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THE MIDDLE AURIGNACIAN IN THE CARPATHIAN BASIN OF EASTERN CENTRAL EUROPE[1]

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In the article a series of Middle Aurignacian *in situ* sites and surface loci situated in the Carpathian Basin of the Eastern Central Europe is analysed using industrial and geochronological criteria recently developed for the respective Middle Aurignacian materials in Southwestern France. As a result, there were not only recognized the respective materials for the Carpathian Basin but were also identified both common and specific techno-typological features for taken together Pan-European Middle Aurignacian materials. Geochronologically, the Carpathian Basin's sites (starting from GI-8a, ca. 36,300 cal. BP) are a little younger of the French materials (GI-8c, ca. 37,900–37,500 cal. BP). The realized study also demonstrated a possible series of various site types for Middle Aurignacian settlement pattern observations in the Carpathian Basin. The resulting analyses also allowed us to see on the new data and knowledge levels a basic Middle Aurignacian human dispersal from Europe into the East Mediterranean Levant.

Keywords: Eastern Central Europe, Carpathian Basin, Aurignacian, Middle Aurignacian.

INTRODUCTION

The present article is second item in the planned by us a series of articles dedicated to the presence of sites having artifacts belonging to various Aurignacian industry types in the Carpathian Basin of Eastern Central Europe. Although chronologically it should be article number three after the already published Proto-Aurignacian item (*Demidenko et al. 2021*) and then an Early Aurignacian subject, now it has been decided to work out with the Middle Aurignacian subject. It is explained by an enough clear situation for us with Middle Aurignacian site/loci and their finds data sets for the region now, while the respective data on the region's Early Aurignacian are still at a preliminary analysis stage. Accordingly, Middle Aurignacian is proposed to be viewed for a detailed analysis at the moment (Fig. 1). The importance of the present Middle Aurignacian study in Eastern Central Europe is basically connected to unclear view of Palaeolithic archaeologists what exactly Middle Aurignacian is in an industrial and geochronological sense there. Our position here is, first of all, based upon the use of respective criteria from the Western European Aurignacian data. As a result, it is offered a set of strict industrial and also chronological features for the Middle Aurignacian that is comparable to some Middle Aurignacian materials in Southwestern France. Furthermore, the defined by us Middle Aurignacian sites/loci and artifact assemblages are also compared with similar Aurignacian materials in both neighbouring to the Carpathian Basin some European regions and the East Mediterranean Levant. The latter comparisons will help us to propose some ways of Middle Aurignacian human moves throughout Europe and Western Asia.

MIDDLE AURIGNACIAN WITHIN THE CLASSIC FRENCH AURIGNACIAN SCHEME

After the pioneering and very important Aurignacian studies of *H. Breuil* (*1912*) and *D. Peyrony* (*1933*; *1936*) in Périgord (southwestern France) during the first third of the 20th c., it is probably possible to say, at least from our retrospective point of view, by Palaeolithic archaeologists from Eastern and Central Europe, not from France, the so-called classic French Aurignacian scheme was finally formed by D. de Sonneville-Bordes on archaeological materials from southwestern France in the late 1950s–early 1960s (e.g. *Sonneville-Bordes 1960*). Our modern view distinguishes among her several Aurignacian stages, stage II, that goes after Aurignacian I/Early Aurignacian with its most characteristic wide-fronted carinated endscraper-cores and so-called Aurignacian blades of two sub-types bearing invasive and usually stepped lateral/bilateral retouch among lithic artifacts and split-based points among organic tools. The stage/industry II was usually considered

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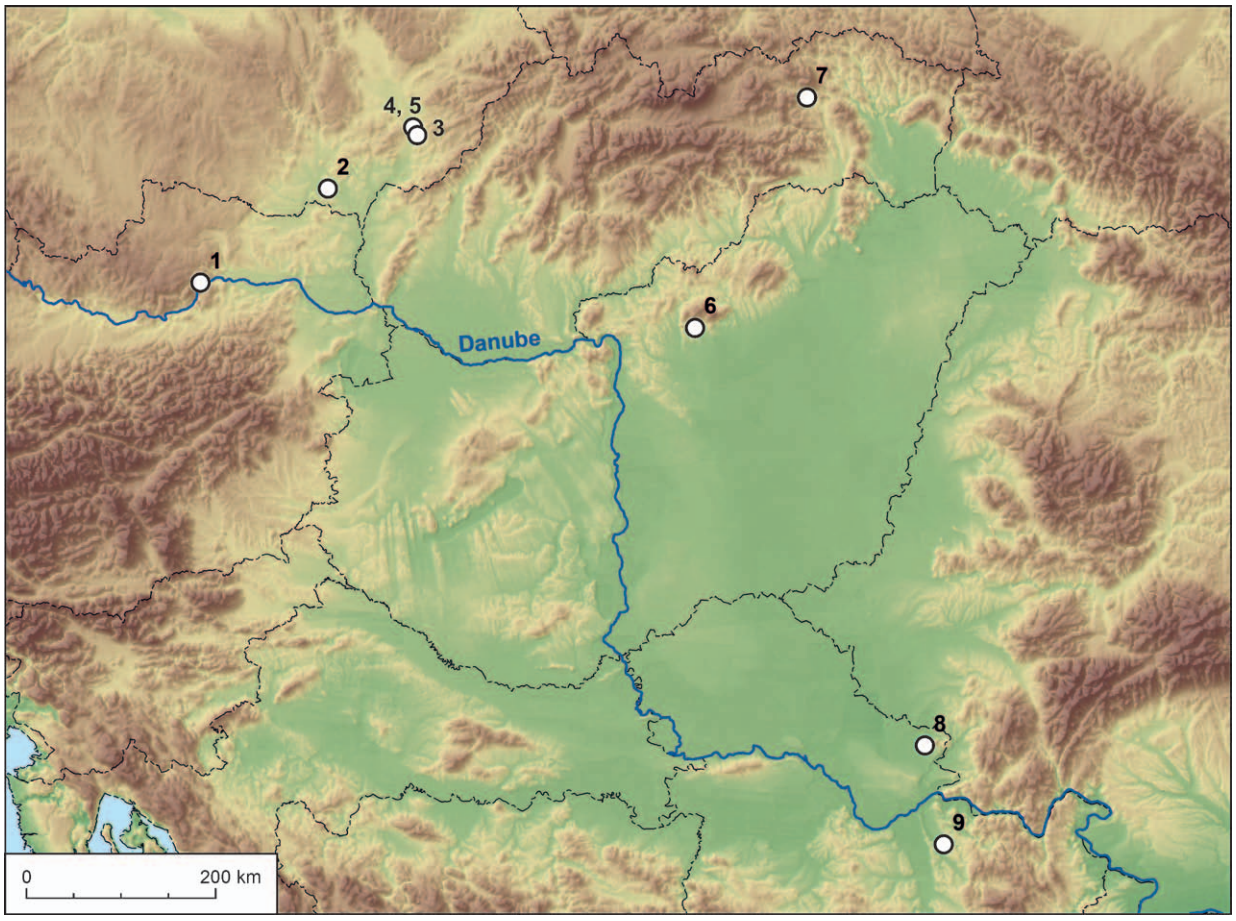

Fig. 1. Map of the key sites mentioned in the text. 1 – Willendorf II; 2 – Milovice I; 3 – Napajedla III; 4, 5 – Žlutava I and Nová Dědina I; 6 – Nagyréde 1, 2; 7 – Medzany I and II; 8 – Crvenka-At; 9 – Bukovac cave.

up to early 2010s representing a sort of Recent/Evolved/Late Aurignacian beginning (e.g. *Bon 2002*; *2006*; *Bordes 2002*; *Chiotti 2000*; *2005*; *Douka et al. 2011*; *Higham et al. 2011*) when shouldered/nosed endscraper-cores, carinated burin-cores with also its *busqué* sub-type and Dufour bladelets of Roc de Combe sub-type become the most indicative lithic types. Moreover, the 1960 D. de Sonneville-Bordes' Aurignacian III and IV stages were thought of the similar to stage II industrial character with numerically variable but still similar characteristic tool-core and tool types. Accordingly, in a simplistic and general way Aurignacian began to consist of three basic and temporally successive stages/industry types, Proto-Aurignacian Early Aurignacian and Recent/Evolved/Late Aurignacian (e.g. *Bon 2002*; *2006*; *Bordes 2002*). One of us (Yu. E. Demidenko), using mainly 1960 D. de Sonneville-Bordes' Aurignacian industrial characteristics, independently from the French colleagues also grouped together Aurignacian II–IV into Late/Evolved Aurignacian c. 20 years ago (*Demidenko 2003*; *2004*). Through time, however, it became certain for us that most of Aurignacian II assemblages in southwestern France in fact represent a distinct industry type with absence or a few present carinated burin-cores, while most of all taken together carinated pieces compose shouldered/nosed endscraper-cores where wide-fronted carinated endscraper-cores are of much less quantity and importance. However, there was a problem with multi-layered sites, even containing Early Aurignacian materials. Distinct Aurignacian II industrial characteristics were sometimes rather clear for both some sites with the only present Aurignacian II layer and also some sites having together Early Aurignacian/Aurignacian I and Aurignacian II layers (see *Sonneville-Bordes 1960*, tab. I; IV; VI; XI). On the other hand, some sites again with both Early Aurignacian/Aurignacian I and Aurignacian II layers often show similar characteristics making Aurignacian II hardly different from Aurignacian I (see *Sonneville-Bordes 1960*, tab. X). The latter problematic cases should be probably explained by old excavation techniques leading to mixed 'industrial pictures' which prevented then distinguishing a real separate status for Aurignacian II.

Here it is also necessary not forgetting two separate attempts in France in the 1980s and 1990s to suggest an Aurignacian stage/industry between Early and Evolved/Recent Aurignacian stages/industries, 'Middle Aurignacian', with characteristic presence of shouldered/nosed endscraper-cores and burins on truncation (*Delporte 1984*; *1991*; *Djindjian 1993a*; *1993b)*. But the proposed hypotheses were not accepted at that time. And as time shows it was done in vain. Now it is possible to say that namely since recent studies of *A. Michel* (*2010*; *2012*) Aurignacian II became not a 'first stage' of Evolved Aurignacian but *'an intermediate phase between the early Aurignacian with a split-based point and the recent Aurignacian with busqued burins'* (*Michel 2012*, 119). Therefore, Michel coined it 'Middle Aurignacian', noted validation by his work of the earlier H. Delporte's and F. Djindjian hypotheses (see *Michel 2010*, 152) and he proposed for the stage/industry an etalon-like artifact assemblage coming from Abri Pataud, level 8. As Michel's study for level 8 is a kind of mostly 'technological living water' for standard typological data, some the most traditional typological indications for level 8 tool-kit has to be first represented (*Brooks 1995*, tab. XXII; XXIX; XXXI). We are not going to recount level 8 artifact data with all already published details that is not an aim for our present article. We only want to note its basic and the most characteristic industrial features.

Endscraper-cores and endscrapers account 123 specimens with no 32 atypical simple and carinated examples. 76 items (61.8%) represent shouldered/nosed endscraper-cores (Fig. 2A) and 15 items (13%) are carinated endscraper-cores. It makes the two endscraper-core types correlation in 5 to 1. At the same time, carinated burins (classified as 'burin *busqué*' type by A. Brooks) only approach six pieces. Grouping together all 98 tool-cores, the following shares of the three types appear: 77.6% of shouldered/nosed items endscraper-cores, 16.3% of carinated endscraper-cores and 6.1% of carinated burin-cores. This is indeed a strict pattern and in contrast to the above-mentioned problems with 1960 D. de Sonneville-Bordes' data for Aurignacian II assemblages, no one Early Aurignacian level at Abri Pataud (levels 11–14) shows the presence of even a single (!) burin-core, while, for example, stratigraphically above level 7 with Recent Aurignacian features demonstrates absolutely reverse picture with a significant prevalence of 85 carinated (*busqué*) burin-cores over 9 shouldered/nosed and 18 carinated endscraper-cores. These Aurignacian tool-core data indirectly once again confirm good excavation techniques applied during field investigations at Abri Pataud by H. L. Movius, Jr. in the 1950s–1960s (see *Movius 1977*). Also, carinated (*busqué*) burin-cores compose only 9.2% of all level 8 burins in 1995 Brooks accounts where dihedral type is also the least represented among other burin types (15.8%) with a dominance of both burins on truncation/transversal on lateral preparation and then of angle/transverse on natural surface type (see also *Chiotti 2000*, tab. I). The shown minor part of dihedral burins is well understood by us as usually they are numerically well occurred only together with carinated burin-cores in Aurignacian industries and the latter tool-cores are nearly absent in level 8. Taking 1995 A. Brooks' blank data for all endscraper-cores, including not counted by us above 17 atypical carinated endscraper-cores, it is seen an overwhelming majority of flakes (72.1%), a moderate occurrence of cores and chunks (21.2%) and only 4.8% of blades with additionally 2% of indefinite pieces. Thus, flakes and namely thick flakes, taking into consideration thick (well over 1 cm) fronts/flaking surfaces of endscraper-cores on flakes, had to be an important part of purposefully produced debitage pieces within core reduction processes for level 8 humans, although they were rarely transformed by retouch into side-scraper-like pieces, with only identified four side-scrapers in the 1995 tool-kit. Finally, it is also worth noting absence of any Aurignacian blades and the presence of just a single endscraper on an Aurignacian blade for level 8, whereas the two characteristic Aurignacian tool types are numerically well occurring among Early Aurignacian levels 11–14 tool-kits at Abri Pataud.

Having such typological basics, the following technology features can be extracted from the A. Michel's studies of level 8 lithics. As his 2012 article was written in English, it will be also used for some citations for making clear some of his statements and suggestions in the present article also in English. Level 8 is characterized by several core reduction strategies and their data were additionally supported by many refits. Flake reduction prevails over blade one. Flakes were purposefully detached for getting thick blanks serving then for a shouldered/nosed endscraper-core bladelet production. Flakes and blades were removed in a similar unidirectional manner why some of the assemblage's cores are strictly speaking flake/blade examples (see *Michel 2012*, fig. 5) and '*laminar flakes*' were specifically recognized. Here it is important to note the absence of any MP-looking core types, Levallois, discoidal and radial ones. Any carinated and shouldered/nosed tool-cores were not included by Michel into tool analyses. Respectively, it much lowered a share of flakes among tool-blanks. This is why '*tools are mainly produced on blades and rarely on*

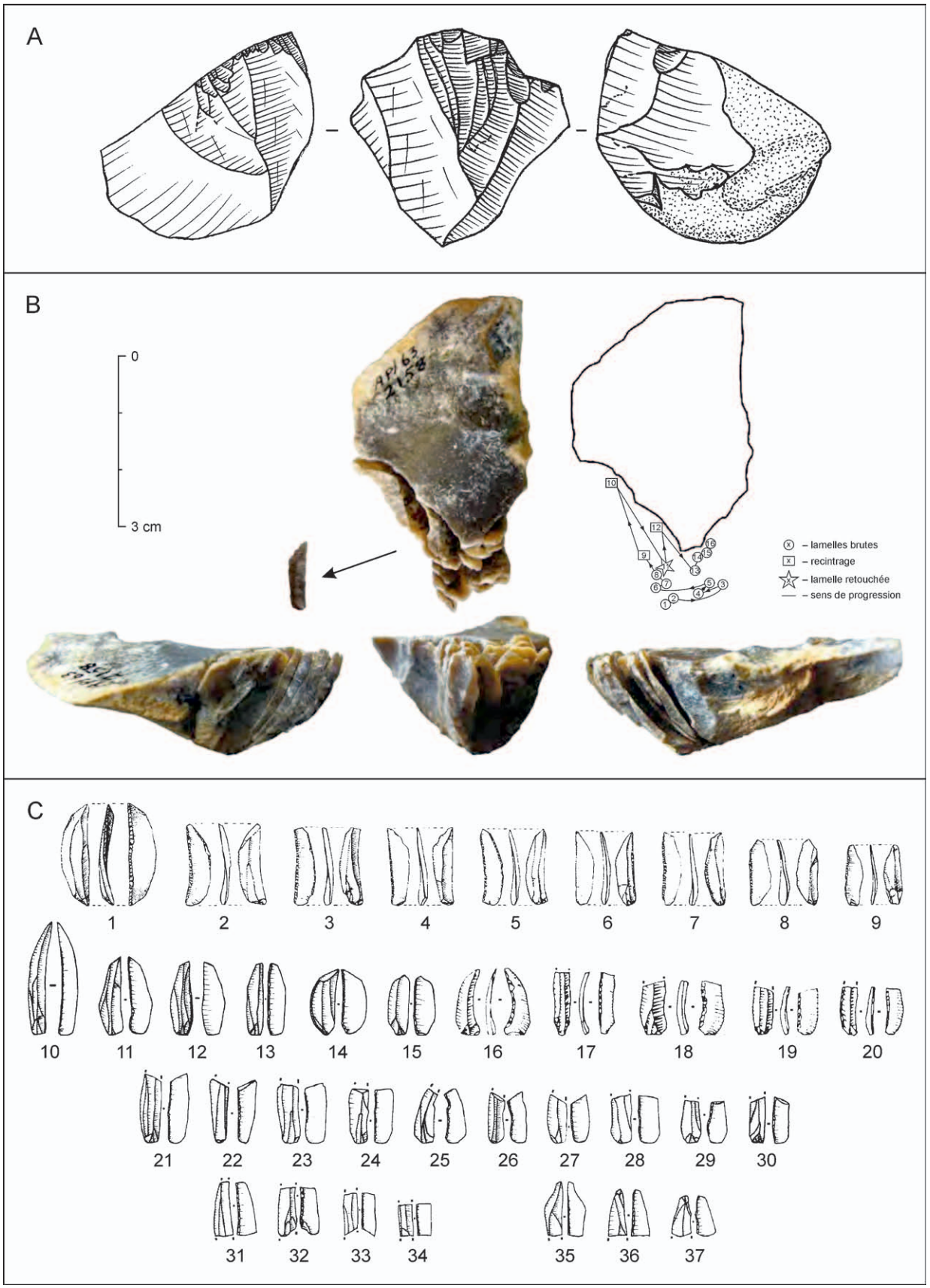

Fig. 2. Abri Pataud, level 8 (France). A – typical example of a shouldered/nosed endscraper-core; B – refits of a shouldered/nosed endscraper-core and a series of microblades; C – microliths (A–C – modified after *Michel 2010,* fig. 51; 59; 60).

Tab. 1. Willendorf II, AH 4 (Austria). Basic debitage type data.

	Willendorf II, AH 4	
	re-calculated from *Hahn 1977*	re-calculated from *Nigst 2012*
Flakes	187/56.8%	1356/85.1%
Blades	66/20.1%	56/3.5%
Bladelets	76/23.1%	181/11.4%
Total	329/100%	1593/100%

flakes' (Tab. 1; *Michel 2012*, 121). Taking a closer look at Tab. 2 with tool-blanks, we calculated the following identified blank types, excluding 43 retouched bladelets: 131/60.1% blades and 87/39.9%. Using these blank data for strict tools, A. Michel noticed the following tool-blank patterns: *'The blades are mostly used for making endscrapers, burins and retouched blades (only one blade with Aurignacian retouch). The flakes are mostly used for making burins, mainly on truncation'* (*Michel 2012*, 121). However, if we add to the 218 strict tool-blank data the respective identifiable 149 blank data for 167 defined by A. Michel '*nosed endscrapers*' where he virtually included all carinated tool-cores (134/89.9% flakes, 11/7.4% blades and 4/2.7% nodules/plaquettes; Tab. 4; see *Michel 2010*, tab. 38; *2012*, 124), the joint tool and tool-core blank-data appear to be with about exactly the reverse order shares of debitage blanks: 142/39.1% blades and 221/60.9% flakes. Remembering the traditional inclusion of the tool-cores into tool type-lists, it is seen a pattern with a dominance of flaky-blank based tools *sensu lato* within such Aurignacian assemblages (see below), especially taking into consideration tool-kits' data from both old excavations with no dry screening/wet sieving of artifact bearing sediments and surface collections where retouched microliths are at best, if ever, are represented by very few examples. Thus, blanks for tool-cores and so-called proper

Tab. 2. Willendorf II, AH 4 (Austria). Indicative tool and tool-core types.

	Willendorf II, AH 4		
	re-calculated from *Hahn 1977*	re-calculated from *Nigst 2012*	the present study's data
ENDSCRAPERS	87/76.3%	96/76.2%	95/78.5%
Carinated endscrapers	22/25.3%	21/21.9%	21/22.1%
Shouldered/nosed endscrapers	48/55.2%	64/66.7%	62/65.3%
Double-triple shouldered/nosed endscrapers	0	0	1/1.1%
Simple flat endscrapers	14/16.1%	10/10.4%	10/10.4%
Endscrapers on laterally/bilaterally retouched pieces	3/3.4%	1/1%	1/1.1%
Endscrapers on blades with Aurignacian-like retouch	0	0	0
Endscrapers on Aurignacian strangled blades	0	0	0
BURINS	26/22.8%	26/20.6%	22/18.2%
Carinated	0?	0?	1/4.5%
Dihedral	10/38.5%	1	10/45.5%
On truncation/transversal on lateral preparation	12/46.1%	?	7/31.8%
Angle/transverse on natural surface	4/15.4%	?	4/18.2%
LAMELLES with a fine lateral/bilateral retouch	1/0.9%	4/3.2%	4/3.3%
Dufour, lamelles with alternate/alternating retouch	0	?	?
Dufour, lamelles wih ventral retouch	1/100%	?	1?
Pseudo-Dufour, lamelles with lateral dorsal retouch	0	?	?
Pseudo-Dufour, lamelles with bilateral dorsal retouch	0	?	?
FONT-YVES/KREMS points with a fine retouch	0	0	0
BLADES with Aurignacian-like strangled retouch	0	0	0
BLADES with Aurignacian-like retouch	0	0	0
Total	114/100%	126/100%	121/100%

tools significantly vary and it should be always kept in mind for not going in a possible 'pseudo-trap' of something like a Middle Palaeolithic (MP) tradition on using mainly flakes for Middle Aurignacian tools. Summing up the A. Michel's core reduction data, it is seen no less than three apart from each other core flaking methods. It also differentiates Middle Aurignacian from chronologically earlier both Proto-Aurignacian and Early Aurignacian industries with no more two reduction methods for each of the two industries.

Taking the shouldered/nosed endscraper-core reduction (Fig. 2: B) where A. Michel also certainly added a few still existing wide-fronted carinated endscraper-cores and carinated burin-cores, it is said it was directed onto receiving of series of rather standardized microblades that were shown for retouched microliths (Fig. 2: C) with about uniform metrics (14 mm long, 3.7 mm wide, 1.1 mm thick) and morphology (from our point of view, a crescent-like shape formed by *'a combination of a straight right edge and a convex left edge'*; *Michel 2012*, 125) where usually ventral fine marginal retouch is the most characteristic for them (see *Michel 2010*, 129–140; *2012*, 125). The latter secondary treatment was in a more detailed way summarized as follows: *'The main type of transformation is an inverse retouched right edge opposite to a not retouched convex left edge (70% of retouched bladelets). This inverse retouch appears to serve only to enhance the straightness of the right edge. Retouching on the left edge mainly helps to straighten this edge. Whether the bladelets were used as part of a composite projectile point is still an unanswered question'* (*Michel 2012*, 125). Moreover, the dominant retouched microblade type was labelled Dufour bladelet of Pataud sub-type by A. Michel in his PhD thesis *'lamelles Dufour sous-type Pataud...: lamelle asymétrique présentant un bord gauche convexe et un bord droit rectiligne, de profil courbe à légèrement torse dans le sens antihoraire et présentant majoritairement une retouche inverse sur le bord droit opposé à un tranchant gauche laissé brut'* (*Michel 2010*, 140). It is, however, interesting to note the absence of Dufour bladelet of Pataud sub-type in the A. Michel's subsequent articles (e.g. *Bordes et al. 2011*; *Michel 2012*).

From our point of view, there are still some reservations for recognition of the newly proposed Dufour bladelet Pataud sub-type. First, the now classic definition of Roc-de-Combe sub-type of Dufour bladelet proposed more than by 30 years ago by P.-Y. Demars is enough 'enveloping' the discussing Abri Pataud microliths with their virtually the same crescent-like shape, small dimensions, twisted/significantly incurvate general profiles, retouch type and location (*Demars/Laurent 1989*, 102, 103, fig. 37: 12, 14–18, 20, 24–27). One of us (Yu. D. Demidenko) studied and published the largest set of Recent/Evolved/Late Aurignacian retouched microliths coming from a single site, after 1990s excavations at Siuren-I rock-shelter, in Crimea, Ukraine (see *Demidenko 2002*; *2012a*; *2014*; *2017*; *Demidenko/Chabai 2012*). In total, there are 77 laterally/bilaterally retouched microliths in Unit F at Siuren-I (^{14}C dated to c. 31,000–30,000 uncal. BP) and most of them, 68 pieces, are of Roc-de-Combe sub-type bearing an alternate, ventral or just dorsal fine marginal retouch (e.g. *Demidenko/Chabai 2012*, 262, 263, 272, 273, 275, fig. 4B: 1–35, tab. 45–48). Their blanks, tiny twisted and off-axis microblades of a crescent-like shape, with a mean metrics for eight fully complete pieces in 18 mm length, 4.5 mm width, 1.4 mm thickness, were technologically connected to reduction of carinated endscraper-cores and burin-cores, including shouldered/nosed endscraper-cores. The function of Roc-de-Combe microliths was suggested to be arrowheads, used in pairs and mounted into mastic of a foreshaft for each composite arrow (see *Demidenko 2012a*, 301, 302; *2017*, 191–195, fig. 1). Knowing so well the Roc-de-Combe sub-type of Dufour microliths from concrete Crimean Siuren-I *in situ* materials, it was also decided to group together the Crimean materials with also French finds from level 8 at Abri Pataud for a Pan-European scale c. 10 years ago (e.g. *Demidenko/Noiret 2012*, 352–357). In sum, Abri Pataud, level 8 retouched microliths are so far better to keep among Roc-de-Combe sub-type microliths with, however, a technological emphasis on their microblade blanks detachment from shouldered/nosed endscraper-cores. Most likely, Michel himself came to a similar conclusion on the Abri Pataud, level 8 microliths.

Finishing with lithic data from Abri Pataud, level 8, it is worth noting a raw material peculiarity known for shouldered/nosed endscrapers there. As a whole, level 8 Middle Aurignacians at Abri Pataud were very mostly using local lithic raw material resources, ca. 99.6% for all identifiable pieces (re-calculated from *Michel 2010*, tab. 26) but all with no exception shouldered/nosed endscraper-cores were on lithic that *'... is primarily local and corresponds with materials which probably originated from the Vézère that flows a few dozen meters below the site…'* (*Michel 2012*, 121). At the same time, tools *sensu stricto* were made on local raw materials in a little lesser share, ca. 91.6% (re-calculated from *Michel 2012*, tab. 3). Thus, the Abri Pataus, level 8 tool-core reduction objects for bladelet reduction are of a 'domestic character' as all other artifact categories are. It allows us to suggest a base camp/residential/living site features with much emphasis on primary reduction processes at the site for the discussing Middle Aurignacian

occupation(s) at Abri Pataud. The few present organic artifacts further confirm the proposed site type suggestion.

Organic personal ornaments and tools are of a limited character at Abri Pataud, level 8. The former pieces are represented by a perforated red deer canine and an undrilled fossil mollusc shell fragment (*Brooks 1995*, 194, fig. 74: i, tab. XXV; *Michel 2010*, 87, fig. 28) and only two distal parts of bone awls/points and two bone '*coins/ciseaux*' demonstrate the presence of the latter pieces (*Brooks 1995*, 200, fig. 78: a–c, tab. XXVI; *Michel 2010*, 88, fig. 30, tab. 24).

Geochronologically, level 8 was always virtually the same dated as level 7 above, ca. 32,000–31,000 uncal. BP 37,600–35,600 cal. BP (*Higham et al. 2011*, fig. 3, tab. 1; *Michel 2010*, tab. 23). New dating efforts for Abri Pataud Upper Paleolithic (UP) occupations, their results were not available yet for A. Michel during his PhD study, were realized in 2007–2008 and resulted with 31 new AMS dates for humanly-modified (cutmarks, retouchers, humanly smashed) ungulate bones (*Higham et al. 2011*, tab. 2). New results indicate dating of level 8 to 33,050 uncal. BP and it *'... occurs between 37,550–36,960 cal. BP (68.2%) or 37,880–36,760 cal. BP (95.4%)... within... GIS-8, the long warmer interstadial that comes after the H4 event…'* (*Higham et al. 2011*, 559, tab. 4). At the same time, level 7 was dated a little bit later, between 32,850–32,200 uncal. BP, during still GI-8 interstadial period (*Higham et al. 2011*, 559, tab. 4).

In short, the modern day French Middle Aurignacian based on Abri Pataud, level 8 data can be summarized as follows. In contrast to the dominating before hypotheses, Middle Aurignacian is a real distinct Aurignacian stage/industry geochronologically appearing in GI-8c, ca. 37,900–37,500 cal. BP (see *Rasmussen et al. 2014*, tab. 2). By lithic artifact data, it, first of all, differs from a part of the *D. de Sonneville-Bordes* (*1960*) Aurignacian II, as well as from Aurignacian III and IV and the recently defined three facies of Late Aurignacian (*Bordes et al. 2011*; *Michel 2010*), by a dominance of shouldered/nosed endscraper-cores for bladelet primary reduction and the absence/paucity of carinated burin-cores and a few in number wide-fronted carinated endscraper-cores. At the same time, it has no less than three distinct core reduction methods, flake, blade and bladelet ones with their own specific technological features, although MP-like specimens are absent among flake cores and a number of flake/blade cores are also present. It makes Middle Aurignacian the first much variable Aurignacian stage/industry in terms of core reduction methods while earlier Proto-Aurignacian and Early Aurignacian/Aurignacian I stages/industries 'could not boast' of such a variety of primary flaking strategies. Due to the absence/paucity of carinated burin-cores, dihedral burins, which are usually an initial reduction stage of carinated burin-cores, are the least present in comparison to burins on truncation/transversal on lateral preparation and angle/transverse on natural surface type. Aurignacian blades and endscrapers on Aurignacian blades (a single example) can be said being about absent. The stated by A. Michel uniformity of Dufour microliths, either it is his of Pataud sub-type or still of Roc-de-Combe sub-type, does not seem to be of an absolute value. Looking at A. Michel's refits and technological reconstruction for shouldered/nosed endscraper-core and microblades (Fig. 2; *Michel 2010*, fig. 58; *2012*, fig. 9), it is seen a series of morphologically variable detached microblades and it should be kept in mind some other retouch data for a part of microliths in level 8 of Abri Pataud as it is also well-known for Late Aurignacian having not only Roc-de-Combe microliths, like in the above-noted Siuren I rock-shelter (e.g. *Demidenko/Chabai 2012*, fig. 4: B: 1–35). From the technological point of view, it is also important to note that not all bladelets and microblades were detached exclusively from shouldered/nosed endscraper-cores or carinated tool-cores, being also flaked from some 'regular' bladelet and blade/bladelet cores on nodules/chunks why these bladelets/microblades do also morphologically vary. All in all, it means if there are more objects for bladelet/microblade reductions, then there are more morphologically different resulted products of these reductions. Therefore, retouched microliths should also have some variability. Organic artifacts are purely represented among level 8 of Abri Pataud with no any characteristic type pieces why they will be only discussed during analysis of Willendorf II, AH 4 artifacts, Austria (see below).

All the above-summarized Abri Pataud, level 8 artifact data will be used during subsequent analyses of assemblages from Eastern Central Europe proposed by us industrially related to Middle Aurignacian for now Pan-European scale, not just known in southwestern France.

SOME REMARKS ON LITHIC ARTIFACT ANALYSES

Basic principles on lithic artifact classifications and analyses were already established by us for a study of Proto-Aurignacian assemblages in the Carpathian Basin of Eastern Central Europe (*Demidenko et al. 2021*, tab. 1–5). The principles mostly follow the approach for classification of Aurignacian lithics

elaborated by one of us more than 10 years ago on a basis of many colleague's studies (*Demidenko 2012b*). At the same time, some minor but special additions were made.

As carinated *sensu lato* (including shouldered/nosed type pieces) pieces usually on debitage blanks are now functionally understood as both cores and tools, their each particular basic type is called tool-core, carinated endscraper-cores, shouldered/nosed endscraper-cores, carinated burin-cores. Shouldered/nosed pieces are with a dual 'first name' for special emphasis on unification of both pieces with a single made concavity and/or one-sided wide removal negative leading to a shouldered outlines for a piece's front/flaking surface and a double made concavity and/or two-sided wide removal negatives making a nosed-like front/flaking surface. Moreover, it is often not really possible to differentiate shouldered and nosed pieces one from another in a case with the presence of many such tool-cores in an assemblage why it is better to classify and keep them together. Still understanding the carinated *sensu lato* tool-cores with a two-fold function, it is also proposed to include them into both core-like pieces lists and tool lists for analyses of these two artifact categories. In doing so, it will be well seen shares of different carinated *sensu lato* pieces among both cores and tools. We will also escape a situation when now some colleagues (e.g. *Michel 2010*) put carinated pieces only into cores, fully erasing them from tool lists, why any reader of such text will have problems with understanding a tool-list and the entire site as an Aurignacian. Thus, we will follow both traditional (carinates within tools) and new technological (carinates among cores) approaches for better understanding of Aurignacian assemblages.

As a result, the core and tool lists are composed from the following most indicative classes and types.

Cores are subdivided into blade, blade/bladelet, bladelet 'regular', bladelet 'carinated' cores on nodules/chunks, bladelet carinated endscraper-cores, bladelet shouldered/nosed endscraper-cores, flake/blade, flake ones.

Tool-lists are made up of endscrapers (carinated, shouldered/nosed, double-triple shouldered/nosed, simple flat, on laterally/bilaterally retouched pieces, on blades with Aurignacian-like retouch, on Aurignacian strangled blades); burins (carinated, dihedral, on truncation/transversal on lateral preparation, angle/transverse on natural surface); *lamelles* with a fine lateral/bilateral retouch; Font-Yves/Krems points with a fine retouch; blades with Aurignacian-like strangled retouch; blades with Aurignacian-like retouch.

Regarding debitage pieces, it is worth reminding our subdivision of *bladelets sensu lato/lamelles* into bladelets *sensu stricto* (width between 7 to less than 12 mm) and microblades (width less than 7 mm; see *Demidenko 2012b*, 96, 97). The 7 mm 'metrical parameter Rubicon' between bladelets and microblades was proposed in dividing 12 mm into two halves excluding 1 mm wide hypothetical items that in reality do not occur in UP assemblages.

Having such the lithic artifact classification approach for assemblages representing different types of Aurignacian stages/industry types in the Carpathian Basin, it will be easy to see techno-typological characteristics of each stage/industry type in the end of our planned study, also summarizing their industrial similarities and differences.

MIDDLE AURIGNACIAN SITES AND THEIR ARTIFACT ASSEMBLAGES IN THE CARPATHIAN BASIN

A thorough observation of Aurignacian materials within the Carpathian Basin has led us to recognition 11 *in situ* sites and even surface find spots with artifact finds quite similar to the above-observed French Middle Aurignacian materials. These are Willendorf II in Lower Austria, Austria; Napajedla III, Žlutava I and Nova Dědina I, Milovice I in Moravia, Czech Republic; Nagyréde 1 and 2 in Hungary; Medzany I and II in Eastern Slovakia, Slovakia; Crvenka-At and Bukovac cave in Serbia (Fig. 1). Only the latter site in Serbia is a cave site, while all the rest sites are open-air sites and surface loci. It can be said that *in situ* and well published find complexes from Willendorf II, AH 4 (Archaeological horizon 4) and Napajedla III are the most reliable materials for understanding of Middle Aurignacian record in the study region. Therefore, analyses of the two sites' data will be represented in the most detailed way in the present article. At the same time, find complexes from each of the other sites and loci much add for insights of Middle Aurignacian variability in terms of both its industrial and human occupation characteristics and peculiarities.

