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Reassessing the Middle and Late Upper Palaeolithic in Hungary

ABSTRACT

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Most Upper Palaeolithic sites dated to 28–12 k uncalibrated BP years in Hungary were classified with the Gravettian Entity model (GEM). GEM sorted lithic assemblages by their technological, typological, and chronological attributes into three units: Pavlovian, Ságvárian, and Epigravettian. GEM claimed technological differences among the groups, and argued that typologically the lithic assemblages were similar. This paper tested the assumptions of GEM and found significant typological differences between the three units. The results supported to create an alternative classification scheme for the Middle and Late Upper Palaeolithic assemblages in Hungary.

K e y w o r d s: Gravettian; Epigravettian; lithic tool typology; Middle and Late Upper Palaeolithic

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INTRODUCTION

The Gravettian Entity model (GEM) (D o b o s i 2000a; 2009b) is a cultural and chronological framework to classify the Middle and Late Upper Palaeolithic (MUP and LUP) archaeological assemblages of Hungary between 28 and 12 k uncalibrated[1] BP years. GEM offers three units with the following features to classify lithic finds.

The earliest unit of GEM is the Pavlovian, also called Early Pavlovian, dated to 28–26 ka BP (D o b o s i 2000a; 2014; 2016). The Pavlovian was described as a blade technology that produced mostly burins, end-scrapers, and retouched blades. Backed blades and bladelets, and Gravette and microgravette points compose the minority of the tools.

The second unit is the Ságvárian, dated to between 20 and 18 ka BP (D o b o s i 2016). The dominancy of pebble raw material use in the lithic technology characterizes the Ságvárian (T o l n a i – D o b o s i 2001). Because the pebbles are limited in size, the tools in the Ságvárian often are smaller than in other units of GEM. In spite of this, the tool types are similar to those found in the Pavlovian, including backed microblades (D o b o s i 2009b; 2016). Another feature of the

[1] All radiocarbon dates in the text are uncalibrated.

Ságvárian, which is the consequence of the pebble use, is the higher frequency of flakes in the assemblages (Dobosi 2016). Due to this striking difference from the general Upper Palaeolithic (UP) lithic character what the Pavlovian possesses, the Ságvárian was described as a lithic industry of an atypical character (Dobosi 2009b). Dobosi (2004) found neither ancestor nor descendent in the whole UP for the Ságvárian.

The third unit is the Epigravettian, dated to between 18 and 12 ka BP (Dobosi 2016). Two chronological phases within the Epigravettian were distinguished. Between 18 and 16 ka BP, partly contemporary with the Ságvárian, expedient lithic industries are characteristic. These have meager quantity and quality of tool types when compared to the Pavlovian (Dobosi 2004; 2009b). Between 16 and 12 ka BP, the sole site is Esztergom (Dobosi, Kövecses-Varga 1991), which was proposed to be named "Epigravettian rich in blunted blades" (Dobosi 2004). Both Epigravettian phases were distinguished from the Ságvárian by the lack of pebble raw material use (Dobosi 2004). Apart from these differences, the same tool types were found in the Pavlovian and the Epigravettian (Dobosi 2009b). The similarity given by the blade technology led to conclude that the Epigravettian was the descendent of the Pavlovian.

The summary above showed that the taxonomy of GEM used three basic archaeological data types to classify the lithic assemblages: tool typology, lithic technology, and the radiocarbon dating. This set of data, however, as GEM applied to classify the archaeological record, did not provide a solid basement to build neither absolute nor relative chronology for the MUP and LUP in Hungary.

The first issue in GEM is the typological similarity between the three units (Dobosi 2009a; 2009b). Most probably this led to incorporate the three units in the entity of the Gravettian. However, this can be questioned because the Ságvárian was differentiated already from the Gravettian by the lack of classic Gravettian backed tool types (Kozłowski 1979). To support the cultural relation of the three units with the Gravettian, GEM's reference was Willendorf II layer 5 assemblage. As GEM stated, in a Gravettian assemblage backed bladelets make up ~10% of the tool kit, burins do over 20%, and end-scrapers fall under 20% (Dobosi 2009a). Indeed, Willendorf II layer 5 contains backed tools ~26%, burins ~15%, and end-scrapers also ~15% (Moreau 2009), which do not meet with the percentages presented by GEM, except for the end-scrapers. Moreover, this layer is dated to ~30 ka BP (Haesaerts *et al.* 1996; Moreau, Brandl, Nigst 2016), earlier than the age defined for the Pavlovian in Hungary, and classified Early Gravettian that fairly differs from later variants of the Gravettian (Moreau 2009). Therefore, Willendorf II layer 5 is not a representative assemblage of a general Gravettian lithic tool typology postdating the Early Gravettian. Further contradiction in GEM is the term Pavlovian for the Hungarian archaeological record (Kozłowski 1996a; Svoboda 2007; Moreau 2009; Lengyel 2014). Indeed, no Pavlovian tool types, e.g. crescents, triangles, backed denticulated bladelets and Pavlov points (Kozłowski 1996a; 2015; Svoboda 1996) were ever published from Hungarian sites. The term Pavlovian in GEM seems especially

erratic regarding the lithic assemblage of Hidasnémeti (Dobosi 2004; 2009a), which yielded shouldered points (Simán 1989) comparable to Kraków–Spadzista street (Lengyel 2014) site that is an indispensable example of the Late Gravettian or Willendorf–Kostenkian of Eastern Central Europe (Kozłowski 1996a; 2007; 2008; Svoboda 1996; 2007; Wilczyński 2016). GEM emphasized differences between its units, such as 1) Esztergom was unusually rich in backed blades, 2) the earlier Epigravettian was uncharacteristic compared with the other units of GEM, 3) the Pavlovian had better executed tools in shape than the Epigravettian, and 4) the Ságvárian was an atypical lithic industry (Dobosi 2004; 2009a; 2009b), but these features were not turned into measurable archaeological data.

