).

edges are worn indicating that it is an older skull which arrived into the crater depression in its present form. This helps to explain why other skeletal elements were not recovered.

The lithic artifacts recovered near the cranial remains include a transversal scraper of Meuse flint, a small discoid core, and a quartz flake (Fig. 11, 2-4). Animal bones and other finds were not recovered in direct association with the skull.

The crater depression containing the skull is about 200 m away from the site of Wannen excavated by Antje Justus, and a connection between the site with stone artifacts and many animal bones and the location of the human skull in the adjacent crater depression cannot be ruled out.

Finds from the first part of the Late Pleistocene come primarily from Tönchesberg and Plaidter Hummerich. In the second crater depression of Tönchesberg, a black humus layer directly overlies the reddish-brown soil of the last interglacial (Fig. 4). Charcoal from deciduous trees (oak, elm) testifies to a relatively warm period, while the pollen, which lacks variety due to selective preservation, attests to the presence of pine. Small mammal remains, namely those of hamster and field mouse, are indicative of open grassland.

This black humus seems to corrolate with MIS 5c (Conard 2001). The open landscape likely correlates with Greenland Interstadial 24, which could correspond to the Amersfoort Interstadial and not the Brörup, which in northwestern Germany seems to be associated with a forested environment that may be represented by the reddish-brown interstadial soil on top of the black humus.

Conard excavated a surface of more than 200 m^2 in the black humus. However, because of the local topography with the presence of a quarry to the West and high section to the East, the excavation trench was long and narrow and only revealed a partial view of the occupation (Fig. 12, 1).

Bone and antler pieces bearing traces of exposure to fire, as well as cracked stone artifacts, indicate the presence of a hearth in the northwestern part of the area. Around this hearth were stone artifacts and animal bones. Further concentrations of archaeological material were observed in the southern and central areas.

The main game animals were aurochs (*Bos primigenius*) and horse (*Equus* sp.). In the case of horse, long bones and shoulder blades predominated while other carcass parts, e.g., parts of the skull, were absent. This indicates that mainly meat-bearing parts of this species were brought to the site. In contrast, skull parts, which included many teeth, of aurochs were found.

Red deer (*Cervus elaphus*) was represented by the bones of at least three animals. In contrast, more than 100 antlers were uncovered (Fig. 12). Only one antler includes parts of the skull of a killed animal. All of the others are shed antlers, which seem to have been collected in the landscape and brought to the site. We do not know why this happened. The antlers are neither worked nor used. If these antlers were important for one reason or another, why were so many left on site? We can at least