WILLENDORF II, AH 4 (AUSTRIA)

Site location and research history

The site is situated in Wachau Valley on the left bank of the Danube River in Lower Austria, about 80 km west of Vienna (Fig. 1). This is north-western corner of the Carpathian Basin already at piedmonts of Bohemian Massif. Actually, Willendorf II is one of

the eight closely located UP sites, Willendorf I and Willendorf I/Nord to Willendorf VII (*Felgenhauer 1956–1959*, 3–6, fig. 1–11; *Nigst 2012*, fig. 13). At the same time, since the sites discovery and field studies starting from 1908, Willendorf II had been the best investigated site with as yet the longest known loess–paleosoil stratigraphy sequence and Initial UP (?)/Early UP–Middle UP multi-layered archaeological record within the site group. The site also has a long history of archaeological and geological investigations that can be grossly subdivided into four following stages:

1. between 1908 and 1927 during 1908, 1909, 1913 and 1927 archaeological campaigns realized by J. Szombathy, H. Obermaier and J. Bayer (*Bayer 1930*; *Szombathy 1909*; *1910*);
2. in 1955 with new site's archaeological excavations added by a re-analysis of the previously discovered finds and data resulted in published book composed of three volumes by F. Felgenhauer and F. Brandtner (*Felgenhauer 1956–1959*);
3. in 1981 and 1993 with some limited site's lithological profile studies and sampling for mainly radiocarbon dating by P. Haesaerts, M. Otte and G. Trnka (*Damblon/Haesaerts/Van der Plicht* 1996; *Haesaerts et al. 1996*);
4. between 2006 and 2011 with the site's stratigraphy more understanding and dating aiming basically studies of Early UP archaeological horizons (AH) 3 and 4 and again some artifact re-analyses for Early UP AH 2–4 by P. R. Nigst and P. Haesaerts (e.g. *Nigst 2006*; *2012*; *Nigst et al. 2014*).

The important for the present study AH 4 was excavated in 1908, 1909, 1913, 1927 and 1955 numbering almost 2,500 lithic and ca. 30 bone/antler/ivory artifacts thanks to P. R. Nigst's extra artifact sample added to the long-known collection in 1,120 more lithics found by him in 2007 in a wooden box after 1908–1909 excavations stored in the cellar of the Museum of Natural History Vienna (see *Nigst 2006*, 286, 287; *2012*, tab. 12; 77). It is needed to note a series of technologically important refits for some lithic artifacts P. R. Nigst and L. Moreau did for some AH finds (see below). Namely the P. R. Nigst's recent published AH 4 data will be basically used for our artifact analysis, although some important information coming from the 1950s records (*Felgenhauer 1956–1959*, 56–58, fig. 24–26), the 1970s personal artifact analysis by *J. Hahn* (*1977*) and some of the studies made by N. Teyssandier in the late 1990s (*Haesaerts/Teyssandier 2003*), and, finally, by one of us (Yu. E. Demidenko) some personal observations of AH 4 artifacts at Natural History Museum Vienna in May of 2019 will be also used for more artifact understanding. Due to these several and different to a considerable extent from one another of artifact information sources, the following below AH 4 artifact data are represented in a very detailed way with many remarks and clarifications.

Stratigraphy and geochronology

AH 4 is the uppermost Early UP AH within the site's overall stratigraphy sequence underlying the lowermost Middle UP, Early Gravettian AH 5 (*Nigst 2012*, fig. 16; 18; 19). AH 4 is *'documented in the Stratigrahic Unit C4, corresponding to a distinct period of soil development'* (*Nigst 2012*, 78), correlated by P. Haesaerts with Huneborg II/Schwallenbach II paleosoil and chronologically related to the strict period in ca. 32,100–31,200 uncal. BP/36,300–35,400 cal. BP based on three 1990s dates of charcoal samples (*Haesaerts/Teyssandier 2003*, fig. 4; *Nigst 2012*, 74, fig. 18; 19, tab. 11; *Nigst et al. 2014*, fig. 1, S17–S19) that is, high likely, geochronologically correlated with Greenland Interstadial (GI-7). From one of us (Yu. E. Demidenko) personal observations of Willendorf II artifacts from the Early UP AHs and reading of all available published stratigraphy data, it appears that AH 4 is the only AH among all four Early or even Initial UP AHs at the site that is truly characterized by both industrial and stratigraphy homogeneity with almost no occurrence of other UP industry's artifacts and/or stratigraphy integrity problems. Simultaneously, now Demidenko considers finds on silicic limestone and red radiolarite from AHs 2–3 are of definite Initial UP (?)/Early UP industrial heterogeneous (!) character with no, however, Szeletian and/or Bohunician features there, and AH 1 is with unclear at all industrial features for only three dubious lithics. There is only a single exception for the subject on possible artifact heterogeneity for AH 4. There is a backed bladelet piece among AH 4 tools (Fig. 8: 1; 9: 2; *Felgenhauer 1956–1959*, fig. 24: 8; *Hahn 1977*, pl. 98: 16). From the UP industrial point of view, such the piece personally seen by Yu. E. Demidenko in 2019 (this is probably a partial unfinished backed micro-Gravette point, 35 mm long, 6 mm wide, 3 mm thick) cannot belong to an Aurignacian tool-kit, although strangely enough both N. Teyssandier and P. R. Nigst just listed but not described and illustrated it in contrast to the F. Felgenhauer's and also J. Hahn's drawings among AH 4 tools (*Haesaerts/Teyssandier 2003*, tab. 3; *Nigst 2012*, tab. 115). Looking at the site's stratigraphy profiles (e.g. *Felgenhauer 1956–1959*, tab. 63; 82; *Nigst 2012*, fig. 19; *Nigst et al. 2014*, fig. 1), it is seen no more and even less than ca. 50 cm of loess sediments separating the discussing here AH 4 and above it AH 5 with Early Gravettian artifacts,

including among them backed bladelets and micropoints (e.g. *Felgenhauer 1956–1959*, fig. 29: 6–20). Although P. R. Nigst did not find any convincing stratigraphy problem signs on some possible artifact mixing for AHs 3 and 4 (see *Nigst 2012*, 78–80), it is still possible remembering understandably gross excavation methods during the site's studies in a period between 1908 and 1955. Here it is also worth looking at AH 5 Early Gravettian lithics where, as it was expected (*sic!*), we recognize a few carinated and shouldered/nosed endscraper-cores (e.g. *Felgenhauer 1956–1959*, fig. 28: 8; 29; 30), the most characteristic AH 4 Aurignacian tool-core types. Finally, L. Moreau made a refit for an AH 5 bladelet and an AH 2 bladelet core with a certain conclusion then that the two pieces have to belong to AH 5 (*Moreau 2009*, 279, 280, fig. 155: 2; *Nigst 2012*, 80, fig. 21). As a result, there was still mutual but minimal vertical 'artifact exchange' between AHs 4 and 5 why the above-discussed partial and unfinished micro-Gravette point should be removed from AH 4 tool-list and definitely considered belonging to AH 5.

Lithic artifacts

According to the most complete and detailed P. R. Nigst's data (*Nigst 2012*, tab. 77), AH 4 lithic assemblage accounts 2,452 pieces, although 23 natural 'manuports' were also included into these numbers.

Raw materials

By the identified raw materials for 2,402 artifacts, a great majority of pieces are represented by various hornstones (1,948/81.1%) and silicic limestones (416/17.3%; re-calculated from *Nigst 2012*, 138, fig. 94 left). Origin sources of the raw materials are not clear yet for us in terms of exact shares of local and non-local raw materials. On one hand, it is said: *'The majority of the objects belong to NUs whose raw material is attributed to exogenous sources. The intermediate and regional sources are represented by only a few pieces'*. But, on the other hand, it is continued this way: *'The local raw materials form the second largest group. A lot of these raw materials might have been transported to the site from further away, but as they might occur in the local available Danube gravels*[2]*, they have been labelled as local raw materials'*. There was also an important note for some hornstone artifacts *'introduced to the site at already a reduced stage'* (*Nigst 2012*, 138) meaning for us from a distant source. At the same time, the Yu. E. Demidenko's personal look at AH 4 artifacts in 2019 has allowed him to make the following basic raw material observations. It looked so that namely erratic flint items of Silesian origin from Northernmost Czech Republic and Southern Poland occupies a significant share in the assemblage. Moreover, many shouldered/nosed endscraper-cores, the most typical tool-core type in AH 4, are also on erratic flint. There are also many artifacts on chert of Krumlovský les-type and also radiolarite, the raw materials of non-local for Willendorf micro-area but of regional origin for Lower Austria. Local hornstones and silicic limestones are also represented. Here it is also worth noting the 'flint remark' from Teyssandier: *'nosed endscrapers… are generally made on small flakes of a high-quality flint'* (*Haesaerts/Teyssandier 2003*, 148). Having all these raw material uncertainties, it is still evident a very significant role of non-local and especially distant raw materials used by AH 4 human groups at the site with just some supportive role of the local lithic sources that will be additionally well seen through some debitage, core and tool data (see below).

Artifact descriptions

As the most detailed artifact data for AH 4 were also published by *P. R. Nigst* (*2012*), our description and analysis will basically follow his way of representing data with, however, a number of our reservations and considerations on proposed by him several very distinct one from the other primary reduction processes. This is why our data will start not from core-like pieces but with debitage as cores were strangely classified and analysed by P. R. Nigst in a limited descriptive way.

Debitage

Despite the known fact that each Willendorf II AH was excavated not only by shovels but also with knives (*Nigst 2012*, 79, fig. 20), however, there was not done any screening of the artifact-bearing sediments during the site's excavations in 1908–1927 and 1955. So, these were regular not bad but with no screening/sieving Palaeolithic excavations in the first half of last c. This is why it is surprising to see 181 bladelets *sensu lato* with a weird width criteria no more than 10 mm (microblades were not separately defined and analysed by *Nigst 2012*, 43) and 205 chips (tiny flaky items no exceeding 10 mm).

At the same time, 1,356 flakes compose more than a half of the entire assemblage (55.3%). Having flake size starting from 10–11 mm for Willendorf II, while it usually starts from 15 mm and all flaky speci-

[2] Yu. E. Demidenko – less than 1 km right below the site.

mens under 15 mm go to chips for most analyses of Eurasian UP assemblages (e.g. *Demidenko 2012b*, 96; *Kaczanowska/Kozłowski/Sobczyk 2010*, 144; *Kozłowski et al. 1982*, 122; *Marks 1976*, 374), there is a problem because a share of flakes would drop into chips with our regular artifact classification approach (with under 15 mm for chips) making respectively a number of chips higher and of flakes lower. Unfortunately, from the published flakes' metric data (*Nigst 2012*, tab. 110; 111) is impossible to re-calculate in a precise way numbers of chips and flakes. But still some re-calculations and considerations is possible to make. First, P. R. Nigst's notion *'… most of the flakes are quite small (10–30 mm)…'* (*Nigst 2012*, 163) is worth taking into consideration here. Second, of the 1,356 recognized flakes only a part, albeit a numerically significant part, was possible to measure, 825 pieces/60.8% (*Nigst 2012*, tab. 110; 111). All the measured flakes were subdivided into nine length intervals in 10 mm each up to 90 mm. The length intervals showed both no presence of any flake longer 90 mm and the strange-looking occurrence of 124 flakes less than 10 mm long. The latter pieces are probably not listed among chips due to their width larger 10 mm, although width and thickness data were not measured at all by P. R. Nigst. Anyway, flakes of three length intervals (0–30 mm) account together 737 items (including 10–20 mm – 484 pieces; 20–30 mm – 129 pieces), 89.3% of all the measured 825 flakes. At the same time, the longest flakes of three length intervals (60–90 mm) only account together 10 items, 1.2%. As a result, no less than 200–250 flakes would be re-classified as chips less 15 mm and it can make the flake number lower. Anyway, any accounts demonstrate really the great dominance of small flakes presence in the assemblage. Usually, it means a low significance of on-site and, at the same time, mostly off-site realized initial lithic primary reduction processes for AH 4 artifacts. Such the position is further supported by the P. R. Nigst's 'decortication and initial core preparation' data. He noted: *'Objects representing the decortication and initial core preparation phase (>66% cortex) are represented by 4.08% (n = 99) of the assemblage. The majority (72.53%; n = 1761) of the lithics belongs to the 0% cortex-class…'* (*Nigst 2012*, 144, tab. 78). Thus, most of on-site lithic reduction processes were done using pieces brought to the site in the already prepared and/or reduced forms. This is why again becomes understandable the presence of both a few flakes longer 6 cm (they could not be lost during the site's 'old fashioned' excavations) and the very most occurrence of small flakes (they were certainly well collected during the last century's 'primitive' excavations) within the AH 4 debitage. Furthermore, AH 4 flakes were likely a result of various reduction object's re-preparation flaking processes and nearly any of large-sized flakes were not on-site detached (but see below one of the refitted blocks; *Nigst 2012*, fig. 74) and then used for carinated piece's production and then reduction. In sum, again the P. R. Nigst's 1,356 flake sample probably represents a nearly real sample of the particular debitage category, still keeping in mind that at least ca. 200–250 of them would be better to keep among chips.

Bladey debitage is numerically much less represented in comparison to the flakes, 56 blades and 181 bladelets (*Nigst 2012*, tab. 77). They make the entire debitage sample in 1,593 specimens as follows through the P. R. Nigst data where, it has to be remembered, tool-debitage blanks from the analysis beginning were included into the list of all artifact categories (*Nigst 2012*, tab. 77): 1,356 flakes (85.1%), 56 blades (3.5%), 181 bladelets (11.4%). While even a few of blades cannot be suspected being lost during the site's 'old fashioned excavations', bladelets were definitely under the main 'threat of loss' at that time, despite the fact that bladelets outnumber blades in proportion 3.2 to 1. Blades are represented by about usual for UP assemblages' shares of complete (15 items/26.8%) and variously fragmented their parts (13 proximal, 17 medial and 11 distal examples; *Nigst 2012*, tab. 80). No one blade is a primary cortical, while only a quarter of all blades bears some cortex (15 examples/26.8%; *Nigst 2012*, tab. 81). As most flakes (66%), blades are even characterized by more pieces with unidirectional scar pattern (43 items/89.6% among all recognized dorsal scar pattern types; *Nigst 2012*, tab. 86). Although triangular profiles at midpoint significantly dominate among the recognized by this attribute blades (30 examples/57.7%), trapezoidal profiles also deserve a special attention indicating their serial and systematic detachment (19 examples/33.9%). Remembering more than probable loss of at least several hundred and even a thousand of tiny bladelets (namely, microblades narrower 7 mm wide) during the site's excavations, a share of blades objectively should be even much lower in comparison to bladelets. It is, of course, poses a question on an independent blade reduction within AH 4 core reduction actions. *P. R. Nigst* (*2012*, 144, 145) stated *'there are no blade cores represented'* and they are indeed not seen among the cores. However, from our point of view, there are still some cores where some blade reduction was realized in a combination with some other debitage piece types, e.g. flake/blade and blade/bladelet cores (see below). Such the subordinate blade core reduction for the considering Carpathian Basin Middle Aurignacian is a common technological feature as it will be repeatedly shown for the region's other Middle Aurignacian assemblages.

Bladelets are different from the blades not only by a greater quantity. *P. R. Nigst* (*2012*, 149–162) has defined two kinds of such tiny debitage pieces: 171 bladelets themselves and 10 burin bladelets. The latter pieces from suggested burin-cores are mainly morphologically understandable for us through their non-twisted general profiles with some of them having left off-axis orientation. Much more numerous 'regular' bladelets are supposed to be removed from both 'prismatic cores' and 'carinated/nosed endscraper-cores'. Such the reduction origins' bladelets have in 46.2% twisted general profiles and in 65.5% off-axis orientation with prevalence of right over left off-axis data (*Nigst 2012*, fig. 92; 93, tab. 98). Here it should be noted that we use the traditional orientation system of naming right/left debitage pieces' lateral edges looking from the butt area/proximal end (e.g. *Debénath/Dibble 1994*, fig. 2.3) in opposite to the *P. R. Nigst's* (*2012*, fig. 8) approach with orientation of cores and debitage pieces from their distal ends. This is why we had to convert his right/left orientation for some pieces into the traditional system.

Going through all the *P. R.* (*Nigst's 2012*) debitage data and proposed by him strict connection for each debitage type and sub-type with a definite and concrete reduction object, various cores and/or tool-cores, it looks indeed too rigorous, not reflecting technological flexibilities, problems and even mistakes during primary reduction processes. Here it is also worth noting that he really understands each core-like piece as serving for production of a single debitage type's pieces while it is often (!) not that way but with several debitage types' removed for each particular core in real UP assemblages (e.g. *Demidenko 2012b,* 93). All the related our concerns on the matter are listed below during core and core-tool piece reconsiderations. Moreover, all possible core-like pieces will be also discussed with technologically connected core maintenance products (CMP) demonstrating a variety of core preparation and especially re-preparation processes.

Core-like pieces and CMP

Blade-related pieces

Remembering the stated by P. R. Nigst absence of blade cores in AH 4 assemblage, this subject deserves a priority consideration. Although a list of cores and their types is absent in the *P. R. Nigst* (*2012*) book, it is possible to extract some core-related data from his each debitage type production dataset. Moreover, CMP are also of some help here. Coming to the so-called separate 'blade production', it is seen not only 56 blades there but also associated with them five crested blades and 10 core tablets (*Nigst 2012*, 144). Having the CMP together with blades themselves is impossible not to have cores with blade reduction. In reality, they are present among the few of all numbered by P. R. Nigst 38 cores in a view of illustrated not just strictly speaking blade cores but of a flake/blade double-platform orthogonal sub-cylindrical core with refitted flakes, a blade and a core tablet interpreted by P. R. Nigst as a flake core (Fig. 3: 1; *Nigst 2012*, fig. 74), and two blade/bladelet single-platform unidirectional sub-cylindrical cores understood by P. R. Nigst as *'prismatic unidirectional bladelet cores'* (Fig. 3: 2; 4: 1; *Nigst 2012*, fig. 96; 97). High likely, the above-noted three cores with some blade removal negatives are not the only such cores among the AH 4 core assemblage taking into consideration that of the listed 28 'flake cores' no one was illustrated by P. R. Nigst and, at the same time, last of all three defined *'prismatic bladelet cores'* was not illustrated either. These data allow us to suggest that some more flake/blade and one more blade/bladelet cores can be in reality present. Such the reduction situation with seeming only occurring cores bearing a combination of blade and flake or bladelet removal negatives probably indeed indicates a technological subordinate role of blades and their detachment from cores. It looks like blades were mainly serving for some convexity preparation and re-preparation on cores' flaking surfaces for then striking off flakes or bladelets, being, however, not strictly speaking lateral/*débordant* blades. Five crested blades (*Nigst 2012*, fig. 72) were supplementary items for some core initial preparation actions. Looking also at tool-blank data (*Nigst 2012*, tab. 116), it is only seen eight tools and tool-cores on blade-blanks (4.8%). Accordingly, blades, the least numerically represented debitage type, were not purposeful core reduction target products for then some systematic tool making processes at the site for AH 4 humans but were only a sort of accompanying technological products. Therefore, it was no on-site and/or off-site 'blade production' at AH 4.

Flake-related pieces

Of all the declared 38 cores, not including among them carinated *sensu lato* tool-cores, 28 (73.7%) were recognized as flake core, although no one of them was illustrated. Their category classification was done on a very basic level and for 27 cores:

1. initial 'cores with only one or two scars (type A; raw material testing?)' – 4 items;
2. so-called platform 'type D cores' – 21 items; 'core type F (multidirectional cores)' – 2 items (*Nigst 2012*, 162).

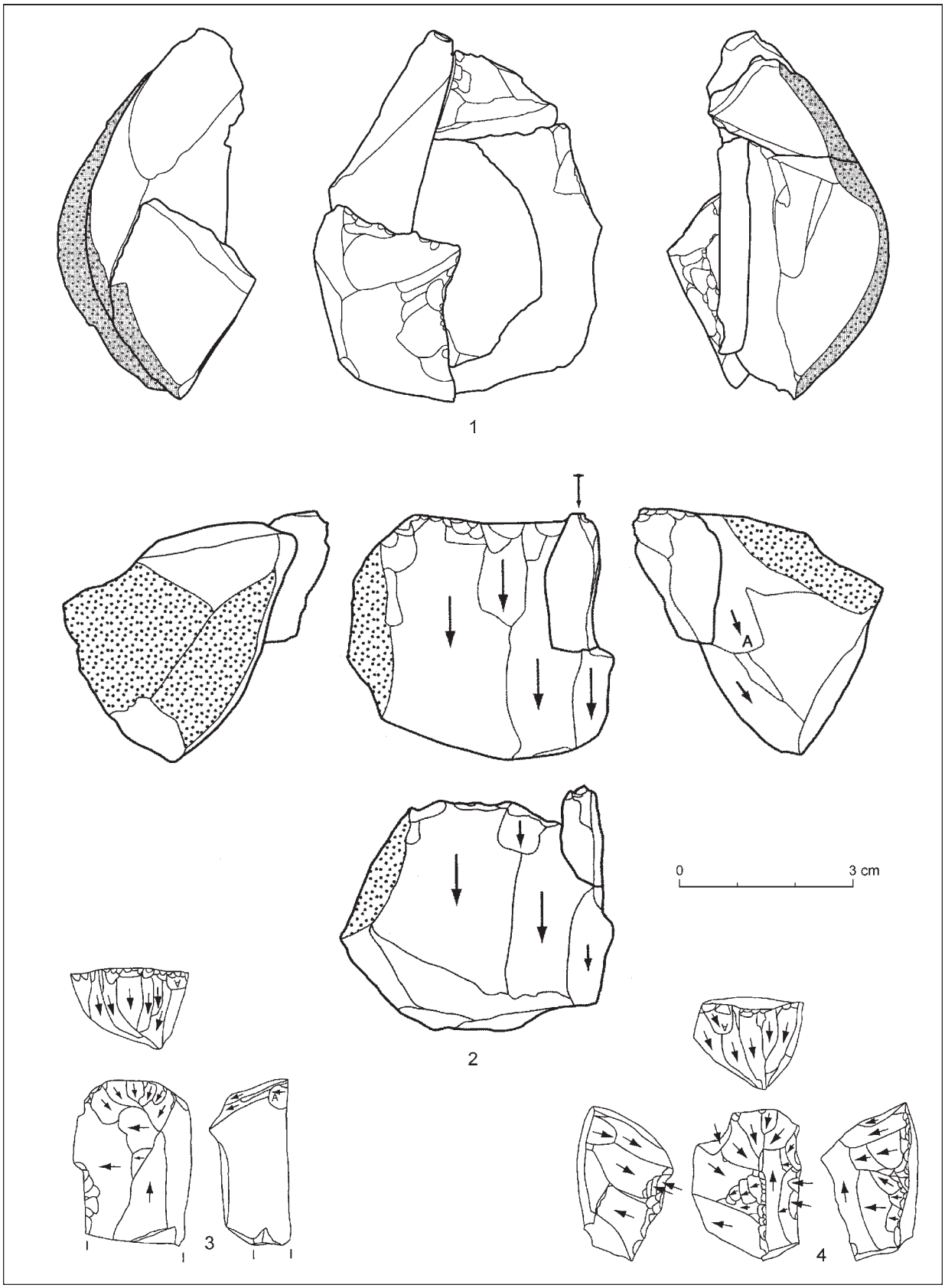

Fig. 3. Willendorf II, AH 4 (Austria). 1 – flake/blade core with refitted flakes, a blade, a shouldered/nosed endscraper-core and a core tablet; 2 – blade/bladelet core; 3 – carinated endscraper-core; 4 – shouldered/nosed endscraper-core (artifact illustrations modified after *Nigst 2012* with the present article authors' classification).

Having such more than scarce core data and no their illustrations, there is no any certainty in their understanding. Adding to the cores again not described 21 crested flakes, it is only possible to say that circa one mean and not initial but really flaked core correlates with circa one crested flake that possibly might indicate some intensive reduction with re-preparation of striking platforms and/or flaking surfaces. Flake data (*Nigst 2012*, 162–166) did not answer many technological questions and, first of all, to what reduction processes and/or stages certain flakes correspond. Having 484 (66%) flakes with unidirectional scar pattern among all 733 identifiable through this attribute flakes does not make much sense remembering that unidirectional flakes always dominate in any UP assemblage. Moreover, the provided core set analysis does not answer to what purpose namely flake cores, which greatly dominate, served. It is especially important remembering AH 4 industrial relation to namely Middle Aurignacian with a characteristic prevalence of both flake cores and flakes, such the single technologically exceptional industry type among all the known Aurignacian industry types, that is understandable through the serial presence of carinated and especially shouldered/nosed endscraper-cores being basically prepared on thick flakes. The problem situation is not saved by some metrical data comparisons between flakes within the debitage and flakes as blanks for carinated and shouldered/nosed endscraper-cores with many tiny chip-sized flakes among debitage.

'The carinated/nosed endscraper-cores are produced predominantly on thick flakes. The second largest group of original forms/blanks of the carinated/nosed endscraper-cores could not be identified without doubt due to heavy reduction, but it is thought that most of them also were flakes. … When comparing the blanks with preserved proximal end it is evident that the platform width and thickness of the flakes used as blanks for carinated/nosed endscraper-cores are significantly larger than the ones of the flake debitage (fig. 89 and tab. 101). Also, the length, width, and thickness measurements are significantly larger with the flakes used as blanks for carinated/nosed endscraper-cores. These findings suggest a selection of large and thick flakes as blanks for the carinated/nosed endscraper-core production. Although, the data does not allow to distinguish if there was a separate reduction sequence for the production of these flakes or the thick flakes were selected from the existing pool of flakes from core preparation and/or flake debitage…' (*Nigst 2012*, 158–160).

From the above-noted metrical comparisons it is, however, not clear at all the following important subjects. 1) All 90 initially large-sized tool-core blanks were probably detached on-site from the assemblage's 24 'regular' flake cores. Then all the produced large debitage items were used as the tool-core blanks. And the further realized endscraper-core reduction has led to flaking of many small-sized flakes now dominating among the flake debitage sample. 2) Or very most of the tool-core debitage blanks were brought to the site already somewhere off-site detached and it leads to a situation when the assemblage's flake cores and flake debitage samples do not correlate by numbers and size data with the tool-core blanks? Taking into consideration almost in four times numerical prevalence of the larger-sized tool-blanks over smaller-sized flake cores at AH 4, the latter suggestion appears to be more likely. Here it is also worth remembering that carinated and shouldered/nosed endscraper-cores in various true Aurignacian industries and their assemblages, including the discussing Middle Aurignacian type, were most likely so-called 'curated pieces' with possibilities to carry them from one to other loci multiply and perhaps even differently and repeatedly using them from time to time. Therefore, some more studies of the AH 4 tool-core blanks, flake cores and flakes themselves and their correlation between each other are still needed.

Bladelet-related pieces

As was already mentioned above, P. R. Nigst proposed three reduction types of core-like pieces for bladelet production: burin-cores, carinated and shouldered/nosed endscraper-cores, and prismatic cores (*Nigst 2012*, 148–162). Burin-cores, however, are of a problematic subject at AH 4. Although there is a single combined tool, a simple endscraper + burin of unspecified type (Fig. 4: 2; 9: 1) which burin's part is proposed to be considered as a burin-core with refitted to it a single detached primary burin spall (*Nigst 2012*, fig. 81; 82), it is not a multi-faceted burin-core and usually only such burins are interpreted as burin-cores for some bladelet/microblade reduction. Thus, traditionally recognized burin-cores are absent in AH 4. The proposed to be connected with them 10 burin bladelets do not look convincing as such pieces either, especially looking at four of them illustrated (*Nigst et al. 2014*, fig. 75; 83). Instead, we would rather suggest the technological connection of these 10 bladelets with three blade/bladelet cores, the P. R. Nigst's 'bladelet prismatic cores', for which he did not find any technologically related bladelets in AH 4. Accordingly, the only burin-cores left are firstly defined by P. R. Nigst for actually more morphologically looking at least five shouldered/nosed endscraper-cores with a lateral burin spall's

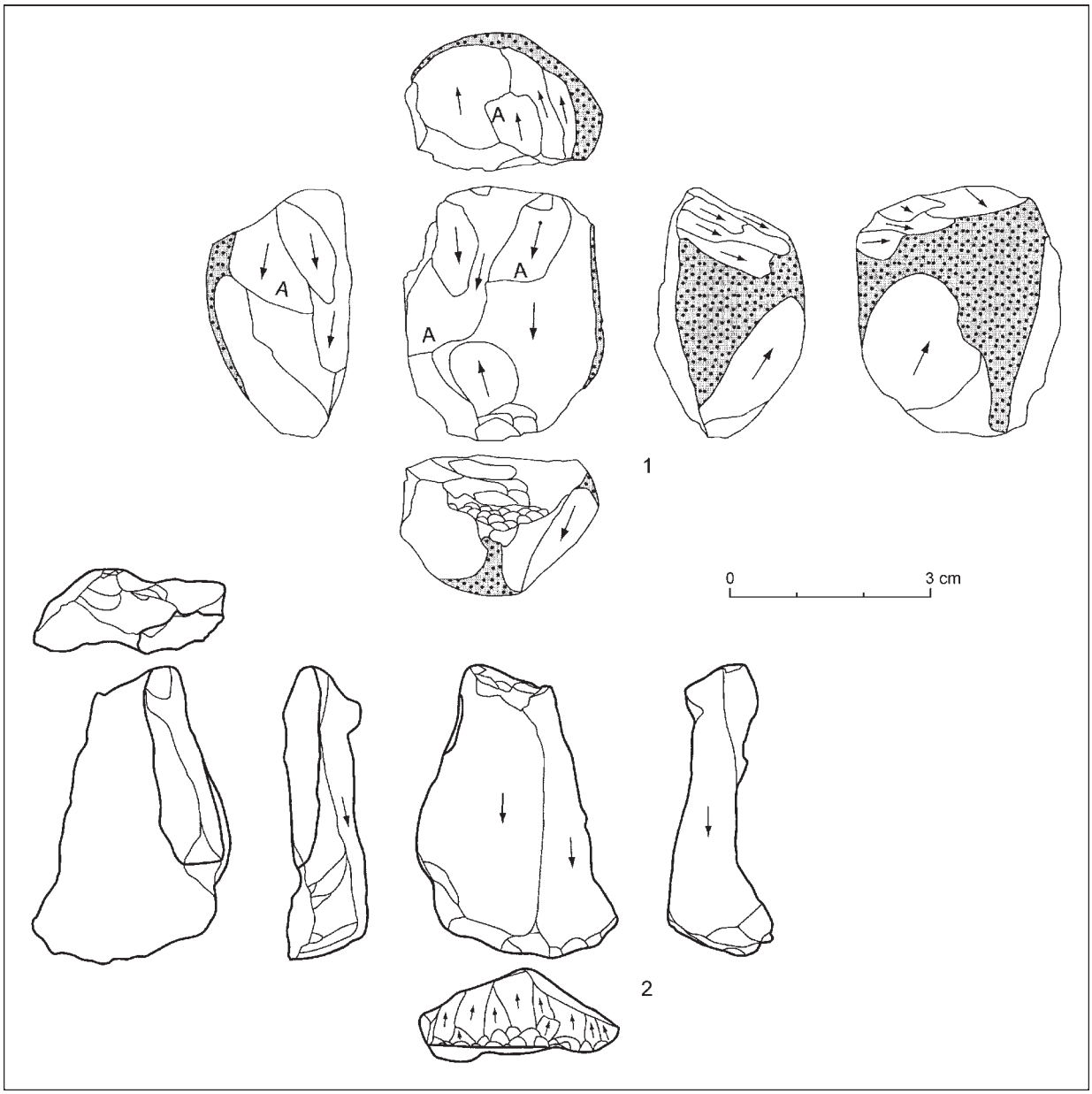

Fig. 4. Willendorf II, AH 4 (Austria). 1 – blade/bladelet core; 2 – simple endscraper + angle burin with a burin spall refitted (artifact illustrations modified after *Nigst 2012* with the present article authors' classification).

removal negative coming from the shoulder/nose termination (Fig. 5; *Nigst 2012*, fig. 76–80). The pieces were before classified as burins on truncations (Fig. 6: 14–16; *Hahn 1977*, pl. 98: 6, 8). From our point of view, the P. R. Nigst's association of burin-like bladelet removals from shouldered/nosed endscraper-cores is very correct. There is, however, a reservation from our side on such, let us say, burin-endscraper-cores. It looks more likely that the pieces were first prepared as shouldered/nosed endscraper-cores, functionally used as tools and/or cores or not used at all in a case of an unsuccessful preparation (e.g. Fig. 6: 16), and only then the pieces' shouldered/nosed termination was used in an *ad hoc* manner as a prepared striking platform for a burin spall detachment. The proposed interpretation of the burin-endscraper-cores is further strengthened by the fact that aside from a single such piece with refitted secondary burin spall demonstrating no less than two detached burin spalls (*Nigst 2012*, fig. 80), all other such pieces are characterized by removal of just one burin spall. Moreover, the detached burin spalls (e.g. *Nigst 2012*, fig. 79; 80) do not show any morphological standardization and were likely even often of an unsuccessful overpassed character. In addition, it

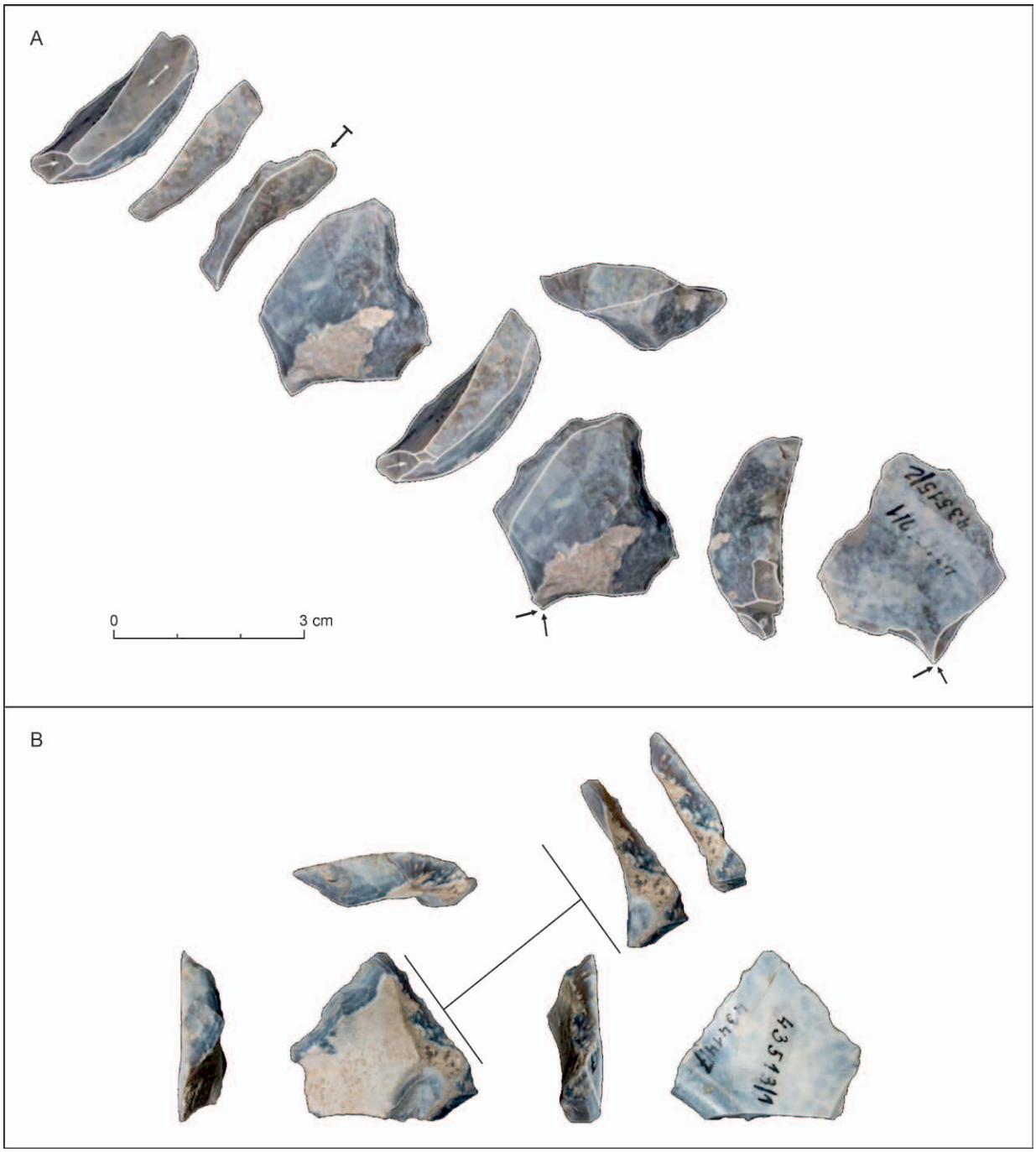

Fig. 5. Willendorf II, AH 4 (Austria). Shouldered/nosed endscraper-cores with refitted burin spall (modified after *Nigst 2012*, fig. 79; 80).

is also obvious that microblades from shouldered/nosed endscraper-cores themselves were much tinnier than coming then burin spalls. Therefore, the resulted burin spalls or burin bladelets are again of a random character, probably, appearing to be burin-related endscraper-cores by a chance.

