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AN ALIEN IN THE MICROLITHIC ASSEMBLAGE: FUNCTIONAL ANALYSIS OF A LARGE TANGED TOOL FROM THE EARLY MESOLITHIC SETTLEMENT OF MĚSTEC/OSTROV (CZECH REPUBLIC)

ABSTRACT: The article deals with an atypical large tanged tool from the archaeological site of Městec/Ostrov in Eastern Bohemia (Czech Republic) found in a context of the microlithic assemblage typical for local Early Mesolithic settlement. This tool differs from a majority of lithic artefacts excavated on this site from technological as well as typological point of view. Morphologically it reminds Late Glacial Northern European tanged points, which were used as components of projectile weapons. However, an abrupt retouch shaping a tip of the analysed tool would be inconvenient for this kind of utilization. The functional analysis resulted in the outcome that, at least in the last stage of the artefact biography, it was not used as a projectile point, but rather as a multifunctional domestic tool, which could have been used for processing of various material (wood, bone and soft animal tissues). Traceological analysis suggests that the terminal part of the artefact was used as a borer, while the lateral edges were used for cutting and whittling. Finally, the occurrence of this tool type in this context is discussed. It remains unclear, whether this artefact represents a northern import, or if it is a Late Glacial reminiscence or even admixture. Also, it cannot be decided, if it was originally manufactured as a domestic tool, or if it is a reutilized tanged point.

KEY WORDS: Early Mesolithic – Preboreal – Late Glacial – Tanged lithic point – Functional analysis

1. INTRODUCTION

Approximately 11,640 years ago, Europe witnessed a rapid climate change. An intensive global warming terminated the last glacial period and the current geological epoch, the Holocene, began (*e.g.*, Walker *et al.* 2009). The first stage of the Holocene is called the Preboreal. It lasted from 11,640 to 10,600 BP and is

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characterized by its still relatively cold and dry climate. The cold steppes and forest-steppes of the preceding stadial Younger Dryas were replaced by pine and birch forests. Reindeer herds and other representatives of artic fauna moved to the north and local foragers had to get used to the new conditions. The economy of the central European Mesolithic hunters was based mainly on the gathering of plants, seeds, mushrooms and fruits, the hunting of forest animals typical for the north temperate zone of middle latitudes (*e.g.*, *Cervus elaphus*, *Capreolus capreolus*, *Sus scrofa*, *Bos primigenius*, *Alces alces*, *Lepus timidus,* etc.) and fishing (see, for example, Vencl 2007c: 128–129). The human response to the Pleistocene/Holocene climatic and environmental change is reflected in the archaeological record at sites with the Early Mesolithic material culture, which is composed mostly of lithic artefacts. In this lithic industry we can observe a trend to "microlithization", *i.e.*, the production of tiny artefacts called microliths, which during the Early Mesolithic were mainly truncated and backed bladelets and triangles, and which were originally inserted as armatures into composite tools. The extensive forestation of the landscape caused a reduction in mobility, and therefore the Early Mesolithic lithic assemblages were mostly made of local and semi-local raw materials (*e.g.,* Bailey, Spikins *eds.* 2008).

During the Early Mesolithic, Bohemia was settled by small groups of hunters-gatherers and fishermen (Vencl 2007c: 125–131, Svoboda 2008). Most of the sites are located in pseudo-karstic areas, usually under sandstone rock shelters (Svoboda, *ed.* 2003, 2017, *ed.*, Šída, Prostředník 2007). Other sites are situated on the shores of prehistoric lakes, such as Lake Schwarzenberg or Lake Komořany (Vencl *et al.* 2006) or on river terraces. One of these lakes was located in eastern Bohemia near the village of Uhersko. Not far from this lake there was an Early Mesolithic site called Městec/Ostrov excavated within the framework of a rescue archaeological excavation in 2018 (Mlejnek, Záhorák 2020, Mlejnek *et al.*, in prep.). This site is located on a hillock above the Loučná River and has provided a large collection of Early Mesolithic lithic artefacts. Most of them are microlithic and made of local or semi-local raw material. One exceptional find (artefact number 116), made of an imported erratic flint and typologically originally labelled as a tanged point, attracted our attention.

1.1 Type vs Function

The "functional" naming of types has been based on the similarity of a tool's morphology to a manner of a tool application in a limited number of ethnological analogies. The serialization of types has provided archaeologists with an essential toolkit of methods for the reconstruction of past human dynamics and their diachronic changes in human history (Bordes 1969, Marreiros *et al.* 2020: 476–477). It has also facilitated the mutual communication and understanding among scholars regarding the description of lithic artefacts. The main disadvantage of this purely techno-functional approach is that it does not really reflect the complex biography of particular artifacts.

Currently, there is a general agreement within the scientific community that the morphology of stone tools by itself does not necessarily reflect the sole function of the stone tool (van Gijn 1989: 143–145, Šajnerová-Dušková 2007: 79). Stone tools have a much more complex biography than we had previously believed possible. The functions of particular tools could change though their life cycles completely, switching multiple times from one function to another with various stages of reutilization and resharpening, until they were finally discarded from their use by humans (Borrell, Molist 2007: 73). Furthermore, even once discarded, they could be again used and modified by the next inhabitants of the site in a completely different socio-economic context. We therefore present in this text the result of a broader functional study of the outstanding artefact number 116 (typologically originally described as a large tanged point), including its techno-functional and traceological analysis, with the aim of a broader interpretation of this artefact that better reflects its prehistoric socio-economic factors.

1.2 Site Description

The analysed artefact was found on the Early Mesolithic site Městec/Ostrov, located in eastern Bohemia (Czech Republic, Chrudim District, Pardubice Region; *Figure 1*) during a rescue excavation conducted prior to the construction of highway D35. Lithic artefacts were deposited mostly in the topsoil (plough horizon) or on the boundary between the topsoil and the underlying terrace of the Elsterian Age. Unfortunately, most of the original prehistoric features had already been destroyed by ploughing, with just a small pit (ca 40 cm in diameter) containing charcoal being preserved. Four of the pine charcoal pieces from this pit were radiocarbon dated and yielded dates of the Preboreal Age (*Table 1*).

