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Mohelno – A terminal Last Glacial Maximum industry with microlithic tools made on carenoidal blanks

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ABSTRACT

Mohelno-Plevovce is a recently discovered Epigravettian site in the Czech-Moravian Highlands dated to the Last Glacial Maximum. The site is located on the shores of a water reservoir and remains of human habitation are continually eroding due to constantly fluctuating water levels. Several aspects of this site are notably unique in this region, including two stone structures interpreted as floor pavements of dwelling structures and microlithic implements. These particular microliths are previously unknown in this region, but they are very similar to other assemblages in distant parts of Europe. Raw materials for lithic artifacts associated with the stone structures were obtained locally as well as from distant sources up to 300 km from the site. Ochre, faunal remains and charcoal were also recovered and analyses of these remains indicate a cold, dry climate in an almost treeless landscape. Mohelno-Plevovce represents a rare insight into human habitation of a very sparsely populated central Europe during the LGM.

1. Introduction

Climatic deterioration causing the Last Glacial Maximum (LGM) commenced 26.5 ka and the glaciers reached their maximum extent causing the strongest impact on the Carpathian Foredeep periglacial zone during the time span 22.0–19.0 ka (Clark et al., 2009, p. 711). In Moravia and adjoining regions, traces of human occupation during the LGM are limited to isolated occurrences, with sites often separated by hundreds of kilometers (Fig. 1). This thinly scattered distribution probably occurs for several reasons. Firstly, the area was abandoned during the peak of the LGM because of deteriorated climatic conditions with groups of peoples surviving in climatically more optimal refuges (Carpathian Basin, Balkans, Black Sea Region), from where they periodically visited depopulated areas (Verpoorte, 2004). Secondly, short term (seasonal?) visits by small groups, probably only for obtaining specific resources (raw material collecting, hunting) resulted in a limited number of archaeological remains and limited archaeological readability of such sites. Thirdly, in contrast to Pavlovian sites or late Gravettian sites, the late LGM sites were occupied close to the end of loess sedimentation and therefore were not covered by thick loess layers; if they were, the remains were still close to the surface and more exposed to erosion in the ensuing ameliorate climate as well as more exposed to disturbance due to agricultural activities. The available radiocarbon dates from Moravia (Fig. 2), Austria, Hungary, Poland and Germany (Terberger and Street, 2003; Svoboda and Novák, 2004; Verpoorte, 2004; Lengyel, 2009; Bobak et al., 2013; Terberger, 2013) indicate a thin scatter of sites during two phases of the LGM: ~23 ka (Stránská skála IV phase) and ~19.5 ka (Plevovce phase) (Škrdla et al., 2014, Fig. 12).

Stránská skála IV phase (sites that date to this period include Grubgraben, Ságvár and Kašov) correlates with a brief warm period around ~23 ka, referred to as GI-2 (cf. Lowe et al., 2008, Fig. 1; Terberger, 2013). All ice sheets in the northern hemisphere began to retreat 20–19 ka (Clark et al., 2009, p. 713), which coincided with

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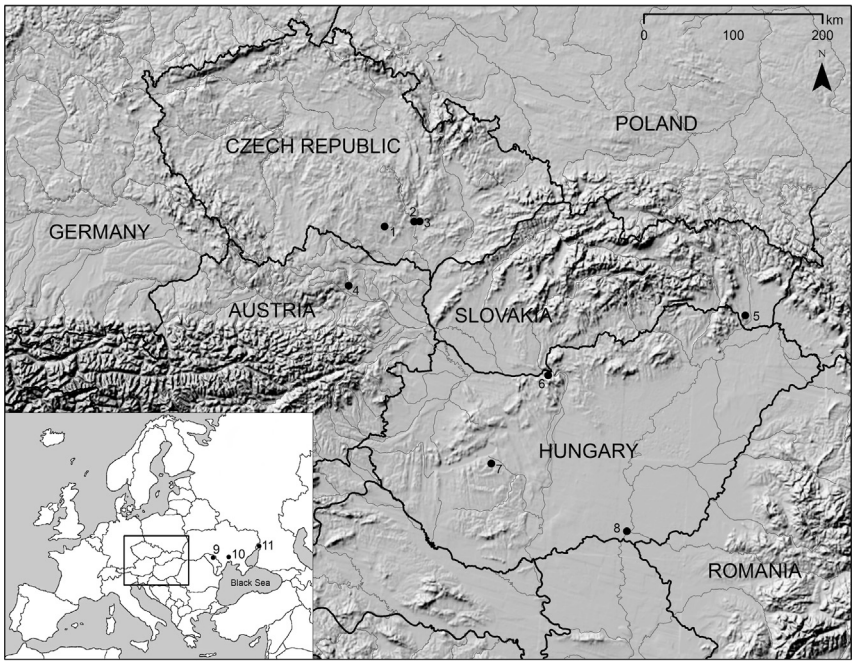