In sum, having no real both bladelet cores on chunks/nodules and burin-cores but instead seeing the presence of a few blade/bladelet cores and burin-endscraper-cores with no systematic and standardized at all just the *ad hoc* bladelet reductions, the only true bladelet (actually for very mostly microblades with width less than 7 mm) reduction was realized by AH 4 humans by using carinated and shouldered/nosed endscraper-cores (Fig. 6: 1–13). Here, however, plays some 'bad role' the site's 'old fashioned excavations' with no dry screening and/or wet sieving of artifact bearing

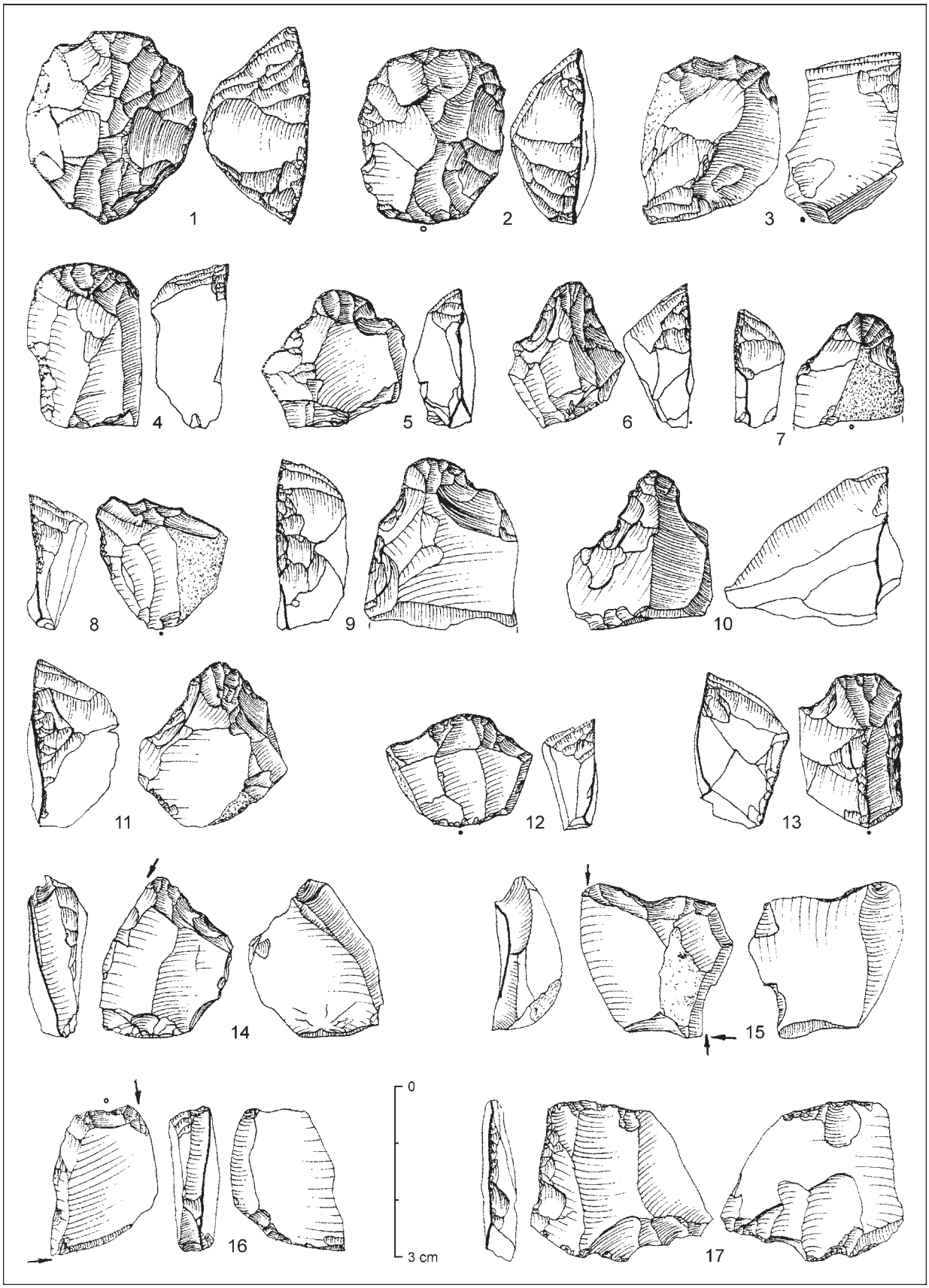

Fig. 6. Willendorf II, AH 4 (Austria). 1–4 – carinated endscraper-cores; 5–13 –shouldered/nosed endscraper-cores; 14–16 – burins; 17 – splintered piece (artifact illustrations modified after *Hahn 1977* with the present article authors' classification).

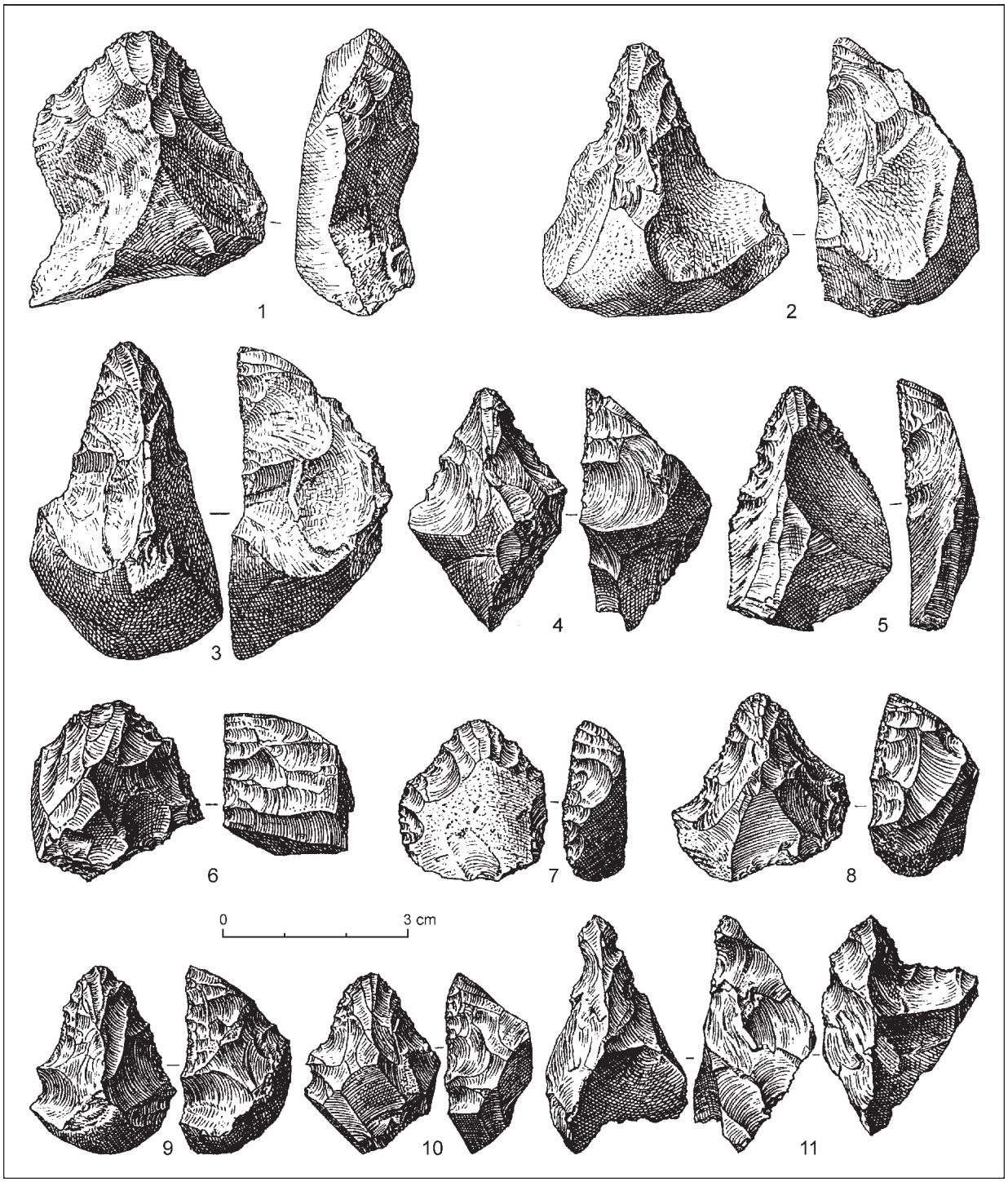

Fig. 7. Willendorf II, AH 4 (Austria). 1, 6 – carinated endscraper-cores; 2–5, 7–10 – shouldered/nosed endscraper-cores; 11 – double alternate shouldered/nosed endscraper-core (artifact illustrations modified after *Felgenhauer 1956–1959* with the article authors' classification).

sediments why at least 90% of resulted microblades from the endscraper-cores were certainly lost. This is because microblades are really tiny that is well demonstrated by various metrical data with mean indices as follows: 13.8 mm long, 5.6 mm wide, 1.7 mm thick (*Nigst 2012*, tab. 92). Such the microblade metrics also indicates that the recognized 21 carinated endscraper-cores are still with rather narrow fronts/flaking surfaces and mainly having convergent order of microblade removal negatives (Fig. 3: 3, 4; *Nigst 2012*, fig. 85: 1). By these morphologies, the carinated pieces are similar to much more

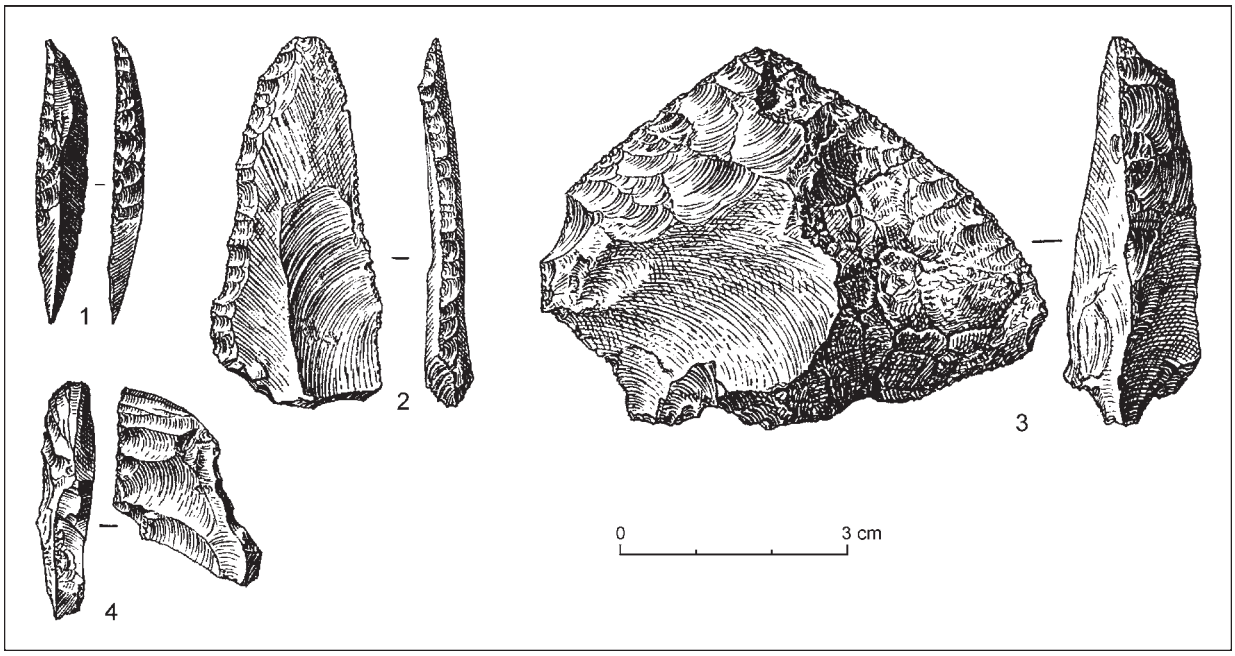

Fig. 8. Willendorf II, AH 4 (Austria). 1 – unfinished partial backed bladelet; 2 – retouched blade; 3 – side-scraper; 4 – carinated burin-core (artifact illustrations modified after *Felgenhauer 1956–1959* with the article authors' classification).

numerous 59 shouldered/nosed endscraper-cores (but adding to them the above-analysed five burin-endscraper-cores a number of the shouldered/nosed items increases up to 64 examples) which even in some cases have so narrow terminations that someone not knowing well carinated pieces would name them as 'carinated pointed items', or something like that (Fig. 7: 2–5, 7–11; *Nigst 2012*, fig. 86–89). Three times numerical prevalence of the shouldered/nosed pieces over the carinated ones (Fig. 7: 1, 6) with still rather narrow fronts allow us a suggestion that the latter items might represent, at least partially, a sort of initial reduction stage for shouldered/nosed items (Fig. 3: 3, 4). In addition to the carinated and shouldered/nosed endscraper-cores, P. R. Nigst very correctly and firstly for AH 4 also recognized 131 specific lateral/front-lateral core maintenance small-sized flakes (*Nigst 2012*, fig. 94, tab. 90) technologically serving for re-shaping/rejuvenation of carinated/shouldered/nosed endscraper-cores' fronts/flaking surfaces. This numerically well represented for AH 4 type of CMP shows intensive and multiple microblade reduction processes from some endscraper-cores with the respective mean correlation 131 : 85/1.5 : 1. Finally, regarding the carinated piece presence within AH 4 assemblage, it is important to note that no one carinated burin-core or a multi-faceted burin of any type was ever identified there, although one of the pieces illustrated by *F. Felgenhauer* (*1956–1959*, fig. 24: 12) could be a single carinated burin-core in AH 4 (Fig. 8: 4). Anyway, about exclusively presence of endscraper-cores among carinated pieces is notable for AH 4 lithic collection.

Some concluding technological considerations

All the above-represented data and their analysis allow us to sum up the following definite numerical and technological records and considerations.

According to our *P. R. Nigst's* (*2012*) re-analysis data and leaving aside technologically unclear both four 'initial cores' and some other defined cores yet, core-like pieces (116 specimens) are represented by the following all possible reduction objects (Tab. 3):

- carinated sensu lato pieces – 85 examples/73.3%:
  - shouldered/nosed endscraper-cores – 59 examples/50.9%;
  - shouldered/nosed endscraper-cores with an additional lateral burin verge – 5 examples/4.3%;
  - carinated endscraper-cores – 21 examples/18.1%.
- blade/bladelet cores – 3 examples/2.6%.
- flake/blade cores – 1 example/0.8%.
- flake cores – 27 examples/23.3%.

Adding the *P. R. Nigst's* (*2012*) debitage data (1,356 flakes/85.1%, 56 blades/3.5%, 181 bladelets/11.4%; see Tab. 1) and remembering that a part (no less than 200–250) of flakes with size between 10 and 15 mm should better go into chips and

Tab. 3. Willendorf II, AH 4 (Austria). Basic core type data.

	Willendorf II, AH 4	
	re-calculated from *Hahn 1977*	re-calculated from *Nigst 2012*
Blade cores	5/6.1%?	0?
Blade/bladelet cores	0?	3/2.6%
Bladelet 'regular' cores	0?	0?
Bladelet 'carinated' cores	0?	0?
Bladelet carinated endscraper-cores	22/26.8%	21/18.1%
Bladelet shouldered/nosed endscraper-cores	48/58.6%	64/55.2%
Flake/blade cores	0?	1/0.8%
Flake cores	7/8.5%?	27/23.3%
Total	82/100%	116/100%

a share of bladelets should be much higher keeping in mind a loss of up to 1,000 pieces during the site's excavations between 1908 and 1955, it is, first of all, seen a very subordinate role of blades. Their detachment is seen only for three blade/bladelet and a flake/blade cores where they likely only served a supportive preparation/re-preparation role for some core flaking surface uplifting and primary reduction change of orientation. Some more blades could be also possibly flaked from some initial formation and re-shaping of some carinated *sensu lato* endscraper-cores and flake cores. Five crested blades do correspond to on-site such core reduction. Absence of a separate large-sized blade core reduction is also traced through not seen in the real presence of any illustrated such blades (more than 20 mm wide) in AH 4 (Fig. 8: 2; 9: 3, 5; *Nigst 2012*, fig. 71–73) with, unfortunately, not actually useful here P. R. Nigst metrics for blades with minimal blade width in 9.59 mm that is in a width range for bladelets (*Nigst 2012*, tab. 89). The blades' supplementary technological role is additionally supported by their similar part for tool manufacture with just a few tools made on blades (8/4.8% tools and tool-cores on blade-blanks). Flakes with the most numerous sample among the debitage types due to 'not survived' for us bladelets, most likely, played the two-fold tasks. On one hand, flakes were the main technological by-product during shaping and re-shaping of both carinated *sensu lato* endscraper-cores and also a few blade/bladelet cores. This is why very most of the *P. R. Nigst's* (*2012*) flakes (737/89.3%) are under 3 cm long. On the other hand, a few large-sized flakes had been also serving as blanks for on-site production of some, just some, carinated *sensu lato* endscraper-cores (see *Nigst 2012*, fig. 74), while as it also goes from raw material data, most of carinated *sensu lato* endscraper-cores, probably at an initial stage of formation and reduction, were already brought to the site either from workshops at raw material outcrops and/or some base-like camps for an intensive bladelet and very mainly microblade primary flaking from these tool-core pieces. At the same time, taking tool and tool-core data (*Nigst 2012*, tab. 116), flakes were also the basic blank data for also 'regular' tools (see below). Thus, namely carinated *sensu lato* endscraper-cores and, first of all, their shouldered/nosed variety types were very main reduction objects for on-site bladelet/microblade primary flaking processes, whereas strictly speaking bladelet cores on chunks/nodules do not occur and only a few microblades were detached from blade/bladelet cores, too. In sum, all the technological information points out mainly on-site microblade production based on reduction objects (very mostly shouldered/nosed endscraper-cores) being off-site already prepared and then brought to the site.

All the above-discussed *P. R. Nigst* (*2012*) core reduction and debitage data can be also checked by going through the 1970s J. Hahn's data. He studied a part of AH 4 assemblage composed of 924 artifacts (*Hahn 1977*, 105, tab. 1; 2). Cores number 16 specimens and, aside from four fragmented pieces, all other 12 cores were subdivided into two main categories: seven flake and five blade items (Tab. 3; *Hahn 1977*, tab. 7). Absence of any blade cores in the *P. R. Nigst* (*2012*) data might indicate the J. Hahn's five blade cores being likely blade/bladelet and flake/blade cores as our analysis showed above, although it is still an open question due to the fact that J. Hahn did not illustrate any cores in his book. Debitage sample in 329 pieces is composed of 66 blades (20%), 76 bladelets (23.1%) and 187 flakes (56.9%; Tab. 1; *Hahn 1977*, tab. 2). The J. Hahn's debitage types' representation significantly differs from *P. R. Nigst*

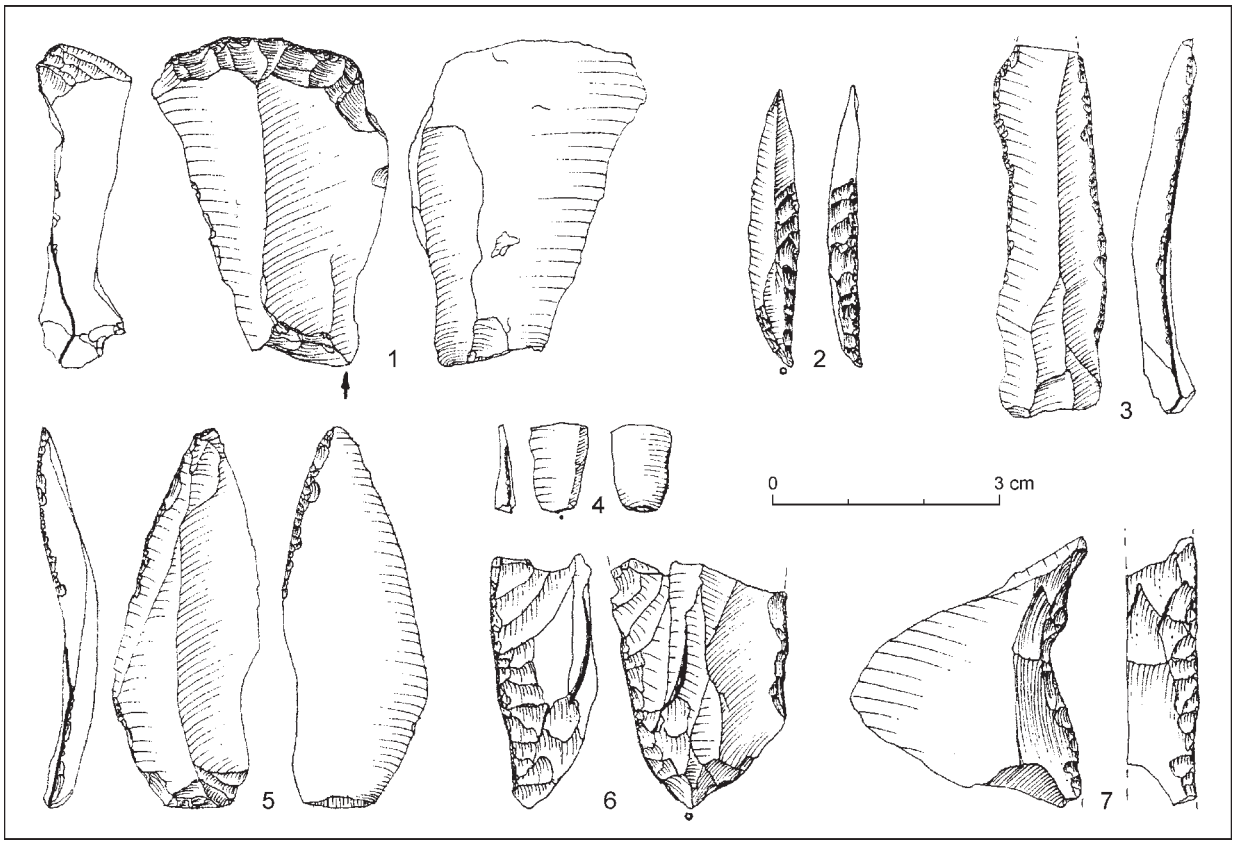

Fig. 9. Willendorf II, AH 4 (Austria). 1 – simple endscraper + angle burin; 2 – unfinished partial backed bladelet; 3, 5 – blades with a partial marginal retouch; 4 – Dufour bladelet with a ventral marginal retouch; 6, 7 – side-scrapers (artifact illustrations modified after *Hahn 1977* with the present article authors' classification).

(*2012*) respective debitage data having in about 1.5 times higher share of flakes (85.1%), in about twice lower bladelet occurrence (11.4%) and in about six times lower presence of blades (3.5%). From our point of view, the debitage differences are reasoned by the following two factors. First, it should not be forgotten a sample in 1,120 lithics after 1908–1909 excavations added by P. R. Nigst to AH 4 since 2007 where small-sized lithic pieces overwhelmingly prevailed. Second, *J. Hahn* (*1977*, 45) used a larger 'metrical border' between flakes and chips in 20 mm than P. R. Nigst did with 10 mm. At the same time, debitage types' numerical order is still the same for the two studies samples with a dominance of flakes, a moderate number of bladelets and a subordinate position of blades. While using *P. R. Nigst* (*2012*) data we recognized 21 carinated and 64 shouldered/nosed endscraper-cores, *J. Hahn* (*1977*, tab. 1) classification resulted in identification of 22 carinated and 48 shouldered/nosed endscraper-cores. The tool-core data demonstrate the 'technological source' of bladelets within debitage.

In sum, remembering different in quantity used artifact samples, both the most detailed of P. R. Nigst and basics of Hahn produce still similar data. Regarding the J. Hahn's dataset with no much of small-sized lithics in it, it appears that his debitage data might well correlate with some systematically collected artifacts for surface loci of Middle Aurignacian in our region (see below).

Tool-kit data and considerations

According to P. R. Nigst tool and tool-core data (excluding the single AH 5 intrusive backed bladelet and five not illustrated and unclear for us type of 'nosed endscraper + burin'), there are 161 related items (*Nigst 2012*, tab. 115; 116). The taken together 85 carinated/shouldered/nosed endscraper tool-cores do constitute more than a half of all the tool-kit's specimens, 52.8%. Taking into consideration that the tool-cores were basically cores and only a part of them also possibly served as actual tools, only strictly speaking 76 (47.2%) tools with retouch and burin facets are of a tool interest and significance. These tools are composed of simple endscrapers, just a single endscraper on a laterally retouched flake, unspecified by types burins,

laterally retouched debitage pieces with no data on retouch applied for their secondary treatment, a single truncation, a few of both not described retouched bladelets and composite tools. Along with this, the dominant presence of carinated/shouldered/nosed endscraper tool-cores were still always easily letting all archaeologist to name from the typological point of view the site's AH 4 assemblage Aurignacian. Here it is needed to note that the *P. R. Nigst's* (*2012*) tool data are basically characterized by statistics and accompanying descriptive data are too short for a detailed understanding of tools' morphology (*Nigst 2012*, 166). However, the providing AH 4 tool list (see also Tab. 2) will include both tools and tool-cores for a traditional strict typological view. Aside from the *P. R. Nigst* (*2012*) respective data, *J. Hahn's* (*1977*) will be also listed due to the fact that his artifact classification data are used by us as one of the traditional typological standards known for Aurignacian artifact assemblages in Central Europe (*Demidenko et al. 2021*) and very basic with no types some tool class classification (e.g. burins) in the P. R. Nigst's data.

P. R. Nigst's (*2012*, 166, tab. 115; 116) data can be re-structured as follows (Tab. 2). Simple flat endscrapers count eight items. Additionally, two more simple endscrapers' fronts can be added here from two combined tools, an 'endscraper + truncation' and an 'endscraper + burin'. Double endscrapers do not occur in the tool-kit. So, the entire simple endscraper sample is in 10 specimens (10.4%). At the same time, type of simple flat endscrapers with lateral and/or bilateral retouch is only represented by the above-noted single specimen on a laterally retouched flake (1%).

Carinated and shouldered/nosed endscraper-cores, as was already shown, are much higher in numbers: 21 (21.9%) and 64 (66.7%) examples, respectively. Again, no one double carinated/shouldered/nosed endscraper-core was recognized by P. R. Nigst. Altogether, the carinated *sensu lato* endscraper-cores number 88.6% of all endscrapers and endscraper-cores.

Burins number 23 items and only a single dihedral burin is distinguished by type among all the other burins. With also three burin terminations at some combined tools (an 'endscraper + burin', a 'carinated endscraper + burin', two 'burin + truncation'), the burin sample reaches up 27 examples. Like the endscrapers and endscraper-cores, burins are not present in a view of any double pieces in the P. R. Nigst data.

Aurignacian blades with either just stepped lateral/bilateral retouch or a strangled retouch do not occur at all.

Retouched bladelets, as was also already mentioned, were not classified with details because it is not even understandable the exact number of the microliths in AH 4 (see *Nigst 2012*, 166).

In sum, P. R. Nigst tool and tool-core lithic types show a characteristic Middle Aurignacian type structure with much dominance of carinated *sensu lato* endscraper-cores where shouldered/nosed pieces in about three times outnumber wide-fronted specimens and where some of the latter examples still can be initial forms of then further reduced shouldered/nosed items. The absence of carinated burin-cores, as well as of any type of Aurignacian blades is also typical for the considering Aurignacian industry type. The paucity of retouched microliths is the permanent problem here due to a tiny size of most of bladelets, mainly microblades smaller 7 mm in width, detached from the shouldered/nosed endscraper-core why almost all of them are usually lost during non-modern excavations.

Finally, it is needed to note that P. R. Nigst did not pay attention to bone/antler artifacts at AH 4 at all and it is especially surprising remembering that Willendorf II, AH 4 is the only artifact assemblage with such serial (!) non-lithic artifacts analysed by him for his PhD thesis published then as a book in 2012 among all other Initial UP and Early UP assemblages in the Middle Danube region of Central Europe.

J. Hahn's (*1977*, 105, tab. 1–3; 7) typological data show the following main indicative tool class and type representations for AH 4 Middle Aurignacian attribution (Tab. 2). Carinated and shouldered/nosed endscraper-cores well dominate among all endscrapers and endscraper-cores (80.5%), although the narrow-fronted pieces (48/55.3%) prevail over the wide-fronted specimens (22/25.3%) only in about two times. Simple endscrapers are still serial (14/16.1%) but they do not, however, outnumber taken separately carinated or shouldered/nosed endscraper-cores. Simple endscrapers with lateral/bilateral retouch account three examples (3.4%). Burins show some prevalence of pieces on truncation/transversal on lateral preparation (12/46.1%) over dihedral ones (10/38.5%) with a subordinate share of angle/transverse on natural surface type (4/15.4%). However, it is worth remembering the P. R. Nigst's very correct re-classification of at least five J. Hahn's burins on truncation in 'nosed endscraper + burin' type. In this case, the new resulted J. Hahn's burins typological structure would be with a prevalence of dihedral type (see Tab. 2). There is a single microlith of Dufour type, a bladelet's proximal part with a continuous ventral marginal abrasion retouch (Fig. 9: 4). Taking into consideration width

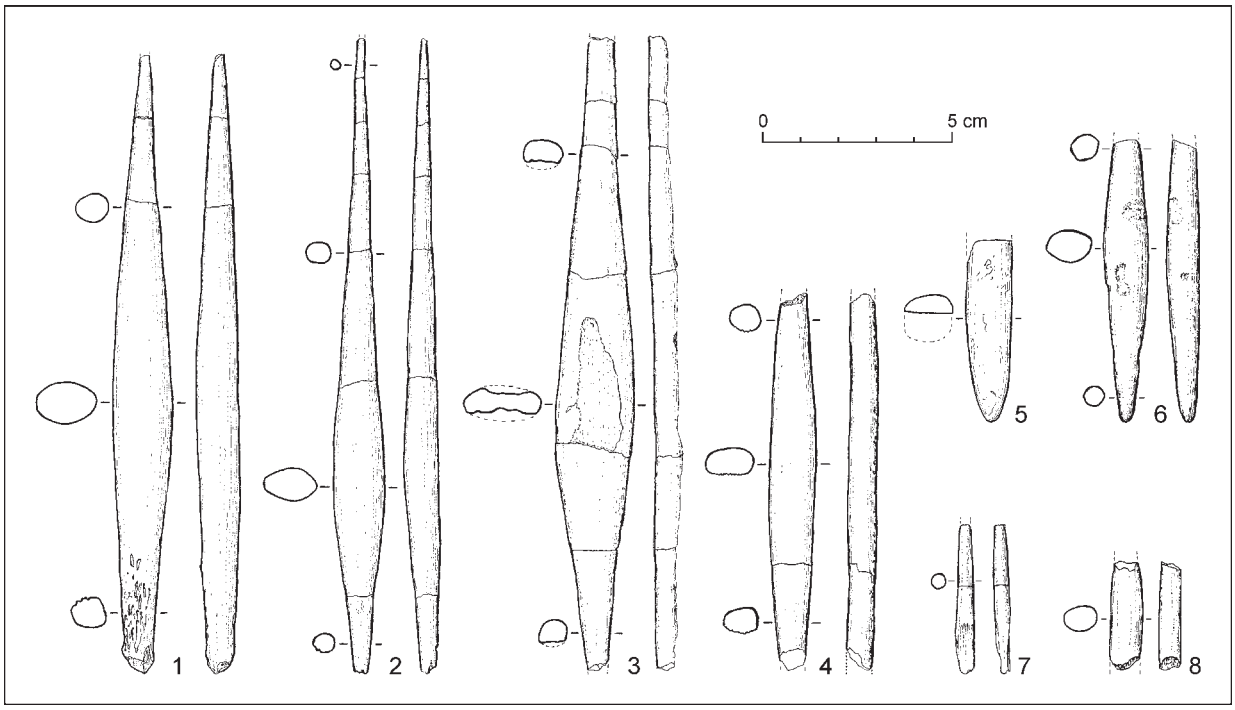

Fig. 10. Willendorf II, AH 4 (Austria). Projectile bone/antler points and their various fragments with a thick oval cross-section and extended distal part (artifact illustrations modified after *Hahn 1977*, '*Geschoßspitzen aus Geweih mit dickovalem Querschnitt und ausgezogenem Distalteil*).

of the microlith in 9 mm, it is likely the bladelet-blank was detached from a wide-fronted carinated endscraper-core and not from a shouldered/nosed piece producing tinier microblades. J. Hahn also listed and illustrated bone/antler artifacts (Fig. 10).

Having the above-analysed two AH 4 artifact classification data sets, it is possible to make additionally of some our own tool and tool-core data reconsiderations below (see Tab. 2). Endscraper and endscraper-core data were already re-structured by us for *P. R. Nigst* (*2012*) data, although a single addition should be done using *F. Felgenhauer's* (*1956–1959*) illustrations. One of the shouldered/nosed endscraper-cores (Fig. 6: 11) is definitely a double alternate one. It demonstrates at least for one piece more than one formed 'shoulder/nose' on two terminations on both dorsal and ventral sides of a flake-blank (?) for twice done technologically specific microblade reductions and also possibly a tool use as well. It is also important noting absence of endscrapers made on any blades with Aurignacian lateral/bilateral stepped retouch. Burins are re-structured a bit more radically (Tab. 2). Following their classification presented by *J. Hahn* (*1977*) and *F. Felgenhauer's* (*1956–1959*) illustrations, it appears the following type occurrence for burins. On one hand, J. Hahn's five burins on truncation are understood as shouldered/nosed endscraper-cores with a lateral burin spall removed, why now dihedral burins (10/45.5%) predominate over burins on truncation/transversal on lateral preparation (7/31.8%) with still low amount of angle/transverse on natural surface type (4/18.2%) and the single proposed to be defined among shouldered/nosed endscraper-cores a carinated burin-core (1/4.5%; Fig. 8: 4). The presence of a single carinated burin-core does not change much for the typological structure of all AH 4 carinated tool-cores with a great dominance of namely shouldered/nosed endscraper-cores. It probably only shows some extreme reduction of some nosed endscraper-cores into very narrow carinated burin-core looking pieces. Also, the single illustrated yet retouched bladelet by J. Hahn (Fig. 9: 4) possibly indicates that all four recognized by P. R. Nigst retouched bladelets could be with an Aurignacian marginal, not backed retouch. The absence in any AH 4 artifact classification of both endscrapers on any types of Aurignacian blades and Aurignacian blades themselves is one better 'typological absence index' for Middle Aurignacian industrial attribution. Finally, two more tool classes in AH 4 being just mentioned before deserve some special attention now. On one hand, only J. Hahn before noted the presence of two splintered pieces (*ausgesplitterte Stücke*; Fig. 6: 17; *Hahn 1977*, 105, tab. 1, pl. 98: 12) in AH 4, while such pieces were not mentioned by both F. Felgenhauer and P. R. Nigst. Looking

at one of the illustrated pieces and remembering that often splintered pieces were serving as bipolar anvil cores, such the use of two splintered pieces cannot be excluded, especially remembering some certain peculiarities of raw material use at the site. On the other hand, both *F. Felgenhauer's* (*1956–1959*, fig. 25: 8, 9) and *J. Hahn's* (*1977*, 105, tab. 1, pl. 98: 14, 15) data show the definite presence of some (four pieces in the J. Hahn's accounts) real side-scrapers in AH 4, not just retouched flakes (Fig. 8: 3; 9: 6, 7). The particular tools are understood by us (e.g. *Demidenko/Škrdla/Nejman 2017*, 30) through the basic dominance of flakes among non-bladelet related debitage with their subsequent use for carinated *sensu lato* tool-cores and laterally retouched pieces where some of the heavily retouched examples among the latter pieces are of Middle Palaeolithic-like side-scraper character. Therefore, such the MP-like side-scrapers within Middle Aurignacian archaeological context should not be regarded as a true MP admixture or 'generic influence' among the Aurignacian artifacts but an inherent part of Middle Aurignacian assemblages.

All in all, now it is the well-established the namely Middle Aurignacian industrial attribution for Willendorf II, AH 4 lithic assemblage with all still existing some misunderstanding and uncertainties of artifact classification.

Bone/antler and some other non-lithic artifacts

The above-described artifacts should be added by some remarks on non-lithic pieces first really described and published by *F. Felgenhauer* (*1956–1959*, 57, fig. 26: 1–12). These pieces (Fig. 10) were also studied and illustrated by *J. Hahn* (*1977*, 105, pl. 99; 100). The most numerous and typologically important pieces are projectile bone/antler points with a thick oval cross-section and extended distal part of a lancet-like form: six nearly complete examples (Fig. 10: 1–3) and no less than 20 their various fragments (Fig. 10: 4–8). There are also five rather simple bone awls and four of them are on splintered ungulate bone fragments (*Felgenhauer 1956–1959*, fig. 26: 5–7; *Hahn 1977*, pl. 100: 2–4). It is also worth noting among the rest of bone/antler pieces a rather large (ca. 70 mm long) bone fragment with unsystematic crossing lines (*Felgenhauer 1956–1959*, fig. 26, 11; *Hahn 1977*, pl. 99: 5). These bone/antler artifacts are added by two more specific pieces: a large-sized (ca. 110 mm long, 50 mm wide, 15 mm thick) stone *retoucher* with two working terminations (*Hahn 1977*, pl. 100: 6) and a fossil mollusk shell with a hole (*Felgenhauer 1956–1959*, fig. 26: 12), although the shell was not studied up to now for establishing a nature of the hole in it.

