INSTITUTUL DE ARHEOLOGIE „VASILE PÂRVAN”

MATERIALE ŞI CERCETĂRI ARHEOLOGICE
SERIE NOUĂ, SUPPLEMENTUM I

SCRIPTA PRAEHISTORICA. MISCELLANEA IN HONOREM MARIAE BITIRI DICATA

EDITED BY
ROXANA DOBRESCU, ADINA BORONEANȚ, ADRIAN DOBOȘ

EDITURA CETATEA DE SCAUN

2021

COVER: Dan Iulian Mărgărit

MCA SERIE NOUA
SUPPLEMENTUM I

www.mcajournal.ro

Descrierea CIP a Bibliotecii Naţionale a României
Scripta praehistorica : miscellanea in honorem Mariae Bitiri dicata /
ed. by Roxana Dobrescu, Adina Boroneanţ, Adrian Doboş. - Târgovişte :
Cetatea de scaun, 2021
Conţine bibliografie
ISBN 978-606-537-545-1

I. Dobrescu, Roxana (ed.)
II. Boroneanţ, Adina (ed.)
III. Doboş, Adrian (ed.)

902

All papers published in *Materiale şi Cercetări Arheologice* are peer-reviewed.
***Materiale şi Cercetări Arheologice* is indexed in the following data-bases:**
Persée, Copernicus, ERIH PLUS, Scopus, CEEOL, EBSCO and DOAJ.

This volume was edited with the financial support of the "Vasile Pârvan" Institute of Archaeology in Bucharest.

MARIA BITIRI

CONTENTS/SOMMAIRE

THE AURIGNACIAN IN THE CARPATHIAN BASIN OF EASTERN CENTRAL EUROPE AND ITS PROTO-AURIGNACIAN INDUSTRY TYPE

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***Keywords**: Carpathian Basin, Early Upper Paleolithic, Aurignacian industry types, Proto-Aurignacian*
***Abstract**: The article represents our first article in a series planned by us, with some more following articles on Aurignacian, its industry types and possible industrial-chronological variability for a large region in the heart of Europe, the Carpathian Basin, Eastern Central Europe. Our study proposes to define four Aurignacian industry types: Proto-Aurignacian/Aurignacian 0; Early Aurignacian/Aurignacian I; Middle Aurignacian/Aurignacian II; Evolved Aurignacian with Góra Puławska II-type microliths. The present article is particularly devoted to Proto-Aurignacian sites and understanding its artefact complexity and variability. Certain attempts, based upon a number of artefact classification mistakes and their erroneous interpretations try to show that the Basin's assemblages in the Banat (south of the Carpathian Basin) allegedly represent a mixture of Proto-Aurignacian and Early Aurignacian features composing an "Aurignacian 0.5" industry; we demonstrate in detail the proper Proto-Aurignacian industrial status for all the Basin's sites and their finds, with some reservations for the Krems-Hundssteig site, Lower Austria. Moreover, the Carpathian Basin Proto-Aurignacian supports well the Aquitaine Aurignacian scheme. Some variability in the lithic assemblages is explained, in our view through the existence of various site types and their human activities, as it was established for the Ukrainian Transcarpathian record. Thus, finding some real industry variability endorses the classic French scheme.*

***Cuvinte-cheie**: Bazinul carpatic, Paleolitic Superior Timpuriu, industrii aurignaciene, Proto-Aurignacian*
***Rezumat**: Articolul de față este primul dintr-o serie dedicată Aurignacianului, tipurilor de industrii și a posibilelor variații cronologice pe cuprinsul unei arii largi din Europa: Bazinul Carpatic și Europa Centrală și de Est. Studiul nostru propune definirea a patru tipuri de industrii aurignaciene: Proto-Aurignacian/Aurignacian 0; Aurignacian timpuriu/Aurignacian I; Aurignacian Mijlociu/Aurignacian II; Aurignacian Evoluat cu microlite tip Góra Puławska II. Articolul de față este dedicat cu precădere siturilor proto-aurignaciene și înțelegerii complexității și variabilității industriilor litice ale acestora. În unele publicații, bazate pe încadrări și interpretări eronate ale materialului litic, se încearcă demonstrarea amestecului elementelor proto-aurignaciene cu cele aurignaciene timpurii, rezultând așa-numitul "Aurignacian 0.5" în Banat (sudul Bazinului Carpatic); noi demonstrăm statutul proto-aurignacian clar al tuturor siturilor din Bazinul Carpatic, cu unele rezerve în ce privește situl Krems-Hundssteig, din Austria Inferioară. Mai mult, Proto-Aurignacianul din Bazinul Carpatic se încadrează foarte bine în schema Acquitană a Aurignacianului. O anumită variabilitate este explicabilă prin existența a diferite tipuri de situri cu tipuri specifice de activități, după cum este cazul siturilor din Ucraina Transcarpatică. Astfel, existența unei variabilități la nivelul industriilor litice nu face decât să întărească viabilitatea modelului francez.*

"*La Bataille Aurignacienne*" will probably never end (rephrasing Zilhão, d'Errico 1999)