An area of 343 m^2 was excavated and all the sediment of the topsoil down to the top of the terrace

TABLE 1: Radiocarbon dating of pine charcoal pieces excavated in the Feature 2 on the Městec/Ostrov site calibrated using the CalPal programme, version 2021.2 (Weninger 1986, Weninger, Jöris 2008) and calibration dataset IntCal20 (Reimer *et al.* 2020). Calibration graph in Mlejnek *et al.*, in prep.

ID	Lab number	Uncalibrated date BP	Standard deviation	Calibrated age BP cal, 2σ
M/O02	DeA-25068	9 856	38	11 376–11 253
M/O03	DeA-25069	9 744	43	11 293–11 151
M/O04	DeA-25070	9 672	39	11 254–10 850
M/O07	DeA-25071	9 852	41	11 381–11 249

surface was dry-sieved and subsequently wet-sieved with 2 mm mesh size sieves. A collection of 4,982 lithic artefacts were obtained during the excavation and another 142 lithics were collected during surface surveys at the site. Their detailed technological and typological description, as well as the raw material composition of this assemblage, are presented in an article by Mlejnek *et al.* (in prep.).

The most common raw material at the site are the Cretaceous spongolites (spiculites) of eastern Bohemia (type Ústí nad Orlicí). The sources of this raw material can be found close by in the Ústí nad Orlicí district (Přichystal 2013: 64–65). The prevalent majority, i.e., 71.97% of all artefacts, were manufactured from this material. This material group probably also contains the spongolites from the Bořitov area in Moravia (Přichystal 2013: 82–84). However, it was not possible to distinguish between these two sources, and therefore we cannot determine the precise amount of this raw material. Silica minerals account for 15.46% of all the artefacts. Quartz is the most frequently occurring silica mineral (9.94%; Přichystal 2013: 134–136). Due to its low quality, only flakes and flake fragments were manufactured from this material. Rock crystal was also used (3.98%; Přichystal 2013: 136–144). Rock crystal and quartz can be collected as small pebbles directly at the site in the sandy gravel terrace. The third most common raw material at the site (5.7 %) are the high quality silicites of glacigenic or glacial sediments (erratic silicites, mainly flint) imported from moraines of the Pleistocene continental ice sheet north of the Orlické Mountains (Přichystal 2013: 51–54). High quality erratic silicites were used as early as the beginning of the Lower Palaeolithic and in the Upper and Late Palaeolithic lithic assemblages they often prevail, while Mesolithic foragers usually preferred local raw materials. (*cf.* Moník 2014 and Čuláková 2015). It is therefore possible that the higher proportions of erratic silicites (including several slightly patinated bladelets, blades and mainly the analysed tanged tool) could indicate a Late Palaeolithic admixture, or a Late Palaeolithic tradition. Other raw

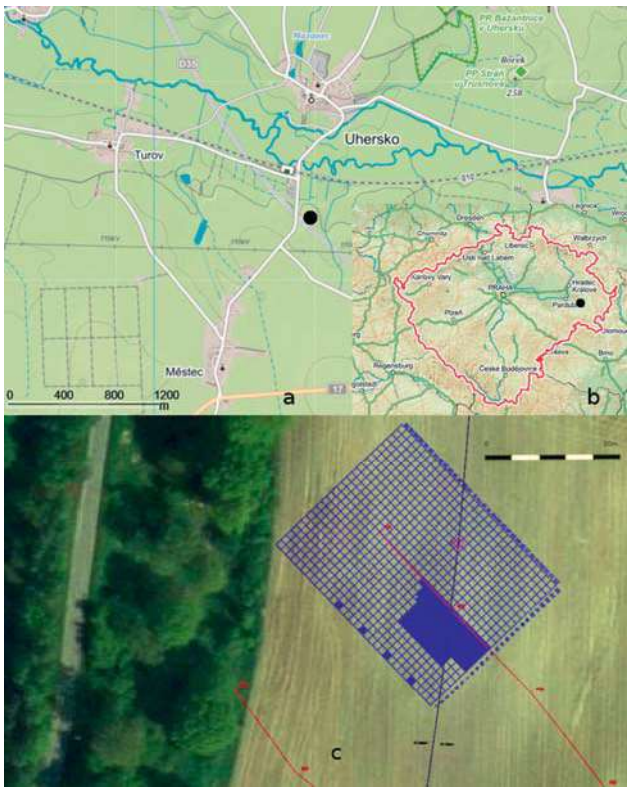

FIGURE 1: Location of the Městec/Ostrov site on a map of Bohemia (b). Location of the Městec/Ostrov site on the map of Uhersko village and its surroundings (a). The Městec/Ostrov site location is marked with a black dot. Aerial photograph of the site with a grid overlay (c). Blue area – excavated squares, red lines – boundaries of the D35 highway alignment. Map source: www.mapy.cz. Processed by O. Mlejnek.

TABLE 2: Městec/Ostrov. Proportion of particular raw materials in the assemblage.