The importance of AH 4 bone/antler points is in their similarity to defined yet by D. Peyrony three distinct Aurignacian bone point types as early as in the 1930s: *'pointe losangique aplatie'* for Aurignacian II stage, *'pointe losangique à section ovale'* for Aurignacian III stage and *'pointe biconique'* with also an ovoid section for Aurignacian IV stage (*Peyrony 1933*, 553, fig. 11; see also *Leroy-Prost 1975*, 117–121, fig. 14). Although five Aurignacian stages were proposed to be distinguished by D. Peyrony on the basis of bone/antler point types that later were not considered to be precisely marking each of the distinct Aurignacian industry type (e.g. *Sonneville-Bordes 1960*), he also noted and illustrated the most characteristic lithic tool types for each stage and the following types are of our interest: Aurignacian II – *'burin busqué, grattoir à museau et épaulement, grattoir épais à museau'*; Aurignacian III – *'burin derive du busqué, grattoir épais à museau'*; Aurignacian IV – *'burin derive du busqué, grattoir épais à museau'* (*Peyrony 1936*, 618). As it is seen, the D. Peyrony's Aurignacian II lithics are characterized by carinated burin-cores and the industry type's points are with a flattened section because both the lithic and bone/antler types do not match the AH 4 respective data, being instead more correlating with Late/Evolved – Aurignacian III–IV now. On the other hand, both D. Peyrony's Aurignacian III and IV are characterized by the same lithic types with the notable uncharacteristic occurrence of carinated burin-cores and typical presence of thick nosed endscraper-cores with the bone/antler points having an ovoid section. All these features well match with Willendorf II, AH 4 respective data. As a result, AH 4 lithic data pointing out namely the modern Middle Aurignacian industrial affinity are now well added by bone/antler projectile point characteristics.

Willendorf II, AH 4 site human occupation specificity

Taking together all lithic and non-lithic artifacts, it is possible to make some suggestions for so-called 'living characteristics' of AH 4 human occupation(s). First of all, it appears to be very important that not much of local raw materials from Danube River gravels situated right below the site were used by site's human visitors for their various on-site lithic treatment processes. Indeed, most of the identified raw materials belong to either very distant or regional rocks. This is why very most of all on-site primary core and tool-core flaking processes were

concentrated on bladelet/microblade reduction using almost exclusively carinated *sensu lato* endscraper-cores with a great dominance among them of shouldered/nosed specimens. As a technologically 'support source', on-site flake core reduction was also intensively realized with a likely aim to get some additional thick flakes from both local raw materials and brought to the site initially prepared/flaked cores on regional and distant raw materials for some more carinated endscraper-core reduction and making some real tools (e.g. endscrapers, burins). A separate blade reduction was not done at all. A few blade/bladelet and flake/blade cores rather demonstrate only a technological supportive role during some bladelet and flake core reductions. At the same time, strictly speaking 'regular' bladelet cores on nodules/chunks seem to be missing either. Consequently, it is needed to underline again that primary core reduction processes were mostly based upon flaking of carinated *sensu lato* endscraper-cores and flake cores in the above-described raw material situation because the carinated pieces and flake cores were 'curated pieces' with their easy transports between both various raw material outcrops and living site types. Therefore, the on-site primary flaking processes data do not indicate a base camp 'living characteristics' for AH 4 human occupation(s). Coming to tool-kit data with no tool-cores and remembering that the latter pieces well outnumber the former specimens, it is seen about a double prevalence of burins over endscrapers (21 versus 11). Such importance of burins among tools could be functionally connected to some definite on-site bone/antler piece production and, first of all, of projectile points seen through the occurrence of many their fragments. Awls are also worth mentioning here. At the same time, keeping in mind an intensive reduction character of many carinated *sensu lato* endscraper-cores, not only bladelets and microblades are underrepresented within AH 4 lithic assemblage but their retouched examples also occur in a few examples. This is well understandable due to tiny size of the discussing pieces and most of them definite loss during the long ago done 'old fashioned' excavations with no realized any dry screening or wet-sieving of artifact bearing sediments at the site. Anyway, bladelets/microblades and their retouched examples had to be very well present at the site. They were really composing all basics of the AH 4 artifact assemblage. Considering also from the functional point of view retouched bladelets/microblades as components of hunting projectile weaponry and the weaponry was also added by a good series of bone/antler points, the following site type pattern for Willendorf II, AH 4 can be proposed below.

Humans visited the site's area because of its location within narrow and hidden Wachau Valley of Danube River being characterized by steep and cliffy slopes of the valley's eastern/right bank. On the other hand, the site was set up at the valley's western/left bank with its rather flat slope, on top of the river's lower terrace (see *Nigst 2012*, fig. 13). The surrounding micro-area was probably attractive not only for humans but also for many ungulates with an easy access to the river. Accordingly, it had to be a good hunting locus for UP humans. The known bone remains of reindeer (*Rangifer sp.*) and Alpine ibex (*Capra ibex prisca*) for AH 4 (*Thenius 1956–1959,* tab. 10; 11) evidence some AH 4 humans hunting activities near the site. Knowing ahead the Wachau micro-area for having a site with good hunting possibilities and some available local raw materials at the river's gravels for some lithic production and treatment support, Middle Aurignacian humans were coming to the site with some already made hunting projectile weapons in a view of bone/antler points and some mounted in them lithic microliths, and also bringing initially prepared flake cores and carinated *sensu lato* endscraper-cores, as well as already prepared tools, probably mostly some burins for renewal of both some lithic microliths and bone/antler point on-site production needed to replace some lost during hunts respective pieces. A few flake/blade and blade/bladelet cores and some other tools, first of all, retouched blades, sidescrapers, simple endscrapers and some burins might reflect both some additional on-site flake, blade and bladelet productions for getting not only bladelets/microblades but also some larger debitage pieces for making some other tools needed for dismembering of killed during hunts ungulates for meat consumption, hide and bone/antler processing. The latter core reduction processes were, however, limited. In sum, Willendorf II, AH 4 looks like one of planned ahead basic hunting stopovers on the way of Middle Aurignacian human group moves among some other sites and their settlement types in the region (see below).

NAPAJEDLA III/NAPAJEDLA-ZÁMORAVÍ SITE (CZECH REPUBLIC)

Site location and field research history

Geographically, the site is situated on the cadastral territory of the town of Napajedla near Napajedla Gate (about 700 m wide), a passage connecting upper and lower Morava River valleys in Eastern Moravia. The site was identified in a colluvial

sediment quarry in the field of Zámoravi (*Demidenko/Škrdla/Nejman 2017*, photo 4) on the western slope of Makova elevation, which reaches 338 m at its highest point. The Napajedla III *in situ* site (initially named 'Napajedla III-Brickyard, Zámoravi') was actually discovered in the autumn of 2004 in a course of one of us (P. Škrdla) project in 1996–2004 for systematic field investigations of UP sites in Uherské Hradiště area within the middle course of the Morava River Valley (*Škrdla 2005*, 116–118). Within the quarry, the site was recognized at the bottom of a slope between altitudes 205–220 m (25–40 m above the current Morava River level) where it was probably redeposited in entire sediment blocks within an uneven gleyic lens, which was a maximum of 50 cm thick, by land sliding from upslope, higher parts of the slope and included Tertiary admixtures (*Demidenko/Škrdla/Nejman 2017*, photo 5). It was then excavated between 2004 and 2006 (*Škrdla 2007*; *2017*) when some quarrying activities were renewed in a former brickyard pit. Three separate excavation blocks A, B and C were systematically dug for a total area of ca. 9 m². The blocks were uncovered in a line 35 m long with a sondage placed every 5–7 m. Thus, there was no a solid area excavated for the noted area at that time. Although these were only rescue excavations, trowels and knives were used for digging. Dry screening and wet sieving of artifact bearing sediments was, however, re1alized only in 2006 during the excavation of block B. Approximately 150 l of sediment were wet sieved and about 300 small-sized lithic pieces and 7 g of burnt bones were recovered in a course of screening and sieving processes. No faunal remains were recovered except for a single weathered mammoth tusk that was dated then.

Geochronology

The site's dating is based on several samples of organic materials from excavation block B that were ^{14}C dated at Groningen and Oxford ^{14}C labs (*Škrdla 2007*; *2017*): GrA-32566 (charcoal sample) – 29,820 + 180/– 170 uncal. BP or 33,940 ± 150 cal. BP; GrA-32568 (burnt bone fragments) – 30,620 + 190/– 180 uncal. BP or 34,550 ± 190 cal. BP; GrA-28280 (mammoth tusk, residual charcoal) – 32,330 ± 900 uncal. BP or 36,540 ± 1100 cal. BP; OxA-18304 (burnt bone fragments) – 32,230 ± 190 uncal. BP or 36,110 ± 210 cal. BP; OxA-18305 (*Picea/Larix* charcoal fragment) – 32,540 ± 200 uncal. BP or 36,470 ± 240 cal. BP. The uncalibrated BP dates range between ca. 30,000–29,600 and 32,730–32,700, accordingly, the calibrated BP dates range between ca. 34,100–33,800 and 36,700–36,200. These Napajedla III absolute dates are comparable to the above-noted ^{14}C Willendorf II, AH 4 dates, ca. 32,000–31,200 uncal. BP/36,300–35,400 cal. BP that is in geochronological sense GI-7.

Lithic artifacts

Three short field excavation campaigns yielded in total ca. 970 lithic artifacts. Relatively few artifacts were found in trench A. Trenches B (5 m² with the ^{14}C dated charcoal samples) and C (ca. 2 m², northern part of the brickyard) yielded most of the lithic pieces recovered at this site. The collection of artifacts from block B consists of 70 items longer than 1.5 cm and 595 micro-debitage pieces. Artifacts from block C include 240 specimens longer than 1.5 cm and 60 chips. Techno-typologically, the lithics from excavation blocks B and C, only spatially separated by no more than 5 m, are very similar and were analysed together. Here it should be noted that after initial field campaign at the site in 2004 its lithic assemblage was very preliminary 'attributed to the Willendorf-Kostenki phase of the Gravettian' (*Škrdla 2005*, 118). However, a closer look at the larger in number recovered then lithic assemblage has definitely showed its Aurignacian and particularly Middle Aurignacian industrial affinity (*Demidenko/Škrdla/Nejman 2017*). Namely, the 2017 publication will be summarized below for purposes of the present article. Finally, it is also needed to remark the absence of any organic artifacts and tools that is understandable due to poor bone preservation at the site. As a result, only lithic artifacts are available for an analysis.

Raw materials

Most artifacts are made on imported erratic flint with the nearest outcrops approx. 60 km to the northeast. Other raw materials including radiolarite, silicified sandstone, quartz and unspecified chert/weathering products are present, but only by a few pieces each. The radiolarite and probably silicified sandstone outcrops are located in the White Carpathians about 45 km easterly from the site. Quartz and cherts were collected in the local river terraces. Some burnt lithics were probably also manufactured from erratic flint. The Napajedla III raw material spectrum with mainly distant and regional used rock types and only some supportive role of local rocks is similar to the Willendorf II, AH 4 respective data, although the Napajedla III case is characterized by truly very minor role of local rocks.

Lithic artifact composition

The entire assemblage is composed of 965 items which are subdivided into the following basic categories:
– core-like pieces – 9/0.9%/4.7%;
– core maintenance products (CMP) – 27/2.8%/14.2%;
– debitage – 100/10.4%/52.6%;
– tools and tool-cores – 51/5.3%/26.9%;
– tool shaping and rejuvenation waste – 3/0.3%/1.6%;
– debris (604 chips, five uncharacteristic debitage pieces, five chunks, 161 heavily burnt pieces) – 775/80.3%/–.

Core reduction data

Core-like pieces

Such nine core-like pieces were identified: eight on erratic flint and a single specimen on radiolarite (a bladelet core). The cores' technological variability is high and no pre-cores are present. Also, a single not classified in details core fragment on erratic flint is burnt. The cores' raw material data demonstrate no use of any local rocks for on-site primary flaking processes which were exclusively based upon the use of distant rocks why pre-cores are understandably absent.

Eight cores are classified as follows (Tab. 4):
– blade/bladelet cores – 2;
– bladelet core – 1;
– microblade core – 1;
– flake cores – 4.

The blade/bladelet cores on nodule are single-platform volumetric with plain striking platforms ones bearing a combination of both blade and bladelet removal negatives (Fig. 11: 1). Due to a fragmentation of one of these cores, it is hard to evaluate if detached blades were of a technological supportive role during a purposeful bladelet reduction (but see then blade data within debitage). The cores are rather small, no more 50 mm in size.

A complete bladelet core on a nodule is only 30 mm long (Fig. 11: 2) being a carinated single-platform sub-pyramidal example with a roughly-prepared striking platform.

The defined single microblade core is also a small reduction object on a nodule, 28 mm long, 34 mm wide, 30 mm thick. It is double-platform, bidirectional-alternate item with two flaking surfaces, and two plain striking platforms. Actually, it more morphologically looks a double shouldered/nosed endscraper-core with two flaking attempts to realize a shouldered/nosed endscraper-core short microblade reduction. It is, however, still classified as a core *sensu stricto* due to its nodule blank.

Four flake cores are morphologically very variable due damage of three of them. Two cores are fragmented. One is single-platform, plain striking platform on a nodule (34 mm long, 33 mm wide, 17 mm thick). The second is a core fragment on a nodule (30 mm long, 43 mm wide, 15 mm) with missing the whole upper part with the platform. The last damaged flake core is unidentifiable because it is heavily burnt and again fragmented (32 mm long and wide, 40 mm thick). Accordingly, only a single flake core demonstrates a 'stable morphology' – a small flake sub-radial core (25 mm long and wide, 13 mm thick) possibly on a flake-blank with roughly-prepared striking platform. In sum, it can be only said that the flake cores are, high likely, of exhausted character after much on-site reduction that is seen through their small size and fragmentation.

At the same time, a number of all taken together carinated tool-cores (16 examples) with a significant prevalence of shouldered/nosed endscraper-cores over carinated endscraper-cores and only a single occurrence of carinated burin-core where some of the shouldered/nosed/carinated endscraper-cores are double (four specimens) and even triple (one specimen) examples (see below) demonstrates an overall dominance of namely carinated piece reduction over a 'regular' core reduction at the site (the double dominance with 16 versus 8 reduction objects, respectively; Tab. 4).

Core maintenance products (CMP)

These 27 items are composed of one technologically undiagnostic core trimming flake, three crested

Tab. 4. Napajedla III (Czech Republic). Basic core type data.

	Napajedla III
	after *Demidenko et al. 2017*
Blade cores	0
Blade/bladelet cores	2/8.3%
Bladelet 'regular' cores	0
Bladelet 'carinated' cores	2/8.3%
Bladelet carinated endscraper-cores	1/4.2%
Bladelet shouldered/nosed endscraper-cores	14/58.3%
Bladelet carinated burin-cores	1/4.2%
Flake/blade cores	0
Flake cores	4/16.7%
Total	24/100%

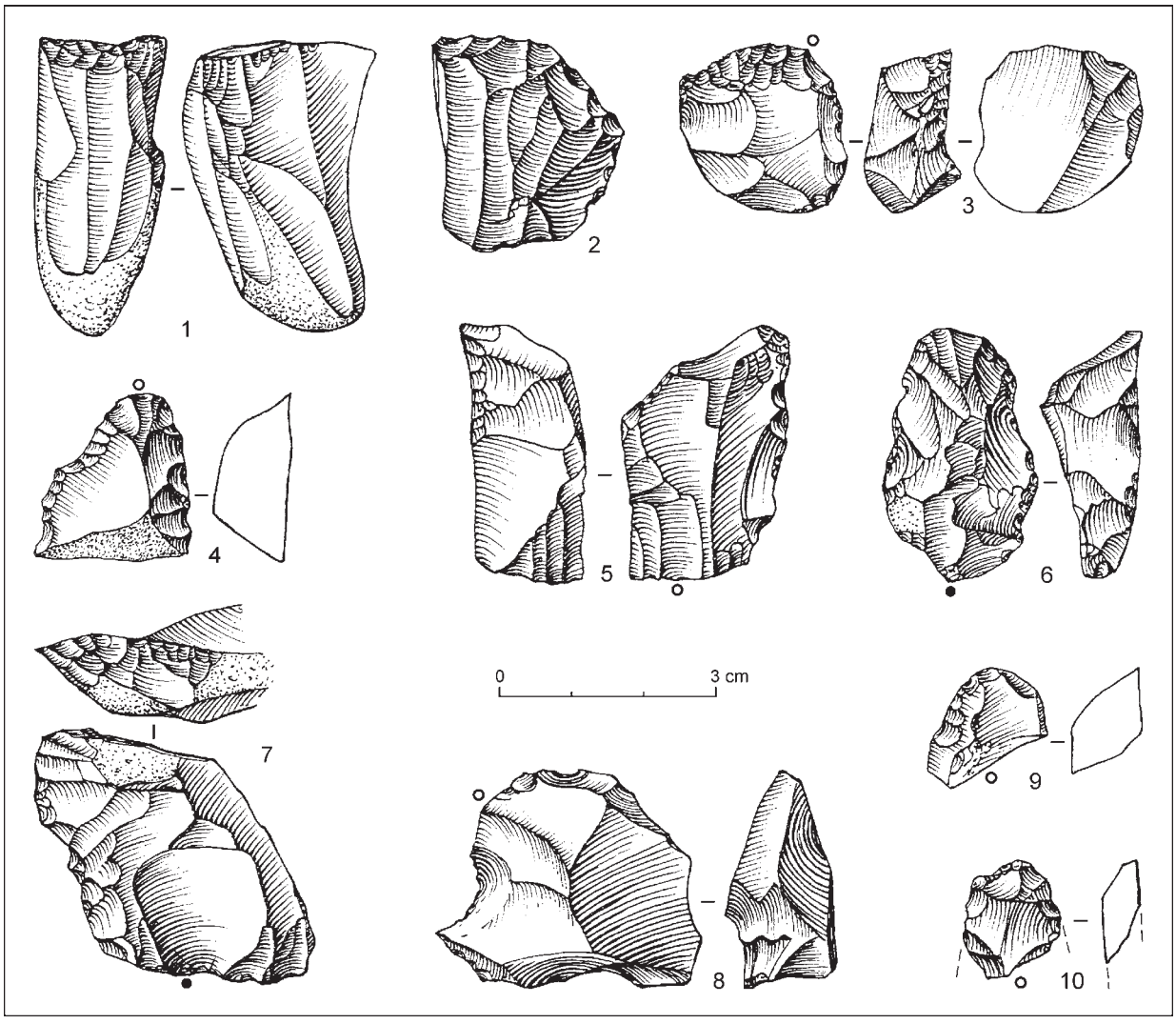

Fig. 11. Napajedla III/Napajedla-Zámoraví (Czech Republic). 1 – blade/bladelet core; 2 – bladelet core; 3–8 –shouldered/nosed endscraper-cores; 9, 10 – shouldered/nosed endscraper-cores – fragments; the presence of only nosed terminations with retouched notched shoulders (artifact illustrations modified after *Demidenko/Škrdla/Nejman 2017*).

items, four core tablets and 19 lateral/front-lateral carinated *sensu lato* endscraper-core maintenance flakes. Such CMP diversity indicates intensive on-site core reduction processes.

All three crested pieces (a bladelet, a microblade and a flake) are technologically associated with bladelet/microblade reduction, from either shouldered/nosed endscraper-cores or bladelet/microblade cores. A true crested bladelet (just distal part) with a two-sided ridge and no cortex is 17 mm long, 7 mm wide, 4 mm thick. A non-cortical microblade (29 mm long, 6 mm wide, 3 mm thick) is a secondary crested specimen (a distal part) with a one-sided ridge. Its presence demonstrates a continuous and multiple '*lamelle à crête technique*' application during an on-site bladelet/microblade core reduction processes. A non-cortical flake (32 mm long, 30 mm wide, 18 mm thick) is also re-crested with a one-sided ridge showing rather radical core flaking surface re-preparation during *lamelle* flaking. It appears that all the crested pieces are associated with on-site bladelet/microblade core reduction processes.

Four core tablets are all on flakes which indicate an absence of systematically applied carinated burin-core technology (there is only one carinated burin-core in the assemblage) usually associated with core tablets on blades and bladelets. It seems that the core tablets and blade/microblade core reduction are technologically connected at this site.

The absence of crested blades (there is only a single crested blade-blank with a one-sided ridge and no cortex for a shouldered/nosed endscraper-core + angle burin from undated C area; Fig. 12: 6) and crested flakes from the initial reduction of blade cores clearly indicating that the preparation of blade and blade/bladelet cores took place elsewhere before

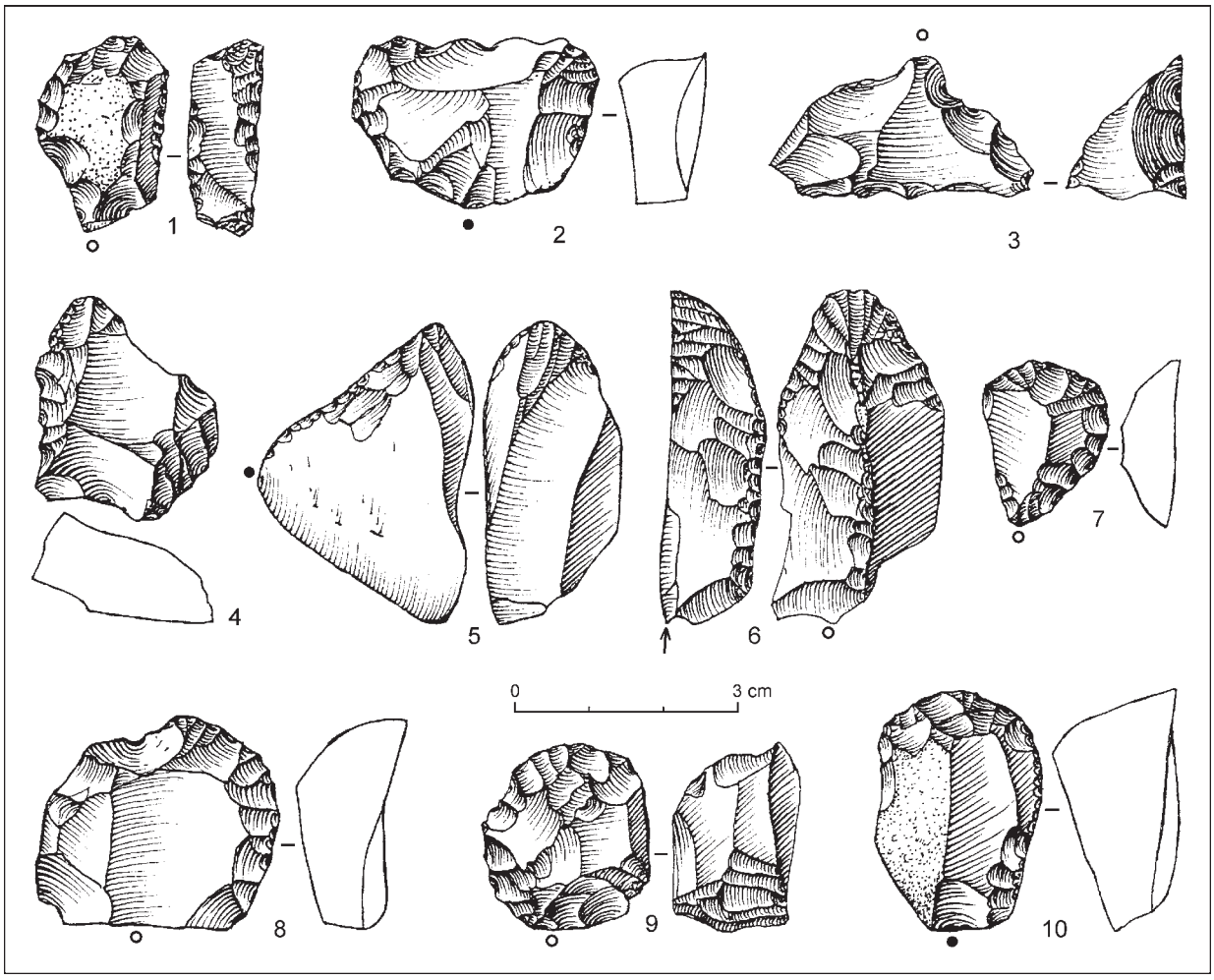

Fig. 12. Napajedla III/Napajedla-Zámoraví (Czech Republic). 1, 2, 4 – double shouldered/nosed endscraper-cores; 3 – triple shouldered/nosed endscraper-core; 5 – carinated burin-core; 6 – shouldered/nosed endscraper + burin angle; 7 – shouldered/nosed + carinated terminal endscraper-core; 8 – thick shouldered endscraper-core; 9 – carinated sub-circular endscraper-core; 10 – thick shouldered endscraper-core + lateral retouch (artifact illustrations modified after *Demidenko/Škrdla/Nejman 2017*).

they were brought to the site for more reduction when, most probably, they became blade/bladelet reduction objects. On the other hand, the presence of crested and re-crested bladelets and respective core tablets points to intensive on-site preparation and multiple bladelet and/or microblade core reductions, including shouldered/nosed endscraper-cores.

19 lateral/front-lateral carinated *sensu lato* endscraper-core maintenance flakes strengthen the above-indicated intensive character of endscraper-core microblade reduction at the site. These CMP are subdivided into two sub-categories – 14 items with on-axis reduction and five items with off-axis reduction (see details in *Demidenko/Škrdla/Nejman 2017,* 23). These pieces demonstrate a dominance of on-axis microblade reduction from shouldered/nosed endscraper-cores and a few carinated endscraper-cores where some off-axis but non-twisted in profile lateral/front-lateral maintenance flakes are mostly re-preparation items from edges of the on-axis nosed flaking extremities.

Debitage

100 debitage pieces are composed of the following four types (Tab. 5):
- flakes (≥ 15 mm) – 51/51%;
- blades – 14/14%;
- bladelets – 13/13%;
- microblades – 22/22%.

The already noted partial wet sieving of the site's artifact bearing sediments explains a higher share of all taken together bladelets and microblades (35%) than it was twice recognized for Willendorf II, AH 4 debitage (23.1% and 11.4%).

Tab. 5. Napajedla III (Czech Republic). Basic debitage type data.

	Napajedla III
	after *Demidenko et al. 2017*
Flakes	51/51%
Blades	14/14%
Bladelets	13/13%
Microblades	22/22%
Total	100/100%

Flakes can be characterized as follows. By primary cortex data, there are two primary pieces (3.9%), 10 partially-cortical pieces (19.6%), 39 non-cortical pieces (76.5%). By raw material data, 39 non-cortical flakes are made up of seven examples/17.9% local pieces (silicified siltstones, sandstones and various weathering products) and of 32 examples/82.1% 'imported' pieces (mostly erratic flints and some radiolarites). The flakes on local rocks have no cortex and there are no cores or tools on them. High likely, these flakes appear to represent *ad hoc* reduction of easily available local rocks quick utilization ('expedient items') by humans stopped at Napajedla III. Such indeed very minor role of local flakes is in a striking contrast with the known important role (e.g. for reduction of some cores and tool-cores) of local rocks for Willendorf II, AH 4 humans. At the same time, flakes on 'imported' rocks are of a different 'reduction nature'. Apart from one artifact, none of the 'imported' flakes indicate on-site production of thick flakes for shouldered/nosed/carinated endscraper-cores. Technologically, these non-cortical flakes are just core and carinated *sensu lato* reduction preparation and re-preparation pieces, demonstrating an 'import' to the site of previously detached thick flakes for on-site shouldered/nosed/carinated endscraper-core reduction.

Blades are composed of a single primary (7.1%), five partially-cortical (35.7%) and eight non-cortical (57.2%) items and all of them, as well as bladelets and microblades are on non-local rocks. The share of blades with cortex is even higher than the respective data for flakes. Remembering the absence of primary crested blades and blade cores *per se*, it is, therefore, possible to suggest flaking of blades with some cortex from blade/bladelet cores where they were doing a technologically supplementary role within a basic bladelet/microblade reduction. At the same time, a single blade with a little of central cortex is *'technologically connected to a nosed endscraper-core initial preparation that took place at the site'* (*Demidenko/Škrdla/Nejman 2017*, 24). Eight non-cortical blades are morphologically diverse, although it seems that large-sized blades (mostly a few pieces wider 20 mm) *'were produced elsewhere and brought to the site'* (*Demidenko/Škrdla/Nejman 2017*, 24). Thus, blades are certainly of a variable and minor reduction origin at the site.

Bladelets are characterized by much less cortex occurrence in comparison to blades, two partially-cortical (15.4%) and 11 non-cortical (84.6%), while primary cortical bladelets are missing. The bladelet data allow us to suggest their basic detachment not from shouldered/nosed/carinated endscraper-cores but from blade/bladelet cores on nodules/chunks where they were actually removed from central areas of core flaking surfaces already uplifted from the cores' edges by already struck blades, while the presence of a single bladelet core on nodule also explains why so few bladelets were produced at the site.

Microblades outnumber bladelets (22 versus 13) and all of them are non-cortical pieces. The microblade data allow us to come to the following considerations. *'It is reasonable to suggest that they were the main goal of nosed endscraper-core reduction. Also, it is possible that some tiny microblade fragments have not been identified and classified as chips instead. The number of complete microblades produced from nosed endscraper-cores may have been small and this explains the high number of nosed/shouldered endscraper-cores in such small Aurignacian assemblages. The trapezoidal midpoint profiles for microblades indicate systematic reduction. There is some variability in shape and converging microblades are dominant. There are also irregular pieces which are a result of reduction mistakes'* (*Demidenko/Škrdla/Nejman 2017*, 25).

In sum, Napajedla III core, CMP and debitage data demonstrate the following several primary flaking reductions realized by the site's human visitors both off-site and on-site.

First of all, any of the above-observed and prepared on non-local raw materials reduction objects were initially prepared at the site and all of them were brought to the site from somewhere in an already initially prepared and/or even flaked way. The double numerical dominance of carinated *sensu lato* tool-cores over 'regular' cores on nodules/chunks indicates a main primary flaking orientation on production of serial bladelets and namely microblades at the site. So, it is seen a sort of very curated and 'mobile' set of reduction objects for mainly microblade production with only a supportive role of four flake cores, probably, serving for some debitage tool-blank flaking with an aim to make a few tools at the site. At the same time, a rather few recognized blades are products of some technological supportive role during detachment of

bladelets and microblades from blade/bladelet cores, and brought to the site a few already produced somewhere large-sized pieces and tools on them. Keeping in mind the above-analysed respective Willendorf II, AH 4 data, it becomes about obvious more accent on microblade reduction from carinated *sensu lato* tool-cores based on exclusive exploitation of 'imported' raw material types at Napajedla III.

Tool-kit data and considerations

There have been identified 51 pieces with the respective flaking and/or secondary treatment traces. They are subdivided into the following seven too-core and tool groups (*Demidenko/Škrdla/Nejman 2017*, 25–29):

I. Carinated *sensu lato* tool-cores – 16 items/31.3%;
II. Simple endscrapers and burins – 3 items/5.9%;
III. Various tools with a well-developed and/or regular continuous retouch – 11 items/21.5%;
IV. Combined tools – 6 items/11.8%;
V. Microliths – 3 items/5.9%;
VI. Pieces with marginal and/or irregular retouch – 6 items/11.8%;
VII. Tool fragments – 6 items/11.8%.

Excluding from the tool-core and tool groups last groups VI and VII which are often not included into some typological considerations in UP assemblages' analyses, carinated *sensu lato* tool-cores become not only the most numerous group (31.3%) among all 51 specimens but it accounts 41% for the left typologically well definable 39 tools. Moreover, it is also worth keeping in mind two combined tools with shouldered/nosed endscraper-core parts (see below). It, finally, would make a share of all taken together carinated *sensu lato* tool-cores in 18 pieces and 46.2%.

Carinated *sensu lato* tool-cores typological variability is as follows (see for more details *Demidenko/Škrdla/Nejman 2017*, 25–27):

– shouldered/nosed endscraper-cores – 6 pieces (Fig. 11: 3–8; blank types: five flakes, one exhausted bladelet core on a flake);
– shouldered/nosed endscraper-cores – fragments (the presence of only nosed terminations with retouched notched shoulders) – 2 pieces (Fig. 11: 9, 10; blank types: two flakes);
– double shouldered/nosed endscraper-cores – 3 pieces (Fig. 12: 1, 2, 4; blank types: three flakes);
– triple shouldered/nosed endscraper-core – 1 piece (Fig. 12: 3; blank type: one flake);
– thick shouldered endscraper-core – 1 piece (Fig. 12: 8; blank type: one flake);
– carinated sub-circular endscraper-core – 1 piece (Fig. 12: 9; blank type: one flake);
– shouldered/nosed + carinated terminal endscraper-core – 1 piece (Fig. 12: 9; blank type: one flake);
– carinated burin-core – 1 piece (Fig. 12: 5; blank type: one flake).

The two related combined tools are the following ones:

– shouldered/nosed endscraper + burin angle (Fig. 12: 6; blank type: one crested blade);
– thick shouldered endscraper-core + lateral retouch (Fig. 12: 10; blank type: one flake).