INTRODUCTION

With all possible reservations on the presence of chronologically preceding Initial Upper Paleolithic (hereafter UP) techno-complexes in Europe (e.g. Bohunician, Szeletian, Châtelperronian, Uluzzian, and Streletskian/"Eastern Szeletian"), the Aurignacian is really the first full-fledged UP techno-complex on the Continent with exclusively UP technological and typological features, while the Initial UP techno-complexes always bear some clear Middle Paleolithic (hereafter MP) or Middle Stone Age (hereafter MSA) technological and/or typological elements. Moreover, the Aurignacian is usually regarded as representing the *Homo sapiens* spread into the "European Neanderthal

homeland", resulting in the disappearance of the Neanderthals and their complete replacement by the *Homo sapiens*. At the same time, all but the Bohunician Initial UP techno-complexes are either directly associated with the Neanderthals (Châtelperronian), or thought to be associated with the Neanderthals without direct proof. Accordingly, the Aurignacian is the first fully *Homo sapiens* UP technocomplex in Europe. Therefore, it requires special attention from Palaeolithic archaeologists.

By the industrial-chronological data, the Aurignacian belongs to the Early UP, the cultural unit following the Initial UP, and it is subdivided into several chronologically sequential industrial types. From our point of view, the latter archaeological subdivision of the Aurignacian techno-complex (e.g. Laplace 1958; Sonneville-Bordes 1960; 1982; Lucas 1997; Bon 2002; 2006; Bordes 2002; Demidenko 2003; 2004; Le Brun-Ricalens *et alii* 2005; Teyssandier 2007; Demidenko, Noiret 2012; Michel 2010; Anderson 2019; Dinnis *et alii* 2019) explains well the actual impossibility to propose a single stone artefact techno-typological definition for the Aurignacian techno-complex as a whole, due to the fact that each industrial type has its own artefact type characteristics and the types vary significantly in quantitative representativeness. This is additionally complicated by a long lasting temporal duration of the Aurignacian, c. 8 000 years (chronologically comparable with the Gravettian UP techno-complex), spanning from the Greenland Stadial (hereafter GS) 11 / Greenland Interstadial (hereafter GI) 10 (c. 42–41 ka cal BP) to probably the GI 6 (c. 34–33 ka cal BP). Therefore, any real study of Aurignacian sites and their artefact assemblages should be carried out through the study of their industry types, and not by lumping together all of them into just one industry unit. Precisely such research is proposed to be initiated for the Aurignacian data within the Carpathian Basin in Eastern Central Europe in the present article. Particularly the Proto-Aurignacian, chronologically the first Aurignacian industry type, will be the prime subject in this first paper of a series on the Aurignacian in the Carpathian Basin. The geographical location of the study region additionally reinforces the relevance of our research on the Aurignacian.

THE CARPATHIAN BASIN: A GEOGRAPHICAL SETTING FOR THE AURIGNACIAN STUDIES

The Carpathian Basin (a region over 200 000 km^2 with mostly areas of c. 100–300 m above mean sea level), also known as the Pannonian Basin, Tisza-Danube Basin, and Mid or Central Danubian Basin (Fig. 1), with the predominant relief consisting of various lowlands and mountain slopes facing towards the lowlands, is mostly sub-circular in shape. The Pannonian/Hungarian Plain is subdivided by the Trans-Danubian Mountains into the Great (Eastern) Hungarian Plain and the Little (Western) Hungarian Plain (Stančík *et alii* 1988). The Danube and the Tisza Rivers also divide the Carpathian Basin almost in half following a north–south line. The Basin is surrounded by imposing mountain ridge boundaries: the Eastern Alps to the west, the Carpathians to north and east, the Dinaric and Šumadija Mountains to the south. By current state territories, the Carpathian Basin stretches (west to east) from the Eastern Austria and the Southern Moravia of the Czech Republic to Transcarpathia of Ukraine and Transylvania of Romania (c. 800 km), and from the central belts of Slovakia to the Banat of Serbia and Romania from north to south (c. 400 km).

The hilly terrains and mountain slopes of the Carpathian Basin are areas where UP sites in general and Aurignacian sites in particular are found, either *in situ* or as surface lithic artefacts scatters. The site and/or surface find spots are usually located close to river valleys, near their tributaries or along certain streams. The Basin is also characterized by numerous primary and secondary sources of various lithic raw materials with good flaking qualities, intensively used by the Palaeolithic human groups (e.g. Biró 2011; Mester ed. 2013; Přichystal 2013; Rácz *et alii* 2016). At the same time, Early UP and Aurignacian sites are mainly distributed at the edges of the Carpathian Basin in its hilly/mountain areas due to the fact that the lowlands of the Pannonian Plain are occupying the centre of the study region. Such a particular geomorphologically predetermined site location should be kept in mind during certain possible site distribution analyses for the region.