Raw materials	Number of artefacts	Percentage
Spongolites (Spiculites)	3687	71.97
Quartz	509	9.94
Silicites (flints) from glacigene sediments	292	5.70
Rock crystal	204	3.98
Quartz/Rock crystal	79	1.54
Jasper	68	1.33
Orthoquartzite, type Bečov	38	0.74
Chalcedone weathering products of serpentinites	17	0.33
Radiolarite	14	0.27
Orthoquartzite, type Skršín	12	0.23
Porcellanite	10	0.2
Other raw materials	32	0.63
Undetermined pieces	161	3.14
Total	**5123**	**100.00**

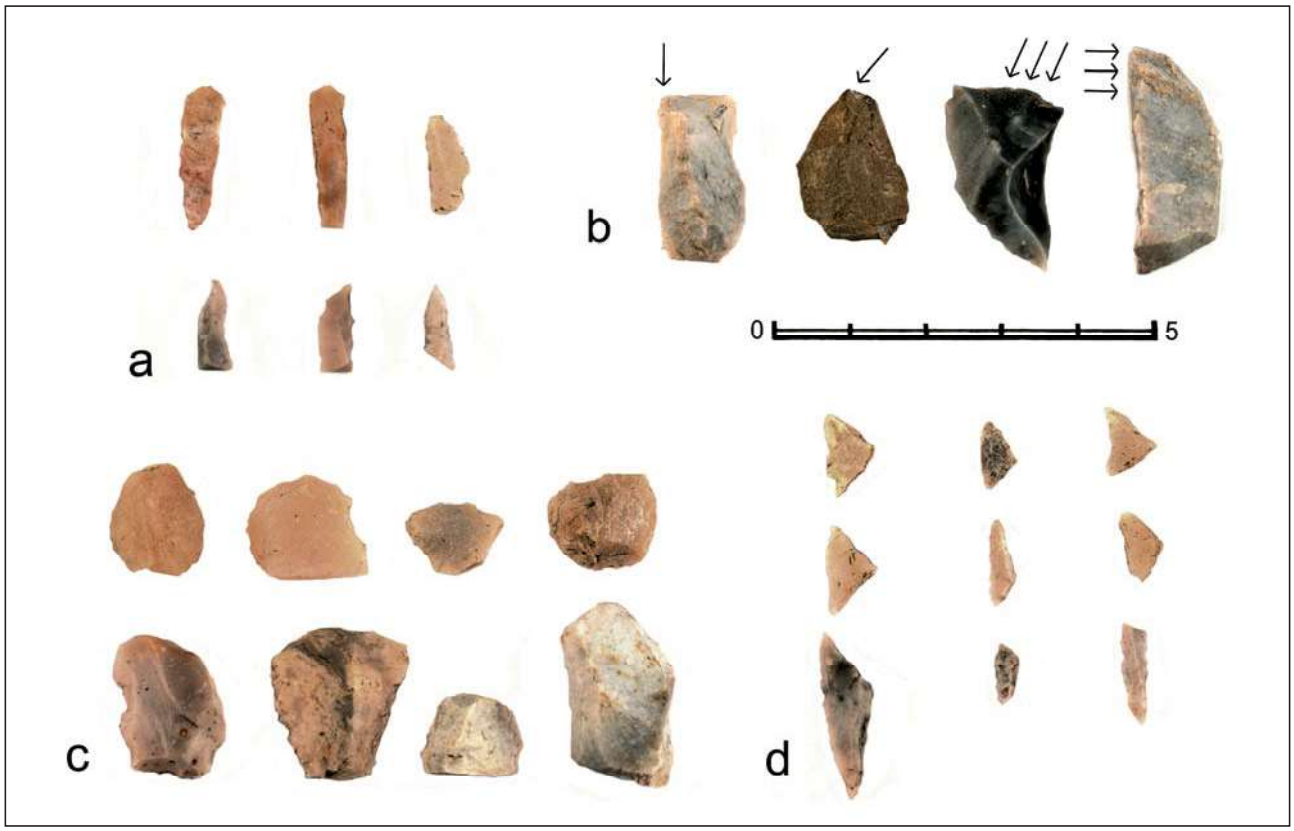

FIGURE 2: Městec/Ostrov. Photograph of selected tools. a) backed bladelets b) burins c) end scrapers d) microlithic triangles. Photograph by M. Kršková, processed by O. Mlejnek.

materials (jaspers, North Bohemian orthoquartzites, radiolarites, chalcedony weathering products of serpentinites, Moravian cherts, porcellanite, etc.) are represented by just some few pieces. From the economical point of view, they were not really important, but these rare raw materials can point to the contacts of local foragers to other groups and regions (*Table 2*).

Most of the excavated artefacts were of very small dimensions (*Table 3*). The typical technology used on the site was based on the production of bladelets (average width 6–8 mm) with the use of a soft hammer, and these bladelets were subsequently used for the production of formal microlithic tools (mostly triangles and backed bladelets). Apart from the microliths, other tool types, such as tiny end scrapers, indistinct burins or retouched bladelets were also produced (*Figure 2*, *Table 4*, Mlejnek *et al.*, in prep.). The artefact number 116 (*Figure 3*), typologically originally determined as a tanged point, stands out from the collection – both from a typological and technological point of view. Tanged tools are not a typical part of the Early Mesolithic lithic collections, which are usually based on a production of microliths used as implements in composite tools. Tanged points are present in the Late Palaeolithic lithic assemblages originating from northern Europe and northern part of central Europe. However, in Bohemia, they are quite rare (*cf.* Vencl 2007b: 121–123). We therefore decided to perform a detailed functional analysis of this tool.