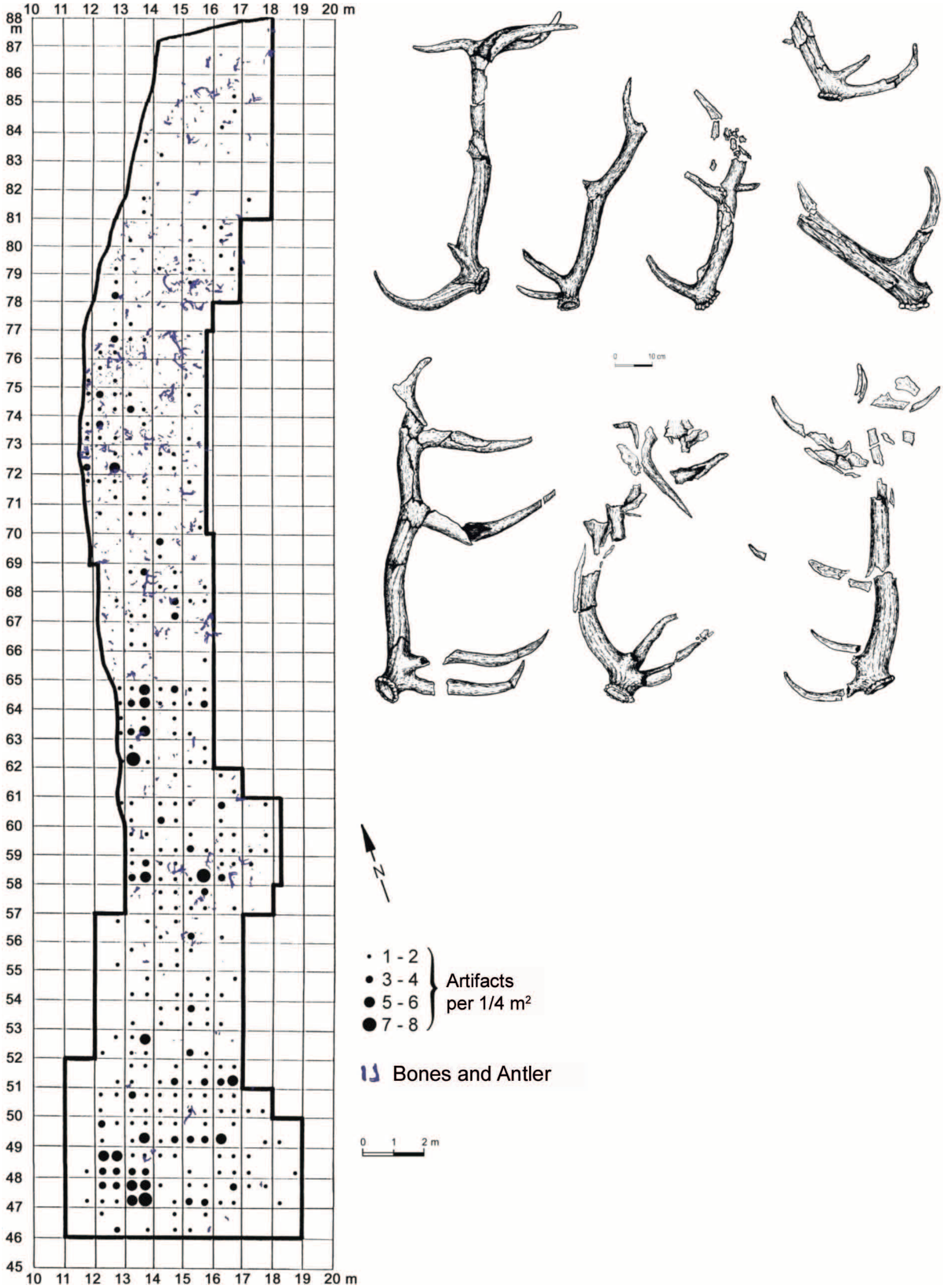

1 - 2
3 - 4
5 - 6
7 - 8
Artifacts per 1/4 m²
Bones and Antler
0 1 2 m
0 10 cm
N

Fig. 12. left
Tönchesberg 2B. Excavation surface and deer antlers (after N. Conard 1992).

say that the large number of collected shed antlers indicates the site was occupied either repeatedly or for an extended period of time.

Other bones found on the site include those of steppe rhino (*Dicerorhinus hemitoechus*), fallow deer (*Dama dama*), and wild ass (*Equus hydruntinus*).

The stone artifacts are predominantly of quartz, but some were also manufactured from fine-grained raw materials including tertiary quartzite, siliceous slate. A small flake of Meuse flint indicates the re-sharpening of a tool on site. The stone artifacts are concentrated in the southern part of the excavation, while animal bones primarily came from the central and northern parts.

Remarkable here was a concentration of tertiary quartzite artifacts in the southern part of the excavation (Fig. 13). The artifacts could be partly refitted, indicating *in situ* tool production. These artifacts, worked from small nodules, are characterized by blades and bladelets, which were the intended products of the core reduction. The blades and bladelets are partly retouched and sometimes backed, including two backed points which resemble the Late Paleolithic *Federmesser* (Fig. 13, 1-2). The blades and bladelets, as well as backed pieces, are characteristic of the Rhein-dahlian (Bosinski 2008: 156–167).

The finds from the first crater depression of Tönchesberg 1B belong to a later period of the Middle Paleolithic after the first cold maximum. Conard excavated a small surface at the base of the yellow loess, immediately above the humus. The sediments and the finds were impacted by permafrost phenomena including cryoturbation and solifluction. The animal bones are primarily from horse, but also from deer, reindeer, woolly rhino, and wild ass. The artifacts are mostly of quartz. In addition, a basalt core and flakes of freshwater quartzite and flint were found. The flint is of medium quality and was collected in the form of river pebbles from local sources in the Middle Rhine region. In addition, there is one artifact of Meuse flint which, together with three other pieces, displays a double patina. These artifacts were apparently collected at older sites and then re-worked. This method of raw material procurement is rarely seen and was first identified in this level.