It is also worth noting a common practice nowadays, i.e. considering each region in the Old World Paleolithic Archaeology to be at crossroads for human group moves. However, the Carpathian Basin indeed lies at such a crossroad between Western and Eastern Europe, being located in the south-eastern part of Central Europe while it geographically links all western and northern regions of Central Europe to Eastern Europe and the Balkans. By acknowledging also the great importance of the Danube River, whose middle sector flows through the Carpathian Basin, serving as a corridor for Aurignacian human movements not only through various Central European territories but also from the Near East into Europe (e.g. Conard, Bolus 2003), the importance of a new re-assessment of the Aurignacian in the Carpathian Basin becomes more than obvious.

AURIGNACIAN DATA RECOGNITION: THE BASIC STUDY METHOD

Despite of over a century of Aurignacian studies in the Carpathian Basin, since the discovery of the Willendorf II and Krems-Hundssteig sites in the Wachau valley of the Middle Danube in Lower Austria (the north-western corner of the Carpathian Basin already at the piedmonts of the Bohemian Massif) (Szombathy 1909; Strobl, Obermaier 1909; Felgenhauer 1959) and even some special synthesis work carried out during the last 10 years (e.g. Nigst 2012; Demidenko *et alii* 2017; Chu 2018), the real understanding of various Aurignacian industry types and their specific artefact "fossil" types is still far from clear. In the attempt to understand the Aurignacian variability, our study method is to identify, first of all, the true Aurignacian assemblages from among the numerous and industrially diverse Early UP assemblages (see, for example, in Chu 2018) of the region. Thus, we decided not to include into our study a number of assemblages. Among them are many earlier excavated materials that might represent industrially mixed artefact collections which still have some definite Aurignacian artefact types (e.g. the Barca site complex in Eastern Slovakia – Bánesz 1968). Also, there are many surface collections and even some *in situ* materials with clear Aurignacian-looking artefact types but the types either do not allow us to relate strictly these materials to one or other Aurignacian industry type defined by us (e.g. see some of the surface collections in Chu *et alii* 2019a and the Seňa I site materials in Chu *et alii* 2020) or might even have an actual Early Epigravettian affiliation of the found Aurignacian-like artefacts (e.g. a part of the finds from the Andornaktálya-Gyilkos Késő surface find spot – Béres, Demidenko 2019). Finally, even some Aurignacian well excavated *in situ* sites were excluded from our paper as the study of their materials is still in progress (e.g. Stratzing-Galgenberg site – Brandl *et alii* 2015). It is also worth remembering that the present effort will only analyze in detail Aurignacian materials - *sensu stricto,* with no discussions of the presence in the region of the LGM "Epi-Aurignacian" assemblages (e.g. Demidenko *et alii* 2019a). As a result of the strict recognition of different Aurignacian industry types through the well-known techno-typological standards already established in Europe, the actual number of assemblages included in our research is rather limited and they might not represent the entire industrial Aurignacian spectrum in the region. Still, it offers a good perspective for more studies on the Aurignacian topic in the region both during our on-going and the future research.

AURIGNACIAN INDUSTRY TYPES FROM THE CARPATHIAN BASIN CONSIDERED IN THE PRESENT STUDY

Following the established study method and looking at the available Aurignacian record in the region, the following four Aurignacian industry types were defined (Demidenko *et alii* 2019b): *Proto-Aurignacian/Aurignacian 0*; *Early Aurignacian/Aurignacian I*; *Middle Aurignacian/Aurignacian II*; *Evolved Aurignacian with Góra Puławska II-type microliths*. Other possible industry types will be additionally discussed briefly in a view of identifying certain potential candidates for further studies.

Each concrete industry type definition is based mainly on the lithic artefact techno-typological characteristics and only partly on the organic tool data, due to the usually limited presence of the latter pieces in some cave sites in the region. It is also necessary to mention here that any recent "intermediate facies and/or adaptive model" approach (e.g. Sitlivy *et alii* 2012; Bataille *et alii* 2018) objectively leading to a kind of erosion of strict Aurignacian industry types are not addressed here. Our negative position to such proposals for inducing, from our point of view, an Aurignacian industry types "chaos" is explained by a few factors. First of all, there are some certain errors in the definition and then interpretation of the various lithic artefact types, followed by the usage of small artefact assemblages with limited numbers of indicative lithic types, and, of course, some of the Aurignacian internal lithic variability data itself. Specific information on such errors and dubious interpretations will be given during each industry type discussion. In sum, the authors of the present article take side with the colleagues supporting the strict Aurignacian industry type definition method used for south-western France/the Aquitaine Basin as a type region (for the latest updates see, for example, Dinnis *et alii* 2019). We will thus try to show its applicability to the Aurignacian materials from the Carpathian Basin, too.