1.3 Finding circumstances

The analysed artefact was found in square T9b in the central part of the site. In this part of the site, in an area of circa 64 m^2, an additional layer sandwiched between the plough horizon and the underlying terrace was identified (*Figure 4*). This approximately 30 cm-thick layer was interpreted as a natural depression on the terrace surface, which had then been mechanically levelled during major agricultural works in the 1950s. This interpretation was also based on the fact that,

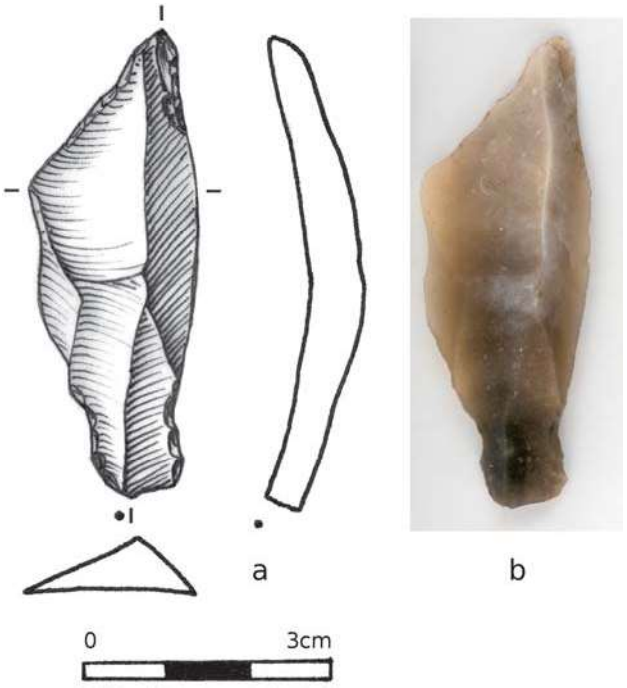

FIGURE 3: Městec/Ostrov. A drawing (a) and a photograph (b) of the analysed artefact number 116. Drawing by L. Dvořáková, photograph by L. Vojtěchovský, processed by O. Mlejnek.

TABLE 3: Městec/Ostrov. Dimensions and weight of lithic tools and unbroken debitage.

Artefact metric	Tools	Complete debitage	Complete flakes	Complete blades	Cores
Mean length (mm)	16.28	14.34	12.94	20.16	23.48
Median length (mm)	14.70	13.00	11.60	18.70	21.80
Mean width (mm)	10.52	10.55	11.09	8.31	20.10
Median width (mm)	9.03	9.41	9.90	7.99	25.40
Mean height (mm)	4.00	3.69	3.63	3.96	14.65
Median height (mm)	3.06	3.09	2.98	3.39	13.50
Mean weight (g)	1.06	0.84	0.81	0.96	9.79
Median weight (g)	0.36	0.33	0.29	0.51	6.05
Number of artefacts in total	**182**	**1,386**	**1,117**	**269**	**158**

apart from the prehistoric lithic industry, this feature also contained recent pottery shards and fragments of iron objects. The analysed artefact was found in this layer in the 54th bucket from this square, circa 110 cm below the surface.

1.4 Cultural context

During the Central European Early Mesolithic period tanged artefacts were no longer in use as tips of projectiles. As proven by numerous functional analyses of Mesolithic artefacts (e.g., Barton, Bergman 1982, Grøn, 1992, Crombe et al.2001, Petru 2004, Chesnaux 2008, Pyżewicz, Grużdź 2013, Cooper, Jarvis 2017 etc.) during the Preboreal period commonly obliquely retouched tiny points of the Zonhoven type (e.g., Vermeersch 2013) served as the arrow points and in the following Boreal period these were replaced in the same function by geometric, usually triangular microliths. Both of these tool types are present in the lithic assemblage from the Městec/Ostrov site in several examples (Mlejnek, Záhorák 2020, Mlejnek *et al.* in prep.); however, the analysed tanged tool is unique in this collection. Since this artefact differs from the rest of the lithic collection from Městec/Ostrov site, it was decided to perform a functional and use-wear analyses of this artefact separately. The techno-typological and raw material analysis of the entire lithic collection is a part of the article by Mlejnek *et al.* (in prep.) and functional and use-wear analysis of the rest of the collection yet has to be done.

If we searched for analogies of this unique tool, we would have to consider, for example, the Late Palaeolithic north European technocomplexes with tanged points (*cf.* Kozlowski, Gurba, Zaliznyak 1999).

