

# Last Glacial Maximum paved stone structures from Mohelno-Plevovce, Moravia

*Die gepflasterten Steinstrukturen aus dem letzteiszeitlichen Maximum von Mohelno-Plevovce, Mähren*

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**ABSTRACT** - The Mohelno-Plevovce site is located in the valley of the Jihlava River, which is deeply incised into the Bohemian-Moravian Highland, ca. 30 km to the west of the present city of Brno. Due to its close proximity to a pumped-storage hydroelectric power plant, the site is continually eroded by water level fluctuations on a daily basis, and thus regularly monitored by archaeologists. Until now, rescue excavations have uncovered two spatially separated paved areas - stone structures labeled A and B. These stone structures are associated with a peculiar lithic industry characterized by tiny microliths, produced on atypical carinated end scrapers/cores, and splintered tools/bipolar anvil cores. The artefacts were made from both local and exogenous rocks. The spatial distribution of finds follows the boundary of the pavement, suggesting a barrier effect. The structures are therefore interpreted as interior floor features of sheltered constructions - possibly huts.

**ZUSAMMENFASSUNG** - Die Fundstelle Mohelno-Plevovce befindet sich im Tal des Flusses Jihlava, der hier in das Massiv der Böhmisches-mährischen Höhen ungefähr 30 km westlich der heutigen Stadt Brünn tief eingeschnitten ist. Heutzutage ist das Tal in Folge einer Talsperre überschwemmt. Da die täglichen Schwankungen des Wasserspiegels, verursacht durch ein Pumpkraftwerk, die Uferbereiche kontinuierlich erodieren, werden diese Bereiche des Wasserreservoirs ständig durch Archäologen überwacht. Bisherige Forschungen stellten zwei räumlich getrennte gepflasterte Flächen fest - die Steinstrukturen A und B. Mit diesen Strukturen ist ein ungewöhnliches Steingeräteinventar vergesellschaftet, welches durch kleine, an atypischen Kielkratzern/Kernen und gesplitterten Stücken/bipolaren Kernen (Ambostechnik) hergestellte Mikrolithen charakterisiert wird. Die Artefakte wurden sowohl aus lokalen Rohmaterialien (Quarz, Bergkristall, Verwitterungsprodukt der Serpentine, Hornstein des Typs Kromauer Wald) als auch aus exotischen Rohmaterialien (erratischer Silizit, Radiolarit des Typs Szentgál) hergestellt. Es wurden keine Besonderheiten in der Verteilung einzelner Rohmaterialien oder Werkzeuge in der Fläche beobachtet. Das Artefakte aus der Struktur A und B sind unter technologischen sowie typologischen Gesichtspunkten identisch, nur die Verhältnisse der lokalen und exotischen Rohstoffe unterscheiden sich.

Die räumlich begrenzte Verteilung der Funde deutet auf einen Barriere-Effekt hin und die Strukturen werden daher als gepflasterte Innenräume überdachter Konstruktionen - mögliche Behausungen - interpretiert. Es wurden keine Besonderheiten in der Verteilung einzelner Rohmaterialien oder Werkzeuge in der Fläche beobachtet. Das Artefakte aus der Struktur A und B sind unter technologischen sowie typologischen Gesichtspunkten identisch, nur die Verhältnisse der lokalen und exotischen Rohstoffe unterscheiden sich.

**KEYWORDS** - Stone floor, spatial distribution analysis, barrier effect, raw material transport  
Steinboden, Analyse räumlicher Verteilung, Barriere-Effekt, Rohmaterialtransport

## Introduction

Mohelno-Plevovce is a Last Glacial Maximum (LGM) site discovered in the 1980s (Škrdla et al. 2012). It is situated 30 km west of Brno, the second largest city in

the Czech Republic (Fig. 1). Surface prospecting at the site commenced in 2011 and a number of excavations followed, beginning in 2013. Excavations to date have produced the remains of two dwellings with stone pavement floors, more than 5'000 lithic artefacts with a strongly patterned distribution (Škrdla et al. 2016), a

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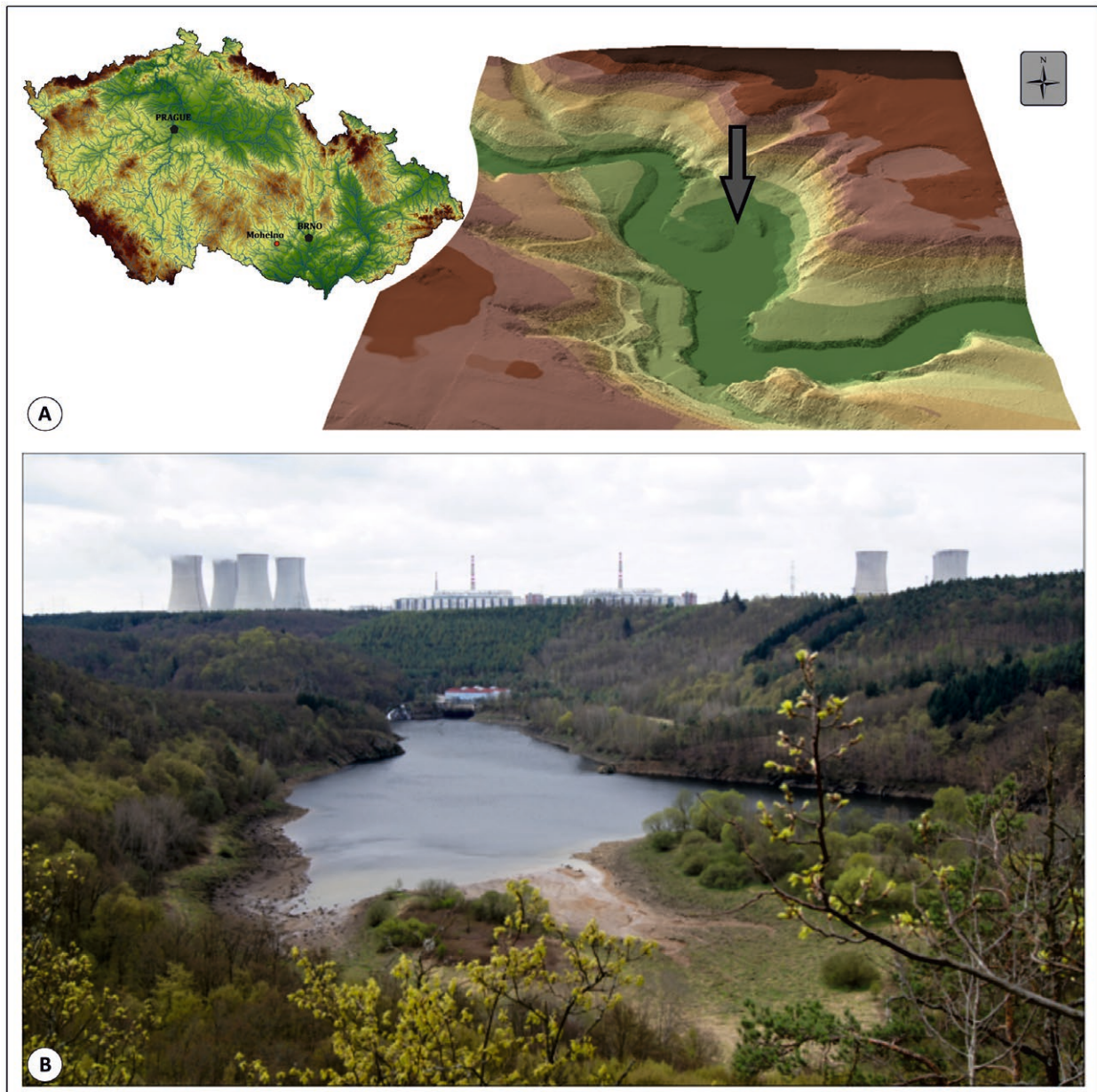