PROTO-AURIGNACIAN ASSEMBLEGES IN THE CARPATHIAN BASIN

Indeed, the Proto-Aurignacian/Aurignacian 0 comes first chronologically and industrially, the so-called Initial Aurignacian industry type recognized in Europe (see also "*Périgordien II (Bos-del-Ser type)*" – Peyrony 1933; 1936; "*Protoaurignacien à pieces à dos marginal*" – Laplace 1958; 1966; "*Aurignacien à lamelles/Aurignacien 0*" –

Sonneville-Bordes 1955a; 1955b; 1960); the prefix "proto-" is used to better distinguish it from the later Aurignacian industry types. As an Aurignacian industry type belonging to Early UP stage, the Proto-Aurignacian is also the only (!) Aurignacian and Early UP industry type geochronologically placed during the time period preceding the Heinrich Event 4 (HE-4) and the Campanian Ignimbrite (CI) eruption, c. 46.000–40.000 cal BP, GI-12–GI-9 (Fedele *et alii* 2002, 2008; Zilhão 2006; Banks *et alii* 2013; Barshay-Szmidt *et alii* 2018) that archaeologically is synchronous with both the Latest Middle Paleolithic and Neanderthals, and the Initial UP and *Homo sapiens*. At the same time, there is data from Italy (e.g., Riparo Bombrini in Liguria, north-western Italy – Riel-Salvatore, Negrino 2018) indicating the possibility that some Proto-Aurignacian *Homo sapiens* were able to survive the harsh climate conditions of the HE-4 and CI eruption for a little while. Anyway, taking into consideration some new dating results (see Bard *et alii* 2020), the position of the Proto-Aurignacian in such a mosaic of various Paleolithic industries and human types becomes even more intriguing. Finally, a possible "generic connection" of the European Proto-Aurignacian to a specific facies of the Ahmarian in the East Mediterranean Levant (Demidenko 2012a; Demidenko, Hauck 2017) makes the Carpathian Basin a key geographic area for understanding the Proto-Aurignacian *Homo sapiens* penetrations into the hinterlands of Central and Western Europe.

The following sites from the Carpathian Basin are assigned by us to the Proto-Aurignacian: Krems-Hundssteig in Lower Austria, north-western corner of the Basin; Românești-Dumbrăviţa I and II, Coşava, and Tincova in the Romanian Banat and Crvenka-At in the Serbia Vojvodina's Banat, south-south-west of the Basin; Berehove I and Berehove II–VII and Muzhievo 1–5 surface find spots in the Ukrainian Transcarpathia, and the site of Tibava in Eastern Slovakia, north-western corner of the Basin. Additionally, some very new research in the Velika Morava River valley in Central Serbia at Orlovača Cave, as well as at some open-air surface find spots in north-eastern Hungary might also possibly indicate the Proto-Aurignacian presence in the southern and northern parts of the Basin. Thus, aside from Krems-Hundssteig located on the north-western corner of the Basin, all other Proto-Aurignacian sites are not connected strictly to the Danube River valley but to its various tributaries. Also, site locations are restricted to the margins of the Basin. Other than Orlovača Cave, the Proto-Aurignacian sites are open-air loci and this site's specificity is not due to the absence or rarity of rocky cavities/shelters in the region.

From the point of view of absolute chronology data, up to date there is only one Proto-Aurignacian site with some reliable dates in the Basin. It is Românești-Dumbrăviţa I in the Romanian Banat where following recent excavations, the Proto-Aurignacian horizon 3 (GH 3) indicates an average absolute OSL and TL age of c. 41.000 cal BP (Schmidt *et alii* 2013, p. 3750), a time interval between the GI-10–GI-9. The scarcity of absolute dates definitely stresses the need to get more absolute ages for the Basin's Proto-Aurignacian sites, although many dating attempts are complicated by the absence or the bad preservation of any organic materials at the sites. Thus, the near absence of absolute dates makes us, the archaeologists, use artefact data as a key factor for proposing the Proto-Aurignacian attribution for the site materials here.

It is worth mentioning some Proto-Aurignacian studies in the late 1990s and early 2000s. The senior author of the present paper (Yu.D.) while working on the assemblages from Siuren I rock-shelter (Crimea, south of Eastern Europe) representing the Proto-Aurignacian with Dufour type *lamelles* (five archaeological levels of the 1990s excavations Units H & G) and he Late/Evolved Aurignacian with Roc de Combe type *lamelles* (four archaeological levels from the 1990s excavations Unit F) had to develop in many ways his own systems of both artefact classification and interpretation, as well as to suggest the industry's name "Early Aurignacian of Krems-Dufour industry type" for a unification of all such artefact assemblages all over the Europe (e.g. Demidenko 2002; Demidenko 2000–2001; Demidenko *et alii* 1998; Demidenko, Otte 2000–2001). However, the Siuren I and the associated final data were only published in detail in the early 2010s (Demidenko *et alii* (eds.) 2012). The problem was that in the early 1990s the notion of Proto-Aurignacian / Aurignacian 0 had lost its original sense proposed by G. Laplace (e.g. Djindjian 1993) while the Demidenko's Proto-Aurignacian studies for Eastern Europe were even criticized (e.g. Djindjian 2006), and it was only since the early 2000s that a new generation of French archaeologists "rehabilitated" the Proto-Aurignacian's status (see again Bon 2002; 2006; Bordes 2002; Le Brun-Ricalens *et alii* 2005; Teyssandier 2007). During the late 1990s and early 2000s, the industrial characteristics described by Demidenko for the Proto-Aurignacian were similar to the ones proposed then by the French colleagues and the only significant difference noted by him was a technological accent placed on the bladelet core reduction based upon the various types of bladelet cores on chunks/nodules.