Fig. 1. Sites mentioned in text – 1: Mohelno-Plevovce, 2: Brno-Vídeňská, 3: Brno-Stránská skála IV, 4: Grubgraben, 5: Kašov, 6: Esztergom-Gyurgyalag, 7: Ságvár, 8: Szeged-Öthalom, 9: Raşcov-8, 10: Anetovka I, 11: Muralovka.

mild warming and increased precipitation (Clark et al., 2012, E1137). This warming chronologically correlates with the Plevovce phase.

The term Epigravettian has been used for early late glacial and LGM assemblage but it is more a chronological designation rather than a technological or typological designation for the relatively inhomogeneous industries (Svoboda, 2006). As a result, there have been attempts to find type sites and to reach more homogeneous characterizations of this period (Svoboda and Novák, 2004; Terberger, 2013; Škrdla et al., 2014).

2. Excavation in Mohelno-Plevovce

A new stratified LGM site, Mohelno-Plevovce, located on the Jihlava River in the Czech Moravian Highland has been recently discovered. At the time of occupation, the site was situated near the bottom of a deeply incised river valley on a plateau ca. 15–20 m above the original level of the Jihlava River. The steep and rocky slopes shield the site from north-east, north and west, and form a natural semi-amphitheater opening to the south. The combination of geomorphological position with heat-accumulation characteristics of local rocks (orthogneiss, serpentinite) presented more suitable conditions (a microclimatic oasis) in the Last Glacial Maximum climate.

Historical maps (Military survey maps and maps of stable cadaster) indicate that the plateau was forested during the Late Medieval period. The presence of the forest prevented sediment disturbance by agriculture. The situation changed in the 1970s when the area was deforested for building of the Mohelno water reservoir. This reservoir is a part of the Dalešice pumped-storage hydroelectric power plant. Since the end of the 1970s, the location has been continuously disturbed by erosion caused by fluctuating water levels. The water level rises and falls up to 11 m, often on a daily basis. As the hydroelectric power plant is a significant part of the Czech electricity system, the archaeological work is possible only during scheduled maintenance breaks (3–5 days), when the water level is at its minimum. Despite this limitation, over the last two years we have been able to excavate an area of 22 m^2 and we have identified two stone structures labeled A and B (KSA and KSB from here on). The KSA (Škrdla et al., 2014) was excavated over three days in September 2013 and KSB was excavated over five days in April 2014 (Škrdla et al., in press). The excavation was complicated not only by a severe time restriction, but also by the high moisture content of the sediments. Despite these limitations, we removed the sediments using trowels and recorded the excavated artifacts in a site grid. The excavated sediments were transported to a nearby lake for wet sieving (using a 2 × 2 mm mesh size). We have documented the stone structures and all artifacts within the structure. At the end of the excavation, we removed the sediments between individual stones, replaced the stones and checked sediments underneath the stones for possible artifacts. We have not observed any postholes or pits, but this could be due to the water-logged, muddy, colluvial sediments.

3. Stone structures KSA & KSB

3.1. Planigraphy

Stone structure A consisted of 40 artificially placed flat stones over an area of approximately 3 × 3 m. All stones were purposefully arranged at the same level presumably to create a floor surface. Dimensions of stones used ranged from 5 cm to 70 cm. The smaller-sized stones were used to infill gaps. The structure was hexagonal in shape (Škrdla et al., 2014). The distribution of artifacts (both in situ and wet-sieved) strongly correlates with the paved area.

Stone structure B 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 size. The paved structure was trapezoidal in shape approximately 3.5 m × 2.0 m in size (Škrdla et al., 2014). Although the distribution of artifacts (both in situ and wet-sieved) correlates well with the paved area, the artifact cluster extends slightly to the east and northeast outside the paved area (~0.5–0.7 m).