Fig. 1. Location of the Mohelno-Plevovce site (A) and a view to the site (beach) from the North (B).

Abb. 1. Lage der Fundstelle Mohelnice-Plevovce (A) und Blick auf die Fundstelle von Norden (B).

small amount of faunal remains, ochre, charcoal, and evidence for long-distance transport of lithic raw material (Škrdla et al. 2015a, b; 2016).

Central Europe was mostly abandoned during the peak of the LGM due to extreme aridity and very cold temperatures (e.g. Terberger 2013; Verpoorte 2004). The occupation at Mohelno-Plevovce, the only known stratified site from this period in Moravia, probably represents a rare excursion from a distant refugial area. The presence of colluvial sediments overlying the loess on which the structures were built is also consistent with a scenario of slight warming at around the time of the human occupation of this site (Škrdla et al. 2016). These authors postulate links between this site and the North Black Sea region over 1'000 km to the east of Mohelno-Plevovce (see also

Demidenko 2008; Demidenko et al. 2016, 2017). Radiocarbon dating of charcoal from both of the stone structures (~23'000 calBP) places the occupation at the beginning of the peak of the LGM. Surface surveys and excavations have shown that this is a polycultural site with human occupation during the Neolithic and Eneolithic periods also documented (Škrdla et al. 2012).

It has been proposed that the unique geomorphological setting of this site in a deeply incised valley of the Jihlava River surrounded by rocks with heat-accumulating characteristics (dark in color), provided a suitably sheltered location (possibly serving as a refugium) during the extreme cold and aridity of the LGM (cf. Clark et al. 2009; Lowe et al. 2008). Its unusual location, currently below the water level of an

artificially constructed water reservoir, presents unique difficulties for archaeological excavations. It is possible to excavate the cultural layers only during scheduled maintenance breaks of the nearby Dalešice power plant and Dukovany nuclear power plant. These two power plants constitute an integral part of the Czech electricity network and both are reliant on this water reservoir. So far, we have been able to conduct excavations for three days in September 2013, five days in April 2014, two days in May-June 2016 and one day in April 2017. Although these periods presented very short windows of opportunity, we were able to excavate a total of 45.5 m<sup>2</sup>, while maintaining strict protocol of excavation by trowel, in excavation units 0.5x0.5 m and 4-10 cm thick (10 liters of sediment), recording all artefacts in a site grid, and wet-sieving all sediments using 2 mm sieves. The artefact bearing horizon reached a maximum thickness of 20 cm (up to 4 spits per square). The upper part of the stratigraphic sequence (a colluvial sediment) was partly removed by erosion (the structures were discovered as unexpected stone concentrations on a fine sediment shore with only the upper parts of several stones visible). Loess was underlying the artefact bearing horizon.

Microlithic tools are the most common type of lithic artefact, followed by endscrapers and splintered pieces/bipolar anvil cores (Škrdla et al. 2016). Most of the lithic pieces are made from imported raw materials including erratic chert and radiolarite. The large source territory covering a minimum distance of 300 km (as the crow flies) from north to south indicates very high mobility (Škrdla et al. 2016). The artefact assemblages from both structures are dominated by microliths and include symmetrical and asymmetrical, marginally retouched elongated microliths (pointed and non-pointed), carinated atypical (non-lamellar removal negatives) endscraper-cores and splintered pieces/bipolar anvil cores. More than 80% of the collection consists of microchips and microfragments (Škrdla et al. 2016).

The stone structures, labeled KSA (excavated in 2013) and KSB (excavated in 2014, 2016 and 2017) were documented (KS – Czech acronym for “Kamenná struktura” translates to “Stone Structure”). A suspected third structure (KSC) was detected 18m to the north (upslope) of KSA and KSB. Artefacts were not found near the stones so the salvage effort was redirected to other artefact concentrations. As there were no further maintenance breaks during 2015-2017, it was not possible to excavate KSC and it was subsequently destroyed by erosion.

In this paper we focus on the description and interpretation of the two stone structures by examining the raw material structure, spatial distribution and refitting of stone artefacts. Their chronological contemporaneity or penecontemporaneity will also be tested.

## Planigraphy

The site is located in a former paleo-meander of the Jihlava River that previously constituted a larger area – a plateau near the river – within a deeply incised river valley. The elevation of this plateau above the current river level (before the construction of the water reservoir) was 10-15 m. The steep rocky slopes protecting the plateau from the west, north and east contribute to the unique character of this place – it resembles a semi-amphitheater open to insolation from the south, resulting in a climatically suitable oasis within the local environment (experienced personally numerous times during excavations).

The current regime of a regularly fluctuating water level (up to 8-12 m on a daily basis) began in the 1970s and it is created by the pumped storage hydroelectric power plant. It affects the Pleistocene sediments covering the plateau, by continuous erosion and redeposition of material at the bottom of the reservoir (below the line of the lower water level). While erosion along the lower shore level (extending up to ca. 35 m up from the level of the lower shore) mainly affects the surface forming a flat beach, it also creates a network of erosional gullies in the upper parts of the beach. The artefacts collected on the beach as well as in the gullies led us to excavate a series of test pits over the area. It was not until the discovery of flat stones and associated stone artefacts in the middle part of the beach that a rescue excavation was conducted at the site. Two stone structures (KSA and KSB) were excavated and documented within an area where stones were otherwise not present, and, as erosion continually unearths cultural remains, we expect that additional stone structures will be revealed.