Here it is worth citing the main technological features defined for the Siuren I Proto-Aurignacian and published 20 years ago: "*Primary flaking processes were mainly directed toward bladelet and, to a lesser extent, microblade production (together 40.3–51.1% of the 1990s all debitage pieces, including tool blanks and core maintenance products) with such main morphological features as "on-axis" orientation and flat/incurvate and twisted general profiles. This bladelet and microblade production was associated with reduction of blade/bladelet and bladelet*

cores, which included the so-called "carinated" types (fig. 3: 16–18; 4: 25–26). The amount of blades is about half as much in comparison with bladelets and microblades" (Demidenko, Otte 2000–2001, p. 135–136)

Moreover, the clearly observed independence of bladelet reduction from the blade / bladelet reduction at Siuren I Proto-Aurignacian was proved through the presence of both crested bladelets and bladelet cores (see Demidenko 2012b, p. 287–295). As a result, the technological co-occurrence of blade / bladelet and bladelet-only core reductions has been proposed for some Proto-Aurignacian assemblages in the late 1990s and the early 2000s, also supported by some new Aurignacian studies (e.g. Dinnis *et alii* 2019). That is why it is hard to understand why the independent bladelet reduction was recently proposed as one of the technological features "erasing" most differences between the Proto-Aurignacian and the Early Aurignacian/Aurignacian I (Bataille 2016; Bataille *et alii* 2018; Falcucci *et alii* 2017). At the same time, all Proto-Aurignacian basic typological features recognized by both Demidenko for Eastern and Central Europe and the French colleagues for Western Europe generally coincide. They can be shortly summarized as follows: numerous and typical Dufour type *lamelles* with mostly alternate retouch and some presence of the Krems / Font-Yves points; rarity or absence of carinated burin-cores; bladelet carinated cores on chunks/ nodules are better represented than carinated endscraper-cores on debitage pieces or make a significant part of all carinated pieces; serial simple flat endscrapers; typical burins on truncation, lateral retouch and angled ones with, at the same time, rare occurrence of dihedral burins; some presence of splintered pieces, truncations and borers, and, finally, the near absence of Aurignacian heavily retouched blades. The lithic artefacts are usually complemented, in stratified sites with good preservation of the organic remains, by simple bone / antler points and awls; at the same time, it is noted the absence of the so typical Early Aurignacian/ Aurignacian I antler split-based points (but see Falcucci *et alii* 2020, p. 121, 126–127), and the presence of various mollusk-shell beads.

Understanding that often when dealing with various sites – functionally different, some excavated over small surfaces, other excavated long ago without modern fine excavation procedures, plus the sites known only through surface materials, a regional overview with a search for all objectively possible recognized Proto-Aurignacian sites and find spots has been done here using not all but several basic techno-typological criteria for the lithic artefacts, the so-called "fossil types" for the Proto-Aurignacian. These show a clear basic blade debitage character; the dominance of bladelet carinated cores on chunks/nodules ("*a bladelet "carinated" core, opposite to a carinated endscrapers, should always have bladelet removal scars longer than the width of the core's striking platform from which the bladelet removals were struck off*" – Demidenko 2012c, p. 97) over still serial wide-fronted carinated endscraper-cores on debitage pieces; the presence of some thick shouldered endscraper-cores with, at the same time, the rarity of true nosed endscraper-cores; absence or rare occurrence of carinated burin-cores; numerous microliths of the Dufour type and some presence of the Krems / Font-Yves points.

Lower Austria and the Krems-Hundssteig site

Although a famous Aurignacian site in Europe, its name having been used for the initial definition of the Aurignacian of the Krems-Dufour industry type and the Krems type point with alternate retouch on *lamelles* (e.g. Kozlowski 1965; Hahn 1977), the site, located on a terrace c. 300 a.s.l. near the Krems River, a tributary of the Danube River, was actually never properly excavated. It was recognized as a site during the removal of lots of sediment in a process of loess quarrying in Krems for the construction of the Danube high dam nearby, in the 1890s and 1900s. Numerous lithic artefacts and animal bones, as well as fireplaces were recognized at different depths during the quarrying processes. The finds were reported to the archaeologists and then J. Strobl acknowledged the archaeological site there. However, the site was not excavated at the time and at Strobl's request, dam workers collected thousands of artefacts, including c. 2000 retouched microliths, later recognized among the finds gathered in the 1960s and 1970s (Broglio, Laplace 1966; Laplace 1970; Hahn 1977). These really surprising artefacts, such numerous microliths for a non-excavated site, are explained by the fact that the workers were paid to found the lithics, and the multi-colored lithic items of various rock types were really easy to spot in the pale yellow loess sediments. The first scientific publication on the site was quickly authored by J. Strobl with H. Obermaier (lithic artefacts, fauna and flora studies) and O. von Troll (gastropods) (Strobl, Obermaier 1909). The authors of the article suggested a Lower Aurignacian character of the found artefacts (c. 20 000 lithics, including c. 3 500 tools, 128 perforated mollusk shells and 2 bone awls). Interestingly, Obermaier mentioned the presence of a few Mousterian-like points and sidescrapers he called "*pseudo-Moustérien artefacte*" (Strobl, Obermaier 1909, Taf. XIII, 1–6). Although part of these Mousterian-like artefacts were later rightly identified as various endscraper types (Laplace 1970, p. 243), the presence of a several meter thick loess sediment sequence with fireplaces reported at various depths (Strobl,