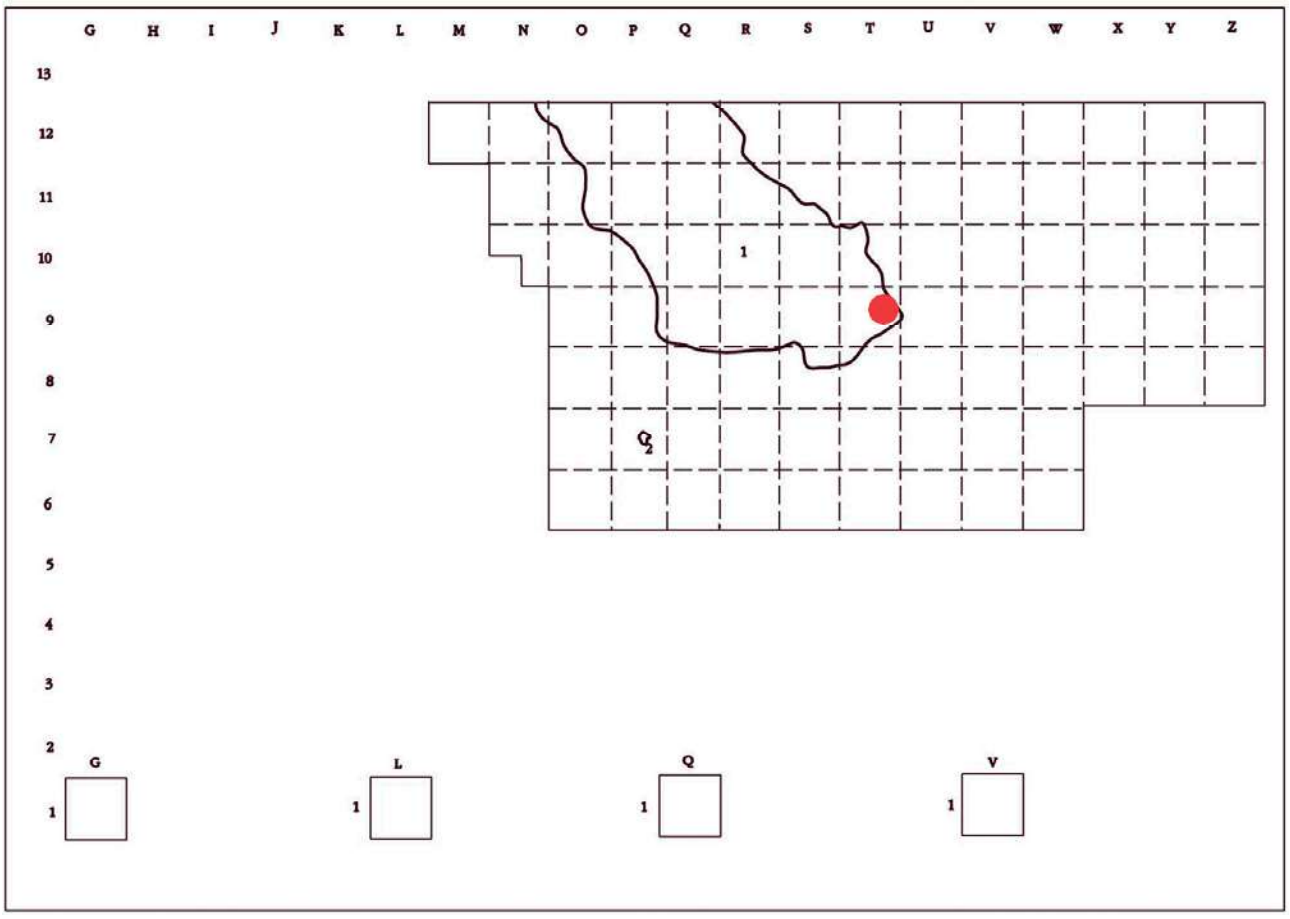

FIGURE 4: Městec/Ostrov. Site plan with locations of features 1 and 2. Finding spot of the analysed tanged tool is marked as a red dot. Drawing by O. Mlejnek and S. Bambasová.

Ahrensburgian tanged points dated to the Younger Dryas (Burdukiewicz 1999: 104–105) are usually of significantly smaller dimensions, because they were, according to published results of functional analyses, used as arrow tips (e.g., Dev, Riede 2012, Riede 2009, 2010 etc.). Tips of these points are retouched only unilaterally and less distinctly. Geographically close examples include a Late Palaeolithic tanged point from Voletiny, near Trutnov, in north-eastern Bohemia (Vencl 1978: fig. 5: 8).

Based on its dimensions, the tool from Městec/Ostrov would match the large tanged points of the Lingby type from the north European Bromme culture, which is dated approximately to the second half of the Allerød oscillation (Taute 1968, Burdukiewicz 1999: 102–104). However, the Lingby type points are not usually retouched in the distal part at all or they are just unilaterally marginally retouched. The large tanged points are present also in the preceding Federmesser-Gruppen techno-complex (Schwabedissen 1954) and according to functional, metric and use-wear analyses, ethnographic analogies and archaeological experiments they presumably served as armatures for darts (javelins) propelled with a help of a spear thrower – atlatl (e.g., Dev, Riede 2012: 49, Donahue, Fischer 2015: 319–320, etc.).

Several points from the Hamburgian culture in northern Germany, dated to the Bölling oscillation, are also of similar shape. Typical Hamburgian type points are asymmetric, usually unilaterally retouched shouldered points, which were probably utilized as arrow points (*cf.* Riede 2010). In the more recent Havelte phase the points are longer and slender shouldered (Riede 2010: Figure 3). On rare occasions, the basal part is retouched (sometimes alternatingly) in the form of a tang and the tip is also sometimes bilaterally retouched (*cf.* Rust 1958: Table 44, Figures 18 and 29, Tromnau 1975, Plate 1, Figure 5, Weber 2008). At least some of the Hamburgian points probably served as a part of composite projectiles (arrow tips) together with antler fore shafts and wooden shafts (Lund 1993, Wild *et al.* 2018). M. Wild *et al.* (2018: 9) argue that "removable fore shafts turn a projectile into a multi-purpose tool since they can be used as handles for knives and awls". Unfortunately, this statement is not supported by results of any functional or use-wear analyses. However, to conclude, this is a distant analogy and furthermore, the Hamburgian elements have not been previously identified in Bohemia. Hamburgian is defined as a local variety of the final Magdalenian present during the Bølling interstadial in northern

TABLE 4: Městec/Ostrov. Table of basic lithic tool types. Complete list of types will be published in Mlejnek *et al.*, in prep.

Tool type	**Number of specimens**	**%**
end scraper	26	14.29
burin	26	14.29
point	9	4.95
retouched blade	28	15.38
notch	2	1.10
splintered piece	15	8.24
side scraper	1	0.55
triangle	16	8.79
bladelet with a retouched end	11	6.04
backed bladelet	22	12.09
backed bladelet with a retouched end	3	1.65
splintered piece - burin	2	1.10
retouched flake	10	5.49
tool fragments	11	6.04
total	182	100.00

Germany, Netherlands, Denmark Poland, Lithuania and southern Sweden (*e.g.*, Rust 1937, Schwabedissen 1937, Burdukiewicz 1989, Grimm, Weber 2008, etc.).

There have not been any Hamburgian sites or elements recorded in Bohemia up to now; however, the Late Magdalenian sites are present, although mostly in other regions, such as central Bohemia (mainly Bohemian Karst). Borers were typical tools during the Late Magdalenian (although usually without a tang) and, additionally, bidirectional reduction of double-platform cores, which was also a manner of fabrication of the analysed tool, is a typical part of the late Magdalenian technology in central Europe (Vencl 2007a: 86–103). We thus could also consider a determination of the analysed tool as a part of the Magdalenian intrusion. On the other hand, there are no Magdalenian sites located in the close vicinity of the Městec/Ostrov locality – and therefore a Magdalenian classification for the find is not very probable.