KSA consisted of 40 artificially placed flat stones over an area of approximately 3.0x3.3 m. All stones were present in the same layer (the layer is about 10-15 cm thick depending on the size of the stones,) and the stones rarely penetrated into the underlying sediment. All stones have a similar shape and are evenly arranged so we suspect that they represent the original surface of the floor of the structure. The size of stones varied from 50x50 cm to 5x5 cm. The smaller-sized stones were used to fill the gaps. The structure originally had a hexagonal shape, prior to its lower (southern) part being disturbed by erosion (Fig. 2 left).

KSB consisted of more than one hundred, mainly flat stones of different shapes. The stone dimensions typically ranged from 15 to 40 cm, with some stones up to 65 cm in diameter. The paved structure was trapezoidal in shape and approximately 3.0x3.0m in size. The distribution of the artefacts extends beyond the paved area in the northeastern direction, increasing the dimension of the feature to 3.0x5.0 m (Fig. 2: right, Figs. 3-6: left).

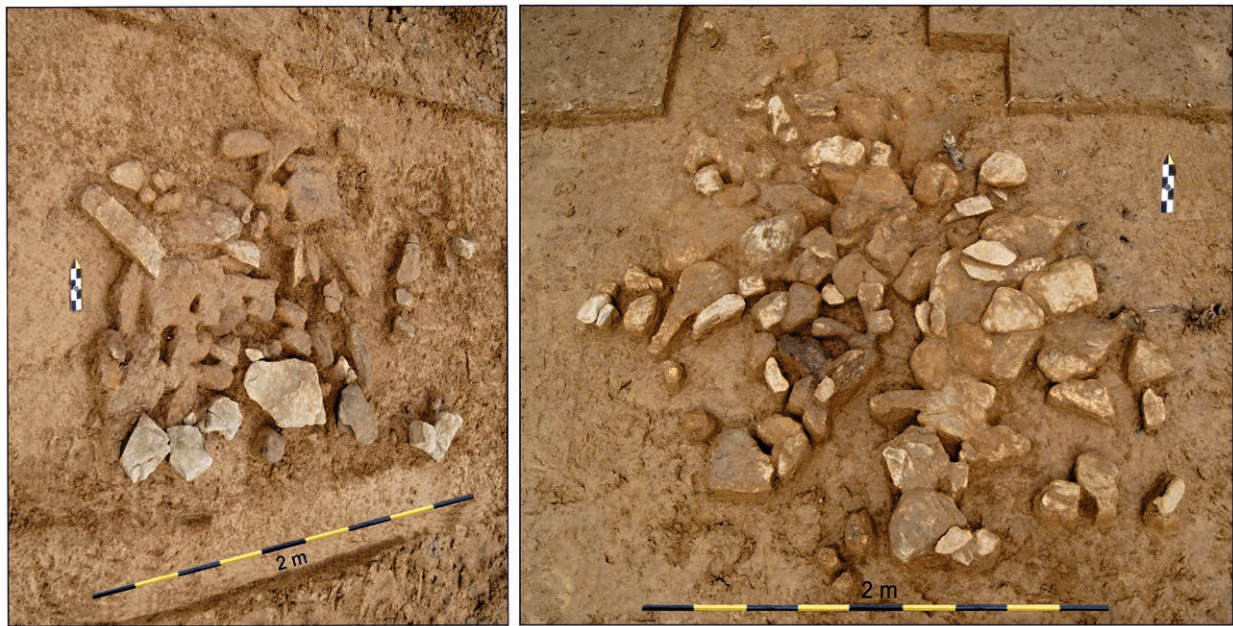


Fig. 2. Paved stone structures: KSA (left) and KSB (right).  
 Abb. 2. Gepflasterte Steinstrukturen A (links) und B (rechts).

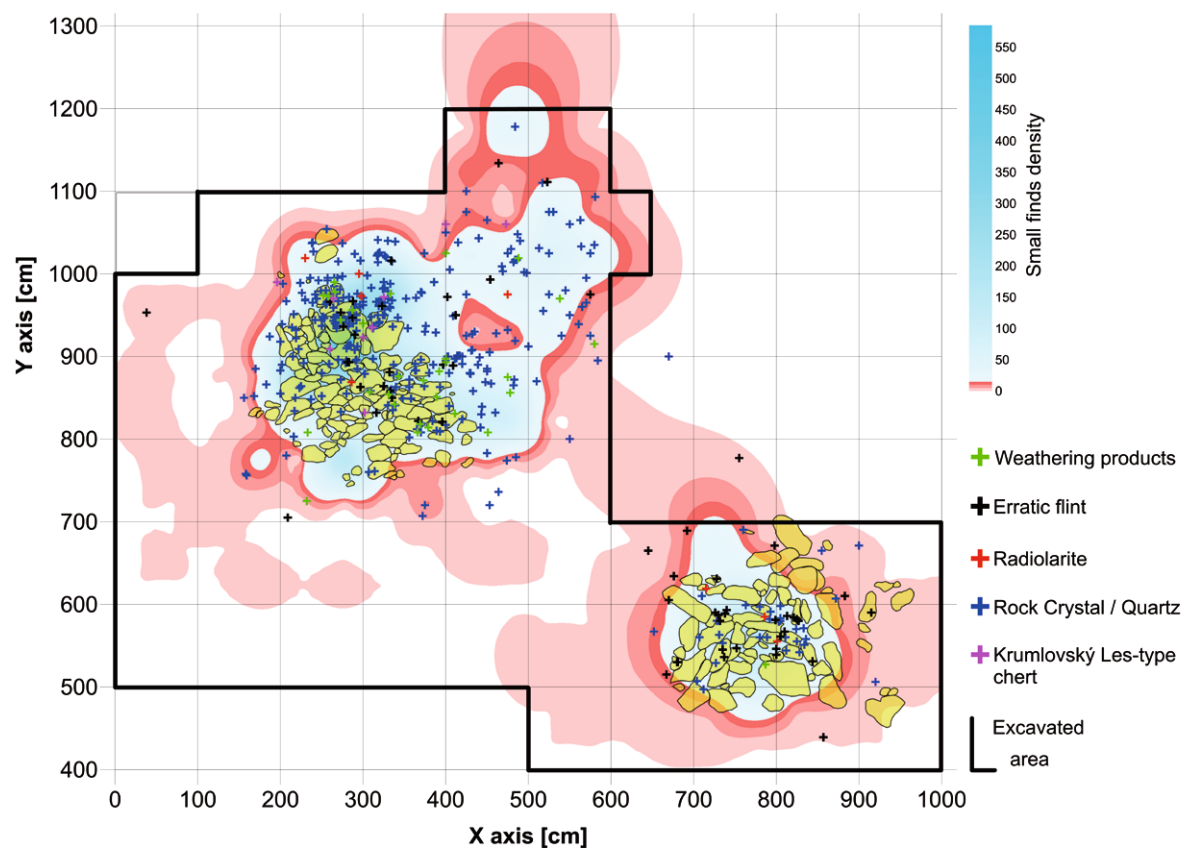


Fig. 3. Spatial distribution of individual raw materials in relation to the structures KSA (lower right) and KSB (upper left).  
 Abb. 3. Räumliche Verteilung einzelner lithischer Rohmaterialien im Verhältnis zu den Strukturen KSA (unten rechts) und KSB (oben links).