Obermaier 1909, Taf. XI, Fig. 1) leaves no doubt that there is also possible to have some Middle Paleolithic remains at the base of the site's sequence. Thus, one can say that the studies of the Krems-Hundssteig lithics questioned their industrial homogeneity from the very beginning. Also, Obermaier placed a strong accent on the three following lithic tool types, naming them in modern terms: carinated endscraper-cores (Strobl, Obermaier 1909, Taf. XIX, 1–10; XX, 1–4; XXI, 1–7), retouched blades (Strobl, Obermaier 1909, Taf. XV, 2–8; XVI, 1–8; XVII, 1–9) and endscrapers on retouched blades (Strobl, Obermaier 1909, Taf. XVIII, 1–14). The illustrated retouched blades also contain some heavily retouched items with real Aurignacian heavy scalar and stepped retouch (Strobl, Obermaier 1909, Taf. XVI, 7) and a series of strangled blades and endscrapers on strangled blades, so typical for the Early Aurignacian / Aurignacian I (Strobl, Obermaier 1909, Taf. XVII, 6–9). These Aurignacian blades and especially the strangled blades and the endscrapers on strangled blades do not usually occur in Proto-Aurignacian assemblages at all; the presence of an Early Aurignacian component, in addition to the already suggested Middle Paleolithic one, is also more than possible at the site. Recently, a study of the Krems-Hundssteig site artefacts stored at the Krems town museum indicates that the site's lithic collection might exceed the previously presumed c. 20 000 pieces, the actually amount reaching up to c. 60–70 000 items; additionally, the study revealed clear data on an Early Aurignacian-like blade core primary reduction at the site (Shidrang *et alii* 2016). Thus, the presence of an Early Aurignacian occupation at the site is very likely, although the presence of the "personal ornament package", the mollusk-shell beads typical for the Proto-Aurignacian, might in fact indicate a rather minor Early Aurignacian occupation at the site. Finally, the acknowledged presence of Gravettian lithics among the site finds was clearly confirmed by the new excavations at the site in 2000–2002 (Neugebauer-Maresch 2008; Neugebauer-Maresch (ed.) 2008) when a sequence over 1 m thick, comprising six Middle Gravettian of Pavlov industry type horizons (AH 3.1–3.8) with uncalibrated dates around 28.000 BP (c. 32–31.000 cal BP) was studied. However, the site's Aurignacian artefact bearing sediments were c. 1.5–2 m below the Gravettian horizons and were, unfortunately, not excavated because of the particular demands of the salvage excavations. All in all, the Krems-Hundssteig site, aside of the clearly established Proto-Aurignacian and Middle Gravettian archaeological components, might contain Middle Palaeolithic and Early Aurignacian remains as well. It definitely makes the site a Paleolithic multi-layered locus with various artefact industry types.

Nevertheless, the well analyzed in the 1960s and 1970s (Broglio, Laplace 1966; Laplace 1970; Hahn 1977) site's Proto-Aurignacian component is certainly the most dominant one recovered among the finds from the early last century. The finds analyzed then consist of almost 4.000 lithic artefacts - 3.967 pieces in Broglio and Laplace's accounts and 3.950 pieces in Hahn's accounts. In the Palaeolithic archaeology of the 1960s and 1970s, core reduction data were not analyzed in any details yet, although core numbers alone are still impressive: 363 items in Broglio and Laplace's accounts and 505 items in Hahn's accounts (Table 1). Accordingly, most of the colleagues' attention has focused on the lithic tool-kit analysis. The 1960s Broglio and Laplace data indicate the presence of 3.583 tools and the most indicative in terms of the Proto-Aurignacian aspect and the numerous tool classes among them are the endscrapers (387 pieces with some various double examples), burins (117 pieces), and – in our terms, non-geometric microliths: *lamelles* with a fine lateral / bilateral retouch (1.904 pieces), so-called Dufour type items with alternate retouch (1.615) and ventral retouch (132) and pseudo-Dufour type items (see Demidenko 2012c, p. 101) with lateral dorsal retouch (70) and bilateral dorsal retouch (87), and points with a fine retouch (142 pieces) (Font-Yves/Krems point types with so-called Krems type variant having an alternate retouch – see Demidenko 2012c, p. 101–102). In total, these tool classes amount to 2.550 pieces; their percentages are: 15.2% endscrapers, 4.6% burins, 74.6% *lamelles* with a fine retouch, 5.6% points on *lamelles* with a fine retouch. The 1970s Hahn total tool data (3.379 pieces) indicate the presence of 399 endscrapers (15.7%), 202 burins (8.0%), 1.854 *lamelles* with a fine retouch (73.1%) and 82 points (3.2%) for a total of 2.537 such tools. Here we specially leave aside from our accounts and analysis the numerous retouched blades (re-calculated by us as 481 pieces in the 1960s data and 457 pieces in the 1970s data) because of the two following reasons. Firstly, some of the retouched blades could indeed be associated with the site's non-Proto-Aurignacian, Early Aurignacian component and their two types (blades with Aurignacian-like retouch and blades with Aurignacian-like strangled retouch will be, however, still counted); secondly, there is no separation between blades with marginal and/or irregular retouch, a fact which makes difficult to compare the retouched blades with some other Proto-Aurignacian assemblages.