The second issue concerns the lithic technology. GEM assumed that lithic industries producing the same type of blank, either blade or flake, likely had a common cultural origin. This put the Pavlovian and the Epigravettian into a lineage against the Ságvárian that was isolated on the basis of the pebble technology. Making blades in the UP, indeed, is very general, and therefore, the abundance of blades alone cannot prove lineage between industries.

The third issue is the chronology. The radiocarbon dating of most sites of GEM was found inappropriate for archaeological considerations (Lengyel 2008–2009). All Pavlovian and many of the Epigravettian dates were disqualified from the radiocarbon database of GEM. However, the period of the Ságvárian seemed to be firmly dated to between 20 and 18 ka BP.

This survey on GEM showed that at present the lithic tool typology, the lithic technology, and the absolute dating only partly are useful to sort lithic assemblages into the cultural units of MUP and LUP in Hungary. This paper aimed at finding measurable archaeological features that can culturally classify the MUP and LUP archaeological record of Hungary. Out of the three pillars of GEM, the most common mean for relative chronology, the tool typology was challenged.

METHOD

Prominent assemblages of GEM were included in this study. Pavlovian sites: Bodrogkeresztúr (Vértes 1966; Dobosi 2000b; Lengyel 2015), Hidasnémeti (Simán 1989), Sajószentpéter (Ringer, Holló 2001), Nadap (Dobosi *et al.* 1988); Ságvárian sites: Ságvár (Csalogovits *et al.* 1931; Gallus 1936; Gábori 1959; Lengyel 2010; 2011), Budapest Corvin-tér (Ringer, Lengyel 2008–2009); Epigravettian sites: Arka (Vértes 1962; 1964–1965) and Esztergom (Dobosi, Kövecses-Varga 1991) (Fig. 1).

The tool kits were divided into two major groups of types, armatures and domestic tools (Fig. 2). Armature includes tools which could have been parts of a composite hunting weaponry (Elston, Brantigham 2002), mostly made of blades and bladelets. Because differentiating the variants of the Gravettian most commonly follows the typology of the armatures (Kozłowski 1986; 2015; Moreau 2009; Pesesse, Flas 2011; Klaric 2013; Marreiros, Bicho 2013;

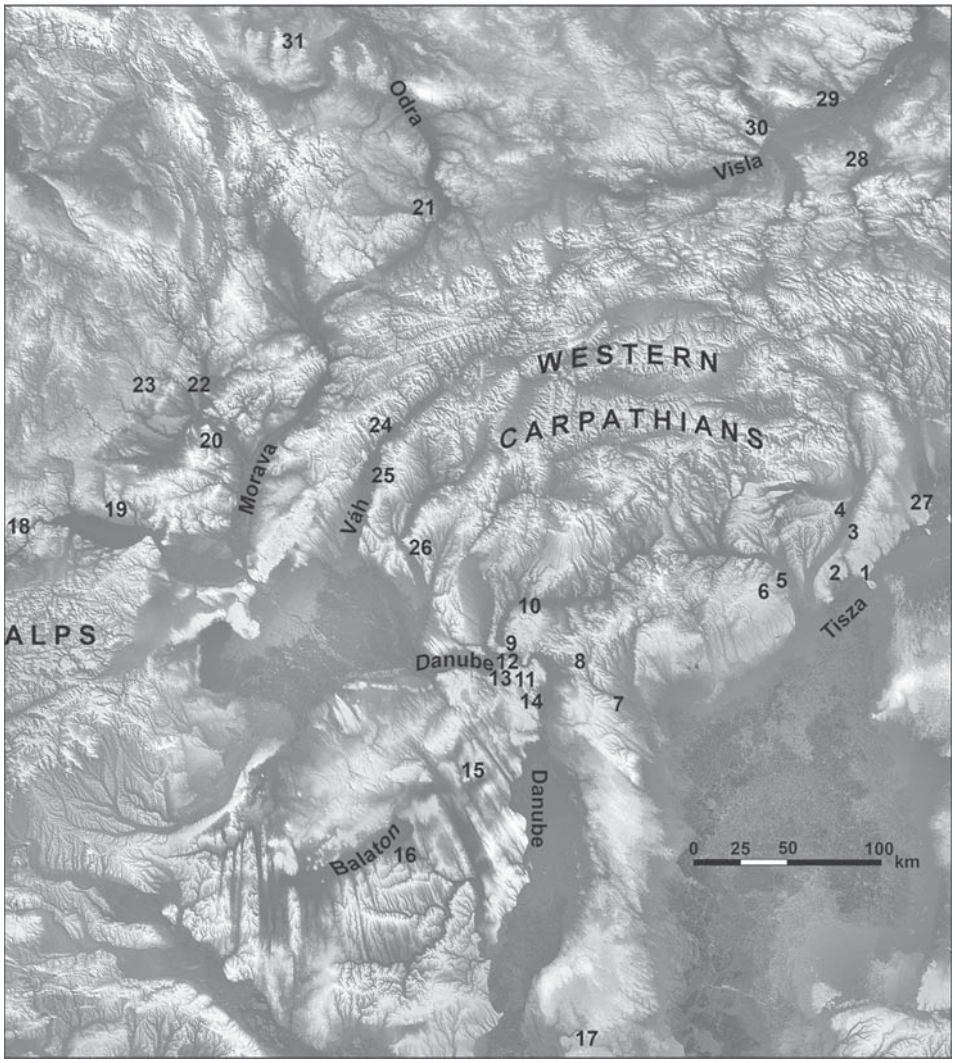

Fig 1. Sites mentioned in the text; drawn by G. Lengyel.