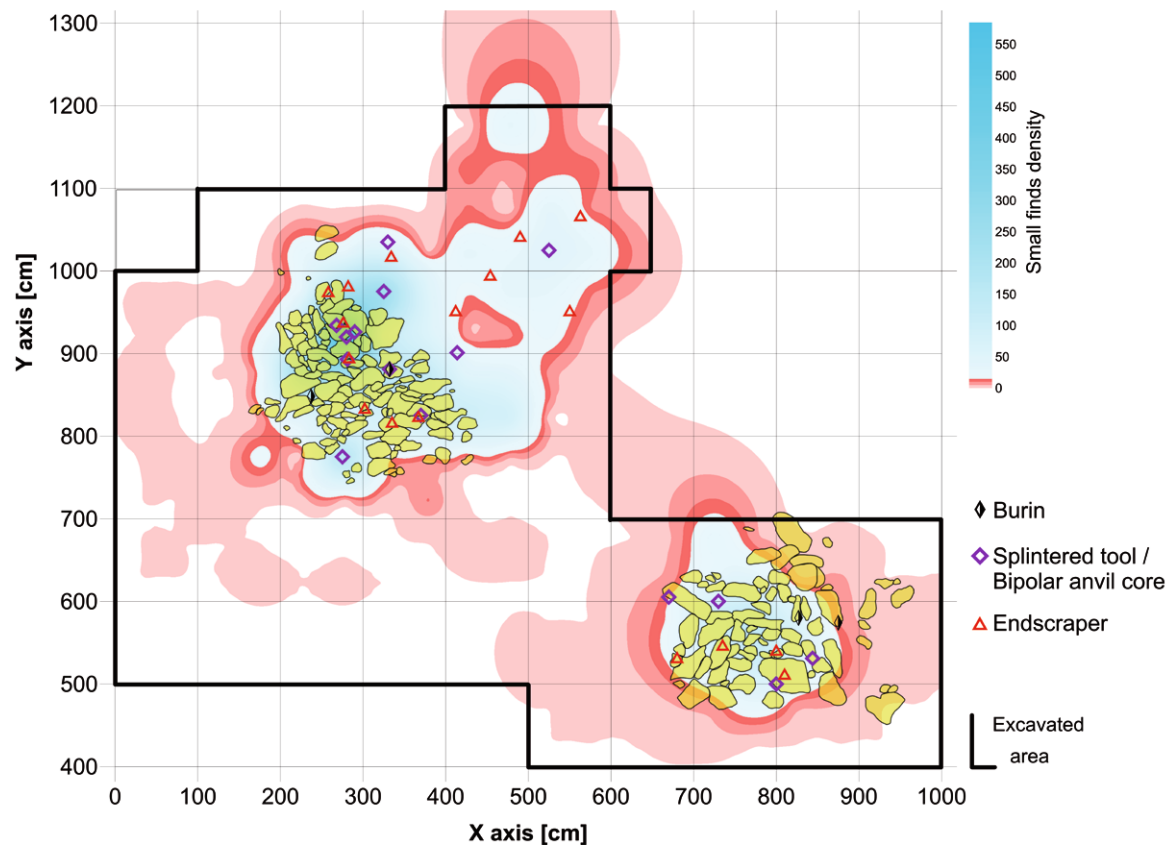


Fig. 4. Spatial distribution of burins, splintered pieces / bipolar anvil cores, and endscrapers / cores.

Abb. 4. Räumliche Verteilung ausgewählter Werkzeugstypen (Stichel, gesplitterte Stücke bzw. bipolar mit Ambostechnik reduzierte Kerne, Kielkratzer bzw. Kerne).

## Rocks used as construction material for the structures

The paved stone structures were constructed from rocks of local provenance. Geological analysis has confirmed that all the utilized rocks come from the Moldanubian geological zone of the Bohemian Massif. The most common rock type is an intensively weathered Gföhl orthogneiss that is sometimes indistinguishable from recrystallized biotite granulite. The raw material composition of both structures is very similar. Stones in KSA also contain other rock types including a fine-grained garnet granulite and a migmatited biotite paragneiss (these two rock types were not documented at KSB). The nearest outcrops of the rocks mentioned above are debris cones along the bottoms of cliffs bordering the site towards the north and north-east. These sources are located at least 150-250 m from the stone structures. The shape, as well as the surface characteristics of the stone slabs (degree of weathering and surface smoothing), are consistent with their origin in the debris cones.

A common feature of both stone structures is the presence of some flat amphibolite cobbles. Surface abrasion and rounding of these cobbles indicate an origin within the local gravel terraces, or in the Jihlava

River palaeochannel. The original river bed is situated just 200 m from the site. Thus, we have shown that rocks used to construct both structures were collected in the immediate vicinity of the site, respectively from detrital and colluvial sediments and from terrace sediments, or directly from the Jihlava River.

The difference between the structures may reflect a choice of a different outcrop (separated by a few meters) or intentional selection of more suitable rock. The magnetic susceptibility indicates similarly low values (tens to hundreds of SI units) for rocks from both structures which is consistent with the hypothesis that the same source was used. The fact that two of the rock types present in KSA were not used in construction of KSB could suggest they were constructed at different times.