Groups & Types	Siuren I,	Siuren I,	Krems-Hundssteig,	Krems-Hundssteig,	Fumane, Units A2 & A1
	1920s excavation lower Layer 1	1990s excavation Units H & G 2	1960s analysis data 3	1970s analysis data 4	external part of the cave 5
ENDSCRAPERS	***23 / 15.2%***	***20 / 6.9%***	***387 / 15.1%***	***399 / 15.7%***	***62 / 3.3%***
Carinated endscrapers & cores	5 / 21.7%	9 / 45.0%	210 / 54.3%	182 / 45.6%	21 / 33.9%
Shouldered / Nosed endscrapers	2 / 8.7%	3 / 15.0%	24 / 6.2%	24 / 6.0%	0
Simple & flat endscrapers	14 / 60.9%	6 / 30%	62 / 16.0%	63 / 15.8%	32 / 51.6%
Endscrapers on laterally/ bilaterally retouched pieces	2 / 8.7%	2 / 10%	91 / 23.5%	130 / 32.6%	9 / 14.5%
Endscrapers on blades with Aurignacian-like retouch	0	0	some piece presence	some piece presence	0
Endscrapers on Aurignacian strangled blades	0	0	some piece presence	some piece presence	0
BURINS	***36 / 23.8%***	***19 / 6.6%***	***131/ 5.1%***	***202 / 8.0%***	***56 / 3.0%***
Carinated	0	0	2 / 1.5%	7 / 3.5%	8 / 14.3%
Dihedral	9 / 25%	3 / 15.8%	33 / 25.2%	52 / 25.7%	10 / 17.8%
On truncation / transversal on lateral preparation	16 / 44.4%	6 / 31.6%	45 / 34.4%	54 / 26.7%	4 / 7.1%
Angle / transverse on natural surface	11 / 30.6%	10 / 52.6%	51 / 38.9%	89 / 44.1%	34 / 60.8%
LAMELLES with a fine lateral / bilateral retouch	***90 / 59.6%***	***39 + 202 = 241 / 83.8%***	***1 904/ 74.3%***	***1 854 / 73.1%***	***1 635 / 86.1%***
Dufour, *lamelles* with alternate / alternating retouch	78 / 86.7%	31 + 150 = 181 / 75.1%	1 615 / 84.8%	1 565 / 84.4%	954 / 58.3%
Dufour, *lamelles* wih ventral retouch	0	3 + 17 = 20 / 8.3%	132 / 6.9%	8 / 0.4%	372 / 22.8%
Pseudo-Dufour, lamelles with lateral dorsal retouch	4 / 4.4%	2 + 21 = 23 / 9.5%	70 / 3.7%	165 / 8.9%	309 /
Pseudo-Dufour, lamelles with bilateral dorsal retouch	8 / 8.9%	3 + 14 = 17 / 7.1%	87 / 4.6%	116 / 6.3%	/ 18.9%
FONT-YVES / KREMS POINTS with a fine retouch	***1 / 0.7%***	***3 + 4 = 7 / 2.4%***	***142 / 5.5%***	***82 / 3.2%***	***143 / 7.5%***
BLADES Strangled with Aurignacian-like retouch	***0***	***0***	***some piece presence***	***some piece presence***	***0***
BLADES with Aurignacian-like retouch	***1 / 0.7%***	***1 / 0.3%***	***some piece presence***	***some piece presenc***	***1 / 0.1%***
TOTAL	151 / *100%*	288 / *100%*	> 2 564 / *100%*	> 2 537 / *100%*	*1 897 / 100%*

Table 1. Krems-Hundssteig with Eastern and Western European Proto-Aurignacian sites and their most indicative tool classes and types.
Tables 1 – 5 site artefact data have been re-calculated from the following publications: 1 - Siuren I, 1920s Lower layer (Hahn 1977); 2 - Siuren I, 1990s Units H & G (Demidenko, Chabai 2012a; 2012b); 3 - Krems-Hundssteig, 1960s data (Broglio, Laplace 1966; Laplace 1970); 4 - Krems-Hundssteig, 1970s data (Hahn 1977); 5 - Fumane, Units A2 & A1 (Falcucci *et alii* 2020); 6 - Românești-Dumbrăvița I; Tincova, Coșava I 2000s data (Bălțean 2011); 7 - Românești-Dumbrăvița I; Tincova, 1970s data (Hahn 1977); 8 - Coșava I 2010s data (Sitlivy *et alii* 2014); 9 - Românești-Dumbrăvița I 2010s data (Sitlivy *et alii* 2012); 10 - Berehove I (Usik 2008).