These carinated *sensu lato* pieces show about the absolute dominance of shouldered/nosed items (16 specimens), while carinated terminations only occur for two specimens with one of them being a combination of a carinated and a nosed piece, and carinated burin-cores are characterized by a single specimen. Remembering the suggestion proposed for Willendorf II, AH 4 on carinated endscraper-cores being often initial, first stage of reduced then down to a view of shouldered/nosed endscraper-cores with double (*Hahn's 1977* data)/triple (*Nigst's 2012* data) prevalence of the latter pieces over the former items, it is reasonable to speak about much more reduction of carinated *sensu lato* endscraper-cores at Napajedla III site. At the same time, both Austrian and Czech lithic assemblages do show the presence of just a single carinated burin-core occurrence that speaks about a consistent endscraper-like microblade reduction for the two discussing Middle Aurignacian sites. The tool-cores also feature very mostly use of flakes as blanks, (17 examples) with a single exception in a view of a crested blade. Location of shouldered/nosed terminations at debitage-blanks is also notable. Only a single specimen, a combined tool (Fig. 12: 6), has a shouldered/nosed termination at the blade's distal end, whereas it significantly varies for all other endscraper-cores with, for example, a *déjeté* position of the shouldered/nosed areas at the intersection/angle between the lateral edge and the distal end of the flake (Fig. 11: 7) and the core (Fig. 11: 5), and three more endscraper-cores possess 'noses' at proximal parts of flake-blanks (Fig. 11: 3, 4, 8). Such the shoulder/nose termination variability is actually explained by a fact that the thickest measured parts of the flake-blanks have been indeed chosen for formation of a shouldered/nosed extremity formation. Taking mean metrical data of the endscraper-cores, it demonstrates an overall small size under 30 mm – 29.3 mm long, 25.7 mm wide, 12.3 mm thick. The thickness parameter also indirectly indicates a small length of removed microblades from the endscraper-cores. Finally, out of 16 pieces, not including two combined tools here,

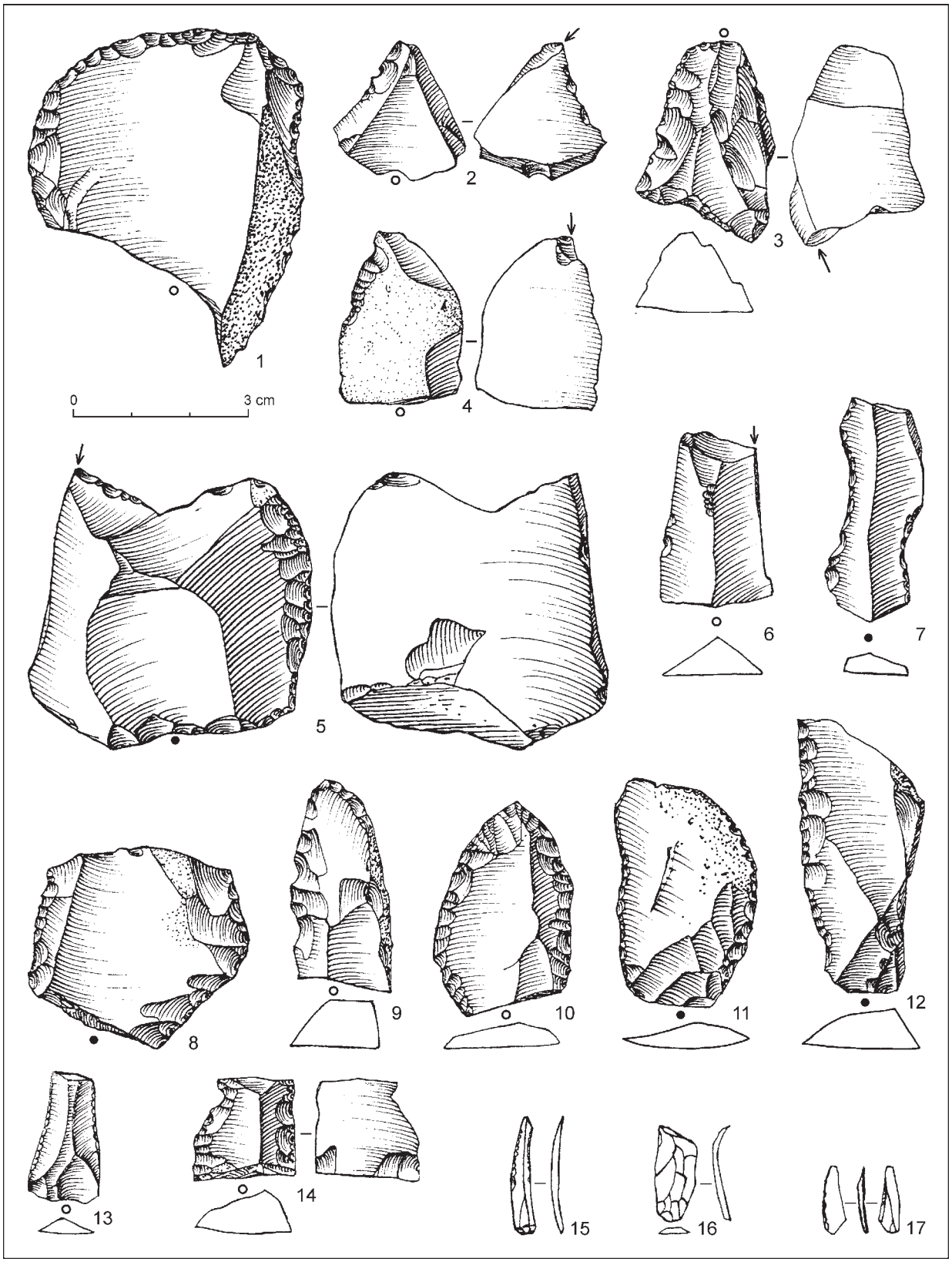

Fig. 13. Napajedla III/Napajedla-Zámoraví (Czech Republic). 1 – simple endscraper; 2 – burin on lateral retouch of a rather atypical value; 3 – broken burin + lateral retouch; 4 – angle burin + lateral retouch; 5 – burin on oblique truncation and lateral retouch; 6 – burin unidentifiable with a broken termination; 7, 9, 12–14 – retouched blades; 8 – double straight-convex dorsal side-scraper; 10 – Aurignacian pointed blade; 11 – retouched flake; 15–17 – microliths (artifact illustrations modified after *Demidenko/Škrdla/Nejman 2017*).

tree double (Fig. 12: 1, 2, 4) and a single triple (Fig. 12: 3) examples are noteworthy. These pieces once again demonstrate a consistent intention to use thick parts of flake-blanks for creation of a shouldered/nosed area. All the above-described carinated *sensu lato* endscraper-core data certainly testify a primary use of these pieces as cores and not tools, at least a tool (scraping?) function was a subordinate and not occurring for each of the pieces.

Having the carinated pieces as a basic part for Napajedla III tool-core and tool inventory and, at the same time, about the only Aurignacian related part, other tools are briefly discussed below.

Simple flat endscrapers (one item – Fig. 13: 1) and burins (two items) are noteworthy by the absence of any simple flat endscrapers with lateral/bilateral retouch and the occurrence of only one typologically identifiable burin, a burin on lateral retouch of a rather atypical value (Fig. 13: 2), when second burin is unidentifiable with a broken termination (Fig. 13: 6). At the same time, if combined tools are additionally used for the discussing tool group, it is seen the presence of four more burins, a burin on oblique truncation + lateral retouch (Fig. 13: 5), an angle burin + lateral retouch (Fig. 13: 4), two broken burins + lateral retouch (Fig. 13: 3). Only a broken burin and an angle burin + lateral retouch are on blade-blanks, while all the rest five tools are on flakes. The burin simple is also typologically indicative by the absence of dihedral burins that is in accord with a single occurrence of carinated burin-core, a 'derivative' of dihedral burin type. Furthermore, like it was observed for Willendorf II, AH 4, Napajedla III also features a prevalence of burins over simple endscrapers but in its extreme value with the recognition of only a single endscraper. Accordingly, the two Middle Aurignacian sites are again similar.

Various tools with a well-developed and/or regular continuous retouch are very mostly represented by lateral retouch pieces (nine items) and a single occurrence of pointed blade and notched piece.

The lateral retouch pieces are differentiated according to their debitage blanks: four flakes and five blades. The pieces on flakes are classified as a double straight-convex dorsal side-scraper (a complete flake; Fig. 13: 8), a double concave alternate side-scraper (distal part of a flake), a simple convex dorsal side-scrapers (a complete flake), and a retouched complete flake. Basic difference between the side-scrapers and the retouched flake is in retouch characteristics where the former pieces are with a continuous and well-made retouch and the latter piece is with a rather light retouch (Fig. 13: 11). All the pieces on flakes are less than 40 mm in size. The pieces on blades (Fig. 13: 7, 9, 12–14) are four fragmented items and a single complete specimen. By retouch treatment, all five blades are different one from other and do not show even two similar pieces why it can be said they are of *ad hoc* secondary treatment character.

The only pointed blade (Fig. 13: 10) deserves a special attention being actually an Aurignacian blade (a distal part) with a well-retouched pointed end. At the same time, the particular Aurignacian tool type does not belong to only one particular Aurignacian industry type and actually sporadically occurs in a view of a few pieces presence in each Aurignacian industry type.

A notched piece is a complete flake 40 mm long with a scalar + semi-steep retouched lateral dorsal notch.

Combined tools are the already above-mentioned only combinations of carinated *sensu lato* endscrapers, burins and lateral retouch.

Microliths are two microblades and a bladelet with a significant variability of their retouch type and placement data. There is a Dufour complete bladelet (12 mm long, 3 mm wide, 1 mm thick) with a bilateral alternate retouch placement (Fig. 13: 17), although it is not a Proto-Aurignacian Dufour sub-type microlith due to the presence of only a fine marginal for the discussing piece. Second microlith (Fig. 13: 15) is a so-called pseudo-Dufour complete microblade (20 mm long, 4 mm wide, 1 mm thick) with a bilateral dorsal fin marginal retouch. Third microlith (Fig. 13: 16) is again a sort of pseudo-Dufour complete bladelet (15 mm long, 7 mm wide, 2 mm thick) bearing a lateral dorsal partial fine marginal retouch. The microliths attest to the wide range of microliths. Due to the morphologically and metrically variable their blanks, the site's microliths represent a random sample, maybe caused by a partial screening/sieving done at the site yet.

Pieces with marginal and/or irregular retouch are characterized by only blade-blanks occurrence. Such blank type regularity may suggest targeted selection of blanks for the considering tools in a situation when most of the tool-core and tool blanks are flakes.

Tool shaping and rejuvenation waste

These are two primary burin spalls with no crest and a chip from the working edge of a simple endscraper. These specimens indicate on-site tool production and re-shaping. There are only a few of them recognized but most likely it is again due to the only partial screening/sieving of artifact bearing sediments during the site's excavations why some of these tiny items may not have been recovered.

Some on-site production and rejuvenation processes might be also evidenced through the occurrence of six recognized tool fragments.

Tool-core and tool summary

Excluding unidentifiable tool fragments, the remaining 45 tool-core and tool blanks are subdivided into the following types:
– flakes (including a single core on flake) – 27/60%;
– blades – 15/33.4%;
– bladelets – 1/2.2%;
– microblades – 2/4.4%.

There is a notable regularity here. On one hand, all 16 tool-cores (35.6%) are on flake-blanks. Two more endscraper-cores of the six combined tools are on a blade and on a flake. It makes a total of 17 tool-cores (37.8%) on flake-blanks with only one piece on a blade-blank (2.2%). Other flake-blanks are classified as a simple flat endscraper (the only such endscraper in the tool-kit), a burin on lateral retouch (the only identifiable burin type with a single burin termination and/or other tool extremity in the tool-kit), four out of nine lateral retouch pieces, one notched piece and three out of other five combined tools (one burin on oblique retouch + lateral retouch and two burin broken + lateral retouch). Apart from the shouldered/nosed endscraper-core + angle burin, there is one more combined tool on a blade (a burin angle + lateral retouch), as well as the following other tool classes and types: one broken burin, five out of nine lateral retouch pieces, one pointed tool, all six pieces with marginal and/or irregular retouch.

The following flake– and blade-blank characteristics can be proposed for the Napajedla III tool-cores and tools. The presence of almost exclusively short flake-blanks for tool-cores, serving basically as cores for microblade production is most relevant for the 'debitage blank subject' as thick blanks are required for these microblade cores. The presence of two simple endscrapers and burins on flakes (the only 'non-combined' types in the tool-kit), also emphasizes the flaky character of the tool-kit. The occurrence of four lateral retouch pieces and three burins + lateral retouch combined tools are again consistent with the flaky character of the tool-kit. At the same time, the number of tools *sensu stricto* on flakes (nine pieces) is less than tool-cores on flakes (17 pieces). Thus, if the 'tool-cores' are removed from the tool type list, the tool-kit does not have as many flakes. These considerations mean that some Aurignacian industries with many shouldered/nosed/carinated endscraper-cores and a few if any burin-cores that appear to be flake-blank based do not have as many flakes as may first appear. Looking at tool blade blanks, a tendency for their use for regularly and irregularly lateral retouch pieces (11 out of 15 pieces/73.3%) is apparent. It seems logical to use more elongated blanks for cutting and scraping tools. That's probably also why such Aurignacian assemblages with many shouldered/nosed/carinated endscraper-cores and serial flake cores also contain some blade and blade/bladelet cores, present independently from the flake and microblade core reduction strategies. The common proportion of *lamelle*-blanks as 6.6% is most likely an underestimate. The partial dry screening and wet sieving of the artifact bearing sediments has likely resulted in some loss of small-sized pieces, including the retouched microliths. In summary, the finding that flake blanks dominate is a robust finding, but excluding the flake– (17) and blade-blanks (1) for all tool-cores (16) and their combinations with other tool classes and types (two), and functionally considering them as specific microblade cores, the entire tool blank type structure would rather change radically with far fewer flake-blanks for the remaining 27 tools:
– flakes – 10/37%;
– blades – 14/51.9%;
– bladelets – 1/3.7%;
– microblades – 2/7.4%.

Although the new tool sample is statistically very small, there is a lack of flake-blank utilization in Napajedla III for the tools *sensu stricto* production – when the tool-cores are excluded. Probably, it is also true for the entire range of such possible 'pseudo-flaky' Middle Aurignacian tool-kits and assemblages containing a great number of typologically easily definable shouldered/nosed endscrapers basically used for specific microblade production. Moreover, the great diversity of tool blanks for the four debitage types is in a good correspondence with the core reduction data which presents several distinct reduction strategies, making the Middle Aurignacian assemblages a mosaic of technological features. The core reduction variability also explains the presence of both 'hard and soft hammer techniques' applications in such lithic assemblages. From a technological point of view, the Middle Aurignacian is like a 'multifunctional attack airplane' featuring a diversity of core reduction strategies. The shouldered/nosed endscraper-cores are also present in Aurignacian I/Early Aurignacian lithic assemblages (e.g. *Chiotti 2012*), which, however, in contrast to the Middle Aurignacian is characterized by a reverse order for shouldered/nosed and wide-fronted carinated endscraper-cores with the dominance of the latter type.

Tab. 6. Napajedla III. Indicative tool and tool-core types.

	Napajedla III
	after *Demidenko et al. 2017*
ENDSCRAPERS	16/66.7%
Carinated endscrapers	1/6.25%
Shouldered/nosed endscrapers	10/62.5%
Double-triple shouldered/nosed endscrapers	4/25%
Simple flat endscrapers	1/6.25%
Endscrapers on laterally/bilaterally retouched pieces	0
Endscrapers on blades with Aurignacian-like retouch	0
Endscrapers on Aurignacian strangled blades	0
BURINS	5/20.8%
Carinated	1/20%
Dihedral	0
On truncation/transversal on lateral preparation	2/40%
Angle/transverse on natural surface	2/40%
LAMELLES with a fine lateral/bilateral retouch	3/12.5%
Dufour, lamelles with alternate/alternating retouch	1/33.3%
Dufour, lamelles wih ventral retouch	0
Pseudo-Dufour, lamelles with lateral dorsal retouch	1/33.3%
Pseudo-Dufour, lamelles with bilateral dorsal retouch	1/33.3%
FONT-YVES/KREMS points with a fine retouch	0
BLADES with Aurignacian-like strangled retouch	0
BLADES ith Aurignacian-like retouch	0
Total	24/100%

Regarding the presence of specific Aurignacian tool-core and tool types and also some indicative UP tools in Napajedla III assemblage (Tab. 6), the most characteristic types are shouldered/nosed endscraper-cores and variable tiny microliths with a fine marginal retouch. The microliths are also morphologically variable due to their technological connection, removing from a set of carinated *sensu lato* tool-cores and not just from a single and/or two but morphologically similar reduction objects. At the same time, wide-fronted carinated endscraper-cores and carinated burin-cores are known by a single example each. No any sort of Aurignacian blades or endscrapers on such blades occur as well. Coming to endscrapers and burins, the presence of a single simple endscraper and absence of any endscraper on laterally/bilaterally retouched flake or blade with in total six burins (two angle, two on truncation/lateral retouch, two unidentifiable with broken terminations) shows even the worse situation with 'simple' endscrapers and burins than it was already observed for Willendorf II, AH 4. The same can be said about both the complete absence of dihedral burins at Napajedla III, while they are serially occurring at Willendorf II, AH 4 and a single finding of a carinated endscraper-core at Napajedla III, whereas they compose a good set of pieces at Willendorf II, AH 4. At the same time, just the single recognized carinated burin-core example is characteristic for both these Moravian and Austrian sites. Accordingly, all these data, still representing a definite example of Middle Aurignacian industry type, indicate an extreme example of the industry's basic typological indices.

Napajedla III site and some probable human activities at the site

From our point of view, the above-discussed specific character of Napajedla III lithic assemblage

within the known typological criteria of Middle Aurignacian industry, as well as basic human activity characteristics seen for the site should be, first of all, understood through a lithic raw material situation. The site is not located at or near a rich raw material outcrop used then by its Middle Aurignacian human visitors. There are few artifacts made on local materials (silicified sandstone, quartz and unspecified chert/weathering products) and none of them are cores or tools. At the same time, almost 90% of all artifacts (chips not included) are produced on imported erratic flints sourced to an area ca. 60–100 km to the northeast. A radiolarite source is located approximately 45 km from Napajedla III site, but there are only a few artifacts on it – a core (Fig. 11: 2), some debitage pieces, a shouldered/nosed endscraper-core (Fig. 11: 4), a shouldered/nosed + carinated endscraper-core (Fig. 12: 7) and some tools (Fig. 13: 7, 13). Thus, most of the techno-typologically important artifacts are on long distance imports erratic flint and radiolarite. Our realized refitting efforts have not been successful and only a few artifacts were conjoined. This was partly due to the fact that the artifacts were recovered from three different areas and only some of the artifact bearing sediments were dry screened and wet sieved. The refit failures are also due to some intensive 'artifact history movements'. A significant number of core-like pieces, endscraper-cores and even tools *sensu stricto* have been brought to the site in an already prepared condition (too few debitage pieces and chips with some primary cortex), then intensively flaked and/or used at the site. In addition, some pieces were subsequently transported away from the site. The proposed intensive and multiple lithic primary and secondary on-site reductions are clearly discernible: the few exhausted cores, their small size and absence of any prepared nodules/pre-cores, the presence of a series of fragmented shouldered/nosed endscraper-cores, double and even triple shouldered/nosed endscraper-cores, a combination of carinated and shouldered/nosed endscraper-core, as well as a diversity of nosed front/flaking edge locations on the endscraper-cores (terminal, *déjéte*, double *dejete* on a piece), as well as the occurrence of some nosed but 'irregular/exhausted' endscraper-cores. The presence of several heavily modified so-called combined tools including two pieces with shouldered/nosed terminations and a burin and laterally retouched edge, variously retouched side-scrapers on flakes and retouched blades, etc. Additionally, all the shouldered/nosed endscraper-core data do definitely testify not only to very intensive specific microblade reduction, but also suggests shortage of raw material at the site.

There is an additional peculiarity of the site (keeping in mind the raw material deficit), the presence of many heavily burnt pieces numbering ca. 200 specimens. That is more than 20% of the entire lithic assemblage that was recovered. Combining these observations (distance to high quality flint and radiolarite outcrops in relation to the site location, an intensive and multiple character of lithic primary and secondary reduction and use at the site, the presence of some large-sized and/or long lasting fireplaces/hearths) raises questions about the nature of human occupation at this site. The most logical explanation is that this site acted as a transitory camp (distance from raw material), with specific tasks being performed at this site. The topography of the surroundings (the narrow passage of the Napajedla Gate is often quoted in literature as a migration route for game animals) is also consistent with hunting being an important activity at this site, although fauna remains almost did not preserve at the site why also probably any bone/antler tools were not found during excavations. But still keeping in mind the presence of many burnt lithic pieces, it becomes evident successful (!) hunting events near the site why then Middle Aurignacian humans had fireplaces for hunted ungulate meet consuming. The absence of known sites that are industrially similar in southern Poland (erratic flint source) and the Váh River valley in western Slovakia (near radiolarite outcrop) prevents us from forming conclusions about settlement patterns of these human groups. However, it is clear that similar find assemblages occur in the discussing Moravian microregion (see below).

Comparing the human occupation characteristics for two key and *in situ* sites with Middle Aurignacian artifact assemblages, Willendorf II, AH 4 and Napajedla III, we also would like to propose the following considerations. The Austrian site looks like the planned ahead and the well-known loci for its good hunting possibilities and some available local lithic raw material sources, why it was probably already multiply visited before, being a sort of basic hunting stopover. On the other hand, the Moravian site is rather an *ad hoc* hunting stopover at random loci for an occasional hunting with no any lithic raw material supply around. This is why there are just a few domestic tools, simple endscrapers and burins at the Moravian site and the seen main emphasis on microblade production from carinated *sensu lato* tool-cores supplying a hunter group by some more microliths. Thus, it is suggested having two different hunting sites for the two keys in situ Middle Aurignacian sites with well representative artifact assemblages.

ŽLUTAVA I AND NOVÁ DĚDINA I SURFACE LOCI (CZECH REPUBLIC)

A few kilometres to the north from Napajedla III site still along the Morava River at Napajedla Gate area were already long ago known at least 20 UP surface loci around villages of Žlutava and Nová Dědina. Two of the loci, Žlutava I and Nová Dědina I were always published as Aurignacian sites and usually most attention was paid to Žlutava I assemblage being, for example, considered belonging to 'Krems facies of Aurignacian' (*Kozłowski 1965*, 37–40), 'Aurignacian with Dufour bladelets' (*Hahn 1977*, 113, 114, 243, 244), 'Typical Aurignacian'... a strong presence of carinated and nosed endscrapers and a lack of Aurignacian burins where 'Žlutava I industries, with finely retouched bladelets have been classified as a Dufour facies' (*Oliva 1993*, 42, 43). Žlutava I and Nová Dědina I are also of particular our Middle Aurignacian interest. However, taking a closer look at the really published some artifact data (*Hahn 1977*, tab. 3; 4; pl. 134–136; *Oliva 1987*, 46–66; *2005*, 45, 46, 50), three not mentioned before and/or undervalued artifact characteristics appear. First, a clear Gravettian component is present within collected Žlutava I and Nová Dědina I surface lithic finds (e.g. *Oliva 1987*, fig. 18: 24–27; 19: 17–22; 21: 21, 22; 25: 4; *1993*, fig. 5: 15–19). The noted feature, surface sites at Napajedla Gate area were often mixed with Gravettian artifacts, was already mentioned by one of us (*Škrdla 2007*). Second, the two loci demonstrate the presence of serial shouldered/nosed endscraper-cores (e.g. *Hahn 1977*, 7–9, 12; *Oliva 1987*, fig. 17: 5, 14–16, 22, 23; 18: 22; 26: 11–13, 16; 27: 18, 20, 21, 23). Third, the recovered microliths with a fine marginal retouch demonstrate a significant their morphological variability caused by blank detachment from different reduction objects, and retouch placement (e.g. *Hahn 1977*, pl. 135: 3–5; 136: 12–16; *Oliva 1987*, fig. 21: 6–18; 27: 1–14) that was already noted for Napajedla III microliths. Finally, like Napajedla III site, many of the collected Žlutava I and Nová Dědina I lithics are on erratic flint and radiolarite (*Oliva 1987*, 50, 62). All the above-enumerated lithic artifact features for Žlutava I and Nová Dědina I allow us to suggest their industrial affinity with Middle Aurignacian industry type too. They together with Napajedla III *in situ* site (there is still good filed perspectives to continue excavations at the site) can indeed represent a cluster of the particular Aurignacian industry in Eastern Moravia. Moreover, remembering about the presence of many UP surface find loci in that microregion when some of them could be potentially recognized as *in situ* sites during a future work, Eastern Moravia could potentially serve a centre for studies of Middle Aurignacian in Eastern Central Europe.

MILOVICE I/MILOVICE I-MIKULOVSKO SITE (CZECH REPUBLIC)

Site location and field research history

This site, as it can be said that way, is a neighbourhood of very famous Gravettian sites of Dolní Věstonice and Pavlov in the microregion of the Pavlov Hills in Southern Moravia. It is located on a north-eastern slope in a small, dead-end side valley penetrating into the Mikulov Highlands from the Dyje River Valley. The altitude of the site reaches 225–240 m a.s.l.

Milovice as a UP site was recognized in 1949 by B. Klíma. Later on, he also found some more animal bone and lithic artifacts identifying *in situ* UP archaeological layers. Since 1986 M. Oliva had been systematically excavating the site until 1990 and then published a collective monograph on the site's Gravettian context and findings, as well as some information on Aurignacian artifact bearing sediments and absolute dates (*Oliva 2009*). Like Gravettian site clusters at Dolní Věstonice and Pavlov, now Milovice I is also well known for its rich *in situ* Gravettian occupations excavated within pseudo-gleyed loess deposits. But Gravettian horizons are underlined by a lithological stratum of Interplaniglacial soil sediment (up to 60 cm thick) disturbed by slope processes. This soil sediment contains *in situ* Aurignacian artifacts in sectors A, C, D, G, L, M. However, in contrast to the Gravettian finds, the excavated much less numerous Aurignacian materials have not been published yet in detail and only some data is available (e.g. *Oliva 1989*). Aside from some fragments of horse and mammoth teeth, animal bones have not been found among Aurignacian finds.

Geochronology

Dating of Aurignacian occupations in two different site's sectors is based on the following uncalibrated radiocarbon dates made on charcoal samples (*Oliva 2009*, 24):

- Sector L – 28,780 ± 230 BP (GrN-22107) 'from upper horizon of Aurignacian layers in superposition of several fireplaces' and 32,030 ± 370 BP (GrN-22108) on a charcoal sample from 'lower horizon of Aurignacian, same superposition of fireplaces'.
- Sector D – 29,200 ± 950 BP (GrN-14826) 'upper level of charcoals in soil sediment with occasional Aurignacian finds'.

Accordingly, it could be an Aurignacian period between ca. 36,000–35,000 and 33,000–32,000 cal. BP for Milovice I. Such the geochronology fits well

into the above-described dates for Willendorf II, AH 4 and Napajedla III.

Studied by Oliva multiple superposition of fireplaces/hearths at Milovice I (see *Oliva 2017*, fig. 63) probably indicates not a single but multiple Middle Aurignacian human occupations at the site.

Lithic artifacts

Due to limited published information on Aurignacian lithic artifacts with no even given statistic data for recovered finds and their artifact categories, the data will be summarized in a very general way.

Regarding the used lithic raw materials, local 'various types of Jurassic and Cretaceous hornstones probably obtained from the near-by environs' (*Oliva 1989*, 269–271) at 'gravel banks and from weathered Jurassic limestone' dominate (*Oliva 2005*, 49), supplemented by distant for the site erratic flint and radiolarite (*Oliva 1989*, 269–271).

Core reduction data are only limited to the following notes: *'both blades and prismatic cores with parallel scars are very rare, however, bladelet-like retouch can be found on carinated and nosed scrapers representing the fundamental part of retouched types'* (*Oliva 1989*, 268). The cited single sentence fits about perfect into the above-discussed primary flaking technological traits for the Middle Aurignacian sites. Taking tool-core and tool data, it is also already clear a dominance of carinated and nosed endscraper-cores among tool-cores where, for example, carinated burin-cores were not noted due to the stated overall burin characteristics: 'usually simple variants' occur (*Oliva 1989*, 268). Although Oliva never mentioned shares of carinated and nosed endscraper-cores separately one from other, looking through his Aurignacian-related artifact illustrations for sector L finds (*Oliva 1989*, fig. 5; 6), it is seen only a single carinated item (Fig. 14: 12), while all other endscraper-cores are actually shouldered/nosed pieces (Fig. 14: 1–8, 10, 11) with two of them even representing a double (Fig. 14: 10) and a triple (Fig. 14: 11) examples. Strictly speaking tools, apart from the mentioned burins (Fig. 15: 1, 2), are said to be represented by the following classes and types that 'do not occur so often: flat endscrapers (Fig. 14: 13), retouched blades (Fig. 14: 9), notches and denticulates' and of special attention for Oliva were 'finely worked small side-scrapers and abruptly retouched flakes' (*Oliva 1989*, 268). The latter tools presence was explained as follows: *'the occurrence of characteristic Middle Palaeolithic types... is a locally surviving specific feature'* (*Oliva 1989*, 271). However, as was shown by us for all the described Middle Aurignacian assemblages, the serial occurrence of side-scrapers (Fig. 15: 3–5) should be better explained by a great dominance of flakes over blades within non-bladelet debitage samples why production of many tools *sensu stricto* was realized on flakes and many laterally retouched flakes with an elaborated retouch look like Middle Palaeolithic types of side-scrapers. At the same time, microliths were not reported and reasons for their absence are unclear. It could be because of some redeposition of the site's Aurignacian bearing sediments and/or absence of systematic dry screening and/or wet sieving during the site's excavations in the late 1980s.

Milovice I site and its human occupation type

Having scarce information for the site's data on Aurignacian human occupation events, it is still possible to make some observations and suggestions on the subject. The prevalence of artifacts made on local raw materials, various hornstones, does differentiate Milovice I from the Middle Aurignacian sites in the area of Napajedla Gate with mainly use of distant raw materials, erratic flint and radiolarite. The latter two raw materials, however, are said to be just supplementary ones at Milovice I. Having no information on burnt lithics, there is still an important fact on multiple superpositions of some fireplaces/hearths at the site. It evidently indicates some repeated visits of Middle Aurignacian human groups to the site during an overall short time period with fireplaces/hearths construction/re-construction at about the same places. The fireplaces/hearths themselves also probably indicate a consumption of ungulate carcasses (horse teeth findings should not be forgotten here) hunted near the site. It is also indicative a rarity of carinated endscraper-cores and numerous occurrences of shouldered/nosed endscraper-cores that is, from our point of view, a technological feature indicating serial reduction of only one morphological type of microblades for on-site microlith manufacturing processes, as well as the presence of series of simple flat endscrapers, burins, retouched blades and flakes, side-scrapers. The latter 'domestic tools' evidence some 'living site characteristics' in addition to hunting features (many shouldered/nosed endscraper-cores) for Milovice I. It potentially makes the site a sort of either a planned ahead basic hunting station, like it is suggested by us for Willendorf II, AH 4, or even a kind of a base camp. The base camp assumption could be reinforced by the known fact on the presence of some other sites in close proximity to Milovice I, at the nearby sites of Pavlov and Dolní Věstonice (*Oliva 2005*, 49; *2017*, 82; *Škrdla 2017*, 124; *Svoboda/Novák/Sázelová 2016*, 47).

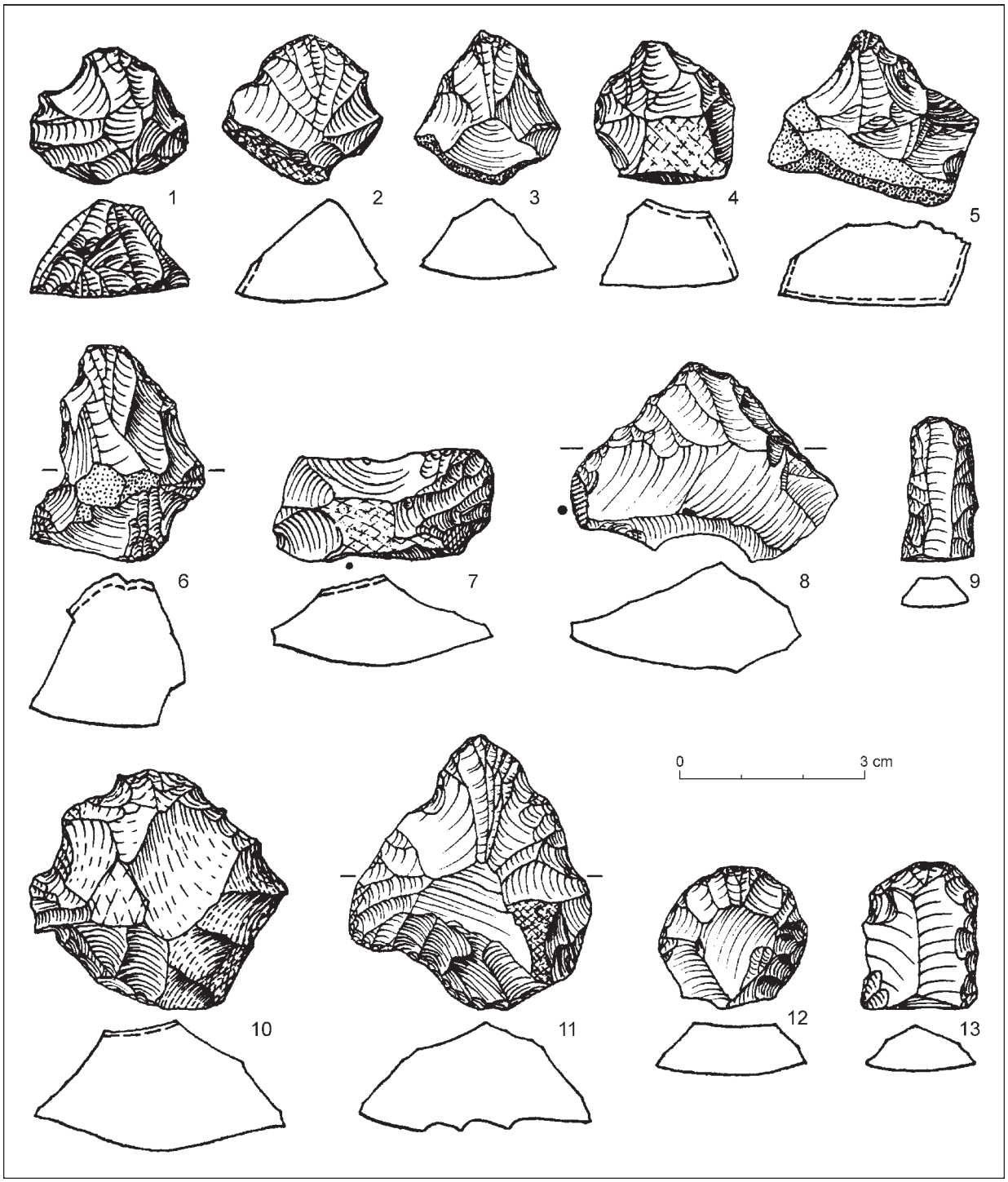

Fig. 14. Milovice I/Milovice I-Mikulovsko (Czech Republic). 1–8, 10, 11 – shouldered/nosed endscraper-cores; 9 – bilaterally retouched blade; 12 – carinated endscraper-core; 13 – simple flat endscraper (artifact illustrations modified after *Oliva 1989*).

Although Aurignacian artifact bearing sediments below Gravettian levels at various loci of Pavlov and Dolní Věstonice sites were up to now just recognized on limited excavated areas with only a few indicative artifacts found and Aurignacian data for Milovice I are not really published yet, it is still possible to put forward a hypothesis on Middle Aurignacian site cluster with both base camps/residential/living sites and some hunting stations at Milovice I, Pavlov and Dolní Věstonice site areas in the microregion under the Pavlov Hills. Remembering also about base camp and hunting station features for the same site cluster during later, Gravettian time, the proposed hypothesis sounds promising. Finally, recently

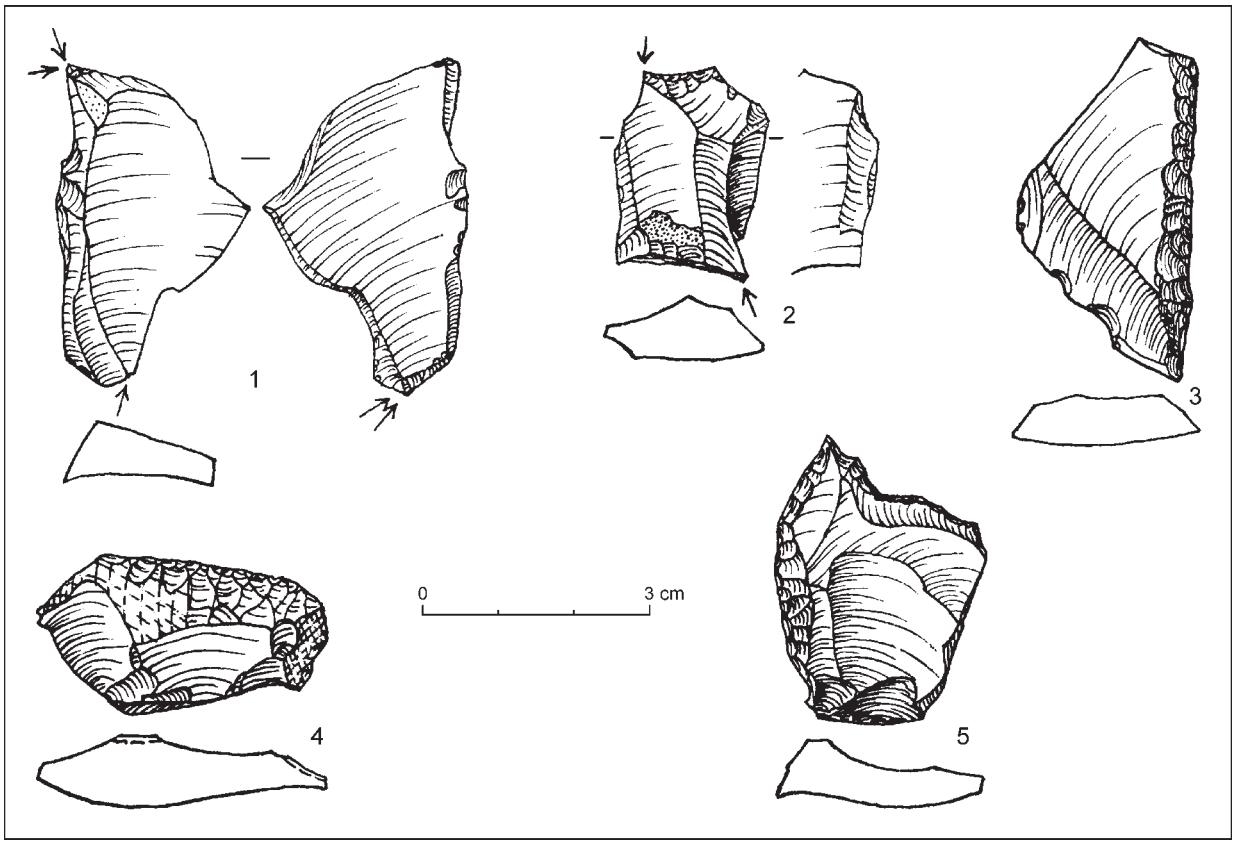

Fig. 15. Milovice I/Milovice I-Mikulovsko (Czech Republic). 1, 2 – burins; 3–5 – side-scrapers (artifact illustrations modified after *Oliva 1989*).

M. Novák initiated new excavations at Milovice I site excavating both Gravettian and Aurignacian artifact bearing deposits and it is hoped to have more data for further Aurignacian studies.