## Provenience of lithic raw materials used for knapping

The rocks used as raw material to manufacture artefacts belong to two basic groups:

1. erratic flint and radiolarite imported from a distance of over 100 km

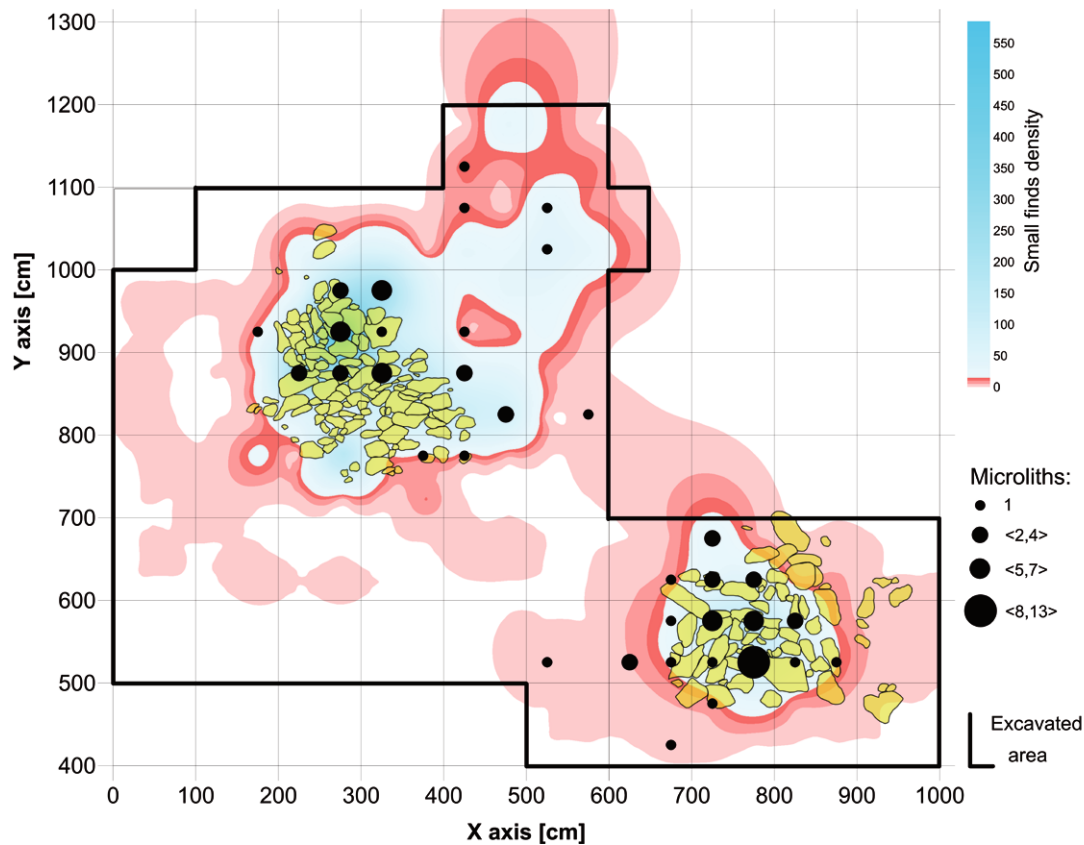


Fig. 5. Spatial distribution of microliths in intervals "1", "2-4", "5-7", "8-13".

Abb. 5. Räumliche Verteilung der Mikrolithen.

2. local rocks obtained from sources within several kilometres of the site (quartz and rock crystal, weathering products of serpentinite, and Krumlovský les-type chert).

The erratic flint nodules were collected from glacio-fluvial deposits in northern Moravia and southern Poland. The nearest outcrops are 150 km from the site in northern Moravia. However, macroscopically similar flint was utilized in the Rashkov VII and VIII (similar to Mohelno-Plevovce both technologically and typologically) sites in the Dniester River Valley (cf. Croitor & Covalenco 2011; Demidenko 2008; Demidenko et al. 2016, 2017). This leads us to postulate an alternative hypothesis for the origin of the flint that will be tested microscopically. Szentgál-type radiolarite originates from several sources in the Bákony Mountains north of Balaton Lake (250 km southeast of Mohelno-Plevovce). Some of the radiolarite artefacts may have different origins: White Carpathian outcrops, or Danube gravel outcrops (we cannot distinguish between those sources without trace element analysis – cf. Brandl et al. 2014; the nearest outcrops are 140 km for the former and 80 km for the latter).

A quartz vein in orthogneiss, which yielded quartz and rock crystal macroscopically similar to the specimens found at the site, was identified 460 m SSE from the site. It is also possible that some items were

imported from the primary outcrops in the Bohemian-Moravian Highlands, or from secondary sources within local gravel terraces. The nearest outcrops of siliceous weathering product of serpentinite (plasma, Přichystal 2013) were identified 2.3 km SE of Mohelno-Plevovce within the cadastral territory of Dukovany (where ochre was also collected). Other outcrops are known within 5-10 km of the site in the neighbouring cadastral territories of Hrubšice and Biskoupky. The principal outcrops of Krumlovský les-type chert (variety I) are located 20 km SE of the site (cf. Oliva 2010), although it is possible that some such chert nodules were collected locally from a secondary deposit in the Jihlava River gravel beds.

### Spatial distribution analyses

As the conditions for conducting an excavation were far from ideal (limited time, water logged sediments, cold and rainy autumn or spring weather), we were forced to modify the excavation methodology in order to excavate the greatest area while still adequately documenting the planigraphy and sieving all of the excavated sediments. We began the excavation using trowels just after water level was artificially lowered in heavily water-logged sediment. All artefacts were recorded in two coordinates. All sediment was collected