1 — Bodrogkeresztúr, Borsod-Abaúj-Zemplén megye; 2 — Megyaszó, Borsod-Abaúj-Zemplén megye; 3 — Arka, Borsod-Abaúj-Zemplén megye; 4 — Hidasnémeti, Borsod-Abaúj-Zemplén megye; 5 — Sajószentpéter, Borsod-Abaúj-Zemplén megye; 6 — Szeleta Cave, Borsod-Abaúj-Zemplén megye; 7 — Jászfelsőszentgyörgy, Jász-Nagykun-Szolnok megye; 8 — Püspökhatvan, Pest megye; 9 — Szob, Pest megye; 10 — Hont–Parassa III, Nógrád megye; 11 — Pilisszántó I rockshelter and Kiskevély cave, Pest megye; 12 — Pilismarót, Komárom-Esztergom megyé; 13 — Esztergom and Mogyorósbánya, Komárom-Esztergom megyé; 14 — Budapest Corvin-tér; 15 — Nadap, Fejér megye; 16 — Ságvár, Somogy megye; 17 — Madaras, Bács-Kiskun megye; 18 — Willendorf II, Bezirk Krems-Land; 19 — Grubgraben, Bezirk Krems-Land; 20 — Milovice I, okres Břeclav; 21 — Petřkovice I, okres Ostrava-město; 22 — Štýřice III, okres Brno-město; 23 — Mohelno, okrese Třebíč; 24 — Trenčianske Bohuslavice, okres Nové Mesto nad Váhom; 25 — Moravany Zakovska and Lopata II, okres Piešťany; 26 — Nitra–I Čermán, okres Nitra; 27 — Kasov okrese Trebišov; 28 — Targowisko 10, powiat Wieliczka; 29 — Jaksice II, powiat Proszowice; 30 — Kraków-Spadzista, powiat Kraków; 31 — Sowin 7, powiat Nysa.

<table>
<tr><td colspan="4">COMPLETE TOOL KIT</td></tr>
<tr><td rowspan="2">Domestic tool types</td><td colspan="3">Armatures</td></tr>
<tr><td>point</td><td>backed</td><td>backed-truncated</td></tr>
<tr><td></td><td>retouched point</td><td colspan="2" rowspan="4"></td></tr>
<tr><td>end-scraper</td><td>backed point</td></tr>
<tr><td>burin</td><td>curved backed point</td></tr>
<tr><td>edge retouched tool</td><td>arched backed point</td></tr>
<tr><td>borer</td><td>Gravette/micrograve</td><td colspan="2" rowspan="4">Classic Gravettian point types</td></tr>
<tr><td>truncation</td><td>fléchette</td></tr>
<tr><td>combined</td><td>Vachons point</td></tr>
<tr><td>splintered</td><td>shouldered point</td></tr>
</table>

Fig. 2. Schema of the typological analysis; drawn by G. Lengyel.

Wilczyński 2016), putting emphasis on the armatures provided an effective way to classify the assemblages. Armatures (Fig. 3) are points and backed and backed-truncated artifacts. The Gravette/micrograve type here had a basal inverse retouch opposed to the backed edge (Demars, Laurent 1992). Rarely, this retouch might have occur on the distal part. This was in contrast with the common use in the Hungarian research, which classified Gravette/micrograve any backed blade/let that has a point. Here, when a point was simply backed to create a point without further retouching on the edge, was called backed point. The delineation of the backed edge served to differentiate the backed point types. Backed blade/lets ending in a point with straight back were the backed points. A curved backed point has a slightly convex back that ends in a point. Arched backed points have a smaller radius of back curvature, therefore the tip is rather in an offset position. Retouched points do not have blunted back and their tips were pointed with a regular retouch. Also, the criterion for backing was restricted for those pieces whose edges were blunted up to the thickest part of the blank. If a blunting retouch was visible only on the edge, the artifact was classified as an abruptly retouched tool and sorted into the edge retouched tools.

The rest of the tools, end-scrapers, burins, edge retouched tools, borer, truncated tools, splintered tool, and combined tool, were regarded here as domestic tools (Fig. 4). This categorization was based on the supposed function of the tools: scraping, cutting and engraving. These classes were not further divided into subtypes. Moreover, I found apt to include notched and denticulated artifacts within the group of edge retouched tools. This simplification was made to reduce the number of typological classes of the domestic tools that are often useless to differentiate cultures in contrast to the armature types.

To make the assemblages comparable, I counted the percentage of each tool class (Table 1). In the armature types, the percentages of the subtypes (backed,