All these possible analogies do not clearly explain the origin of this unusual find. It could be an integral part of the Early Mesolithic collection, it could be an import from Northern or North-eastern Europe, or it could perhaps also be evidence of an earlier Late Palaeolithic or Magdalenian occupation. To answer this question and also to clarify an exact manner of use of this tool, it was decided to perform a traceological (use-wear) analysis.

2. METHODS

Traceological (use-wear) analysis was realized at the Traceological laboratory at the Department of Archaeology and Museology of the Faculty of Arts, Masaryk University in Brno to detect the physical alterations of artefact number 116 with the aim of reconstructing the functional life of this artefact. In the framework of the traceological analysis, a stereoscopic microscope with continuous zoom of magnification ranging from 10–90× and an Olympus BX3M metallurgical incident light microscope with magnification 50×, 100× and 200× were used. Microscopic observations were performed according to the standards described in recent publications (e.g., Marreiros *et al.* 2015). The artefact was cleaned in an alcohol solution to remove fingerprints and other recent traces. Microscopic photographs were taken by a Cannon EOS 2000 camera connected to the Olympus microscope. QuickPHOTO CAMERA 3.2 Image processing software with the photo stacking module was used in order to obtain photographs with a deeper focus. High resolution images of 5567 × 3709 pixels were digitally processed afterwards, which allowed the observation of tool modifications up to a magnification of 500×. Linear measurements were performed with the use of a digital caliper, and weight measured by a digital scale with an accuracy of 0.01 grams. Angles were measured by a digital goniometer 2 mm from the edge.

Use-wear related patterns - including edge removals, edge and ridge roundings, micro-polishes and micro-striations together with edge morphology – were recorded into a relational Postgres database inspired by Van Gijn (1990: 3–22) utilizing the *Lithician app* (Python: Django framework) by one of the authors (D. Štefanisko). All use-related attributes were recorded separately for each active area.

3. RESULTS

3.1 Techno-functional analysis

The tool was manufactured on a blade made of slightly patinated silicite of glacigenic or glacial sediments (erratic silicites, flint) of Maastrichtian age. Typologically it can be described as a large tanged point with a distinctly bilaterally retouched tip and tang. The bidirectional pattern of negative scars visible on the dorsal side indicates a blade production from a double-platform core. The proximal part of the blank was probably snapped off in order to remove the bulb of percussion for the purpose of hafting. The tool is 55.6 mm long, 20.1 mm wide, 7 mm thick and its weight is 6.35 g. If it had originally served as an armature of a projectile, it would have been, according to its weight and large dimensions, used rather as a tip of a dart propelled with an atlatl than a point of an arrow for a bow.

However, the tip of the tool is shaped by a rather abrupt retouch, which would be a drawback when used as a projectile. Because of the presence of a distinct and locally even abrupt bilateral retouch on the tip of the tool, it did not seem probable that this artefact was used as a part of a distance weapon. We suggested a hypothesis that this artefact had rather some kind of a domestic use. With the aim of verifying our hypothesis concerning the manner of use of this tool, we decided to perform a traceological analysis.

3.2 Traceological analysis

Traceological analysis identified four areas related to the tool's utilization along the outline of its edges and ridges (*Figure 5*).

Area 1 (*Figure 5: F1*) is located on the basal part of the artefact. The lateral edges of the base are shaped by a steep direct retouch from the ventral forming an angle of up to 85° with a plano-convex cross-section. The blade blank was most probably intentionally snapped, removing the butt and the bulb of percussion for the purposes of hafting. The physical alterations resulting from the friction with the haft are composed of micro-scars, polishes, striations and roundings. Scarring is only developed on the dorsal basal protruding part, and individual isolated negatives are distributed in a line. The micro-scars mostly have a trapezoidal shape and a hinged termination with a quite deep initiation ranging from 100 to 150 µm in length. The roundings can be especially identified on the lateral edges and dorsal ridges of the negatives copying the microtopography; however, they could be identified in the lower degree of development on the previous use-related microscars' negatives. The polishing distribution can be characterized as spread out, both on the dorsal and ventral side with various degrees of development and intensity in relation to the microtopography of the ridges and outline of the edges. The bright micropolish has mostly a domed topography and a rough texture. The short rather than wide and deep striations within the polishing have random directions, suggesting multiple directions of forces. Following the criteria published by Veerle Rots (2015: 101–102), this area was used as hafting of the "male type" that is inserted into the wooden handle, to a high degree of certainty.

Area 2 (*Figure 5: F4-F5*) is located on the left lateral edge of the artefact. This area, with an edge at an angle of 25° and with a straight-concave cross-section, wavy outline and straight profile, does not exhibit any intentional production-related modifications of the blank; however, it provided all types of use-related traces that we interpret as a result of cutting. The area exhibits a frequent bifacially alternating-lined micro-scarring of a quadrangular shape, sometimes in clusters with rather close spacing randomly distributed, ranging from 100 µm up to 1000 µm in length with a prevailing hinge and step termination, although feather terminated scars are also present in lower quantity. The rounding is variable around the outline of the edge, ranging from a medium to high degree of formation, while the dorsal and ventral ridges are rounded in a medium stage of development. The well-developed bright bifacial polishing has a rather rough texture with isolated greasy spots and a rather domed topography, occasionally pitted. The distribution of polish is in the form of a wide band up to 3300 µm in width and has a linear direction parallel to the edges on both the ventral and dorsal sides and it is also present on the previous-use related micro-scars. The striations parallel to the edge indicate a longitudinal cutting movement; these are rather short and wide, and present on both the dorsal and ventral sides. The polish attributes, regarding published experiments (van Gijn 1989: 30–32), display the properties of wood origins. However, the rare smooth brighter spots within the polish could also be the result of contact with bone; moreover, the edge rounding could be a result of cutting softer material such as meat. As already stated by Ibáñez and González-Urquijo (2003: 164–165), the absence of certain damage types could be the result of an overlapping and/or immediate brief activity, and therefore, the cutting of some other softer material could not be excluded. The range of variability in the use-wear traces seems to be a result of extended usage of this area for cutting activities involving different materials and indicating prolonged use.