Plaidter Hummerich, situated between Plaidt and Kretz, in the bend between the Nette and the Krufter Bach rivers, was the first scoria cone we excavated (Bosinski, Kulemeyer et al. 1983; Bosinski, Kröger et al. 1986; Kröger 1987, 1990; Street 2002). The Hummerich cone reaches a height of 274 m above sea level, 150 m higher than the surrounding plain. Between the two peaks there is a crater depression with a diameter of about 100 m, of which we excavated 439 m^2.

The crater contained two loess layers separated by the soil of the Last Interglacial (Semmel 1991). Above the interglacial soil was a solifluction

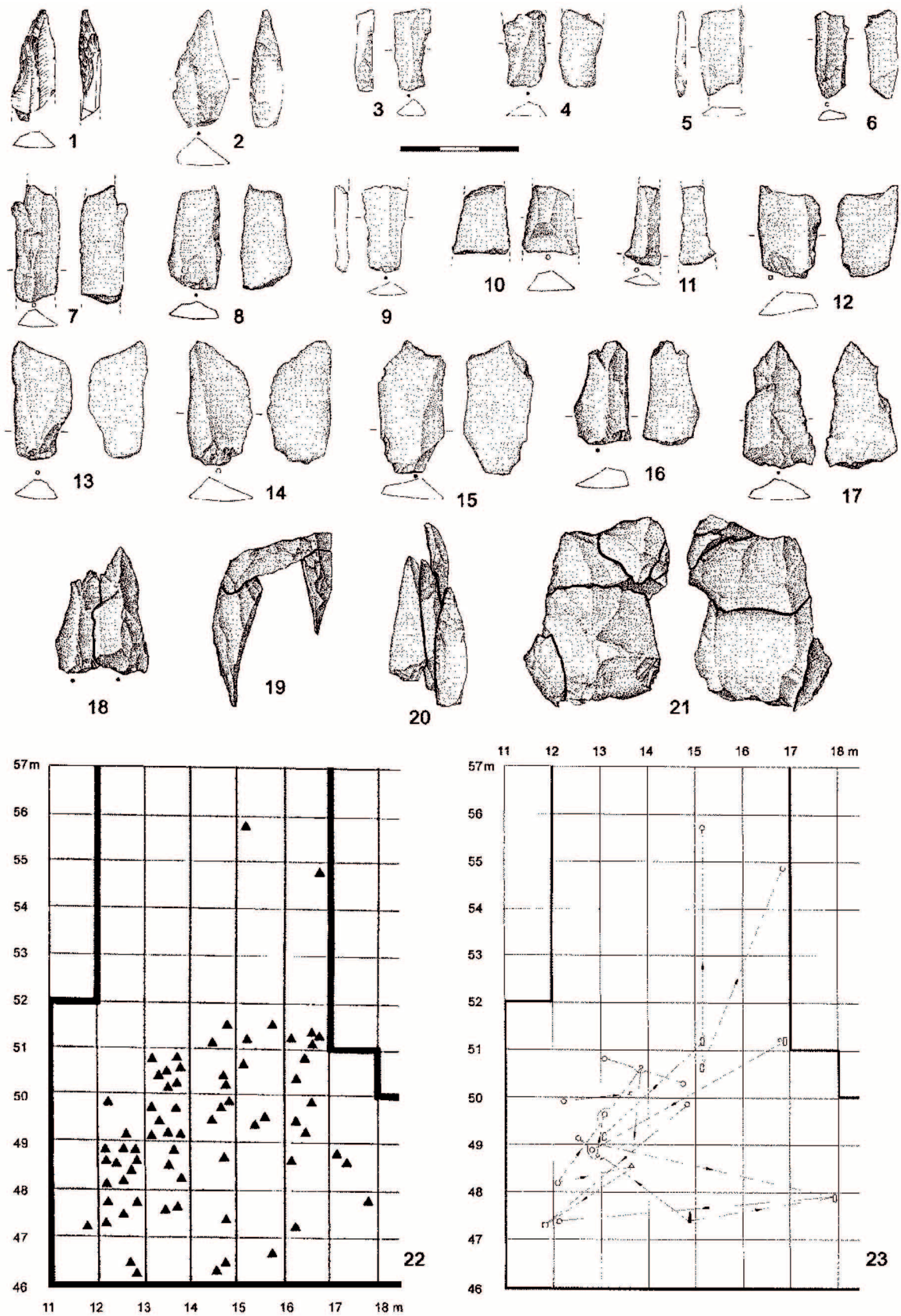

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Fig. 13. left
Tönchesberg 2B. Artifacts from tertiary quartzite (after N. Conard 1992).

horizon with redeposited material, which perhaps dates to the first cold period of the Last Glaciation (MSI 5d). Above this lies a thick humus layer (D), which was subdivided into three layers (D1-D3). The lower part (D1) was dark to black in color and contained many fragments of scoria. The central part (D2) was lighter with less scoria, and the upper part (D3) was again dark with many pieces.

This tri-partite humus layer corresponds to the humus layer above the rill-washed loess of the second crater at Tönchesberg (Fig. 4). In contrast, the black humus directly above the interglacial soil, which at Tönchesberg contained a Rheindahlian assemblage rich in blades and bladelets and may correspond to the Greenland Interstadial 24 (Amersfoort ?), and the reddish soil above, which likely corresponds to the Greenland Interstadial 23 (Brörup), are both absent at Plaidter Hummerich. The humus layer of Hummerich could therefore correspond to the Greenland Interstadial 21 (Odderade) and the MIS 5a. This seems to be the case for at least the lower darker part (D1), in which most of the finds occurred. Whether or not the central and upper part of the humus (D2, D3) belongs to the subsequent Greenland Interstadials 20 and 19 remains an open question.

The upper part of the humus was generally eroded at the edge of the crater depression. The sediment shifted to the center of the depression and remained there as a redeposited horizon containing many finds which originally came from the humus layers. This solifluction probably took place during the first cold maximum of the Last Glaciation (MIS 4).