NAGYRÉDE 1 AND 2 SURFACE LOCI (HUNGARY)

Sites location and field research history

Now it is proposed to take a look at two most closely geographically situated loci to the Moravian and Austrian sites, Nagyréde 1 and 2 surface find spots in North-Central Hungary. They are situated about 70 km to north-east from Budapest in southern part of Mátra Mountains. It is on the right bank of Rédei-Nagy-patak stream at Öreg-hegy (Old hill) that is a dominant height for the surrounding areas. There is a great panoramic view from the hill to the southeast on vast territories of the near-by plain. The stream itself is located ca. 1 km from Nagyréde 1 and ca. 1.5 km from Nagyréde 2. Nagyréde 1 (187 m a.s.l.) is ca. 1 km away from Nagyréde 2 (200 m a.s.l.). Vast vineyards have been occupying the loci areas for many years until now.

After many years of Palaeolithic research in Hungary when Aurignacian *sensu stricto* artifacts have been exclusively suggested for cave sites (e.g. Istállóskő), finally, first undoubtedly Aurignacian homogeneous lithic finds were recently found at two surface find spots in north-central part of the country. The discovery of Nagyréde 1/Nagyréde-Öreg-hegy loci was done by L. Fodor in 2002. Since than one of us (S. Béres) joined L. Fodor for studies of the found loci in 2002, 2003 and 2005. One more Aurignacian loci near-by, Nagyréde 2/Nagyréde-Vájsz, was then recognized in 2005. Starting from 2005 the two loci were simultaneously under studies by S. Béres and L. Fodor with repeated annual visits in 2005, 2006, 2009, 2015. Taking found lithic artifacts during first field campaigns and inviting for artifact analysis G. Lengyel, who was already one of the leading UP specialists in Hungary at that time, G. Lengyel, S. Béres and L. Fodor published a good article on Nagyréde 1 and 2 and their find (*Lengyel/Béres/Fodor 2006*). Their basic conclusions and suggestions were as follows at that time: *'Nagyréde sites with the 24–25% of Aurignacian endscrapers in the tool kits resemble the Aurignacian II in Périgord (Djindjian 1993b) or the 'classic' Aurignacian phenomenon across Europe (Kozłowski/*

Otte 2000). Although Istállóskő upper layer and Peskő are also designated Aurignacian II (Vértes 1955; 1965), the Nagyréde assemblages signify a different and still unique Aurignacian lithic appearance in Hungary. Future excavations will clarify the position of the Nagyréde assemblages among the Hungarian Aurignacian context' (*Lengyel/Béres/Fodor 2006*, 84). Now it is already planned by two of the present article's authors (Yu. E. Demidenko and S. Béres) to make a new study for Nagyréde 1 and 2 lithics which numbers significantly enlarged after collecting events in between 2006 and 2015 years. For purposes of the present article, it was decided to stay on the 2006 published data adding to them just a few remarks that will mainly show some perspectives on more lithic artifacts' analyses.

Lithic artifacts

More than 15 years ago the quantity of lithic artifacts found at the two loci were as follows: 1,305 items at Nagyréde 1 and 1,885 items at Nagyréde 2. In spite of the more numerous overall artifact sample from Nagyréde 2, actually, the sample from Nagyréde 1 was more informative, regarding the most techno-typologically indicative data (see below).

Raw materials

The prevailing lithic raw material for the two loci artifacts was limnosilicite that was named 'hydroquartzite' in the 2006 article. The two names for the particular rock are actually synonyms (see for example *Mester/Faragó 2016*). Most important, however, that limnosilicite was a local raw material for Nagyréde Middle Aurignacian humans. Nearest to the two loci limnosilicite outcrops are situated ca. 5–6 km to the north. At the same time, numerous some other limnosilicite sources are well known within a radius of 25 km from the loci. Thus, it is understandable why 95.9% and 90.8% of all artifacts found at Nagyréde 1 and 2 occur on limnosilicite (*Lengyel/Béres/Fodor 2006*, tab. 1). The rest artifacts were made on a few still local for Mátra Mountains andesite (0.6% and 0.1% for Nagyréde 1 and 2, respectively), while all other raw material types can be regarded as either regional (Southern Bükk hornstone) or distant (Carpathian 1 Zempén obsidian, Southern Poland erratic flint, Western Slovakia radiolarite) still numbering usually a few pieces each, aside from erratic flint and radiolarite. The latter two raw material types are not only at little more numerous (2.2% and 0.9% at Nagyréde 1, 8.4% and 0.3% at Nagyréde 2) but show particularly more significant roles within the discussing assemblages' tool-kits (see below). In sum, it is well seen a reliance on local limnosilicite with supplementary roles of some other but non-local, regional and distant raw materials for the two loci Middle Aurignacian human visitors where the latter raw materials indicate some network connections with some other Middle Aurignacian humans who both probably left behind them already above-mentioned sites in Moravia and Austria, and some unknown yet sites in Hungary and Slovakia.

Lithic artifact composition

The two assemblage basic artifact categories can be represented as follows, restructuring the respective 2006 data (*Lengyel/Béres/Fodor 2006*, tab. 2) and providing all the data first for Nagyréde 1 and then for Nagyréde 2:

- Core-like pieces – 105/8%/13.2% and 71/3.8%/5.9%;
- Core maintenance products (CMP) – unknown, the artifact category was not defined;
- Debitage – 581/44.5%/72.8% and 1,057/56%/87.6%;
- Tools and tool-cores – 112/8.6%/14% and 79/4.2%/6.5%;
- Tool shaping and rejuvenation waste – unknown, the artifact category was not defined;
- Debris – 507/38.9%/– and 678/36%/–.

The above-represented first analysed artifact data for the two loci indicate some variability of artifact categories where the more numerous samples of tool-cores and tools, as well as cores are known for Nagyréde 1.

Core reduction data

Core-like pieces

As was done for all the above-discussed Middle Aurignacian assemblages, tool-cores are also considered among total core samples for Nagyréde 1 and 2. At the same time, cores *sensu stricto* classification is given according to the 2006 article classification approach where, like P. R. Nigst did for Willendorf II, AH 4, blade/bladelet cores were not recognized. The resulted overall core lists can be listed by us as follows (see also Tab. 7).

Nagyréde 1 are with 132 specimens:

- pre-cores – not defined during the 2006 article study;
- blade cores – 31/23.5%;
- blade/bladelet cores – not defined during the 2006 article study;
- bladelet 'regular' cores – 14/10.6%;
- bladelet 'carinated' cores – ?;
- bladelet carinated endscraper-cores – 5/3.8%;

Tab. 7. Nagyréde 1 and 2 (Hungary). Basic core type data.

	Nagyréde 1	Nagyréde 2
	re-calculated from *Lengyel et al. 2006*	re-calculated from *Lengyel et al. 2006*
Blade cores	31/23.5%	12/13.2%
Blade/bladelet cores	0?	0?
Bladelet 'regular' cores	14/10.6%	2/2.2%
Bladelet 'carinated' cores	0?	0?
Bladelet carinated endscraper-cores	5/3.8%	3/3.3%
Bladelet shouldered/nosed endscraper-cores	22/16.7%	17/18.7%
Flake/blade cores	0?	0?
Flake cores	60/45.4%	57/62.6%
Total	132/100%	91/100%

– bladelet shouldered/nosed endscraper-cores – 22/16.7%;
– flake/blade cores – not defined during the 2006 article study;
– flake cores – 60/45.4%.

Nagyréde 2 with 91 specimens:
– pre-cores – not defined during the 2006 article study;
– blade cores – 12/13.2%;
– blade/bladelet cores – not defined during the 2006 article study;
– bladelet 'regular' cores – 2/2.2%;
– bladelet 'carinated' cores – ?;
– bladelet carinated endscraper-cores – 3/3.3%;
– bladelet shouldered/nosed endscraper-cores – 17/18.7%;
– flake/blade cores – not defined for the 2006 article study;
– flake cores – 57/62.6%.

Data on the two core sets allow us to speak about a newly recognized Middle Aurignacian core features among all the under observations Austrian, Moravian and Hungarian sites. On one hand, there are some already well-known characteristics as co-occurrence of serial both flake cores and bladelet carinated and shouldered/nosed endscraper-cores, and also a few examples of either blade/bladelet and bladelet 'regular' cores. For Nagyréde 1 and 2, however, we have the entire possible core type spectrum, if we forget not defined during the 2006 article study pre-cores and blade/bladelet cores that have to be present there. Taking a closer look at the listed cores, it is first time seen significant shares of blade cores (23.5% and 13.2%), while before there was no one real blade core among the Eastern Central European Middle Aurignacian assemblages. Also, if Willendorf II, AH 4 and Napajedla III do show a good presence of flake cores (23.3% and 16.7%), Nagyréde 1 and 2 cores are characterized by a great dominance (45.4% and 62.6%) of flake cores. At the same time, shares of carinated and shouldered/nosed endscraper-cores among all taken together cores at Nagyréde 1 and 2 are the lowest among the above-analysed sites in Austria and Moravia. On the other hand, the Hungarian loci show the permanent Middle Aurignacian trend in multiple prevalence of bladelet shouldered/nosed endscraper-cores over bladelet carinated endscraper-cores. Keeping in mind a great reliance on local limnosilicite for all-around primary flaking processes at Nagyréde 1 and 2, there is no other way than to suggest a dominance of 'domestic cores' there, when flake and blade cores compose a 'home basis' for both on-site preparation on thick flake-blanks of shouldered/nosed and carinated endscraper-cores and also on-site production and then use on blade-blanks of many 'domestic tools', first of all, simple endscrapers and burins. Such the core data and their understanding also lead us to a hypothesis on a base camp/residential/living site features for both Nagyréde 1 and 2 loci.

Debitage

The artifact category was composed of three debitage type pieces when microblades were not defined among bladelets during the 2006 article study. They are as follows providing all the data first for Nagyréde 1 (all 581 debitage items) and then for Nagyréde 2 (all 1,057 debitage items; Tab. 8):
– flakes (≥15 mm) – 488/84% and 960/90.8%;
– blades – 79/13.6% and 84/8%;
– bladelets – 14/2.4% and 13/1.2%.

Tab. 8. Nagyréde 1 and 2 (Hungary). Basic debitage type data.

	Nagyréde 1	Nagyréde 2
	re-calculated from *Lengyel et al. 2006*	re-calculated from *Lengyel et al. 2006*
Flakes	488/84%	960/90.8%
Blades	79/13.6%	84/8%
Bladelets	14/2.4%	13/1.2%
Total	581/100%	1057/100%

The above-represented internal structure of debitage pieces shows about an absolute prevalence of flakes over all taken together bladey pieces. Flakes show more shares among debitage than flake cores do for all cores. Remembering collecting lithics on modern surface during two loci field studies, it is understandable the received 'debitage picture'. Having much more cores and tool-cores with bladelet removal negatives (41 for Nagyréde 1 and 22 for Nagyréde 2) than bladelets, it is clear a great loss of bladelets at the surface find spots. At the same time, the also seen a great predominance of flakes over blades can again indicate all-around on-site primary flaking processes from pre-core stages to exhausted cores when flakes played many roles in preparation and re-preparation of various blade, blade/bladelet and bladelet core flaking surfaces, striking platforms processes in addition to proper flake core reductions for thick flake detachment. The abundance of flakes also explains why shares of tools on flakes are higher than tools on blades (see below).

Tool-kits and some remarks on their data

112 and 79 tool-cores and tool are listed for Nagyréde 1 and 2 tool-kits *(Lengyel/Béres/Fodor 2006*, tab. 4). These pieces are re-structured by us with a loss of some items (e.g. various atypical endscrapers and *raclettes* that certainly could be simple naturally damaged pieces at surface find spots) in the following way (see Tab. 9).

Endscraper-cores and endscrapers – 58 for Nagyréde 1 and 35 for Nagyréde 2:
- carinated endscraper-cores – 5/8.6% for Nagyréde 1 and 3/8.6% for Nagyréde 2 (Fig. 16: 1, 2);
- shouldered/nosed endscraper-cores – 22/37.9% for Nagyréde 1 and 17/48.5% for Nagyréde 2 (Fig. 16: 3–6; 17: 1–7);

Tab. 9. Nagyréde 1 (Hungary). Indicative tool and tool-core types.

	Nagyréde 1	Nagyréde 2
	re-calculated from *Lengyel et al. 2006*	re-calculated from *Lengyel et al. 2006*
ENDSCRAPERS	58/82.8%	35/87.5%
Carinated endscrapers	5/8.6%	3/8.6%
Shouldered/nosed endscrapers	22/37.9%	17/48.5%
Double-triple shouldered/nosed endscrapers	0	0
Simple flat endscrapers	19/32.8%	12/34.3%
Endscrapers on laterally/bilaterally retouched pieces	12/20.7%	3/8.6%
Endscrapers on blades with Aurignacian-like retouch	0	0
Endscrapers on Aurignacian strangled blades	0	0
BURINS	12/17.2%	5/12.5%
Carinated	0	0
Dihedral	6/50%	0
On truncation/transversal on lateral preparation	1/8.3%	2/40%
Angle/transverse on natural surface	5/41.7%	3/60%
LAMELLES with a fine lateral/bilateral retouch	0	0
FONT-YVES/KREMS points with a fine retouch	0	0
BLADES with Aurignacian-like strangled retouch	0	0
BLADES with Aurignacian-like retouch	2?	3?
Total	70/100%	40/100%

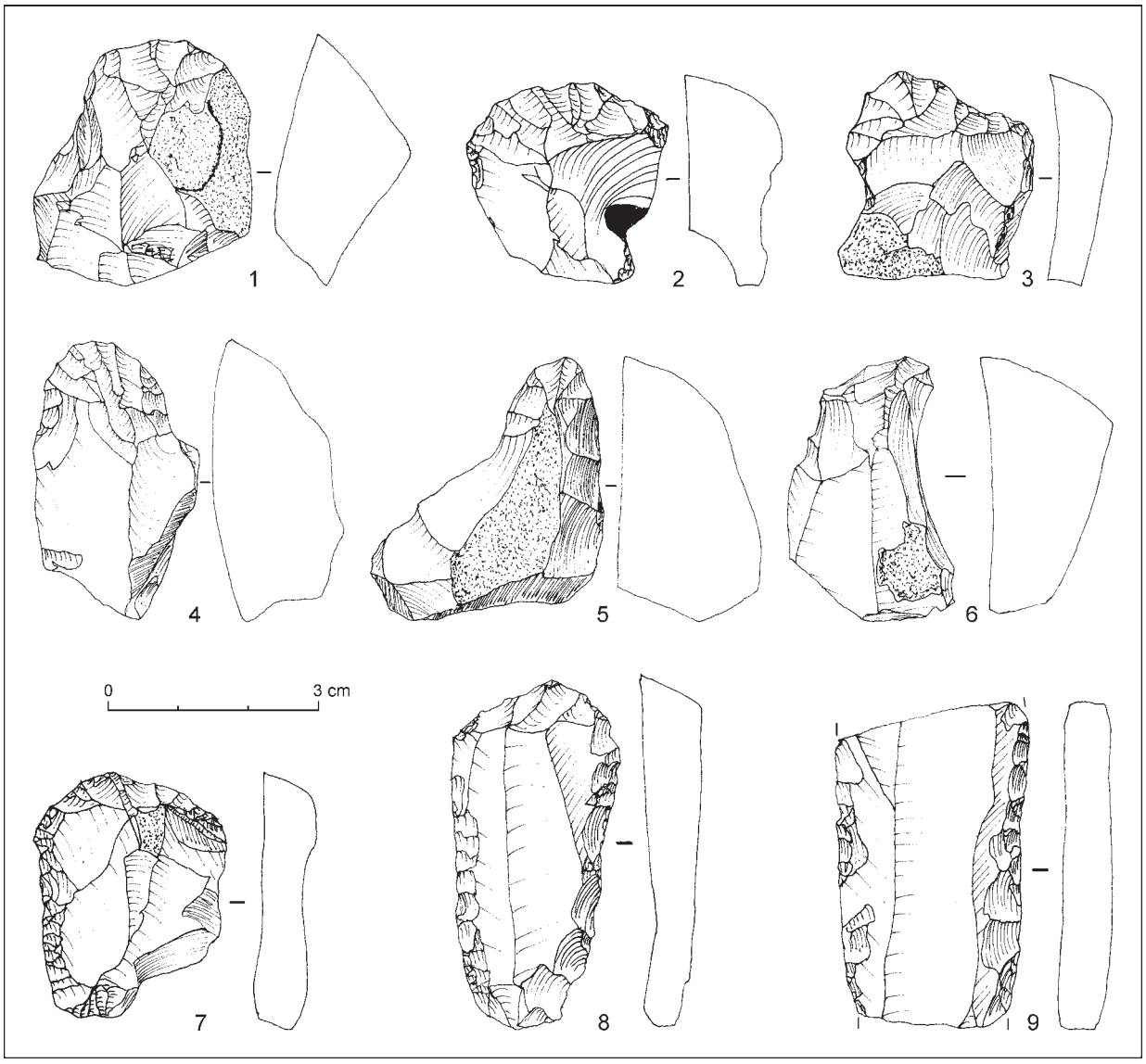

Fig. 16. Nagyréde 1/Nagyréde-Öreg-hegy (Hungary). 1, 2 – carinated endscraper-cores; 3–6 – shouldered/nosed endscraper-cores; 7, 8 – simple endscrapers on laterally/bilaterally retouched flake and blade; 9 – retouched blade (artifact illustrations modified after *Lengyel/Béres/Fodor 2006*).

– simple endscrapers – 19/32.8% for Nagyréde 1 and 12/34.3% for Nagyréde 2 (Fig. 17: 8);
– simple endscrapers on laterally/bilaterally retouched flakes and blades – 12/20.7% for Nagyréde 1 and 3/8.6% for Nagyréde 2 (Fig. 16: 7, 8).

Such the total endscraper set composition is, like core data, very different from the respective endscraper types' representation for the Austrian and Moravian sites with low shares of two types of simple endscrapers and high representation of endscraper-cores, having either more than a half (Nagyréde 1) or close to a half (Nagyréde 2) of all simple endscrapers. Such the great representation of all simple endscrapers can serve as one more indication on base camp/residential/living site features for the discussing two surface find spots.

Burins – 12 for Nagyréde 1 and 5 for Nagyréde 2:
– carinated burin-cores – no one for two tool-kits;
– dihedral – 6/50% for Nagyréde 1 and 0 for Nagyréde 2;
– on truncation/transversal on lateral preparation – 1/8.3% for Nagyréde 1 and 2/40% for Nagyréde 2;
– angle/transverse on natural surface – 5/41.7% for Nagyréde 1 and 3/60% for Nagyréde 2 (Fig. 17: 10).

The two burin sets are, first of all, characterized by absence of any carinated burin-cores and some variability of burin types' representation (see a series of dihedral burins at Nagyréde 1 and no one

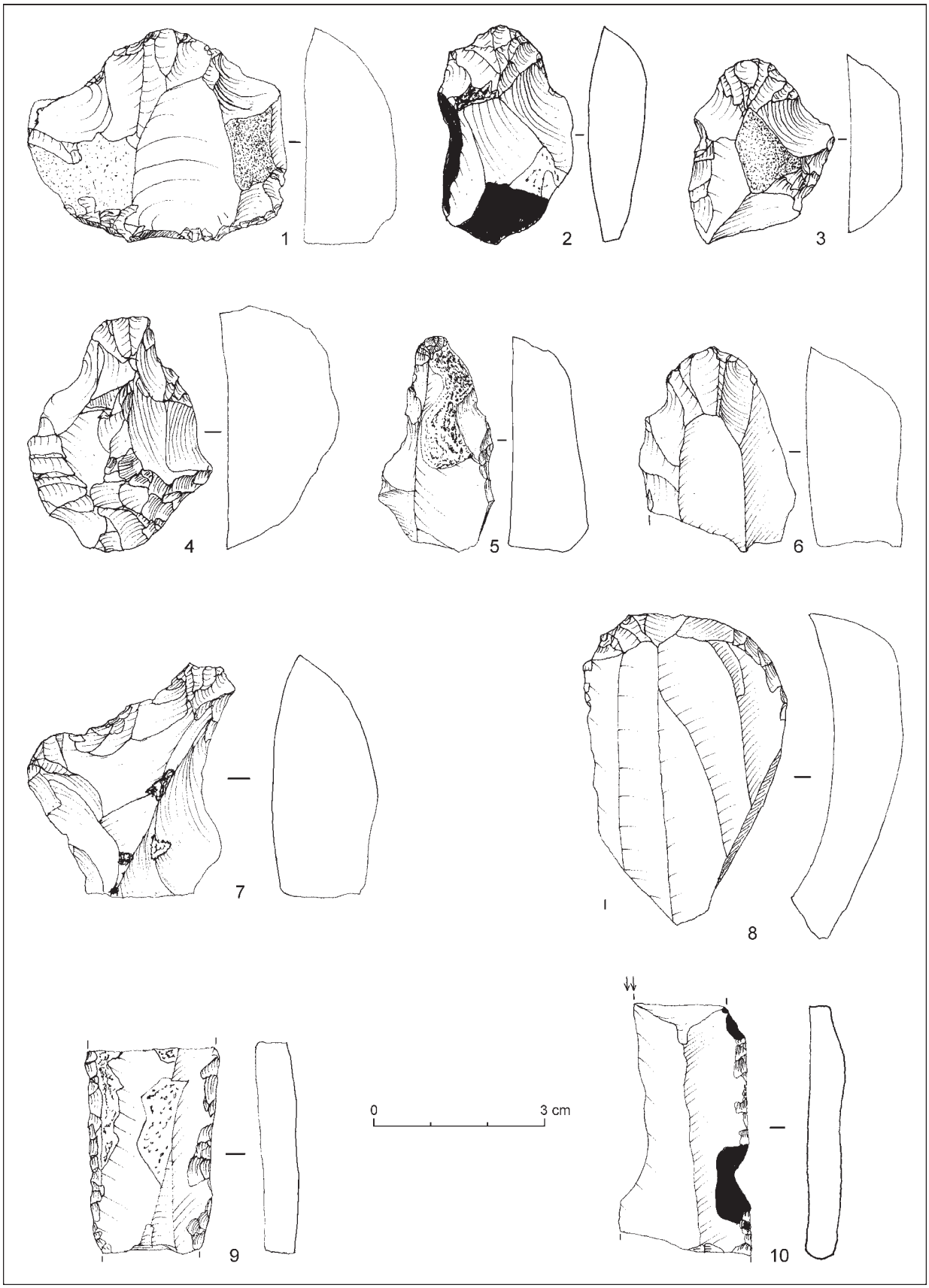

Fig. 17. Nagyréde 2/Nagyréde-Vájsz (Hungary). 1–7 – shouldered/nosed endscraper-cores; 8 – simple endscraper; 9 – retouched blade; 10 – angle burin (artifact illustrations modified after *Lengyel/Béres/Fodor 2006*).

such burin at Nagyréde 2), although angle type is well occurring at both loci.

'Retouched items' are, as it seems, laterally retouched flakes and blades where the latter pieces were said to 'have scaled retouch in both assemblages, situated frequently partially on the edge' (Fig. 16: 9; 17: 9), although retouch types for retouched flakes were not mentioned, aside from a remark retouch 'often is continuous'. At the same time, it was also noted that *'in Nagyréde 1 and Nagyréde 2, there are respectively two and three specimens that resemble Aurignacian blades with two retouched edges'* (*Lengyel/Béres/Fodor 2006*, 82). Absence of any illustrated Aurignacian-like blades does not allow us to agree with their recognition yet and only a new look at the two assemblages' retouched blades will clarify their presence or absence. Finally, microliths are, of course, not present due to collecting lithics on the two spots' modern surfaces.

Apart from some 'truncations', 'notches', 'denticulates', a 'raclette', a 'rabot', an 'endscraper/burin', a series of 'sidescrapers' deserves a special attention. There are six in Nagyréde 1 and two in Nagyréde 2 that was respectively 7.1% and 2.6% of all the 2006 article's defined tools. At the same time, 'retouched items' on flakes were not classified as side-scrapers why they probably bear a marginal and/or irregular retouch. Anyway, the defined series of side-scrapers fits well into the known tool features of Middle Aurignacian assemblages.

Nagyréde 1 and 2 loci and suggested human activity data at the loci

Despite the fact that the lithic artifacts from the two Hungarian loci come from a surface, not from excavated *in situ* archaeological artifact bearing sediments, all the above-described data on the find spots' dominant position within the surrounding topography, raw materials (a clear emphasis on local raw material limnosilicite use), core data (a great spectrum of many core types with a significant prevalence of 'domestic cores', both flake and blade cores, over 'mobile cores', both carinated and shouldered/nosed endscraper-cores) and tool data (a prevalence/significant share of all simple endscrapers over endscraper-cores and serial burins) point out that we are dealing with a sort of base camps or residential/living sites. Two of us (Yu. E. Demidenko and S. Béres) still hope to make a new study for numerically large samples of Nagyréde 1 and 2 assemblages for producing more data that might prove or disprove the proposed settlement type characteristics.

MEDZANY I AND II SURFACE LOCI (SLOVAKIA)

Location and research history

The two surface find spots are geographically situated ca. 190 km to northeast from Nagyréde 1 and 2, in northern part of Eastern Slovakia, in Prešov district of the Prešov region, about 14 km to northwest from Prešov town. It is an area in the middle course of Torysa River of south-eastern part of Spiš-Šariš Highlands. The loci are within Medzany village at a high elevated Kamenec terrace ca. 320 m a.s.l. above the near running stream named Pat'ovský potok. There were recognized first archaeological lithic artifacts at Medzany since the 1980s (e.g. *Klčo 1988*). However, only in 2006 A. Karabinoš found first UP artifacts at Kamenec terrace in Medzany and since then (*Derfiňák/Karabinoš/Vizdal 2009*) four surface find spots were recognized there. Two spots, Medzany I (Medzany-Kamenec I) and Medzany II (Medzany-Kamenec II), were recognized being characterized by many Aurignacian type finds. Then Medzany I and II lithic artifacts became a core of A. Voľanská's PhD thesis prepared and then defended in August of 2016 at Prešov University (*Voľanská 2016*). In 2016 Y. E. Demidenko was an official opponent for A. Voľanská PhD thesis defense, was then shown the Medzany I and II lithics and brought to the find spots together with Polish colleague K. Sobczyk by A. Voľanská and her PhD dissertation supervisor M. Vizdal. Accordingly, we know the two loci Aurignacian finds not only from literature but also from the personal knowledge of one of us. It preliminary allows us to suggest that Medzany I and II spots might represent a similar set to Nagyréde 1 and 2 Middle Aurignacian loci.

Raw materials

The dominant lithic raw material for the two loci artifacts were radiolarites of basically reddish colour being very well numerically represented below Kamenec terrace. These local numerous radiolarite pebbles are considered to be of a sort of secondary outcrops connected to Torysa River natural transporting events from their various sources in Eastern Slovakia (*Kaminská 1991*, 29; *Voľanská 2016*, 79). Medzany I have 87% artifacts produced on radiolarite and Medzany II is characterized by 89.6% of radiolarite artifacts (re-calculated from *Voľanská 2016*, tab. I; VIII). Numerically next raw materials are various limnosilicites. They are supposed to be non-local but regional raw materials mainly originating from Slanské hills area, ca. 50 km from Medzany and ca. 10 km to southeast from Košice

town in South-Eastern Slovakia, and a minor part of it possibly coming from Korlát area in North-Eastern Hungary, ca. 80 km to the south from Medzany (*Voľanská 2016*, 79). Limnosilite artifacts account 9.4% at Medzany I and 7.1% at Medzany II (re-calculated from *Voľanská 2016*, pl. I; VIII). All the other raw materials, either of regional or distant origin (flint, quartz, quartzite, andesite, obsidian, opal), are usually represented by a few pieces each (see *Voľanská 2016*, pl. I; VIII). At the same time, there are some deviations in raw material type representation for some artifact categories. On one hand, radiolarite is even more occurring for core-like pieces (92.9% for Medzany I and 90.2% for Medzany II) than for all taken together lithic pieces, whereas it is significantly less represented among tools (71.7% for Medzany I and even with 52.6% for Medzany II). Regarding limnosilicite artifacts, there is an opposite pattern with only 5.3% for Medzany I and 4.9% for Medzany II core-like pieces and 14.5% Medzany I and even 36.8% for Medzany II tools (re-calculated from *Voľanská 2016*, pl. I; VIII). A similar to limnosilicite pattern is traced for other non-local raw material types. Here it is only has to be noted that the A. Voľanská's tools include both tools and tool-cores, while defined by her core-like pieces do not involve tool-cores.

Thus, the considering two Eastern Slovakian surface find spots are of a similar raw material pattern with Nagyréde 1 and 2 in Hungary where one local raw material type, radiolarite, was very basic rock for all on-site intensive primary flaking processes and also for production of many tools, while significant tool numbers are also on other regional and distant raw materials which are, however, much rarely, if ever, occur for core-like pieces. The tools' raw material pattern indicates mainly off-site tool production for regional and distant rocks and *ad hoc* on-site core reductions. As a result, it is already possible to put forward a hypothesis that Mezdany I and II loci can represent a sort of regional base camp for Middle Aurignacian human groups in Eastern Slovakia.

Lithic artifact composition

The two spots' assemblages are represented by the following basic artifact categories, following the *A. Voľanská's* (*2016*, pl. I; VIII) data, and presenting all the data first for Medzany I and then for Medzany II:

- raw material pieces – 39/2.2%/2.8% and 19/1.7%/2.1%;
- core-like pieces – 476/27.4%/34.9% and 246/22.7%/27.4%;
- core maintenance products (CMP) – unknown, the artifact category was not defined;
- debitage – 693/39.8%/50.7% and 577/53.2%/64.2%;
- tools and tool-cores – 159/9.1%/11.6% and 57/5.3%/6.3%;
- tool shaping and rejuvenation waste – unknown, the artifact category was not defined;
- debris – 375/21.5%/– and 185/17.1%/–.

The above-listed artifact category data basically show similar patterns for the two assemblages, although it is worth noting a higher share of tool and tool-cores for Medzany I and more presence of debitage at Medzany II. At the same time, very high shares of core-like pieces, about a quarter and even more, among all lithics pieces for two assemblages deserve some special explanations.

A special note has to be added regarding the industrial homogeneity of the Medzany I and II lithic artifacts. A quick observation of the two assemblages' finds in 2016 by Y. E. Demidenko revealed only a few 'intrusive non-Aurignacian lithics' like, for example, two flint small-sized endscrapers of likely Mesolithic/Neolithic affinity and two radiolarite semi-products of bifacial leaf points. At the same time, all the rest numerous artifacts look of a homogeneous Middle Aurignacian character. In 2016 Y. E. Demidenko also suggested a possibility to find an *in situ* Middle Aurignacian artifact bearing sediments at Medzany. The suggestion was done on a basis of two factors. First, it is seen the good conservation of most lithic artifacts' edges with the low degree of rolling on them that indicates the good preservation of the collected artifacts and the low post-depositional alteration. Accordingly, it means a recent (!) appearance of the Middle Aurignacian artifacts at Kamenec terrace modern surface due to the activity of agricultural machinery why L. Bánesz, who realized systematic surveys for UP sites finding in Eastern Slovakia including Prešov region in the 1950s–1980s with, of course, finding some archaeological loci near Medzany (e.g. *Bánesz 1961*), never reported any UP finds from Medzany area. Second, a few dug sondages at Kamenec terrace did not lead to recognition of an *in situ* UP level. However, the sondages had been put on a top of the terrace where Quaternary sediments were significantly blown out and/or washed out and thinned throughout the time, why new sondages have to be put on the slopes of the Kamenec terrace where Quaternary sediments likely well preserved with hopefully still intact Middle Aurignacian lithics at some areas. The similar situation was well traced by one of us for Moravian IUP and EUP loci where *'aeolian deposits (losses)... are deposited on leeward and backward sides of elevations while the top of elevations are most often missing'* (*Škrdla 2014*, 132). Finally, it has to be noted that all classifications of Medzany I

and II concrete core and especially tool types done by A. Voľanská have to be taken with some caution. It is because Medzany artifacts were first lithics she ever classified and her supervisor is not a Palaeolithic archaeologist why there are some problems in this regard that will be noted for some concrete artifact types below. Therefore, the 'classification caution subject' do not allow us to use her artifact data for our classification tables and directly compare them with some other Middle Aurignacian assemblages and, first of all, with Nagyréde 1 and 2. But it is still possible to extract many useful data from the *A. Voľanská's* (*2016*) data using the Yu. E. Demidenko's personal lithic observations in 2016.

Core reduction data

Core-like pieces

Core-like pieces were subdivided by A. Voľanská into two main categories: cores and core fragments (*zvyšky jadier*) where the former pieces were a little outnumbering the latter pieces, respectively 240 and 236 items at Medzany I, and 141 and 105 pieces at Medzany II (*Voľanská 2016*, pl. I; VIII). Here it is also needed not to forget the presence of some raw material pieces with no flaking removal negatives, very mostly radiolarite pebbles and chunks, in the assemblages (39 and 19 pieces at Medzany I and Medzany II, respectively), showing an abundance of easily available rocks for the find spots' Middle Aurignacian human visitors. Having these three basic categories of pieces for understanding of on-site core reduction processes, it is possible to speak about the entire *chaîne opératoire* for primary flaking processes starting with 'raw flaking objects' and finishing with exhausted cores when many cores were fragmented. Taking the core and debitage data, there is a little prevalence of debitage items over cores (693 vs 476 and 577 vs 246 for Medzany I and Medzany II respectively). Aside from the understandable loss of some small-sized debitage pieces during collecting artifacts at modern surfaces of the two loci, why debitage samples are numerically underrepresented in comparison to core-like pieces, it is also possible to put forward a hypothesis that the loci were serving for two basic purposes keeping in mind Middle Aurignacian humans, while visiting the spots, were about sitting on high quality radiolarite source there. On one hand, adding a dominating view on the surrounding areas, Kamenec terrace was a good place for having a sort of base camp/residential/living site. On the other hand, such a base camp had a good option to be a workshop as well for production of many and various both cores and debitage pieces not only for a reduction and/or use at the two loci but also for some their 'export'. The main two-fold purposes make the two loci of multi-functional character base camps.

Excluding from classification efforts core fragments, the left so-called proper and complete cores were also classified by *A. Voľanská* (*2016*, pl. VII; XIV) into several types and adding to them carinated *sensu lato* endscraper-cores (identified by A. Voľanská some carinated burins were rejected by us being in reality burins of other types and a few cores *sensu stricto*, see details below for tool-core and tool data), the following core structures can be listed below.

Medzany I all 277 cores *sensu lato*:
- carinated and shouldered/nosed endscraper-cores – 37/13.4% (Fig. 18: 1–3; 19: 2, 3; 20: 1–6);
- bladelet carinated cores – 69/25% (Fig. 18: 4, 5);
- discoid cores – 7/2.5%;
- prismatic cores – 2/0.7%;
- flake irregular cores – 53/19.1%;
- blade irregular cores – 45/16.2%;
- bladelet irregular cores – 64/23.1%.

Medzany II all 157 cores *sensu lato*:
- carinated and shouldered/nosed endscraper-cores – 16/10.2%;
- bladelet carinated cores – 26/16.6%;
- discoid cores – 0;
- prismatic cores – 0;
- flake irregular cores – 28/17.8%;
- blade irregular cores – 20/12.7%;
- bladelet irregular cores – 67/42.7%.

Still keeping in mind some reservations on possible not correct classifications for some cores, it is still possible to trace several main primary flaking processes' tendencies seen for the above-enumerated reduction pieces.