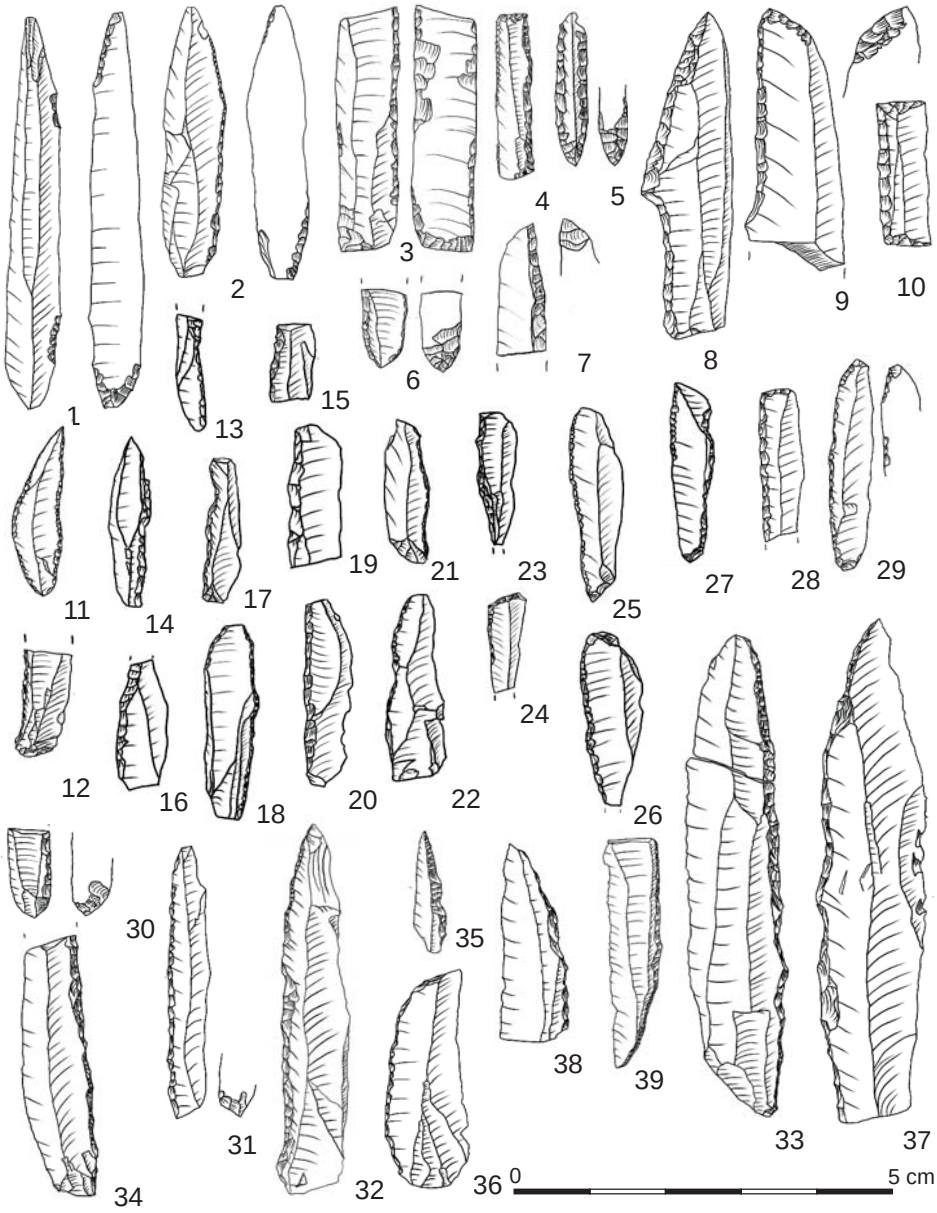

Fig. 3. Armatures of the studied sites; drawn by G. Lengyel.

1–7 — Bodrogkeresztúr; 8–11 — Hidasnémeti, 12–24 — Ságvár; 25, 26 — Corvin–tér; 27–31 — Arka; 32–35 — Nadap; 36–39 — Esztergom. 1, 2, 11, 29 — Fléchette; 3 — Backed ventrally truncated blade/let; 4, 24, 28 — Backed–truncated blade/let; 5, 6 — Vachons point; 7, 9, 30, 31 — Gravette/micrograve tte; 25 — Retouched point; 18, 21 — Abruptly retouched blade/let; 8 — Shouldered point; 10 — Rectangle; 12–17, 19, 20, 22, 23, 26, 27, 34 — Backed blade/let; 32, 37–39 — Curved backed point; 36 — Arched backed point; 33, 35 — Backed point.