Area 3 (*Figure 5: F2-F3*) is located on the right lateral edge with an angle of 45°. The edge has a straight triangular cross-section, a straight profile, a straight outline and does not exhibit any intentional retouching. Micro-scarring mostly occurs on the dorsal side, but in lower quantities it is also visible on the ventral side. Micro scars have mostly a half-circular shape with a feather-hinge termination occurring in isolated areas with wide spacing ranging from 100 to 210 µm in length. This area does not exhibit any rounding on its dorsal ridges in contrast to the ventral side, where previous use-related removals exhibit low rounding, which is also present on the edge. Micro-polishes occur both on the ventral and dorsal sides in different distributions. On the dorsal side there is a well-developed polishing distributed in the form of a thin greasy bevel along the edge with occasional brighter spots. On the other hand, the ventral polish distribution is spread out and reticulated far apart from the edge with lower brightness - implying scraping and whittling movements. This interpretation is also supported by the striations perpendicular to the edge, visible on the ventral side, resulting from a transverse movement. The polish texture could be described as rough, occasionally also greasy with medium to high brightness, and mostly with a domed topography suggestive of wood as being the predominant contact material.

Finally, active area 4 (*Figure 5: F6-F7*), located in the terminal part of the artefact, has been intentionally

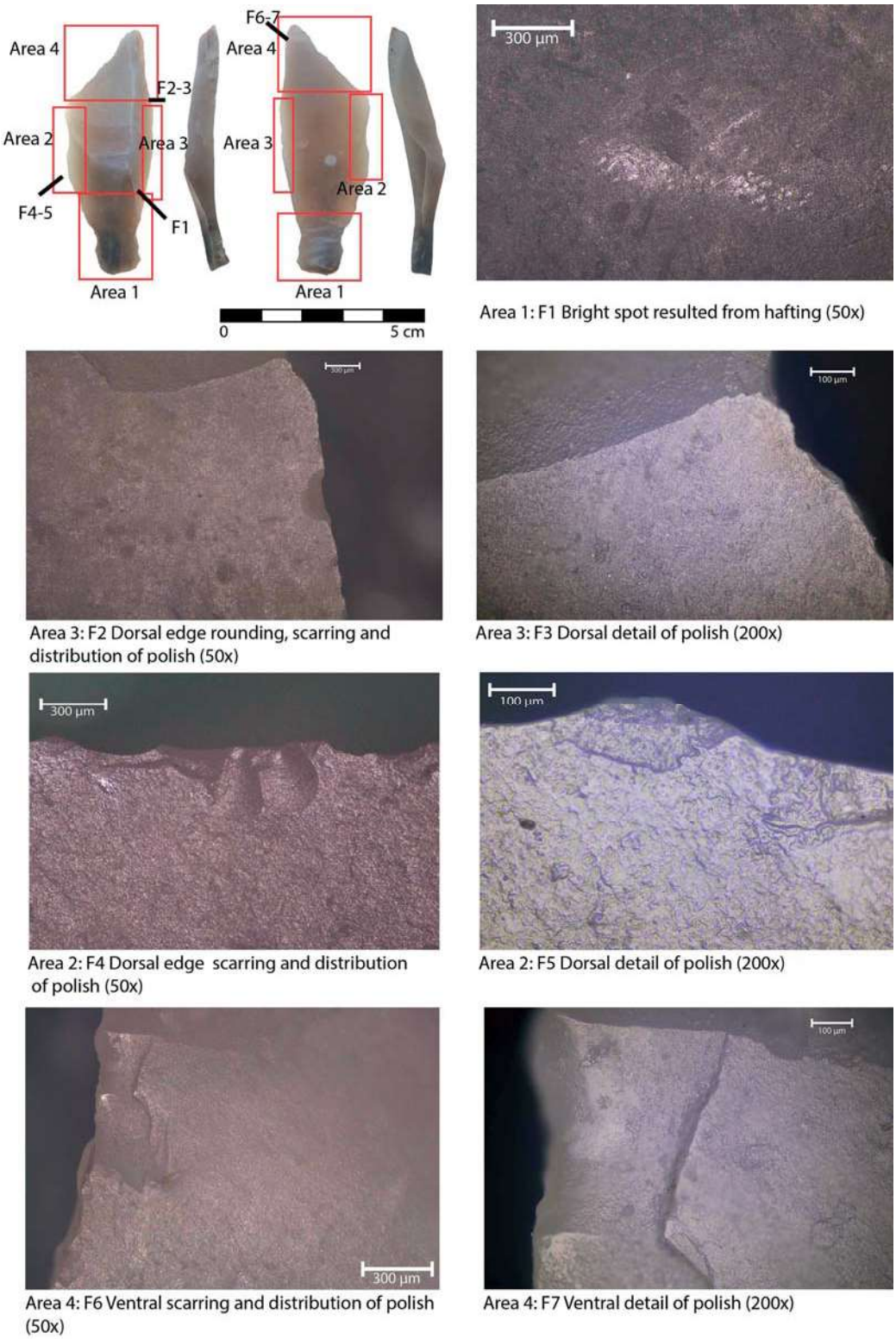

FIGURE 5: Artefact 116 and micro-wear traces recorded during the traceological analysis. Photographs by D. Štefanisko.

shaped by its retouching into a tongue with a rounded tip and with the angle of the lateral edges at 47°. The rather short length of the tip and the overlapping, superiorly-intensified, trapezoidal scars suggest that the tip has been resharpened and repaired before its disuse from living culture. The angles of the active edges, varying from 56° to 67°, have a straight-convex cross section. The observed microremovals, alternating both in the dorsal and ventral side, have a step termination and trapezoidal form with a length of up to 1500 µm, implying the function of this part as a borer. The polishing is localized bifacially with a higher degree of development on the dorsal ridges in a linear direction. The polishing has a "comet tails" topography (*Figure 5: F7*), a smooth, greasy texture and a very bright shine that is diagnostic of being for bone and antler processing.