The carinated *sensu lato* endscraper-cores still occupying either about one quarter (Medzany II) or a little more than one third (Medzany I) of all primary reduction objects is worth noting, especially in a context when only Nagyréde 1 and 2 suggested base camps have similar related indices, while at other Middle Aurignacian sites with mostly use of non-local raw materials such 'mobile' endscraper-cores account well over a half of all reduction objects. Accordingly, various 'domestic' cores prevail at the Slovak spots. In addition to strictly defined blade and bladelet cores, there are also some blade/bladelet cores (Fig. 19: 1). Also, like in all other Middle Aurignacian assemblages, flake cores have a notable share in ca. 20% and they always outnumber blade cores. On the other hand, two more groups of bladelet cores (carinated and irregular examples)

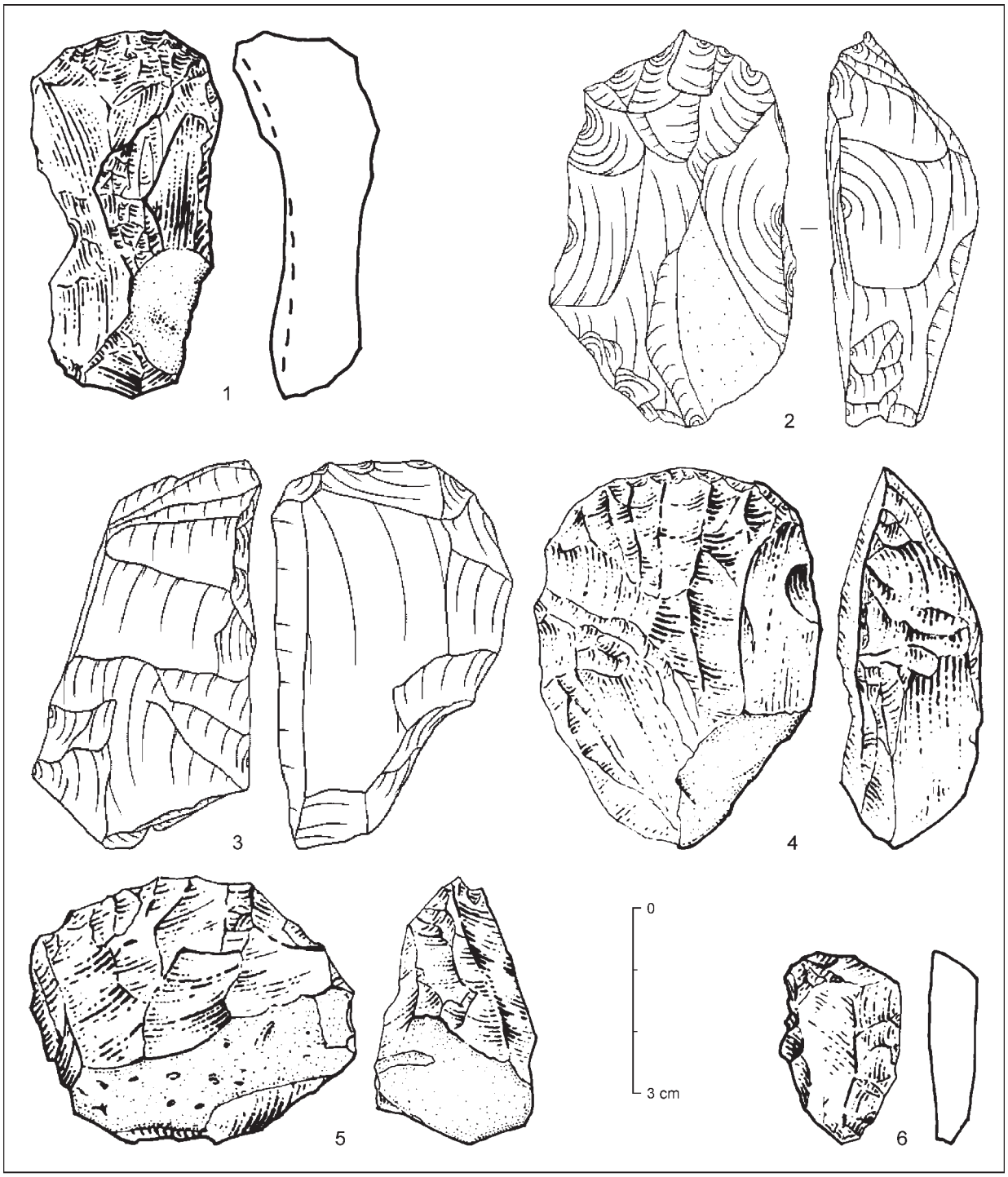

Fig. 18. Medzany I (Slovakia). 1–3 – carinated endscraper-cores; 4, 5 – bladelet carinated cores; 6 – simple endscraper on a bilaterally retouched flake (1, 4–6 – artifact illustrations modified after *Derfiňák/Karabinoš/Vizdal 2009*; 2, 3 – artifact illustrations modified after *Voľanská 2016*).

numerically dominate among all taken together reduction objects. Taking a closer look at all these morphologically and technologically variable bladelet cores on pebbles/nodules/chunks and also tool-cores mainly on flakes producing different bladelets and microblades, it again well corresponds to the known Middle Aurignacian features. Some more notes can be added from the Yu. E. Demidenko's lithic observations in 2016. Aside from cores themselves and not flaked at all raw material pieces defined by A. Voľanská, there are many tested raw material pieces (pebbles, blocks and chunks of radiolarite)

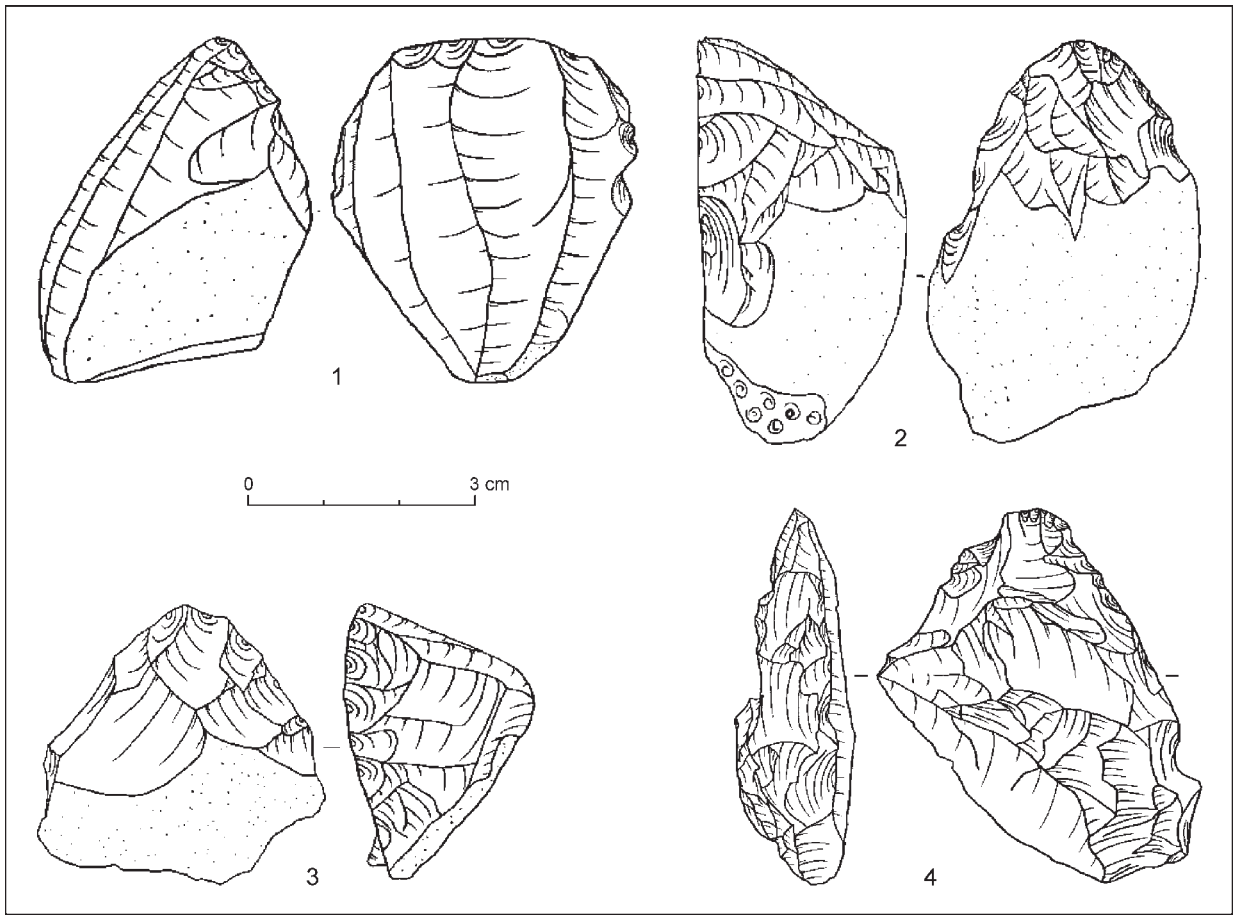

Fig. 19. Medzany I (Slovakia). 1 – blade/bladelet core; 2, 3 – shouldered/nosed endscraper-cores; 4 – side-scraper (artifact illustrations modified after *Voľanská 2016*).

and various pre-cores. Numerous pre-cores can be also subdivided into 'initial pre-cores' of two types, having two-three removal negatives from either unprepared or prepared striking platform, and also of third 'developed pre-core' type with a formed crested ridge. Each of the types is well quantitatively represented. Thus, the pre-cores once again demonstrate intensive on-site core reduction processes from very beginning and a variety of initial flaking directions.

The debitage pieces and data on blanks of both tool-cores and proper tools also well correlate with the reduction object information, again not forgetting loss of many bladelets and microblades on the spots' modern surface. Identifiable tool-cores' and tools' debitage blanks are as follows (*Voľanská 2016*, pl. IV; VIII): 55/77.5% on flakes and 16/22.5% together on blades and bladelets for Medzany I; 28/77.8% on flakes and 8/22.2% together on blades and bladelets for Medzany II. The debitage pieces alone with differentiation of blades and bladelets look this way: 609 flakes (87.9%), 47 blades (6.8%) and 37 bladelets (5.3%) for Medzany I 693 specimens; 487 flakes (84.4%), 55 blades (9.5%) and 35 bladelets (6.1%) for Medzany II 577 specimens. In total with non-tool-related debitage blanks, the debitage pieces can be represented in the following way: 664 flakes (86.9%) and 100 blades/bladelets (13.1%) for Medzany I 764 specimens; 515 flakes (84%) and 98 blades/bladelets (16%) for Medzany II 613 specimens. Such the overwhelming majority of flakes have the following main implications. Flakes show initial flaking of raw material pebbles/nodules/chunks for formation of pre-cores, some re-preparation of the already flaked cores of different types and also purposeful detachment of thick flakes from flake and discoidal cores for planned then endscraper-cores at the two loci. Numerically minor prevalence of blades over bladelets should not hide a loss of many bladelets at modern surface of the two loci why bladelets have to be much more quantitatively represented at Medzany I and II. Thus, although bladelet/microblade production is still well traced through the debitage data, flakes dominance once again points out a significance of workshop characteristics for the two loci.

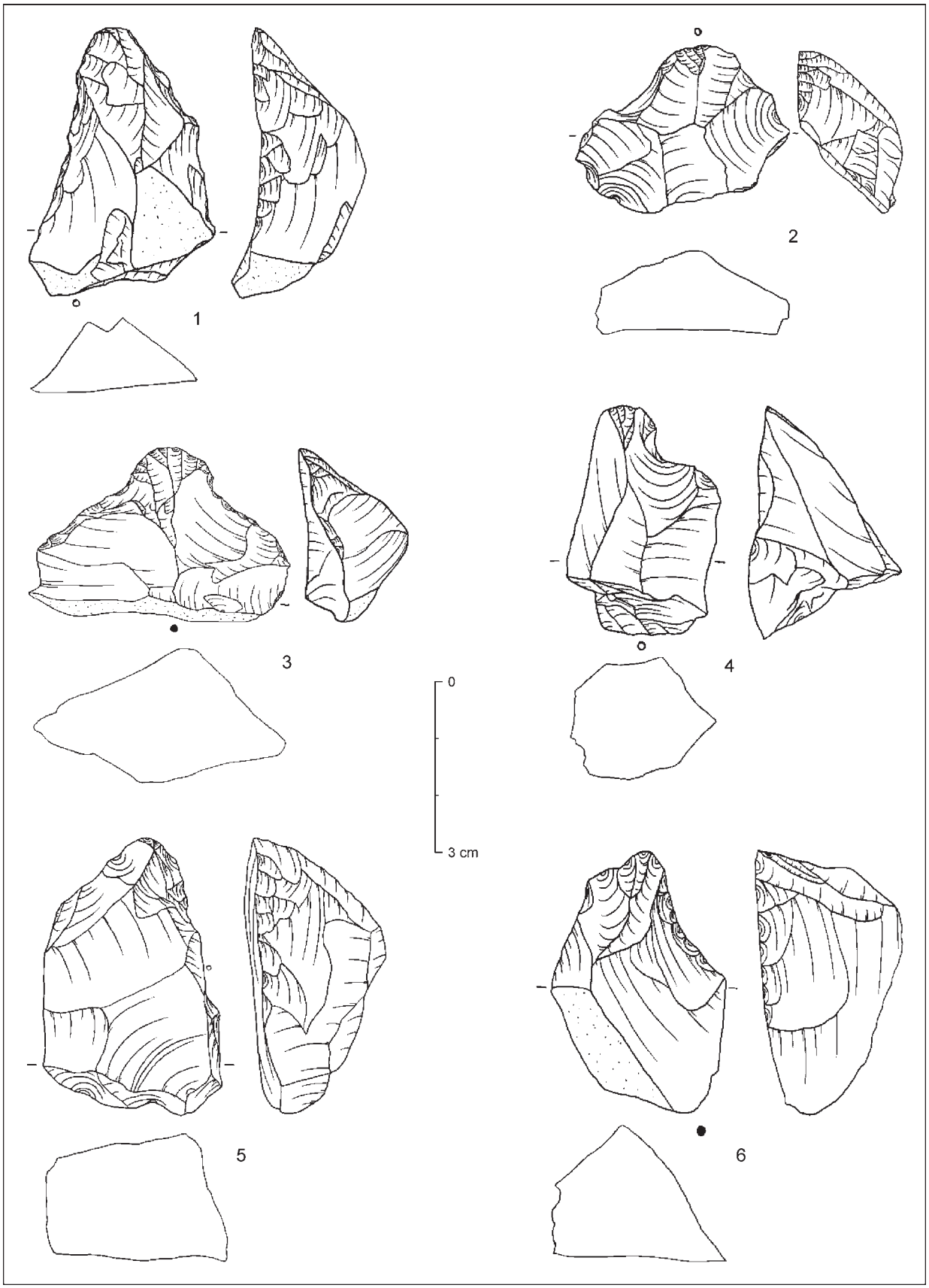

Fig. 20. Medzany I (Slovakia). Shouldered/nosed endscraper-cores (artifact illustrations modified after *Voľanská 2016*).

Tool-kits data

159 and 57 tool-cores and tool were classified among Medzany I and II lithics (*Voľanská 2016*, 84–86, 88, pl. II–IV; IX–XI). These pieces are re-organized with firstly removing from Medzany I tool-list 13 'denticulates' and 'notches' (possibly, naturally damaged debitage pieces), two 'thumbnail endscrapers' (probable, Mesolithic/Neolithic intrusion), seven 'carinated burins' (being either blade/bladelet cores or dihedral burins; see *Voľanská 2016*, pl. XXX: 1, 2), two 'choppings' (likely pre-cores), two 'tools with flat retouch', three 'borers' (actually, fragmented and unevenly retouched unidentifiable tools; see *Voľanská 2016*, pl. XXXI: 1, 2), 14 'fragmented tools', 11 'hammerstones' and also from Medzany II tool-list three 'notches', four 'fragmented tools', one 'hammerstone' and one 'retoucher'. Grouping together then under a basic term 'retouched pieces' a series of the following tool types 'knives', 'retouched blades/bladelets', 'retouched flakes' (10 for Medzany I and 10 for Medzany II), the following tool classes and types 'survive' for our tool-core and tool list (100 for Medzany I and 37 for Medzany II):

– endscraper-cores and endscrapers – 47/47% for Medzany I and 22/59.5% for Medzany II;
– burins – 17/17% for Medzany I and 5/13.5% for Medzany II;
– endscraper-burins – 1/1% for Medzany I and 0 for Medzany II;
– borers – 1/1% for Medzany I and 1/2.7% for Medzany II;
– side-scrapers – 30/30% for Medzany I and 9/24.3% for Medzany II;
– points – 1/1% for Medzany I and 0 for Medzany II;
– splintered pieces – 3/3% for Medzany I and 0 for Medzany II.

The shown tool-core and tool internal class structures are characterized by: an overall dominance of endscraper-cores and endscrapers, a moderate occurrence of burins with no carinated burin-cores, the presence of a single endscraper-burin and point at Medzany I and their total absence at Medzany II, a single finding of real borers for both Medzany I and II, significant shares of sidescrapers. Some remarks on each tool class are given below.

Endscrapers are composed of the following types (*Voľanská 2016*, pl. III; X):

Medzany I – 25/53.2% carinated endscraper-cores (Fig. 18: 1–3), 12/25.5% shouldered/nosed endscraper-cores (Fig. 19: 2, 3; 20: 1–6), 4/8.5% simple endscrapers, 6/12.8% endscrapers on laterally/bilaterally retouched pieces (Fig. 18: 6);

Medzany II – 10/45.5% carinated endscraper-cores, 6/27.3% shouldered/nosed endscraper-cores, 4/18.2% simple endscrapers, 2/9% endscrapers on laterally/bilaterally retouched pieces.

The striking feature about the endscraper-cores is about double prevalence of wide-fronted carinated pieces over shouldered/nosed items while it was always observed a reverse their representation for all the above-analysed Middle Aurignacian assemblages. There are some possible explanations for the particular Medzany endscraper-core feature. First, some of the A. Voľanská's carinated pieces look more as shouldered/nosed specimens (*Voľanská 2016*, fig. 13: 9, pl. XXVIII: 3, 4) why the above-noted very significant predominance of carinated pieces could actually be lower. Moreover, some of the rather wide-fronted carinated items have one and/or two side notches limiting fronts of their flaking surfaces (Fig. 18: 2, 3). Accordingly, these pieces, being still at an initial stage of wide-fronted reduction well could be then flaked for their narrow fronts during a later reduction stage for still the same pieces. Keeping in mind the well seen workshop character for on-site Medzany I and II lithic reduction processes, it could be the most plausible explanations on the endscraper-core subject. Furthermore, the Yu. E. Demidenko's Medzany lithic observations in 2016 actually have led him to a note on the presence of many shouldered/nosed endscraper-cores at Medzany I and II anyway.

Burins, by types, look as follows (*Voľanská 2016*, pl. III; X):

– Medzany I – 9/52.9% possible dihedral burins, 1/5.9% burin on truncation, 7/41.2% possible angle burins;
– Medzany II – 1/20% dihedral burin, 4/80% possible angle burins.

Excluding carinated burin-cores, it is seen a variable occurrence of both dihedral and angle burins for the two discussing tool-kits. On the other hand, a single burin on truncation is notable remembering that we are dealing with Middle Aurignacian where they are typical in the French related materials.

Apart from other not numerically at all well represented tool classes, side-scrapers deserve a special note (Fig. 19: 4). Although A. Voľanská was inclined to consider sidescrapers representing a 'Middle Palaeolithic intrusion' among the dominating Aurignacian items for the two loci, such unifacially treated side-scrapers and their notable number well fits the known Middle Aurignacian tool characteristics technologically caused by the occurrence of many flakes among debitage pieces. Remembering the microlith subject, it should be noted their understandable absence among surface finds of the two assemblages.

More studies of Medzany I and II lithic assemblages are surely needed and the noted good field perspectives on finding in future some areas with *in situ* artifact bearing sediments for the loci really cannot but inspire us. In this regard the basic problem is that A. Voľanská left archaeology five years ago and there is nobody in Prešov to continue a work with Medzany I and II but we hope it will be soon somebody for doing such the important scientific job.

Medzany I and II and possible site types

There are two aspects for Middle Aurignacian human activity that are about clear for us so far. First, it is a good topography location on an elevated terrace near a stream and rich radiolarite source that makes the two loci suitable places for having a sort of base camp/residential/living site. The presence of artifacts produced on several other local and regional raw materials only strengthen the suggestion on a base camp/residential/living site and even a regional Middle Aurignacian occupation centre in Eastern Slovakia. Second, the abundance of easily available radiolarite additionally makes the two loci of an evident workshop character with numerous cores, endscraper-cores and various debitage pieces where samples of each of these three artifact categories were also probably made for some 'export' outside the Medzany microregion to some possible hunting station situated far from lithic raw material outcrops. As a result, in addition to a series of the above-shown possible Middle Aurignacian hunting stations and base camps, Medzany I and II loci represent a base camp with a 'strong accent' of lithic workshop characteristics. To some extent the Slovak pair of loci is similar by lithic artifact data (first of all, by all core reduction types occurring at only base camps as it clearly appears now) to the Hungarian Nagyréde 1 and 2 loci but Medzany I and II with Middle Aurignacian humans literally about 'sitting at a radiolarite source' is likely a combination of a base camp and a workshop. If it is true, then the revealed Middle Aurignacian settlement and mobility characteristics approach sorts of pattern and system.

CRVENKA-AT SITE AND BUKOVAC CAVE (SERBIA)

The two sites are located in another from Eastern Slovakia 'corner' of the Carpathian Basin, in Serbia, the Carpathian Basin's south-eastern part. One of the sites, the already well-known in the Balkan Palaeolithic archaeology Crvenka-At site complex, was discussed in our previous article but mainly within a Proto-Aurignacian context (*Demidenko et al. 2021*). On the other hand, another site, Bukovac cave, the only yet Middle Aurignacian cave site in the study region, represents the recently discovered site. However, both sites are similar each other in a rather limited real data on their Middle Aurignacian context. Therefore, it will be given below only some restricted information set.

Crvenka-At site

It is situated in Serbian Vojvodina part of Banat. First UP lithic artifacts have been known and periodically collected near Crvenka town since end of 19th c. but real archaeological studies, surveys and some limited excavations were only realized in ca. 100 years, in the 1980s. Namely, thanks to a field work of I. Radovanović in the 1980s and then MA study D. Mihailović performed on all for a long time collected data with an emphasis on I. Radovanović's materials (*Mihailović 1992*; *Radovanović 1986*), D. Mihailović established a bipartite Aurignacian context of Crvenka-At site complex finds. The two find sets were thought to be related to 'Aurignacian of Krems type' related to layer IIb Crvenka site with industrial similarities to Romanian Banat Aurignacian sites and to a more chronologically recent 'Typical Balkan Aurignacian' characteristic for layer IIa lithics at At site with industrial comparisons to Aurignacian sites in the Balkans (*Mihailović 1992*, 49). However, in a course of new multidisciplinary studies at Crvenka-At realized by German-Serbian colleagues in the 2010s (*Chu 2018*; *Chu et al. 2016*; *Chu/Hauck/Mihailović 2014*; *Nett et al. 2021*) an 'archaeological paradigm' for the site was changed. It was only claimed the presence of just Banat-like (well-known in the neighbouring Romanian Banat) Aurignacian materials with no mentioning any later the previous D. Mihailović's 'Typical Balkan Aurignacian' finds. Our considerations on the site's archaeological context (*Demidenko et al. 2021*, 156–158) are, however, fully on the side of 1992 D. Mihailović study results. The 2010s research also objectively agrees with it. New excavations at Crvenka-At confirmed the presence of two *in situ* Early UP levels with some lithics of Aurignacian character. Recovery of a few ungulate bones with not enough collagen for a radiocarbon dating did lead to a successful use of OSL dating with the following results: *'the sediments of the upper artifact level deposited at 35,300 ± 3,600 (2σ), while the lower level deposited between 35,300 ± 3,600 (2σ) and*

37,800 ± 4,200 (2σ)' (*Nett et al. 2021*, 8). However, suggesting the same Aurignacian archaeological character of the found rare lithic artifacts, it was calculated *'an overall modelled average timing of 36,400 ± 2,800 (2σ)'* (*Nett et al. 2021*, 8) for the two archaeological levels six and eight separated (!) by an archaeologically sterile 35 cm thick layer seven for 2014 trench profile at At II loci (*Chu/Hauck/Mihailović 2014*, fig. 2; tab. 1). As it was said for the At II stratigraphy, the same stratigraphy with two archaeological levels was established during yet the 1980s excavations. As a result, stratigraphically and chronologically, there are two distinct archaeological layers (sets of layers?) at Crvenka-At. Due to a few found lithics during the 2010s excavations with only single Aurignacian endscraper-cores, industrial character of the two layers' assemblages can be only established yet on a basis of 1992 D. Mihailović's publication. Stratigraphically lower lithic assemblage with OSL dating around Heinrich Event 4 (HE-4), ca. 40,000 cal. BP (37,800 ± 4,200 uncal. BP) was already assigned by us to European Proto-Aurignacian that is a broader term for the used by D. Mihailović 'Aurignacian of Krems type' definition (*Demidenko et al. 2021*, 157, 158). Stratigraphically upper lithic assemblage is said to be characterized by the following indicative techno-typological features: '*typical Aurignacian nosed endscrapers*' being '*the most common finds in layer IIa at At*', '*Aurignacian blades and burins*' with also a notable notion that '*there are few Middle Palaeolithic elements and they are to be found only in Phase II*' (*Mihailović 1992*, 49, 50). Going through the respective illustrations 'Middle Paleolithic elements' and, first of all side-scrapers, well numerically occur within layers IIa at both the At and Crvenka sites (*Mihailović 1992*, pl. XII; XIII; XXIII).

In sum, it is clear for us the Middle Aurignacian attribution for the Crvenka-At Aurignacian upper find complex. More details of it can be made through such two approaches. First, it should be certainly useful to re-analyse all artifacts found before the 2010s field studies, actually, to make a new upgraded version of the *D. Mihailović 1992* study using many appeared Aurignacian techno-typological criteria during last 30 years. Second, some more field work at Crvenka-At is possible with an aim to find rich in artifacts area for systematic excavations.

At last, Crvenka-At newly performed multidisciplinary studies showed the site complex location at '*fluvial deposition close to a river mouth draining into a paleolake in the Alibunar Depression*' (*Nett et al. 2021*, 12) where different Aurignacian human groups, including Middle Aurignacian ones, hunted some herd ungulates also using as an 'economic basis' local and regional lithic raw material resources (mainly radiolarites). Accordingly, the site might be again an example of a hunting station at low elevations in ca. 86–87 m a.s.l. but near the river flowing into the lake.

Bukovac cave

The cave site is one of over 40 caves and rock-shelters discovered by T. Dogandžić in her 2012 initial survey for new sites in not systematically explored before by Palaeolithic archaeologists Valley of Resava River, a tributary to Velika Morava River in Central Serbia. Two of the found caves, Orlovača and Bukovac, T. Dogandžić selected for excavations then where she found *in situ* Palaeolithic archaeological layers. Orlovača cave was already discussed by us in a context of Proto-Aurignacian subject for the Carpathian Basin (*Demidenko et al. 2021*, 164, 165).

Bukovac (*Dogandžić/McPherron/Mihailović 2014*)[3] is a cave ca. 250 m a.s.l. with a small sheltered part (7 × 6 m) and a wide terrace in front. In addition to a Gravettian level 2c (with a ^{14}C date ca. 25,000 uncal. BP), level 3 with sub-levels 3a and 3b being uncovered for an area in ca. 3 m^2 yet small artifact assemblage still showed the presence of bladelet cores, shouldered/nosed endscraper-cores, microblades with a marginal retouch. A single ^{14}C date in ca. 28,000 uncal. BP was already obtained for sub-level 3b. Despite the very preliminary and limited excavations at Bukovac cave and its Aurignacian data context yet, from our point of view, level 3 deserves much attention during further field studies at the site. Being the only cave site with Middle Aurignacian *in situ* finds in the southwestern corner of the Carpathian Basin at a 'gate to Balkans', Bukovac cave could be potentially one of the key such Aurignacian sites in the study region connecting the Basin's Aurignacian with the related sites and their Aurignacian assemblages in the Balkans (see below).

CONCLUDING CONSIDERATIONS

The conducted analyses of Middle Aurignacian sites and their artifact assemblages allow us to put forward a series of some new observations and hypotheses structured into the following subjects.

[3] Yu. E. Demidenko – personal communication with T. Dogandžić, December of 2013; September of 2019.

Middle Aurignacian industrial features

The used French Abri Pataud, level 8 artifacts as an industrial basis for recognition of the related Middle Aurignacian materials in the Carpathian Basin of Eastern Central Europe proved to be the right choice. At the same time, the recognized Central European sites and their finds have shown both their great similarities and also some peculiarities with respect to the French 'industrial standards'. The common and specific features are summarized as follows.

Common data

Technologically, taking the Central European assemblages as a whole, the region's Middle Aurignacian shows the presence of about all core reduction strategies and core types known for the Aurignacian techno-complex. By the core variability, Middle Aurignacian seems to be the only such technologically variable industry stage/type in Aurignacian among all the known its stages/types. These are systematic mainly unidirectional or, when in depth flaked, multiply-unidirectional but almost never bidirectional reductions of 'regular' (on nodules/chunks) blade, blade/bladelet, bladelet cores, as well as flake/blade, flake, bladelet 'carinated' cores, additionally added by tool-core reductions (mainly on thick flakes) with a great dominance of shouldered/nosed endscraper-cores among also found but much less occurring wide-fronted carinated endscraper-cores and single, if ever present at all, carinated burin-cores for a specific microblade reduction processes. The tool-core data allowed us a suggestion on wide-fronted carinated endscraper-cores representing mainly an initial stage of microblade reduction morphologically ended up in a view of shouldered/nosed endscraper-cores. In this case it is possible to say that the latter reduction objects represent a basic tool-core type for a microblade production that well corresponds to the *A. Michel's* (*2010*) data and technological observations for Abri Pataud, level 8 'nosed endscraper-core reduction'. Actually, flake cores and shouldered/nosed endscraper-cores do constitute the most indicative technological interdependent reduction objects where the former pieces were producing thick flakes serving then as blanks for the latter endscraper-cores' preparation and proper microblade reduction. Moreover, the two core types and their reductions might in fact serve as the most indicative technological features for recognition of Middle Aurignacian assemblages even for not numerous lithic assemblages coming from surface loci. The two core and tool-core types' pieces numerous occurrences also leads to the presence of many flakes within debitage samples, while microblades are poorly present in the considering assemblages coming from both long ago excavated (e.g. Willendorf II, AH 4) or recently but partly excavated with a limited use of dry screening and wet sieving of artifact bearing sediments (e.g. Napajedla III) and surface find spots. More work should be done yet for a better understanding of Middle Aurignacian core reduction features. For example, it is not yet studied an important technological aspect on reduction of all the above-enumerated cores in terms of a use of soft– and hard-hammers for their flaking.

Typologically, again taking *summa summarum* of tool-kit data with included tool-cores for the discussing Carpathian Basin assemblages, it is seen a significant occurrence of shouldered/nosed endscraper-cores with much fewer recognized wide-fronted carinated endscraper-cores and at best single found carinated burin-cores, some simple flat endscrapers with also some of them on laterally/bilaterally retouched debitage pieces with, however, absent endscrapers on any type of Aurignacian blades, a diverse type occurrence for burins with the notable absence of any type examples with multi-faceted verges why real burin-cores for a systematic bladelet/microblade reduction are not found there, a notable quantitative occurrence of various retouched pieces both on blades and flakes where the latter pieces usually compose significant shares connected to a fact on the presence of many flakes in debitage, although Aurignacian blade types are not found, microliths are actually securely known by a few examples and only for excavated Willendorf II, AH 4 and Napajedla III materials and their basic common feature is a marginal fine retouch with variable retouch placement and blank types used.

Specific data

Technologically, it is seen a variable occurrence of almost all core types and their reduction processes for some sites and loci. On one hand, Nagyréde 1, 2 and Medzany I, II assemblages in Hungary and Slovakia indeed show the entire known variability of core reductions with such notable shares of the following main core types: a prevalence of flake cores and a moderate occurrence of both blade cores and carinated *sensu lato* endscraper-cores. On the other hand, all other loci (first of all, sites with clear data, Willendorf II, AH 4 and Napajedla III) demonstrate the absence of blade cores, a significant prevalence of carinated *sensu lato* endscraper-cores

and a moderate presence of flake cores. The realized analysis of these core type and reduction differences are explained by us through various site type patterns (see below). Finally, flake cores and shouldered/nosed endscraper-cores being a sort of 'domestic core-like objects' produced on local raw materials at Abri Pataud, level 8, show 'two-fold qualities of technological properties' for the Carpathian Basin's sites being for some loci again 'domestic objects' on local raw materials (e.g. Nagyréde 1, 2 and Medzany I, II) and being for some sites 'mobile/highly curated objects' basically on distant and regional raw materials. These technological properties for the two reduction objects definitely allowed a high degree of technological flexibility to Middle Aurignacian humans and their survival strategies within topographically different landscapes and varying availability to lithic raw materials.

Typologically, the technological variability trend is continued for endscraper-cores and endscrapers *per se*. Nagyréde 1, 2 and Medzany I, II demonstrate a dominant position of both carinated *sensu lato* endscraper-cores and all taken together simple flat endscrapers with shares around 50% each. However, Willendorf II, AH 4 and Napajedla III are indicative by a great predominance of carinated *sensu lato* endscraper-cores (ca. 90% and 70%) over all taken together simple flat endscrapers (ca. 10% and 30%). Remembering the poor presence of dihedral burins and an emphasis on a dominance of burins on truncation for level 8 at Abri Pataud in France, burin types' occurrences are of 'diving nature' for the Carpathian Basin's Middle Aurignacian tool-kits for both surface loci in Eastern Slovakian and Hungarian loci (52.9% possible dihedral burins, 5.9% burin on truncation, 41.2% possible angle burins at Medzany I and 20% dihedral burins and 80% possible angle burins at Medzany II; 50% dihedral burins, 8.3% burins on truncation/transversal on lateral preparation, 41.7% angle burins/transverse on natural surface at Nagyréde 1 and 40% burins on truncation/transversal on lateral preparation and 60% angle burins/transverse on natural surface at Nagyréde 2) and for *in situ* sites in Austria and Czech Republic [4.5% carinated burin-cores (one piece), 45.5% dihedral burins, 31.8% burins on truncation/transversal on lateral preparation, 18.2% angle burins/transverse on natural surface at Willendorf II, AH 4, and 20% (one piece) carinated burin-cores, no dihedral burins, 40% burins on truncation/transversal on lateral preparation and 40% angle burins/transverse on natural surface at Napajedla III]. The shown typological differences, first of all, already obvious for endscraper-cores and endscrapers are again proposed to be seen through understanding of site type variability (see below). Microliths, due to the above-noted their poor 'recovery origin' in the discussing assemblages, are of a random character why it is not possible to say about the real presence of a series of Roc-de-Combe sub-type of Dufour microblades yet that are well-known for the French materials. Therefore, a need in modern excavations of *in situ* Middle Aurignacian sites in our region is obvious from the microlith subject, too.

Organic artifacts are only exclusively known for Willendorf II, AH 4 and they are more numerous than at Abri Pataud Middle Aurignacian. The most indicative among them are projectile bone/antler points with a thick oval cross-section and extended distal part of a lancet-like form. They well correlate with the *D. Peyrony's* (*1933*; *1936*) '*pointe losangique à section ovale*' for his Aurignacian III stage and '*pointe biconique*' with also an ovoid section for his Aurignacian IV stage being also characterized in that time by the uncharacteristic occurrence of carinated burin-cores and typical presence of thick nosed endscraper-cores. Accordingly, the Carpathian Basin's site demonstrates the presence of one more artifact feature for understanding of Pan-European Middle Aurignacian data.

Finally, there are some techno-typological elements in the Carpathian Basin's materials that are not present at all in Abri Pataud, level 8 assemblage. The uniting all Middle Aurignacian assemblages flake cores and many flakes within debitage samples do feature the absence of any MP-like radial and/or discoidal cores in the French core sample, while they are sporadically occurred for core assemblages from Napajedla III, Medzany I and II, and, most likely, Willendorf II, AH 4 where they have to be recognized yet. More special core studies are expected for the subject for clarification of the MP-like cores presence in Middle Aurignacian, being, for example, an exhausted and multiply re-shaped/re-flaked variant of just UP parallel cores and/or an intentional technological trait of a centripetal reduction for detachment of some special thick flakes aiming namely getting a number of blanks for endscraper-tools. From the typological point of view, the presence of a series of MP-like side-scrapers on flakes in the Eastern Central European tool-kits is notable (Willenforf II, AH 4; Napajedla III; Milovice I; Nagyréde 1 and 2; Medzany I and II; Crvenka-At) and is anyway understood through an abundance of flakes within the sites' debitage pieces, although they are represented by only four examples/0.98% among level 8 tools at Abri Pataud (*Brooks 1995*, tab. XXII). Here it is needed to underline once again that the MP-like side-scrapers are not a 'surviving trait' from the time of MP but a flake-connected

technologically reasoned trait within the Middle Aurignacian. Regarding the UP side differences, of particular interest is a habit on utilization/rejuvenation of some shouldered/nosed endscraper-cores as burins and/or *ad hoc* burin-cores for Willendorf II, AH 4. Such the secondary use/re-use of a series of the tool-core pieces could be explained seeing some problems with available high quality raw materials and, at the same time, some intensity of lithic treatment processes at Willendorf II, AH 4. The habit is a remarkable feature that is known yet for us only for some Aurignacian materials in the East Mediterranean Levant (see below).

Thus, the Carpathian Basin's Middle Aurignacian materials do not only confirm the validity of the recent recognition of Middle Aurignacian in Southwestern France but add to them some more notable techno-typological features.