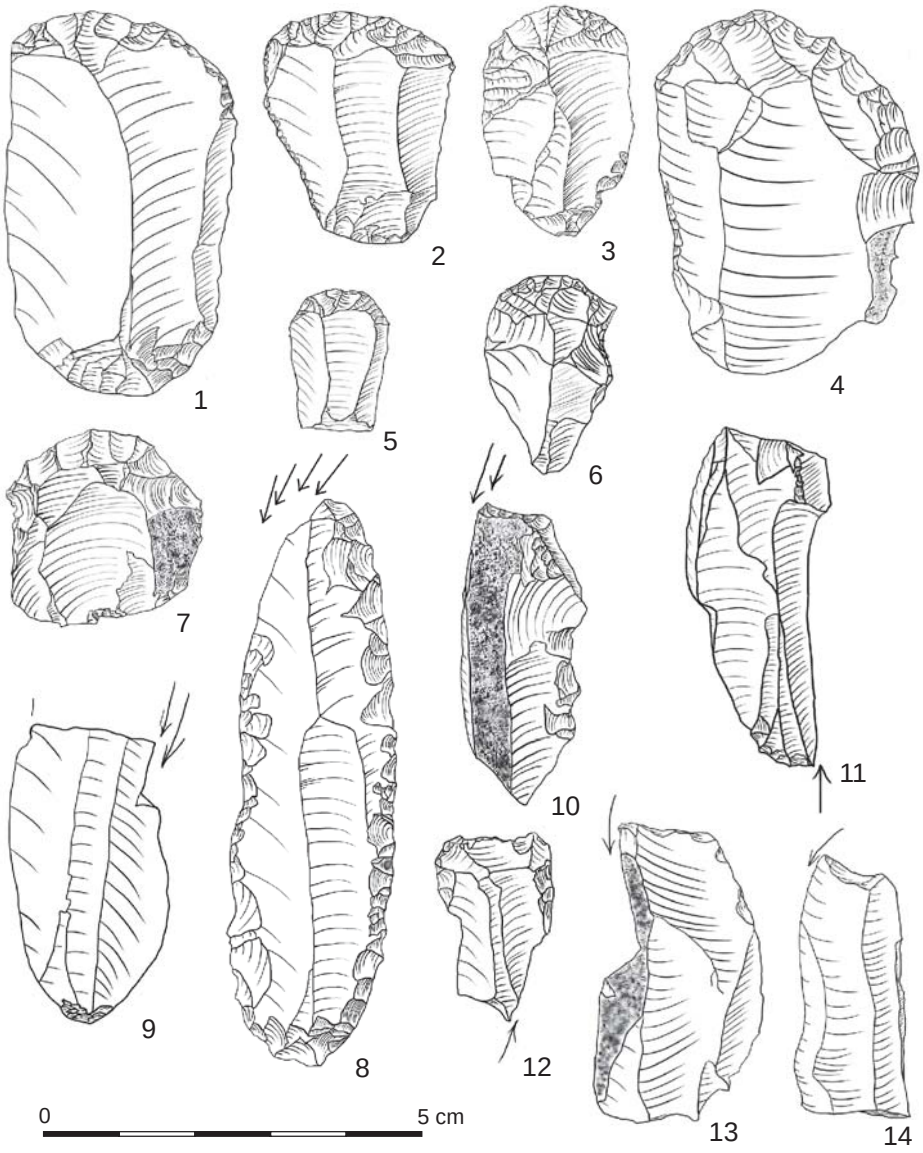

Fig. 4. Domestic tools of the studied sites; drawn by G. Lengyel.

1 — Arka; 2, 3, 8 — Bodrogkeresztúr; 4, 9 — Hidasnémeti; 5, 7, 10, 11 — Ságvár; 6, 12 — Corvin-tér; 13 — Esztergom; 14 — Nadap; 1–7 — end-scrapers; 8–14 — burins.

Table 1

Typological data of the assemblages. B — Bodrogkeresztúr, H — Hidasnémeti, SP — Sajószentpéter, S — Ságvár, C — Budapest Corvin-tér, A — Arka, E — Esztergom, N — Nadap.

		B	H	SP	S	C	A	E	N
Major tool types (% within toolkit)									
1	End-scraper	22.9	13.8	8.9	17.2	19.2	31.3	1.2	7.6
2	Burin	25.8	33.8	55.6	22.0	15.4	13.0	8.7	16.7
3	Edge retouched tool	35.4	25.4	17.8	32.6	34.6	21.3	18.4	1.5
4	Splintered tool	1.8			21.0		0.4		
5	Borer	1.0	0.8	2.2	1.9	3.8	0.9	0.9	
6	Truncation	3.6	3.1	2.2	1.6	11.5	10.0	2.3	3.0
7	Combined	1.6	0.8	2.2	1.3	3.8	1.7	0.3	
8	Armature	7.8	22.3	11.1	2.6	11.5	21.3	68.3	71.2
	Total number of tools	384	130	45	309	26	230	344	66
Armature subdivision (% within armature)									
9	Backed blade/let	33.3	55.2	20.0	87.5	100.0	49.0	60.4	76.6
10	Backed truncated blade/let	16.6	10.3		12.5		24.5	21.7	12.8
11	Backed bitruncated blade/let	3.3	3.4				2.0	3.8	
12	Points	46.7	31.0	80.0			24.5	14.1	10.6
	Total number of armatures	30	29	5	8	3	49	235	47
Point variants (% within points)									
13	Gravette/microgravette	35.7	22.2	75.0			33.3	3.0	
14	Retouched point	28.6	22.2				50.0	18.2	
15	Backed point						8.3	15.2	40.0
16	Curved backed point							57.6	40.0
17	Arched backed point							6.1	20.0
18	Fléchette	14.3	11.1				8.3		
19	Vachons point	14.3		25.0					
20	Shouldered point	7.1	44.4						
	Total number of points	14	9	4			12	33	5

backed-truncated, points) were counted within the total number of the armature. The variants of the points were counted within the total number of points.

To measure similarities between the assemblages hierarchical cluster analysis was used. This method did not show statistically significant results, but indicated the level of similarity between the compared assemblages on the basis of the percentages.

RESULTS AND DISCUSSION

The proportions of the major tool types (rows 1–8 in Table 1) sorted the samples into two groups. One group is dominated by domestic tools and the other by armatures (Fig. 5). The latter includes only two assemblages, Esztergom and Nadap. In the domestic tool dominated group end-scrapers, burins, and edge retouched tools are prevalent (Table 1). Here, backed blade/lets make up the majority of the armatures in most cases, except for Bodrogkeresztúr and Sajószentpéter, at which points are the most frequent armature types. Backed-truncated blade/lets never lead this list and they are absent at Sajószentpéter and Corvin-tér. Points make up a greater percent of the armatures in the domestic dominated assemblages except for Ságvár and Corvin-tér assemblages that do not contain this type of armature. Points made with retouch and not backing are more frequent in the domestic tool abundant industries. Within the points, Gravette/microgravette type is best present at Arka, Bodrogkeresztúr, Hidasnémeti, and Sajószentpéter. In the other assemblages, this type absent, except the 3% at Esztergom, which represent a single fragment. Fléchette, Vachons point and shouldered points seem to accompany the Gravette/microgravette, which is a logical phenomenon, since all of these types are regularly part of a Gravettian tool kit and absent in other cultural context. Backed points and its variants show high proportion in the armature dominated assemblages.

Replacing with its variants in the major tool types (rows 1–7 and 9–12 in Table 1), Ságvár and Corvin-tér jumped out of the domestic tool dominated cluster, and Esztergom and Nadap were still closely related (Fig. 6). Sajószentpéter showed the greatest difference among the sites because of the extremely high ratio of points in the armature and the absence of backed-truncated types. Including only the armatures in the classification (rows 9–11 and 13–20 in Table 1 with rows 13 and 18–20 lumped together as Gravettian type points), three clusters were defined, Esztergom–Nadap (EN), Ságvár–Corvin-tér (SC), and Arka–Bodrogkeresztúr–Hidasnémeti–Sajószentpéter (ABHS) (Fig. 7). Loading the data only form the point types (rows 13–20 in Table 1 with rows 13 and 18–20 lumped together as Gravettian type points), I observed the same three clusters (Fig. 8).