Higher up in the section we find yellow loess from the second part of the Last Glaciation.

The lower humus layer (D1) contained most of the animal bones and stone artifacts and corresponds to a period when people and animals were frequently present on the site. The marked erosion and the small area excavated made it almost impossible to reconstruct the original situation. The finds likely reflect many short-term occupations over the ca. 11,000 years of the Odderade Interstadial.

The most numerous animals represented in the bone assemblage were deer (NISP 310), horse (164), and bovines (180) (Street 2002a). Deer are mainly represented by shed antlers (Fig. 14) which were collected by humans and brought to the site, as was the case at Tönchesberg. Wild ass (23) and fallow deer (3) were also hunted.

These animals, along with microfauna (v. Kolfschoten 2002), are characteristic of a steppe biotope as it existed in historical times north of the Black Sea and the Caucasus. Animals indicative of cold conditions—reindeer, mammoth, woolly rhino—are absent.

During our work on the site of Plaidter Hummerich, we found many marmot bones, mostly from krotovinas in the humus layers (Kalthoff 1999a-b), indicating the existence of marmot colonies.

Fig. 14.
Plaidter Hummerich. Shed deer antlers from the humus layer.

The stone artifacts are primarily made of quartz (Fig. 15), but the site has also yielded artifacts of Devonian quartzite, tertiary freshwater quartzite, siliceous slate, and flint (Fig. 16). Quartz, quartzite, and siliceous slate occur in the Middle Rhine region. They were brought up to the volcano and kapped there. In contrast, the flint artifacts, mostly of Meuse flint, were brought to the site as finished, and perhaps hafted, tools and were subsequently further modified on the site.

Within the corpus of quartz artifacts we find types belonging to the *Keilmesser* groups: some *Fäustel* (small bifaces; Fig. 15, 1), fragments of *Faustkeilblättern* (flat bifacially-worked tools; Fig. 15, 3, 5, 10), and *Keilmesser* (backed bifacial knifes; Fig. 15, 11). The quartz raw material used makes the classification of the tools difficult.