Middle Aurignacian geochronological data

All so far dated Middle Aurignacian sites in the Carpathian Basin are of a little younger geochronology in comparison to the French Abri Pataud, level 8 related to GI-8c, ca. 37,900–37,500 cal. BP/33,050 uncal. BP. Indeed, they seem to be corresponding to a time interval between GI-8a and GI-6 with the following concrete dates: ca. 36,300–35,400 cal. BP 32,100–31,200 uncal. BP for Willendorf II, AH 4; between ca. 36,700–36,200 and 34,100–33,800 cal. BP 32,700–32,300 and 30,000–29,600 uncal. BP for Napajedla III; between ca. 36,000–35,000 and 33,000–32,000 cal. BP 29,200 and 28,700 uncal. BP for Milovice I. Of course, more absolute dates are needed for the Carpathian Basin sites for more confirmation of their younger age and now the most promising among the region's sites is Milovice I where new excavations are under the way.

Middle Aurignacian settlement pattern observations for the Carpathian Basin's sites

The analysed several sites and loci with attributed by us Middle Aurignacian artifacts allow us to propose several types of site/loci based upon lithic primary and secondary treatment features.

Base camps (residential/living sites) – Nagyréde 1 and 2 loci, are located at a dominant height for the surrounding areas with a great panoramic view and 'hunting ungulate perspectives' from the hill on vast territories of the near-by plain and a water supply in a view of an easy reach stream. Probably, the most important for the loci is also situation at a close distance to rich lithic raw material outcrops but not their location right at a raw material source. The loci are, first of all, characterized by a basic use of local limnosilicite for the entire known Aurignacian core reduction variability with a dominance of 'domestic cores' when flake and blade cores composed a 'home basis' for both on-site preparation of many thick flake-blanks for shouldered/nosed and carinated endscraper-cores and also on-site production and then use for blade-blanks of many 'domestic tools' manufacture, first of all, simple endscrapers and burins. At the same time, more occurrence than for cores of tools *per se* on regional and distant raw materials indicates that the Hungarian loci were in a centre of some regional Middle Aurignacian human groups activities. Accordingly, the base camp hypothesis is seen as the best choice for Nagyréde 1 and 2 loci site type recognition.

Base camps (residential/living sites) with also a great aspect of workshop activity – Medzany I and II loci, are again characterized by a good topography location on an elevated terrace near a stream with rich secondary radiolarite sources right under the loci. By core reduction, tool-core and tool data, the Eastern Slovak loci are much alike Nagyréde 1 and 2 loci. But 'sitting at a radiolarite source' allowed Middle Aurignacian humans to use the Slovakian loci as also workshops for some likely 'export' of many cores, endscraper-cores and debitage outside the Medzany microregion to some possible hunting station located far from lithic raw material outcrops. Moreover, the presence of artifacts produced on several other local and regional raw materials probably make the two loci as a regional Middle Aurignacian centre in Eastern Slovakia. As a result, Mezany I and II allow us to see a base camp sub-type with a workshop accent.

Hunting stations, planned ahead basic hunting stopovers – Willendorf II, AH 4 (Lower Austria), do represent sites in hidden topographic areas near a river with good hunting possibilities and availability of some local lithic raw materials. It seems Middle Aurignacian humans were coming to such places with some already made hunting projectile weapons in a view of bone/antler points and some mounted in them lithic microliths, and also bringing initially prepared flake cores and carinated *sensu lato* endscraper-cores, as well as already prepared tools, probably mostly some burins for renewal of both some lithic microliths and bone/antler point on-site production needed to replace some lost during hunts respective pieces. A few flake/blade and blade/bladelet cores and some other tools, first of all, retouched blades, sidescrapers, simple endscrapers and some burins might reflect both some additional on-site flake, blade and bladelet productions for getting not only

bladelets/microblades but also some larger debitage pieces for making some other tools needed for dismembering of killed during hunts ungulates for meat consumption, hide and bone/antler processing. Most of Aurignacian archaeological levels at sites of Milovice I, Pavlov and Dolní Věstonice in Southern Moravia (Czech Republic) might represent similar to Willendorf II, AH 4 hunting stations, although it cannot be excluded the presence of a base camp there in addition as well. Crvenka-At in Serbian Vojvodina part of Banat also probably belongs to planned ahead hunting stations.

Hunting stations, transitory hunting camps – Napajedla III in Eastern Moravia (Czech Republic), demonstrate *ad hoc* hunting stopovers at random loci within the 'natural route', Napajedla Gate, for occasional but needed ungulate hunting events with no local lithic raw material supply. It explains the presence of only a few domestic tools, simple endscrapers and burins, and an emphasis on microblade production from carinated *sensu lato* tool-cores supplying hunters by some more microliths.

Accordingly, there were possibly two different sub-types of hunting stations, planned ahead (e.g. Willendorf II, AH 4) and by chance organized for a hunting need (e.g. Napajedla III).

Cave sites with unclear yet site type characteristics. Bukovac (Central Serbia) is the only yet known cave with Middle Aurignacian artifact bearing sediments but only at an initial phase of its archaeological investigations.

As a result, the above-represented Middle Aurignacian site type variety probably represents about the entire spectrum of functionally different sites where the absence of pure workshops can be explained by the presence of base camps with some workshop activities as well (Medzany I and II that look similar in this aspect to Abri Pataud, level 8 occupation(s) that we also consider as a base camp with much workshop characteristics too). It is also very probable that Middle Aurignacian *Homo sapiens* groups had some regional centres within the Carpathian Basin, like Nagyréde 1 and 2 in North-Central Hungary and Medzany I and II in Eastern Slovakia.

In addition, there are also some data for speculations on a migration route for Middle Aurignacian human groups for the discussed sites in Austria and Czech Republic connecting Napajedla III, Žlutava I and Nová Dědina I sites at Napajedla Gate area in Eastern Moravia and Willendorf II site in Wachau Valley of Lower Austria through Milovice I, Pavlov and Dolní Věstonice sites in Southern Moravia. The route was probably functioning in both directions, from northeast to southwest and *vice versa*. It followed courses of Morava River (with the sites at Napajedla Gate) and its right and longest tributary Dyje River (with the sites under the Pavlov Hills) with the confluence of the two rivers located in the southernmost part of Moravia. At the same time, Willendorf II site Middle Aurignacian humans in Wachau could be connected to the Moravian sites via Danube River Valley in west – east direction where the confluence point of Morava and Danube Rivers is at the modern outskirts of the Slovak capital Bratislava city. Taking additionally into consideration that Eastern Moravian and Austrian sites were various hunting sites, while sites in Southern Moravia, being located in between the above-noted Moravian and Austrian sites, could represent some central aggregation sites with perhaps one of them with base camp functions, it is further proposed to understand it as an entire Middle Aurignacian hunters network representing a logistic/foraging/radiating settlement mobility system.

Middle Aurignacian human diffusions throughout the Western Eurasia

Adding to the French Middle Aurignacian the discussed in the present article sites and surface loci in the Carpathian Basin, the Pan-European Middle Aurignacian record becomes much richer and important for geographically wider comparisons within the Western Eurasia where Aurignacian techno-complex is about entirely only known in the Old World. Relying on the present day known geochronology, it is possible to guess carefully that Middle Aurignacian may have had its industrial roots and origin in Southwestern France, in the Western Eurasian '*cul-de-sac*', in Early Aurignacian, geochronologically appearing in GI-8c, ca. 37,900–37,500 cal. BP. On the other hand, the Carpathian Basin sites seem to be a little younger starting from GI-8a, ca. 36,700–36,300 cal. BP. One of us (Yu. E. Demidenko) already proposed some years ago that European Middle Aurignacian (Abri Pataud, level 8; Willendorf II, AH 4; Napajedla III) and the so-called Classic Levantine Aurignacian/Ksar Akil Phase 5 Early UP industry – 1930s excavations levels VIII–VII/1940s excavations levels Xb–IXc in the East Mediterranean Levant (see *Bergman 1987*; *Williams/Bergman 2010*) are industrially and chronologically connected (Fig. 21; 22; *Demidenko/Hauck 2017*, 93, fig. 3). The hypothesis actually rejects an old idea on a supposedly striking similarity between Early Aurignacian/Aurignacian I in Southwestern France and the Classic Levantine Aurignacian '*that one tempted to view them literally as well as figuratively having just disembarked from*

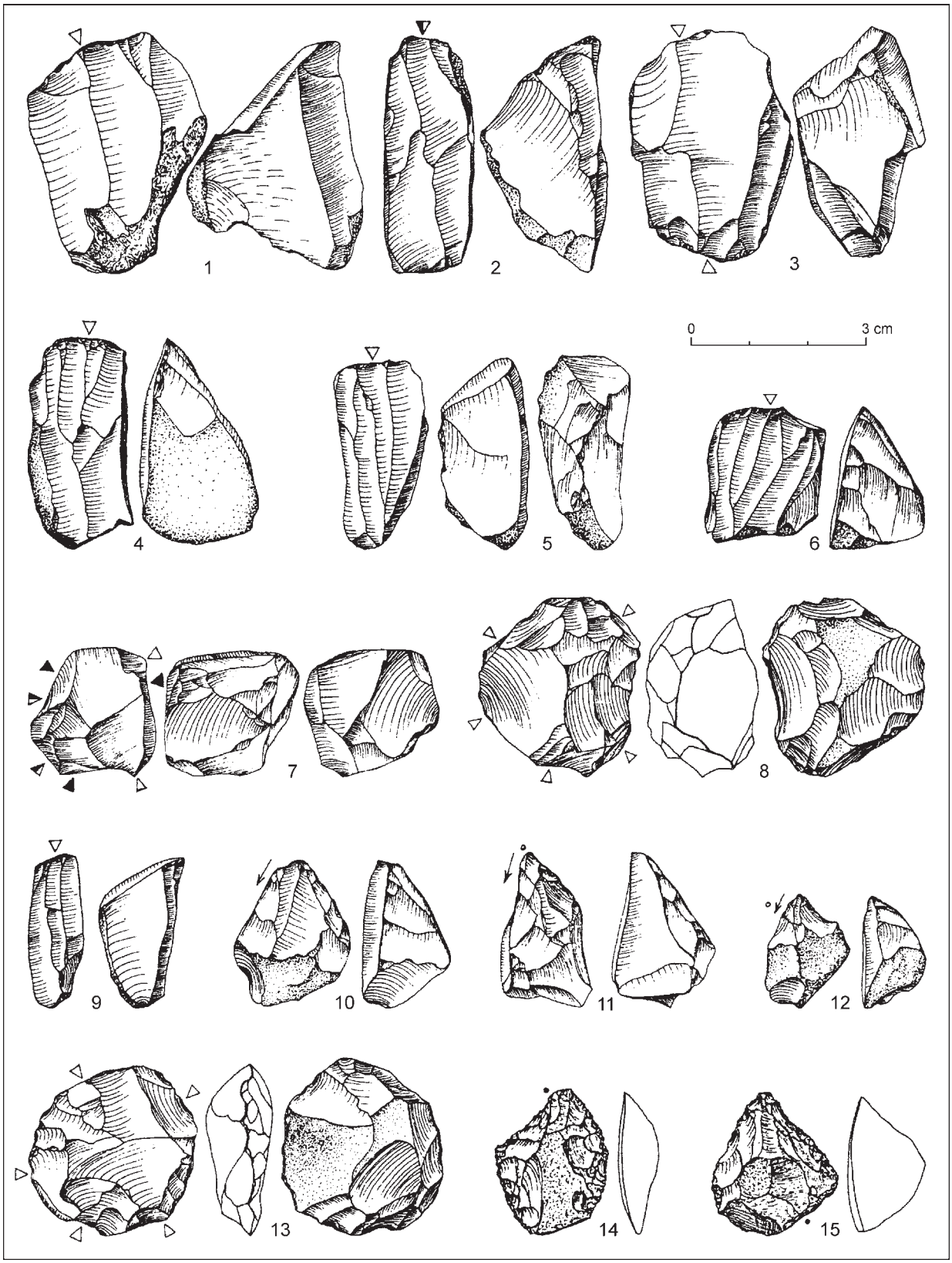

Fig. 21. Yabrud II, layer 1 (Syria). Classic Levantine Aurignacian/Phase 5 Early UP industry. 1–3 – blade cores; 4, 5 – blade/bladelet cores; 6, 9 – bladelet cores; 7, 8, 13 – flake cores; 10–12 – burins on shouldered/nosed endscraper-cores; 14, 15 – shouldered/nosed endscraper-cores (artifact illustrations modified after *Rust 1950*, pl. 93; *Bagdach 1982*, pl. 51–63).

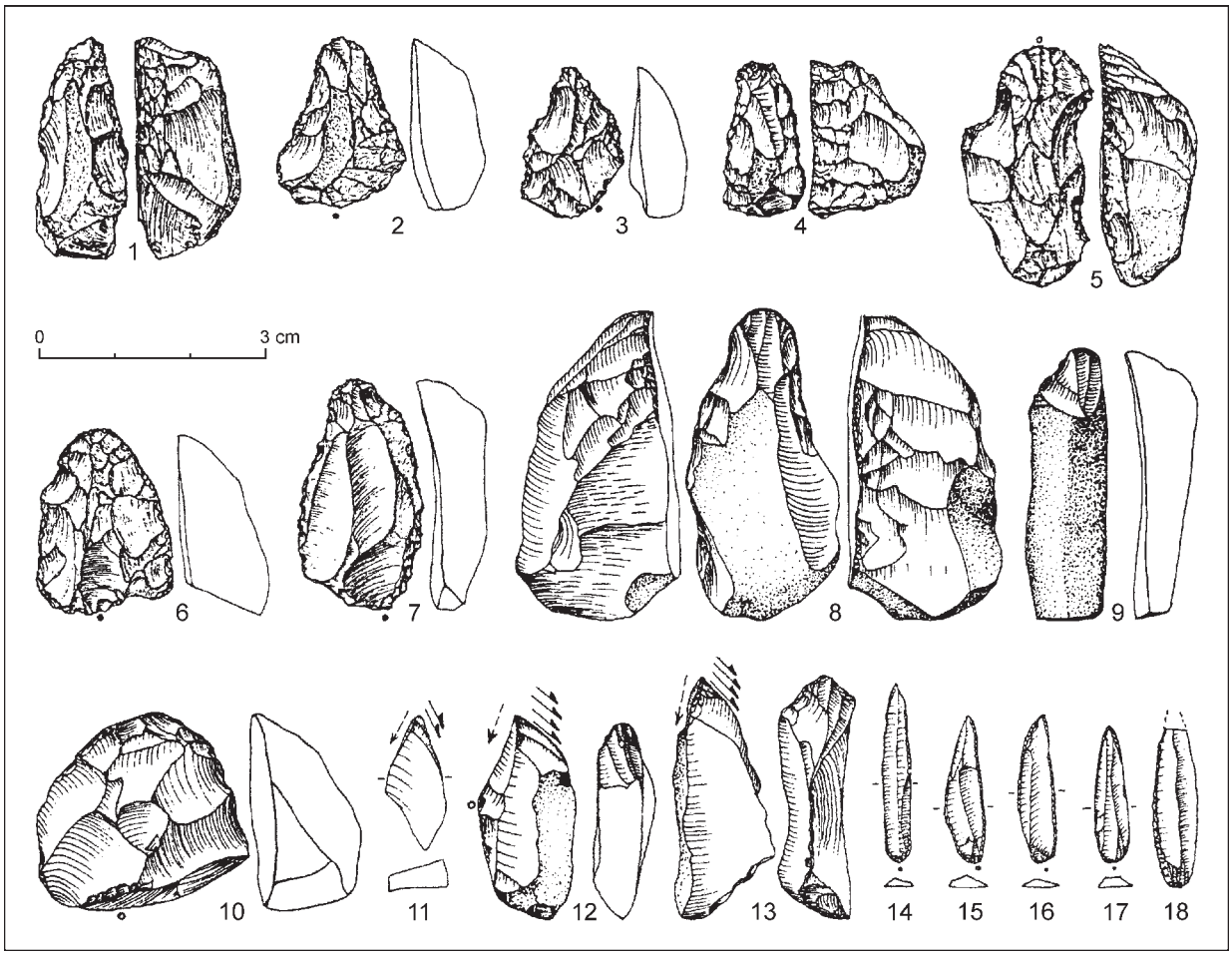

Fig. 22. Yabrud II, layer 1 (Syria). Classic Levantine Aurignacian/Phase 5 Early UP industry. 1–9 – shouldered/nosed endscraper-cores; 10 – wide-fronted carinated endscraper-core; 11–13 – carinated burin-cores; 14–18 – microliths (artifact illustrations modified after *Rust 1950,* pl. 93; *Bagdach 1982,* pl. 51–63).

the boat!' (e.g. *Goring-Morris/Belfer-Cohen 2006*, 307, 308). The newly obtained ^{14}C dates for Levantine sites further support that suggestion when the most securely dated and recently well excavated Classic Levantine Aurignacian materials at Manot Cave, layers VIII–IV in Israel are dated now to ca. 37,000–35,000 cal. BP (*Alex et al. 2017,* 3; *Marder et al. 2021*, 19). From our point of view, the Balkan Peninsula proposes an intriguing 'intermediate' rich in Aurignacian finds site between the Eastern Central Europe and the Levant, Klissoura Cave 1, layers IV–IIIg-d in the Argolide of Peloponnese, Greece with very similar to the present article's Middle Aurignacian artifacts, '*the middle phase of the Aurignacian in the northern Mediterranean*' (*Kaczanowska/Kozłowski/Sobczyk 2010*, 159) and ^{14}C dates between ca. 33,000–31,000 uncal. BP 37,500–35,000 cal. BP (*Kuhn et al. 2010*, 38–40), having even also recognized by us for the Greek site some specific for Willendorf II, AH 4 and Yabrud II, layer 1 (Fig. 21: 10–12) burins on shouldered/nosed endscraper-cores (see *Kaczanowska/Kozłowski/Sobczyk 2010*, pl. 23: 6; 46: 17). Moreover, Aurignacian finds from Franchthi Cave, lower units of stratum R (H1B210–208) again in the Argolide of Peloponnese in Greece (*Douka et al. 2011*) and probably Šalitrena Cave, layer 5 in Western Serbia (*Marrin-Arroyo/Mihailović 2017*; *Plavšić/Dragosavac/Mihailović 2020*) also belong to the discussing Middle Aurignacian. As a result, there is a site chain from Southwestern France via Central Europe and the Balkans to the East Mediterranean Levant. All these data really support a pioneering work of D. Garrod in the East Mediterranean Levant and her Aurignacian hypothesis for the Levantine Aurignacian/R. Neuville's UP stage III on *'the close resemblance on the Aurignacian in both'* Western Europe and South-West Asia and *'the Aurignacian... providing good evidence for cultural diffusion when found at about the same time in separated areas – an assemblage of very distinctive artefacts, identical or closely similar in both regions, and produced by the same methods'* why it is

'most unlikely to have been invented independently in Europe and the Middle East' (*Garrod 1953*, 24). Accordingly, she came to a conclusion that *'the Aurignacian is a relatively late arrival in Palestine and the Lebanon by comparison with its position in Europe, and that the direction of its diffusion must therefore have been from West to East'* (*Garrod 1953*, 32). In sum, all the above-analysed data allow us on a new data and knowledge levels to see a Middle Aurignacian human dispersal from Europe into the East Mediterranean Levant.

As it often happens with some scientific subject studies, a seemingly comprehensive study effort should be then added by some more research. It also relates to our Middle Aurignacian studies which continuation is apparent.

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However, all the above-noted data and the proposed hypotheses are our own and we are only responsible for any possible mistakes.

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Stredný aurignacien Karpatskej kotliny východnej časti strednej Európy

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SÚHRN

Štúdia sa zaoberá definíciou stredného aurignacienu východnej časti strednej Európy, Karpatskej kotliny, s ohľadom na geochronologické kritériá, v kontexte príslušných industrií, podrobne spracovaných v juhozápadnom Francúzsku. Porovnanie menovaných regiónov, spolu s ostatnými európskymi regiónmi a Levantou na Prednom východe umožňuje navrhnúť modely šírenia človeka v období stredného aurignacienu naprieč Európou a západnou Áziou.

Kamenná industria stredného aurignacienu

Výber kamenných artefaktov z francúzskej lokality Abri Pataud (vrstva 8), ako základných pre rozpoznanie príbuzných industrií stredného aurignacienu v Karpatskej kotline sa ukazuje ako kľúčové. V kolekciách sa okrem podobných čŕt vyskytli aj niektoré odlišnosti.

Spoločné črty

Z technologického hľadiska sa v kolekciách stredného aurignacienu v strednej Európe vyskytujú všetky redukčné stratégie a typy jadier, ktoré sú známe pre celý aurignaciensky technologický komplex. Ako v jedinom stupni sa v jeho strednej fáze nachádzajú všetky typy jadier. Ide najmä o unipolárne, prípadne viacnásobne unipolárne, nie však bipolárne varianty. Karenoidné škrabadlá – jadrá zjavne predstavujú počiatočné štádium redukcie mikročepelí, ktorých ťažba bola ukončená v podobe zanechaných vyčnených škrabadiel – jadier. Tie tvoria základný typ nástroja – jadra pre produkciu mikročepelí, čo korešponduje so závermi *A. Michela* (*2010*) z Abri Pataud (vrstva 8). Úštepové jadrá a vyčnené škrabadlá – jadrá reprezentujú najcharakteristickejšie technologické redukčné objekty, kde pôvodné kusy produkovali hrubé úštepy, ktoré ďalej slúžili na prípravu škrabadiel – jadier a následnú produkciu mikročepelí. Mimoriadne dôležitá je ich prítomnosť v málopočetných kolekciách z povrchových zberov ako technologického znaku, resp. príslušnosti k strednému aurignacienu. Iná situácia je v kolekciách získaných počas archeologických výskumov, najmä vďaka plaveniu sedimentov, kde sú početne zastúpené úštepy, ojedinele dokonca aj mikročepieľky (napr. Willendorf II, AH 4).

Z typologického hľadiska dominujú v súboroch Karpatskej kotliny vyčnené škrabadlá – jadrá, menej zastúpené sú široké karenoidné škrabadlá – jadrá, taktiež karenoidné rydlá – jadrá, jednoduché ploché škrabadlá, pričom niektoré z nich sa nachádzajú na laterálne alebo bilaterálne retušovaných polotovaroch. Na druhej strane, absentujú napr. škrabadlá na typických aurignacienských čepeliach, prípadne niekoľkonásobné rydlá. Mikrolity pochádzajú výlučne z lokalít Willendorf II, AH 4 a Napajedla III. Ich spoločným znakom je marginálna jemná retuš, situovaná variabilne, v rôznych častiach jednotlivých exemplárov.

Špecifické črty

Na niektorých lokalitách sú z technologického hľadiska prítomné takmer všetky typy jadier a to v rôznych štádiách ťažby. Súbory Nagyréde 1, 2 a Medzany I, II jednoznačne vykazujú známu variabilitu jadier, prevahu úštepových jadier a mierny výskyt čepeľových jadier, ako aj karenoidné škrabadlá – jadrá *sensu lato*. Na druhej strane ostatné kolekcie, predovšetkým Willendorf II, AH 4 a Napajedla III, poukazujú na absenciu čepeľových jadier, výraznú prevahu karenoidných škrabadiel – jadier *sensu lato* a miernu prevahu úštepových jadier. Tieto rozdiely možno pripísať variabilite typov lokalít. Zaujímavé je využitie úštepových jadier a vyčnených škrabadiel – jadier, ktoré sú akýmsi druhom „domácich jadrovitých predmetov", vyrábaných z miestnych surovín v Abri Pataud (vrstva 8). V Karpatskej kotline poukazujú na dvojaké technologické využitie. Na niektorých lokalitách opäť predstavujú „domáce predmety" vyrábané z miestnych surovín (Nagyréde 1, 2 a Medzany I, II), na iných zase akési „mobilné predmety", vyrábané zo surovín zo vzdialenejších zdrojov.

Z pohľadu typológie pokračuje trend väčšej variability škrabadiel – jadier a škrabadiel ako takých. V súboroch z Nagyréde 1, 2 a Medzian I, II dominujú karenoidné škrabadlá – jadrá *sensu lato* a jednoduché ploché škrabadlá (spolu 50 %). Na lokalitách Willendorf II, AH 4 a Napajedla III prevažujú karenoidné škrabadlá – jadrá *sensu lato* (90 % a 70 %) nad ostatnými jednoduchými plochými škrabadlami (približne 10 % a 30 %). Čo sa týka rydiel, pre lokalitu Abri Pataud (vrstva 8), je príznačné dominantné postavenie hranových variantov na úkor klinových. Situácia je mierne odlišná na východnom Slovensku (Medzany I – 52,9 % klinových rydiel; 5,9 % hranových rydiel; 41,2 % uhlových rydiel. Medzany II – 20 % klinových rydiel; 80 % uhlových rydiel), Maďarsku (Nagyréde 1 – 50 % klinových rydiel; 8,3 % hranových rydiel; 41,7 % uhlových rydiel. Nagyréde 2 – 40 % hranových rydiel; 60 % uhlových rydiel), Rakúsku (Willendorf II, AH 4 – 4,5 % resp. jedno karenoidné rydlo – jadro; 45,5 % klinových rydiel; 31,8 % hranových rydiel; 18,2 % uhlových rydiel) a na Morave (Napajedla III – 20 % resp. jedno karenoidné rydlo – jadro; žiadne klinové rydlá; 40 % hranových rydiel; 40 % uhlových rydiel). Mikrolity sa

v predmetných súboroch vyskytujú ojedinele, a preto nie je možné hovoriť o reálnej prítomnosti tzv. Roc-de-Combe, podtype mikročepelí Dufour, známeho výhradne z francúzskych lokalít. Z tohto dôvodu je v Karpatskej kotline nevyhnutná realizácia nových výskumov.

Organické artefakty, v rámci predmetného regiónu, pochádzajú iba z Willendorfu II, AH 4 a sú početnejšie ako v Abri Pataud. Najcharakteristickejšie sú kostené/parohové hroty s hrubým oválnym prierezom a predĺženou distálnou časťou lancetovitého tvaru. Korešpondujú s tzv. „*pointe losangique à section ovale*" stupňa aurignacien III *D. Peyronyho* (*1933*; *1936*) a „*pointe biconique*", rovnako s oválnym prierezom, stupňa aurignacien IV, v tom čase s výskytom atypických karenoidných rydiel – jadier a typickou prítomnosťou vyčnených škrabadiel – jadier.

V zbierkach kamenných industrií Karpatskej kotliny sa nachádzajú aj elementy, ktoré naopak neboli zistené vo vrstve 8 na lokalite Abri Pataud. Ide predovšetkým o rôzne „stredopaleolitické" varianty radiálnych a diskovitých jadier, vyskytujúcich sa v kolekciách Medzany I, II a Napajedla III. V budúcnosti je potrebná podrobnejšia analýza týchto jadier, ktoré by mohli byť napr. výsledkom vyťaženia mladopaleolitických jadier a ich následného pretvarovania za účelom získania špeciálnych hrubých úštepov a polotovarov pre prítomné škrabadlá. Pozoruhodná je aj prítomnosť driapadiel, ktoré sa len v minimálnom množstve zistili aj vo vrstve 8 v Abri Pataud (*Brooks 1995*, tabela XXII).

Geochronológia stredného aurignacienu

Všetky doteraz datované lokality stredného aurignacienu Karpatskej kotliny sú o niečo mladšie v porovnaní s francúzskou lokalitou Abri Pataud (vrstva 8), radenou do GI-8c, konkrétne 37 900–37 500 cal. BP/33 050 uncal. BP. Zodpovedajú totiž časovému intervalu medzi GI-8a a GI-6 s dátumami: 36 300–35 400 cal. BP/32 100–31 200 uncal. BP pre Willendorf II, AH 4; medzi 36 700–36 200 a 34 100–33 800 cal. BP/32 700–32 300 a 30 000–29 600 uncal. BP pre Napajedla III; medzi 36 000–35 000 a 33 000–32 000 cal. BP/29 200 a 28 700 uncal. BP pre Milovice I. Pre jednoznačné potvrdenie ich mladšieho veku je v Karpatskej kotline potrebné získať viac absolútnych dát. V súčasnosti sú najperspektívnejšie Milovice I, kde aktuálne prebieha nový archeologický výskum.

Sídelná štruktúra stredného aurignacienu v Karpatskej kotline

Predmetné lokality stredného aurignacienu možno na základe primárnej a sekundárnej úpravy kamenných industrií rozdeliť do viacerých typov:

Základné tábory (rezidenčné/obytné lokality) – Nagyréde 1, 2

Situované sú na mieste s dominantným prevýšením nad okolitou oblasťou, s výborným panoramatickým výhľadom na rozsiahle územia blízkej roviny a ľahko dostupného potoka. Pre lokality je s najväčšou pravdepodobnosťou dôležitý neďaleký zdroj surovín na výrobu kamennej industrie. Ide predovšetkým o limnosilicit, zastúpený v celej redukčnej schéme jadier, s ojedinelým zastúpením ďalších regionálnych surovín, či vzdialenejších zdrojov, ktoré vypovedajú o ľudských aktivitách v predmetnej oblasti.

Základné tábory (rezidenčné/obytné lokality) s dielenskou aktivitou – Medzany I, II

Taktiež sa vyznačujú dobrou topografickou polohou, na vyvýšenej terase v blízkosti potoka, s bohatými sekundárnymi zdrojmi rádiolaritu. Na základe redukcie jadier, jadrovitých nástrojov a nástrojov sa východoslovenské lokality podobajú lokalitám Nagyréde 1 a 2. Blízkosť zdrojov rádiolaritu umožnila nositeľom stredného aurignacienu využívať lokality aj ako dielne na pravdepodobný vývoz väčšiny jadier, škrabadiel – jadier a debitáže mimo mikroregión Medzian.

Lovecké stanice, vopred plánované lovecké základné zastávky – Willendorf II, AH 4

Ďalšie lokality sú umiestnené v skrytých topografických podmienkach, v blízkosti rieky s dobrými možnosťami lovu a dostupnosťou miestnych kamenných surovín. Lovci na takéto miesta zrejme prichádzali už s vyrobenými loveckými zbraňami v podobe kostených/parohových hrotov a do nich vsadenými mikrolitmi. Prinášali tiež úštepové jadrá, karenoidné škrabadlá – jadrá *sensu lato*, ako aj hotové nástroje, najmä niektoré typy rydiel, využívaných na obnovu mikrolitov a kostených/parohových nástrojov stratených počas lovu. Niekoľko ďalších nálezov reflektujú stopy po spracovaní ulovenej zveri, napr. ich rozštvrtenia, spracovaní kože, kostí, parožia, či ich konzumáciu. Väčšina aurignacienskych archeologických kontextov z Milovíc I, Pavlova a Dolných Věstoníc na južnej Morave by mohla predstavovať, podobne ako Willendorf II, AH 4, lovecké stanice, hoci nemožno vylúčiť, že išlo aj o základné tábory. Crvenka-At, v srbskej časti Vojvodiny v Banáte, pravdepodobne tiež patrí medzi plánované lovecké stanice.

Lovecké stanice, prechodné lovecké tábory – Napajedla III

Ide o lovecké zastávky na náhodných miestach v rámci prirodzenej trasy, v tomto prípade Napajedelskej brány, pri príležitostných, ale potrebných lovoch kopytníkov, bez prítomnosti lokálnych kamenných surovín v regióne. Vysvetľuje to prítomnosť len niekoľkých domácich nástrojov, jednoduchých škrabadiel, rydiel a dôraz na výrobu mikročepelí z karenoidných nástrojov – jadier *sensu lato* zásobujúcich lovcov niekoľkými ďalšími mikrolitmi. Podľa toho zrejme existovali dva rôzne podtypy loveckých staníc, vopred plánované (napr. Willendorf II, AH 4) a náhodne organizované pre potrebu lovu (napr. Napajedla III).

Jaskynné lokality s nejasnou charakteristikou typu lokality

Bukovac (stredné Srbsko) je zatiaľ jedinou známou jaskyňou so sedimentmi obsahujúci artefakty zo stredného aurignacienu. Archeologický výskum sa však nachádza v počiatočnej fáze.

Absenciu čistých dielní v rámci uvedených typov lokalít stredného aurignacienu možno vysvetliť prítomnosťou základných táborov s určitými dielenskými aktivitami (Medzany I a II), ktoré sa v tomto aspekte podobajú na Abri Pataud (vrstva 8). Je tiež veľmi pravdepodobné, že v Karpatskej kotline existovali niektoré regionálne centrá, ako napríklad Nagyréde 1, 2 v severnom Maďarsku a Medzany I, II na východnom Slovensku.

Šírenie človeka stredného aurignacianu v západnej Eurázii

Na základe aktuálnej geochronológie je možné s istou dávkou opatrnosti skonštatovať, že stredný aurignacien mohol mať svoj pôvod v juhozápadnom Francúzsku, vo včasnom aurignaciene, objavujúcom sa v GI-8c, približne 37 900–37 500 cal. BP. Na druhej strane, lokality Karpatskej kotliny sa zdajú byť o niečo mladšie, so začiatkom GI-8a, zhruba 36 700–36 600 cal. BP. *J. E. Demidenko* a *Th. C. Hauck* (*2017*, 93, obr. 3) už dávnejšie navrhli, že stredný aurignacien v Európe (Abri Pataud, vrstva 8; Willendorf II, AH 4; Napajedla III) a tzv. klasický levantský aurignacien (Ksar Akil, fáza 5 – EUP industria; výskum z 30. rokov 20. stor., vrstvy VIII–VII/1940 a vrstvy Xb–IXc) z východnej časti stredomorskej Levanty (*Bergman 1987*; *Williams/Bergman 2010*) sú prepojené chronologicky a prostredníctvom industrie (obr. 21; 22). Nové C^{14} dáta levantských lokalít tento predpoklad ešte viac podporujú, nakoľko materiál klasického levantského aurignacienu z nedávneho výskumu v jaskyni Manot, vrstvy VIII–IV, v Izraeli je najnovšie datovaný do 37 000–35 000 cal. BP (*Alex et al. 2017*, 3; *Marder a i. 2021*, 19). Z balkánskeho polostrova pochádzajú „medzistanice", medzi východnou časťou strednej Európy a Levantou, ktoré sú bohaté na nálezy stredného aurignacienu. Ide napr. o Peloponézsku jaskyňu Klissoura, vrstvu IV-IIIg-d, v Grécku (*Kaczanowska/Kozłowski/Sobczyk 2010*, 159), s C^{14} dátami v rozpätí 33 000–31 000 uncal. BP, resp. 37 500–35 000 cal. BP (*Kuhn a i. 2010*, 38–40) s prítomnými rydlami na vyčnených škrabadlách – jadrách (*Kaczanowska/Kozłowski/Sobczyk 2010*, tab. 23: 6; 46: 17), identifikovaných aj na lokalite Willendorf II, AH 4 a Yabrud II, vrstva 1 (obr. 10: 11, 12). Podobné nálezy boli nájdené aj v jaskyni Franchthi v spodnom kontexte vrstvy R (H1B210–208), na Peloponéze v Grécku (*Douka a i. 2011*) a pravdepodobne aj v jaskyni Šalitrena (vrstva 5) v západnom Srbsku (*Marrin-Arroyo/Mihailović 2017*; *Plavšić/Dragosavac/Mihailović 2020*).

Z uvedených pozorovaní je možné vyčleniť sieť lokalít od juhozápadného Francúzska cez strednú Európu, Balkán, až po východnú časť stredomorskej Levanty. Podporuje zároveň priekopnícku prácu *D. A. E. Garrodovej* (*1953*) o mladopaleolitickom stupni III R. Neuvilla/levantského aurignacienu a jej hypotézy o podobnosti aurignacienu západnej Európy a juhozápadnej Ázie. Aurignacien podľa nej poskytuje vhodný dôkaz kultúrnej difúzie, nakoľko sa v približne rovnakom čase vo vzdialených geografických oblastiach našli súbory s identickými alebo veľmi podobnými artefaktmi, vyrobené rovnakými metódami a bolo by veľmi nepravdepodobné, aby boli vynájdené nezávisle od seba v Európe a na Strednom východe (*Garrod 1953*, 24). Autorka dospela k záveru, že aurignacien sa v Palestíne a Libanone objavil relatívne neskoro, v porovnaní s Európu a smer jeho šírenia musel byť preto zo západu na východ (*Garrod 1953*, 32). Na záver preto možno skonštatovať, že aj nami vyhodnotené údaje potvrdzujú šírenie človeka stredného aurignacienu z Európy do východnej časti stredomorskej Levanty. Keďže ide o pomerne rozsiahlu problematiku, budúci výskum by sa mal zamerať na získanie ďalších doplňujúcich údajov.