The three site clusters in this analysis (ABHS, SC, EN) can be understood as the three units of GEM. But, the typological resemblance with Arka, Bodrogkeresztúr, Hidasnémeti and Sajószentpéter pulled Arka to the Pavlovian and so did Nadap to the Epigravettian. In the reorganized succession of the three

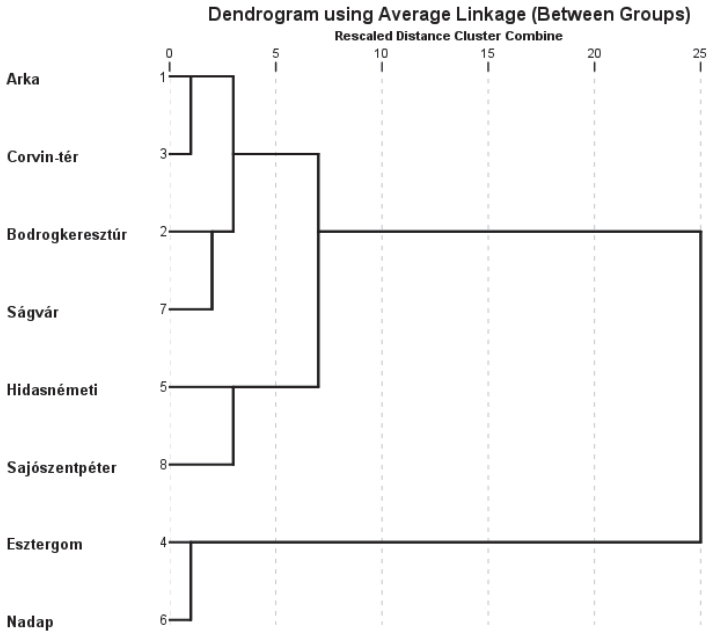

Fig. 5. Hierarchical cluster analysis, major tool types; drawn by G. Lengyel.

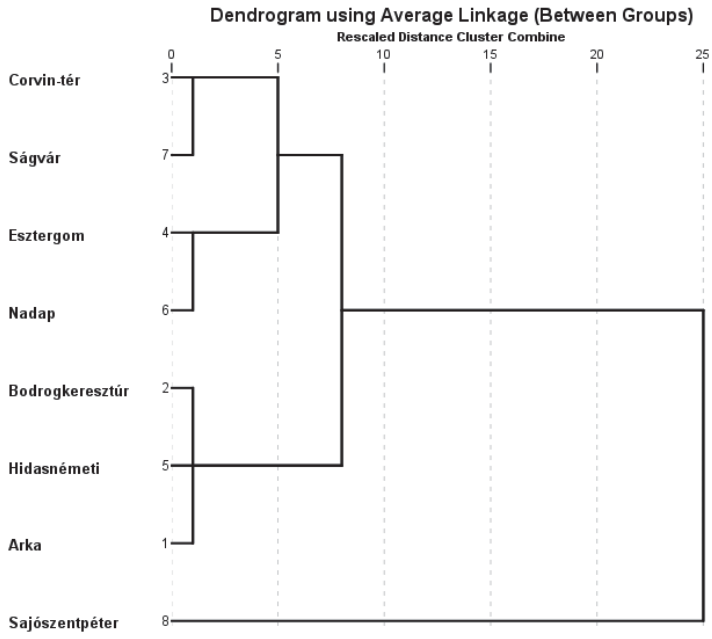

Fig. 6. Hierarchical cluster analysis, major tool types and armature subtypes; drawn by G. Lengyel.

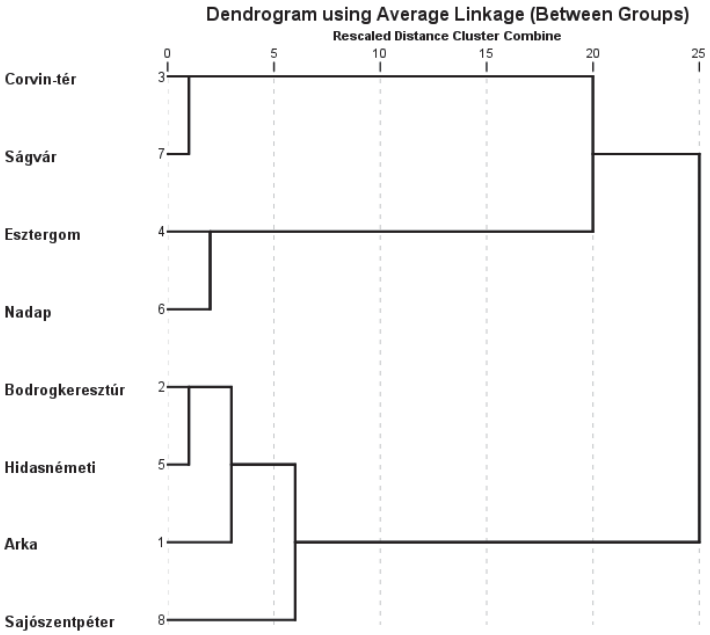

Fig. 7. Hierarchical cluster analysis, armatures; drawn by G. Lengyel.

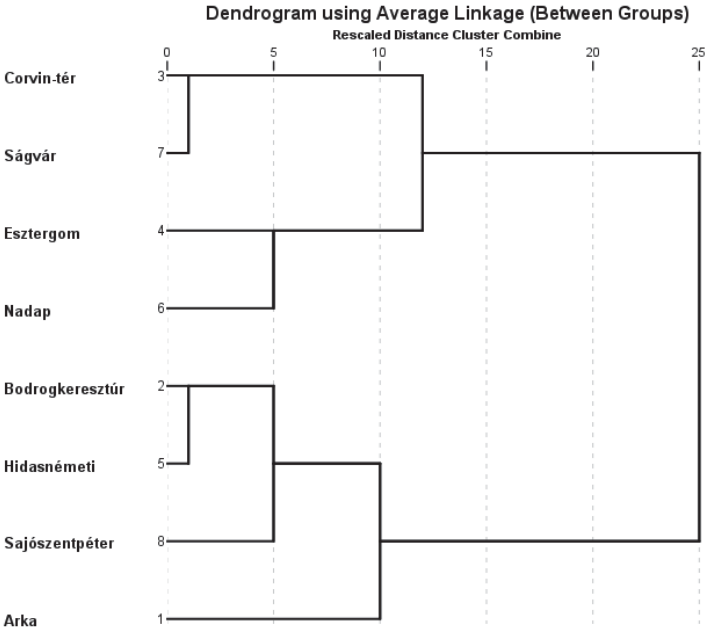

Fig. 8. Hierarchical cluster analysis, point types; drawn by G. Lengyel.