The taphonomic alteration in the form of a white-blueish patina occurs only on the medial-distal part of the dorsal side, while the basal part exhibits the "fresh" surface of the raw material on both sides. The patina distribution could indicate that the basal part was protected from weathering factors by the covering of the hafting at the time of it being discarded. However, it could also be a result of an orientation of the artefact after its deposition.

4. DISCUSSION

The functional analysis of artifact number 116 proved that this tool was not, at least at the end of its biography, used as a projectile point. It was probably a multifunctional domestic tool. Specifically, microscopic traces of cutting, drilling and trimming of wood, and perhaps also of flesh and bones, were found on its edges. Functionally, we could call this tool a knife combined with its use as a drill or a perforator. Despite the fact that from a functional point of view it is functionally not a tanged point, it is possible to claim, from several points of view, that this artefact does not really fit into the Early Mesolithic assemblage, obtained during the archaeological excavation at the Městec/Ostrov site. In particular, one of these points of view are the dimensions of the artifact, which are significantly larger than most of the other lithics from this microlithic industry. Most importantly, however, this tool differs from the point of view of its morphology. A large part of the tool collection from this site consists of microliths, especially backed bladelets and points and microlithic triangles, which were inserted as armatures into composite devices, which were subsequently used either as (hunting) weapons or as domestic tools (Mlejnek *et al.* in prep.). The main advantage of these composite tools was that when the edge was damaged, it was not necessary to sharpen the tool or stop using it straight away: just replacing one or several microlithic segments was enough (Burdukiewicz 2005: 339–342). The microlites are complemented in the tool set by tiny end scrapers, indistinct burins, retouched blades and splintered pieces (*Figure 2, Table 4*, Mlejnek *et al.* in prep.). However, the tool with a tang, which was probably set into a handle made of some organic material, is unique in the assemblage. Similar tools are known from the Late and Upper Palaeolithic rather from the more northern areas than from Central Europe (Kozłowski *et al.* eds. 1999). Artifact number 116 is also interesting from a technological point of view. Based on the presence of opposite negatives on the dorsal side of the blade, we can state that it was detached from the double-platform core. Although the double-platform cores are rarely present in the collection, they are all of small dimensions and it would not be possible to detach such a large blade out of them. Moreover, trimming and maintenance elements, or other by-products diagnostic of bidirectional blade production are just rarely represented within the assemblage. It is therefore likely that the tool was not manufactured at the excavated site, but was imported as a finished product. It is also worth mentioning the raw material used to make this tool, which is silicite from glacigenic sediments. Although this raw material is represented in the assemblage with a 5.7% share, its representation in the Late Palaeolithic lithic collections in the territory of Bohemia is usually considerably higher (*e.g.*, Moník 2014), and in addition it is a raw material of northern origin (Přichystal 2013: 51–54).

The above-mentioned clues can help us in finding the answer to the origin of this interesting find. As previously stated, this artefact was probably imported to the site as a finished ready-to-use tool. We do not know if it was manufactured and imported by the foragers inhabiting the terrace above the Loučná River during the Preboreal period at the very beginning of the Mesolithic, as the radiocarbon dating of four charcoal pieces found in a single preserved pit excavated at the site suggests (*Table 1*). If it is the case, could it be a Late Palaeolithic reminiscent of hunters and gatherers coming from more northern parts of Europe? Or could it rather be an object of trade between locals and some other community, perhaps from the northern part of

Central Europe. Another, probably less likely possibility is that it could be an originally Late Palaeolithic tool (perhaps a real large tanged point), which was later found and reutilized by the early Mesolithic hunters, who used it as a domestic tool. It is also possible that this find is not related to the predominant Early Mesolithic component of the assemblage at all and that it is evidence of a short-term settlement of this site during the Late Palaeolithic, or at the end of the Upper Palaeolithic. In addition to the raw material used, this possibility can also be supported by the indistinct patina on the surface of the tool and also by the presence of several other slightly patinated flint blades in the excavated lithic collection. However, if this variant was correct, it would be only a small admixture of an otherwise predominantly Early Mesolithic assemblage.

5. CONCLUSIONS

As presented in the Results section, artifact number 116 exhibits a variety of use-wear traces connected to various activities and contact materials; however, none of these traces are related to the use of this tool as a projectile point. The type of hafting and its extended multi-purpose utilization (mainly for cutting, boring and scraping/whittling), suggest that the biography of the tool (in contrast to the onsite prevailing microlithic industry) is a long and complex one with a tendency to having its lithic element repaired instead of being replaced. The curation of tools, and their having a complexity of tasks in which they are involved, are more characteristic of less mobile communities (Ibáñez, González-Urquijo: 167–168), which incline to a storage of their artefacts; however, the bright spot in the medial part of the tool edge could suggest its friction with a protective cover and perhaps also the long-distance transport of the tool.

The functional analysis of tool number 116 clearly proved that it has been used rather as a kind of a domestic tool (knife or borer) and that, at least at the end of the artefact biography, it has not served as a projectile point. The possibility that this tool was originally used as a projectile tip and later it was reutilised to a domestic tool cannot be excluded. In this case it would have been used rather as an armature of a dart than as an arrow point.

Finally, it is clear that this artefact does not really fit into the Early Mesolithic assemblage excavated at the Městec/Ostrov site, from a typological as well as from a technological point of view. However, it is not possible to decide if it was contemporary with the prevailing Early Mesolithic assemblage component (perhaps as an import from northern Europe or as something reminiscent of the Late Palaeolithic) or if it is a part of the earlier, probably Late Palaeolithic or Magdalenian (Hamburgian) component present in the excavated lithic assemblage.

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