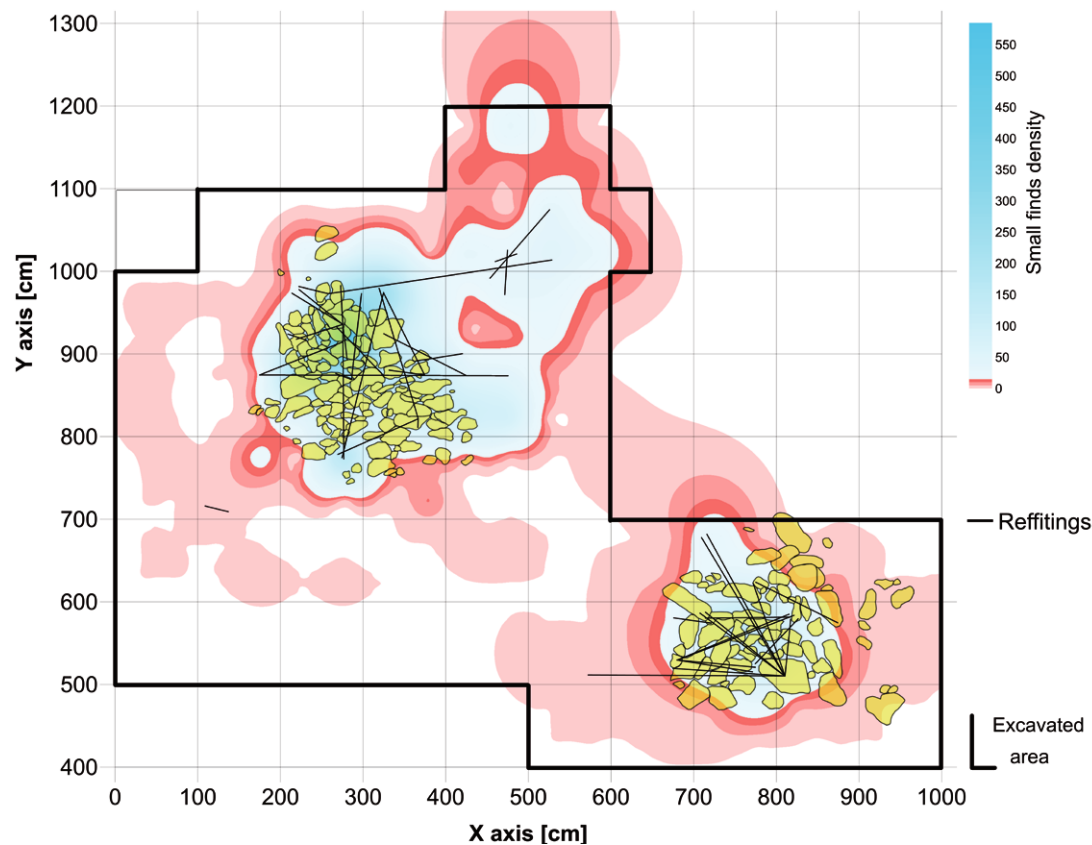


Fig. 6. Spatial distribution of refitted artefacts.

Abb. 6. Räumliche Verteilung der zusammengepassten Artefakte.

according to 0.5x0.5 m sub-squares and transported to the water edge for wet sieving using 2x2 mm mesh screen. As a result, (often) larger finds are recorded in XY coordinates (10.5 % of artefacts), while many of the smaller finds recovered during sieving were recorded within the 0.5x0.5 m grid. All microlithic implements were found during wet sieving and their positions were identified within the 0.5x0.5 m sub-squares.

The stone structures were photographed from all directions, converted (referenced) into a horizontal plan and redrawn for use as a base map in Surfer. 3D models are also available for further analysis.

The artefact database numbers 956 pieces for KSA and 4'228 for KSB (both recorded in XY coordinates and wet-sieved artefacts recorded in 0.5x0.5 m units). The database was visually analyzed using Surfer software pack utilizing post function (artefacts recorded in coordinates) and classed post function (small finds, microliths), contour map function (for density of small finds, using the Kriging method option and used as a background raster in Figs. 3-6), all combined with a base image map (stone pavement).

#### Spatial distribution of artefacts

Spatial distribution analysis of artefact concentrations for both KSA and KSB using classed post (related rings) map function in Surfer indicates the maximum

density area (hundreds of artefacts per 0.5x0.5 m sub-square) and a well-defined zone where artefact density rapidly decreases. The artefacts within KSA are more or less regularly distributed over the paved area. There are very few artefacts beyond the paved area.

The area of maximum density of artefacts in KSB is located in the northern part of the paved area of the structure. The limit of artefact distribution (both in situ recorded and wet-sieved) strongly correlates with the boundary of the paved structure. The only exception is the northeastern margin of KSB, where artefact distribution extends significantly beyond the pavement, thus doubling the size of the feature.

#### Spatial distribution of individual raw materials

There is a significant difference in the raw material spectra of the individual structures (Fig. 3): while erratic flint (70.3 %) prevails over quartz and rock crystal in KSA, local quartz and rock crystal (84.6 %) prevails over erratic flint within KSB. In both stone structures there was a smaller proportion of Szentgál-type radiolarite (KSA 0.4%; KSB 0.9 %) and the siliceous weathering product of serpentinite (KSA 2%; KSB 6.7 %). In addition, several pieces of Krumlovský les-type chert are present in KSB, but no pieces are present in KSA. The spatial distribution of individual

raw materials within both structures is regular, i.e. without any clustering.

### Spatial distribution of selected tools

We mapped the distribution of endscrapers, burins and splintered pieces/bipolar anvil cores (Fig. 4). These artefacts have a uniform distribution inside the paved area of KSA and KSB. In KSB the tools and all other artefacts also occur in the northeastern extension.

### Spatial distribution of microlithic implements

Most microliths (Fig. 5) in KSA (49 were made from erratic silicate) have been found inside the paved area. Only three pieces were found outside the paved area, two to the west and one to the southwest. This observation may be due to the accuracy of measurement (the 0.5x0.5 m sub-squares extended partly onto and outside the paved area), or to post-depositional processes that took place after site abandonment by its human visitors. The main microlith cluster occurs in the central part of the paved area, in an area of 1.5 m<sup>2</sup>.

In KSB the microlith cluster occurs over an area of 2 m<sup>2</sup> in the northern section of the paved area. Some were also found outside the paved area to the northeast. Two pieces were found outside the cluster, one to the north and one to the east. Only three pieces were found outside the cluster (i.e. outside the paved area and the northeastern extension), two in the northern part and one in the eastern part. The raw material spectrum of KSB microlithic implements is more variable than in KSA. Raw materials include erratic flint, (26 items, 60.5%), rock crystal (14 items, 32.6%), and isolated items made from Krumlovský les-type chert, radiolarite, and siliceous weathering product of serpentinite.

The spatial distribution pattern of microlithic implements for both structures is characterized by a positive correlation with the paved area (and its northeastern extension in the case of KSB), and is consistent with the general distribution of all other artefacts.

### Spatial distribution of refittings

Nine sequences consisting of between two and nine artefacts respectively were refitted from the KSA assemblage (Fig. 6). All refitted artefacts were found inside KSA except for one artefact which was found approximately 1 m to the west, past the barrier. All refitted sequences are on erratic flint except for one refitting on weathering product of serpentinite. This is consistent with the fact that erratic flint is the major raw material used.

Eighteen sequences consisting of between two to seven artefacts were refitted from the KSB assemblage (seven erratic flint artefacts, three from radiolarites, two from Krumlovský les-type chert, two from weathering products of serpentinite, and four rock crystal artefacts). These proportions roughly correspond to the raw material proportions. Most of the refitted artefacts are from the paved structure, but several come from the northeastern extension.

It was not possible to refit any artefacts between the two stone structures, even though considerable effort was expended on this task (Fig. 6). This finding was consistent with the different proportions of raw materials used in the two assemblages, as well as with the expectation that the two stone structures are not chronologically contemporaneous. Thus it is likely that the two stone structures are not associated with each other.