The artifacts of quartzite and flint are mainly unifacially-retouched sidescrapers and points (Fig. 16).

The large crater of the Plaidter Hummerich cone was certainly used repeatedly over a long period of time by humans; these occupants may have belonged to different groups with different stone-working traditions. A significant portion of the lithic artifacts belong to the *Keilmesser* groups. The position of these finds in the humus layers indicates that they date to the MIS 5a (GI 21; Odderade), or, in any case, before the first cold maximum of the Last Glaciation (MIS 4), and certainly before the yellow loess of the MIS 3. This is important for the geostratigraphical position of the *Keilmesser* groups.

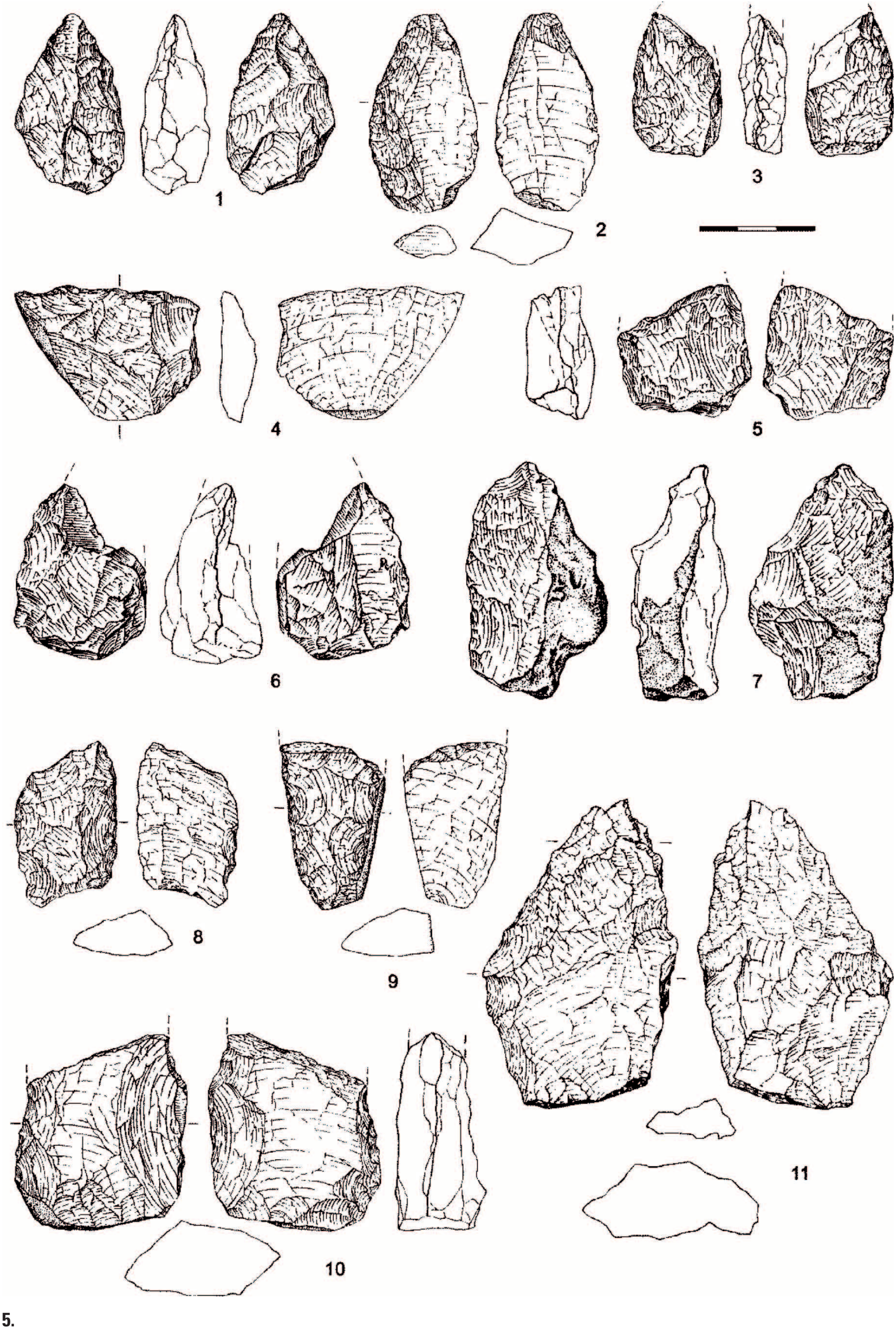

Fig. 15.
Plaidter Hummerich. Quartz artifacts (after Kröger 1987 and Street 2002).