site clusters, as ABSH the earliest, SC in the middle, and EN is the youngest, there are tendencies in the changes of the tool types throughout the MUP and LUP periods. From ABSH to SC there is a decrease of armatures, including the complete lack of Gravettian point types. From SC to EN the frequency of armature was highly increased but without the Gravettian point types. Instead, curved, arched and straight backed points proliferate. Between ABSH and EN site clusters, a great difference is the increased proportion of armatures in EN including backed blade/lets and backed point variants, but without Gravettian point types. Running a correlation test regarding the three groups as successive periods, out of the tool types defined in this study, there was a statistically significant increase of armature ($r = 0.777$, $n = 8$, $p = 0.023$), including backed points ($r = 0.716$, $n = 8$, $p = 0.046$), curved backed points ($r = 0.852$, $n = 8$, $p = 0.007$), and arched backed points ($r = 0.741$, $n = 8$, $p = 0.035$), and a significant decrease of Gravette/micrograveтte points ($r = –0.745$, $n = 8$, $p = 0.034$) towards the younger periods. Further types did not show statistically significant correlation, which may be due to the low number of samples involved in the test. But, the lack of fléchette, Vachons point, and shouldered point in the groups that chronologically follow the ABHS group is meaningful.

The result of this analysis showed that the typological similarity between the three units of GEM cannot be supported. The Ságvárian had the smallest frequency of armatures which are mainly backed bladelets. No classic Gravettian armature was found in this group. The high frequency of armatures in the Epigravettian toolkits, the proliferation of the backed point variants and the lack of classic Gravettian armature types made this group different from the other two units. The single backed point fragment with ventral retouch at Esztergom sorted here into the class of Gravette/micrograveтte points can be an "accident", while in the earliest assemblages most backed points are Gravette/micrograveттes. This is a significant difference between what was called Pavlovian and Epigravettian in Hungary. Thus, there are measurable archaeological differences among the assemblages of GEM. To formulate this conclusion was greatly supported with the exchange of Arka and Nadap between the Epigravettian and the Pavlovian. The chronological position of these sites as proposed here by their typological features can be supported via further data. Arka's chronology was defined by radiocarbon dates, but the revision of the archaeological integrity of the organic samples already supposed that the age of the site may have been older than the Epigravettian (Lengyel 2008–2009). Among the three dates of Arka, the only associated with archaeological remains, ~17 ka BP, was obtained from a sample that was contaminated by recent carbon, and thus the age was claimed to have been a minimum for that sample (Vogel, Waterbolk 1964). Concerning Nadap, its originally established chronology was already challenged by the revision of the dating circumstances of the site (Lengyel 2008–2009). Nadap was dated first by the visible features of the embedding sediments and the faunal remains (Dobosi *et al.* 1988). The faunal assemblage later was revised (Vörös 2000), which re-dated the human occupation from 28 and 22 ka BP to 18 and 12 ka

BP. Meanwhile, a radiocarbon date ~13 ka BP obtained from a horse phalange (Verpoorte 2004) proposed a younger age for the site, as well. The typological analysis performed here also supports that the age of the occupation at Nadap is rather the Epigravettian.

Surveying the archaeological references for similar lithic features found that Pilisszántó I rock shelter (Kormos, Lambrecht 1915) yielded the best examples of fléchette, micrograve tte, Vachons point, and a backed and ventrally truncated bladelet, dated roughly on the basis of the faunal remains to between ~23 and 18 ka BP (Dobosi, Vörös 1987). Micrograve ttes and backed bladelets, were found at Szeleta Cave Layer 6 and 5, which were related with Gravettian instead of Upper Szeletian (Simán 1990), and recently redefined as a Late Gravettian with leaf points (Lengyel, Mester, Szolyák 2016). A further site of GEM that was classified Pavlovian is Hont–Parassa III (Dobosi, Simán 2003), which may be similar to Szeleta Cave layers 6 and 5, because it yielded backed bladelets, Gravette points, and a bifacial leaf point fragment. The dating of Hont-Parassa III ~27 ka BP was also found unrelated with the human occupation, which cannot confirm the Pavlovian age (Lengyel 2008–2009). Another site in the Pavlovian of GEM is Megyaszó (Dobosi, Simán 1996). Its radiocarbon date also cannot be associated with archaeological remains (Lengyel 2008–2009). Although the excavators described Gravette points, the tools on the figures published (Dobosi, Simán 1996, Fig. 12) do not resemble the Gravette/micrograve tte type as defined here. Hence, this assemblage, cannot be securely related with the ABHS group.

The tool types in the assemblages called Pavlovian by GEM, Gravette/micrograve tte points, fléchettes, and the Vachons points (Fig. 7), indeed can be parts of a Pavlovian tool kit (Svoboda 1996). However, present study did not find the crucial typological elements of Pavlovian, namely backed denticulated bladelets, crescents, triangles, and the basal ventral thinned blade points (Kozłowski 1996a; 2015; Svoboda 1996; 2007), in the Pavlovian assemblages of GEM. The types defined here, however, are characteristics of the Late Gravettian (Kozłowski 1986; Wilczyński 2016). The Late Gravettian relation is especially supported by the presence of a backed and ventrally truncated rectangle (Fig. 7:3) that appears solely from the period of 26–21 ka BP of Eastern Central Europe (Wilczyński 2016), including for example at Bodrogkeresztúr, and Pilisszántó I rockshelter from Hungary. Therefore, I claim that no Pavlovian occupation can be found in the Hungarian UP record yet, and the Pavlovian sites of GEM belong to the Late Gravettian of Eastern Central Europe dated approximately to 26–21 ka BP.