### Charcoal and dating

No hearth features were discovered and no burned artefacts were detected. A small amount of charcoal was documented in the vicinity of the largest flat stones in both structures – in the case of KSA at coordinates  $x = 800$  cm,  $y = 500$  cm and in the case of KSB at  $x = 325$  cm,  $y = 925$  cm in the site grid. The charcoal was identified as mainly birch (*Betula* sp.) with some juniper (*Juniperus* sp.), a small amount of willow (*Salix* sp.) and the Vacciniaceae family (Škrdla et al 2016).

The charcoal from KSA was recovered from a darker ashy lens, along with fragments of teeth, small rock crystal chips and red ochre lumps of anthropogenic origin, which filled a shallow depression below the flat stone mentioned above. The charcoal provided two dates with no probability overlap. The first sample (the species was not identified) yielded a date of  $16'280 \pm 80$  <sup>14</sup>C BP (Poz-57891). Juniper charcoal from KSA produced a date of  $18'970 \pm 110$  <sup>14</sup>C BP (Poz-76195). A sample of juniper charcoal from KSB provided a date of  $19'100 \pm 110$  <sup>14</sup>C BP (Poz-76196). All dates are uncalibrated. While the juniper samples from both KSA and KSB yielded results with a significant probability overlap, there is no probability overlap with the more recent date on unidentified charcoal from KSA. This suggests that the two older dates are more reliable.

There is an important contradiction concerning the presence of charcoal that requires explanation. Although a small amount of charcoal has been discovered in the paved structures, a hearth was not found in the paved areas, or anywhere else in the excavated area. In addition, burnt lithics were not identified amongst the thousands of excavated artefacts. It is possible that the fire which produced the charcoal occurred under special circumstances, where contact with the lithics did not occur or where the charcoal was transported to the site by people from a place outside the excavated area. There are four possible hypotheses sourced from experimental archaeology and ethnographic observations that would account for the existence of tangential evidence of fire within the paved structures:

1. Birch bark tar production (e.g. Kozowyk et al. 2017),
2. Smudge fire as protection from flying insects (e.g. Mallol & Henry 2017),
3. A hearth outside the paved structure and the excavated area,



4. Burning of the ground before the construction of pavement.

Dry distillation of birch bark to produce tar was a technology developed for the hafting of lithic implements as early as in the Middle Paleolithic period (e.g. Königsau, e.g. Grünberg 2002). In Mohelno-Plevovce, the tiny microlithic tools were most probably utilized as implements hafted in composite tools and used in hunting projectile weaponry as indicated by diagnostic impact fractures (Rios-Garaizar et al. in preparation). Since birch tar is produced in airtight pits or wraps and heated by controlled fire and birch charcoal was also identified at the site, the production of birch tar could be an explanation for the Mohelno-Plevovce "concealed" fires. Unfortunately, no traces of tar microresidues were identified on the lithics – possibly due to unfavorable conditions of deposition. The second explanation presumes spring to autumn occupation when the site was infested with flying insects due to its close location to the river, and fire (made with fresh wood) served as protection (cf. Mallol & Henry 2017). The third possibility hypothesizes a hearth located outside the structure and excavated area (given that no traces of a hearth,

heated artefacts, or burned sediments were identified during excavations) and the transfer of charcoal as a secondary product (with food, tar, etc.) into the paved area. The fourth possible explanation of the presence of charcoal without burned lithics, is that the fire was lit prior to the construction of the pavement, i.e. just before the ensuing occupation (e.g. in a context of cleaning and/or preparing the ground surface for construction).

Discussion

An analysis of the spatial distribution of artefacts identified two distinctive and spatially separated artefact clusters (Fig. 7) within the excavated area (KSA and KSB). The boundaries of the clusters are relatively sharp and follow the boundaries of the paved areas (except for the northeastern extension of KSB). The majority of the artefacts were found within the pavement structures (and the northeastern extension of KSB) leading us to postulate the existence of a distinct "barrier effect" (cf. Stapert 1991). On the basis of this interpretation we hypothesize that the structures possessed walls, which prevented the dispersal