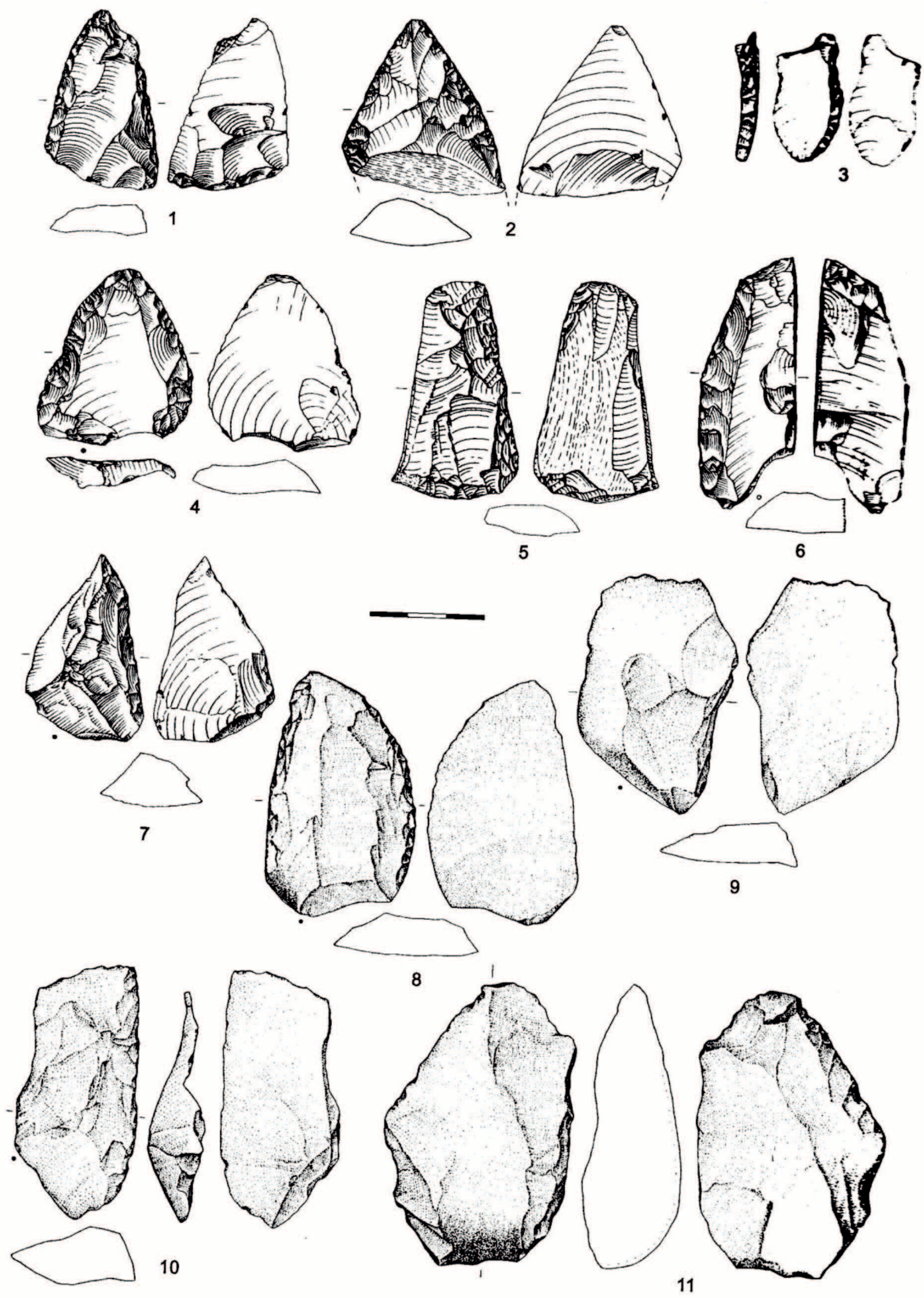

Fig. 16.
Plaidter Hummerich. Artifacts from flint (1-5), siliceous slate (6), calcedony (7), and quartzite (8-11) (after M. Street 2002).