The Hungarian assemblages seem to represent the variants of the Late Gravettian (Kozłowski 2013; Wilczyński 2016). The equivalent of Hidasnémeti are Kraków-Spadzista street layer 6 (Kozłowski, Sobczyk 1987; Wilczyński *et al.* 2015), Petřkovice I (Novák 2008), Willendorf II layer 9 (Otte 1981), Milovice I (Oliva 2009), Nitra–I Čermáň (Kaminská, Kozłowski 2011), all dated to 26–21 ka BP. These assemblages are characterized with shouldered points, micrograve ttes and fléchettes. Bodrogkeresztúr, Arka and Sajószentpéter showed

typological similarity to Jaksice II in Poland (Wilczyński 2016), Trenčianske Bohuslavice (Barta 1989; Žaár 2007) and Moravany-Žakovska (Hromada, Kozłowski 1995), with the fléchettes, micrograveттes, and the backed ventrally truncated rectangles. These sites were dated to the period of the shouldered point Gravettian (Verpoorte 2002; Vlačiky *et al.* 2013). Besides these types, bifacial leaf points also occurred in Late Gravettian at Trenčianske Bohuslavice (Barta 1989; Žaár 2007), Moravany — Lopata II (Kazior, Kozłowski, Sobczyk 1998) and Szeleta cave layer 5–6 (Lengyel, Mester, Szolyák 2016).

The Ságvárian completely lacks the Late Gravettian types and has a decreased frequency of the armature compared to both the previous and the succeeding periods. Only backed bladelets were found in the armature. At the eponymous site of the Ságvárian, Ságvár, although pebble raw material is abundant, it far does not dominate the whole assemblage (Lengyel 2014). The pebbles are chiefly of radiolarite, mostly Bakony types, which seem to be the closest raw material source to Ságvár. Among Ságvárian sites not analyzed here, Mogyorósbánya and Szob were presented as pebble consumer (Markó 2007; Dobosi 2016). The exploitation of pebbles at these sites seems to be related with the fact that this raw material was the closest to the sites in the largest quantity. Dismissing the pebble raw material from the determinants of the Ságvárian, I agree that the meager presence and low variability of armatures can be the criteria to differentiate the Ságvárian from other assemblages (Kozłowski 1996b). Taking into account this typological criterion for Ságvárian, the Pilismarót site cluster (Dobosi 2006) and Jászfelsőszentgyörgy (Dobosi 2001), what GEM regarded contemporaneous Epigravettian occupations with the Ságvárian, share the features of the Ságvár type of tool kit. Therefore, they may belong to the same culture in the period 20–18 ka BP. At sites of this period outside Hungary, such as Kašov upper layer (Bánesz *et al.* 1991), Grubgraben (Montet-White 1990), Gravettian point types are meager and backed bladelets constitute the armature. This period is often called Epigravettian (Kozłowski 1986, 1996b), but according to Svoboda and Novák (2004) the term Epigravettian should be retained for the armature rich assemblages of southern Europe. Because both eponymous sites, Ságvár and Kašov, which were used to name the archaeological culture for the period of 20–18 ka BP, are very specific (Bánesz *et al.* 1992; Lengyel 2011), I suggest to use the neutral term Early Epigravettian.

No other assemblages of Hungary are typologically similar to the group consisted of Esztergom and Nadap. The radiocarbon dates of Nadap and Esztergom may suggest that the age of this type of lithic tool kit is roughly 17–13 ka BP. Their features, the abundance of backed armature, backed points, lack of Gravette points, is a feature in the period dated after 17 ka BP: Mohelno Plevovce (Škrdla *et al.* 2016), Targowisko 10 (Wilczyński 2009), and Sowin 7 upper layer (Wiśniewski *et al.* 2012). The abundance of backed armature therefore seems to fit the expectations of Svoboda and Novák (2004) concerning what to call Epigravettian. These industries are proposed here to be called Late Epigravettian. Štýřice III dated to 15–14 ka BP (Nerudová, Neruda 2014)

in Brno, Moravia, does not match this hypothesis. This assemblage has only a few backed armatures, similarly to what is called here Early Epigravettian. Either the dating is too young, which might be due to the generally low preservation of collagen in the bones (Nerudová, Neruda 2014), or this period is more variable in lithic remains, alike the Late Gravettian in Eastern Central Europe.

CONCLUSION

This paper tested the typological considerations of the Gravettian Entity model of the Hungarian MUP and LUP. The typological homogeneity of GEM lithic industries was not supported. The armature typology served to differentiate lithic assemblages of MUP and LUP in Hungary. Most probably the Gravettian in Hungary was present mainly by its late phase dated to ~26–21 ka BP which can be characterized by classic Gravettian armature. Assemblages dated to between 20 and 18 ka BP were characterized by simple backed bladelets and a few points instead of the classic Gravettian armature. These industries were proposed to be called Early Epigravettian. The period dated after 18 ka BP was proposed here to call Late Epigravettian. It was characterized by abundant armature tool kit including backed bladelets, backed points, curved backed points, arched backed points, and the lack of classic Gravettian types. The analogies from the archaeological literature may support the proposal of this paper, and the assumptions presented here must be tested by studying further lithic assemblages with the method used here. Greater sample size may result more statistically significant correlations and greater strength between lithic features, archaeological cultures, and periods. Until then, these findings must remain a hypothesis.

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