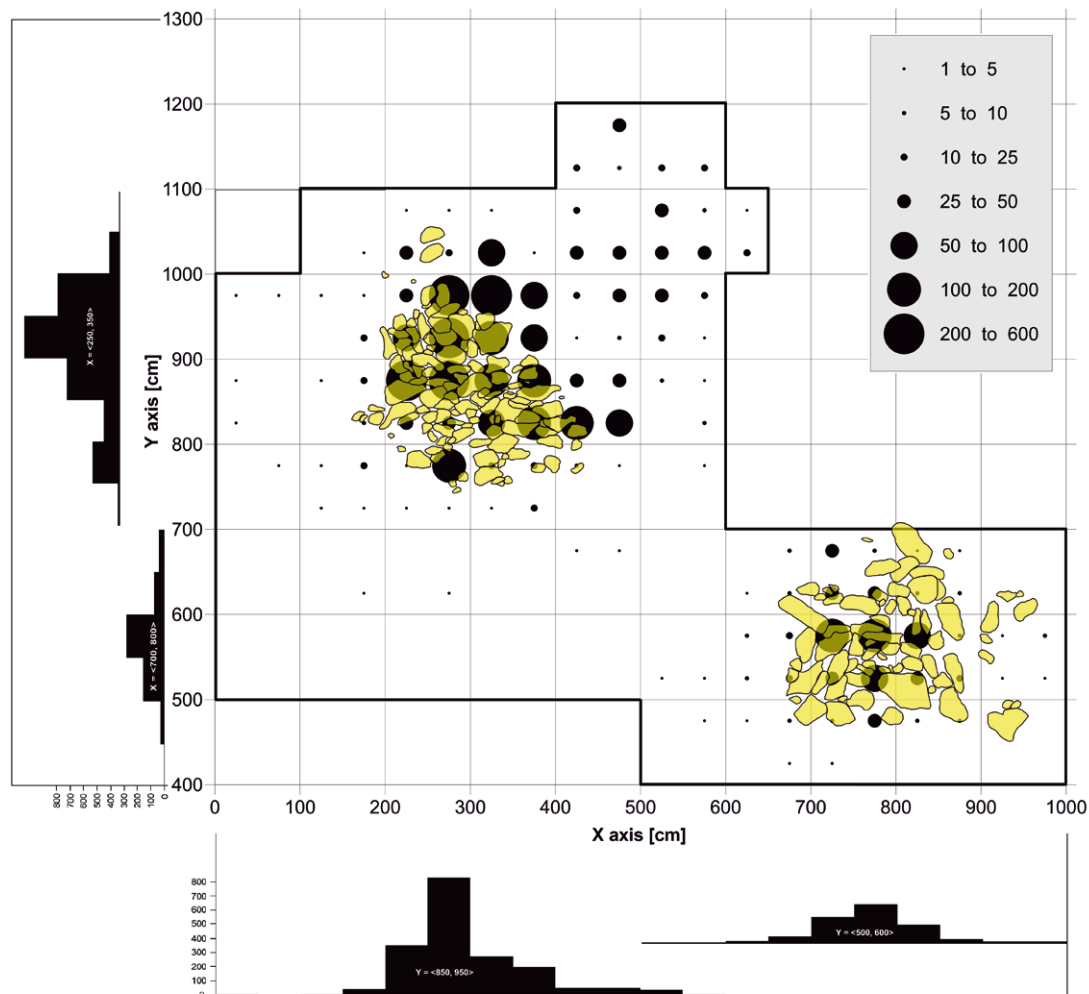


Fig. 7. Spatial distribution of artefacts in KSA und KSB, a classed post map and histograms.

Abb. 7. Räumliche Verteilung der Artefakte in KSA und KSB, Mengenkartierung und Histogramme.

of the artefacts beyond the structures (Škrdla et al. 2016). We suggest that the extension in KSB, which was not paved, is an entrance area with knapping space (however, no hammers or knapping supports were found here). In all likelihood the entrance appears to have been covered, since the continuing barrier effect forms sharp boundaries to this portion of the site and its connection to the paved area, as documented by the refitted artefacts. There is a possible small extension where artefact distribution extends partly beyond the paved area in the northern direction in KSA too. The unpaved extension in KSB can be used as an argument against the role of erosion in shaping the artefact clusters. This hypothesis (incorrect, in our view,) posits that the absence of artefacts outside the paved area is due to erosion. The sediment itself and its condition during the excavations did not allow identification of potential post holes.

We conclude that the hypothesis where the stone structures are interpreted as the interior parts of huts, fully paved (KSA), or partially paved (KSB), is currently the most likely interpretation. The absence of any form of heating installation (supported by the absence of burned artefacts) in the interior of the hut suggests that the occupation may have taken place in the spring to autumn period rather than in winter. This site possessed several unique advantages for habitation: a wind protected area sheltered by heat accumulating rocky slopes and opened to solar insolation from the south (micro-climatic oasis) while the pavement structure served as insulation from the melting permafrost ground. Unfortunately, the reindeer and horse teeth surfaces are probably too weathered to permit seasonality studies (tests are currently being conducted).

The stones used for the construction of the pavement tend to be of similar shapes and sizes and their provenance has been traced to nearby scree slopes and river beds or terraces – in all cases local material available in the vicinity (within dozens of meters) of the site (Škrdla et al. 2016).

Stone pavements are not a unique feature as they have been documented at several sites of similar age. They have been described at the Epigravettian site Grubgraben in Austria (Brandtner & Klíma 1995; Montet-White & Williams 1994) and at Muralovka in Russia (Praslov 1967). Scattered flat stones were distributed over an artefact cluster at the Austrian site of Rosenberg (Ott 1996). An accumulation of stones (there is uncertainty if it can also be interpreted as a “pavement”) and faunal remains were discovered at Stránská skála IV in Moravia (Svoboda 1991). However, none of the described stone accumulations within artefact bearing horizons are interpreted as paved hut floors.

The imported rocks used for manufacturing artefacts from geographically distinct areas indicate a high degree of mobility of groups penetrating Moravia during the Last Glacial Maximum (cf. Verpoorte 2004).

In fact, when connecting the Mohelno-Plevovce site with the nearest outcrops of erratic flint and Szentgál radiolarite, the resulting ellipse, with the longer axis roughly oriented in a north-south direction, covers an area over 200 km in length and 100 km in width. It is also possible that the flint originates in Moldova, where the distance to source is significantly greater (up to 1'000 km). The human inhabitants of Mohelno-Plevovce also possessed knowledge of local outcrops and utilised a variety of locally available raw materials, for knapping and as colorants. While the distant raw materials speak for high mobility, or contact networks throughout a large territory, the local materials and the construction of permanent structures document residential duration longer than a short hunting event; such a scenario has been proposed for another Moravian LGM site – Stránská skála IV, which has been interpreted as a hunting site (Svoboda 1991). Exogenous raw materials used for manufacturing lithic artefacts have also been recorded at this site.

Important questions that also need to be discussed include site function, duration of occupation, and contemporaneity of the two structures. While the microlithic implements indicate hunting activities and retooling of hunting implements, the presence of endscrapers (not carinated), some splintered tools (not bipolar anvil cores), burins, and a borer also indicate “domestic” activities. Therefore the site cannot be interpreted solely as a hunting camp with hunters penetrating a highland area for a short time. Different activities as documented by a diverse toolkit in combination with the construction of permanent structures and sufficient time for obtaining good knowledge of the surrounding area indicate a longer stay rather than merely a hunting trip lasting several days. So far, there appears to be no direct association between the two stone structures: refittings of lithic artefacts that would potentially connect them were not recognized, and the raw material spectra differ. These observations collectively imply that the structures were most probably not contemporaneous. As KSA has mostly imported raw materials whereas KSB has a more significant proportion of local raw material, a “romanticised” interpretation could posit that the obtained knowledge of local resources during earlier occupation of KSA was utilised during the later occupation of KSB.

## Conclusion

The results of the spatial analysis show a positive correlation between a dense artefact cluster and a paved area. It allows us to interpret both features as the interior part of dwellings. We can conclude that both structures were similar in shape and dimensions. The stones used for the floor surface were of similar shapes and originated from identical sources. In terms of the horizontal distribution of artefacts, both in situ and wet-sieved artefacts form a cluster that roughly coincides with the paved area. Artefact density drops

off markedly away from the edges of the structure, where only a very small number of lithic artefacts were found. Spatial analyses of different raw materials, technological and typological categories did not detect any specific patterns of distribution, except for some microlithic tools which were concentrated in the center of the stone structures. The use of exogenous raw materials documents high mobility, while good knowledge of the local rock outcrops suggests a longer duration of the site. Up to 2 hectares of the site area is under threat from erosion. The continuous washing out of sediment will bring to light new artefact clusters in the near future. A recent ground penetration radar survey indicated another paved area close to KSA. For these reasons, the salvage efforts will continue during expected maintenance periods and we expect that more discoveries will be made.

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