Sites in the crater depressions of scoria cones almost certainly exist in many other volcanic regions. But the finds, which are situated at a depth of 10–20 m within the crater depressions, and which are covered by loess and other sediments, can only be discovered if the scoria cones are quarried. While the volcanos in other regions are still untouched, and many are even protected, the destruction of the scoria cones of the East Eifel volcanic field is advanced (Fig. 17). It is for this reason that, for the moment, such sites are only known from this region.

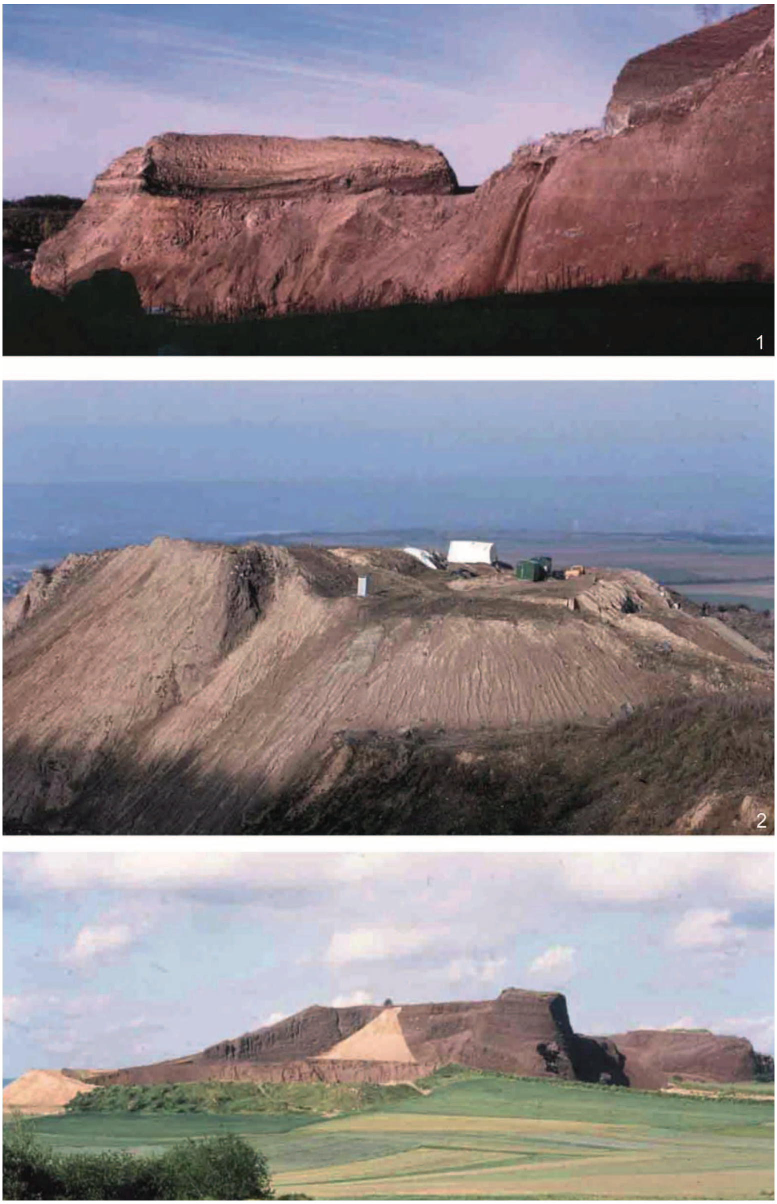

Fig. 17.
Scoria cones of the East Eifel during mining: Kunkskopf (1), Schweinskopf (2), Plaidter Hummerich (3).

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