The internal typological representation of listed tool classes is also possible to trace. Endscrapers (no duplicates present – 387 pieces in the 1960s accounts and 399 pieces in the 1970s accounts) consistently show a significant predominance of the wide-fronted carinated endscrapers (210 items/54.3% in the 1960s accounts and 182 items/45.6% in the 1970s accounts) (Fig. 2, no. 2–7) and thick nosed / shouldered endscrapers (24 items in both the 1960s and 1970s accounts – 6.2% and 6.0%, respectively) (Fig. 2, no. 8) over simple flat endscrapers (62 items/16.0% in the 1960s accounts and 63 items/15.8% in the 1970s accounts). At the same time, numerous simple flat endscrapers with lateral and/or bilateral retouch (91 items/23.5% in the 1960s accounts and 130 items/32.6% in the 1970s accounts) should be taken with caution, as a good part of them might belong to the site's Early Aurignacian component. It is also worth noting here that a good share, if not even the majority of the wide-fronted carinated endscrapers should be now named bladelet carinated cores. Burins (with no few flat examples but with additionally separately taken burin ends for double / multiple examples – 131 pieces in the 1960s accounts and 202 pieces in the 1970s accounts) are, first of all, characterized by a very few number of carinated pieces (2 items/1.5% in the 1960s accounts and 7/3.5% items in the 1970s accounts) and a subordinate position of dihedral pieces (33 items/25.2% in

the 1960s accounts and 52 items/25.7% in the 1970s accounts). On the other hand, the best represented type is the angle burin (51 items/38.9% in the 1960s accounts and 89/44.1% items in the 1970s accounts) and on truncation/retouched (45 items/34.4% in the 1960s accounts and 54/34.4% items in the 1970s accounts) ones. *Lamelles* with a fine retouch are dominated by the Dufour sub-type pieces with alternate retouch (1.615 items/84.8% in the 1960s accounts and 1.565 items/84.4% in the 1970s accounts) (Fig. 2, no. 9–14) and ventral retouch (132 items/6.9% in the 1960s accounts and 8 items/0.4% in the 1970s accounts) (Fig. 2, no. 15–16). At the same time, the so-called pseudo-Dufour pieces with dorsal lateral retouch (70 items/3.7% in the 1960s accounts and 165 items/8.9% in the 1970s accounts) and dorsal bilateral retouch (87 items/4.6% in the 1960s accounts and 116 items/6.3% in the 1970s accounts) are much fewer. Points on *lamelles* with a fine retouch (Font-Yves / Krems point types with so-called Krems type variant) (Fig. 2, no. 17–30) do also appear in the above-noted good series of examples. Most likely, the number of points was even higher if one counts the 1960s fragmented *lamelles* with a fine retouch. There are 744 proximal and 343 medial fragments of Dufour *lamelles* with alternate retouch, 1.087 items or 67.3% of all this type microliths, and 55 proximal and 24 medial fragments of pseudo-Dufour *lamelles* with dorsal bilateral retouch, 79 items or 90.8% of all this type microliths in the 1960s accounts. These numerous fragmented microliths with two retouch types, very likely contain series of actual broken points meaning a higher percentage of pointed microliths.

At the same time, both the 1960s and 1970s Krems-Hundssteig lithic artefact analyses revealed some notable typological features that were already mentioned above for H. Obermaier's tool descriptions. Aside from the high percentage of simple endscrapers with lateral and/or bilateral retouch that always significantly prevail over simple endscrapers on blanks with unretouched lateral edge(s), these is also the presence (by more than a single piece for each type) of endscrapers on blades with Aurignacian-like retouch and endscrapers on Aurignacian strangled blades (Hahn 1977, Taf. 111, 7, 9); also blades with Aurignacian-like retouch (Hahn 1977, Taf. 115, 5, 11–12) and Aurignacian strangled blades (Hahn 1977, Taf. 116, 3, 6, 9). These four tool types had not been defined as separate categories in the 1960s and 1970s analyses but were still illustrated by Hahn. The same "quantitative uncertainty" is present in relation to some Aurignacian pointed blades (Hahn 1977, Taf. 114, 10–12), although the particular tool type occurs in different Aurignacian industry types, from the Proto-Aurignacian up to the Evolved Aurignacian.

All in all, the Krems-Hundssteige Proto-Aurignacian lithic tool-kit with very numerous indicative tool classes and types does demonstrate many true Proto-Aurignacian typological features with some over-represented possible Early Aurignacian "additions", although the additions might indicate the absence of real differences between the Proto-Aurignacian and the Early Aurignacian for some colleagues who are trying to "erase" them (e.g. Bataille *et alii* 2018). To resolve the particular Krems-Hundssteig Aurignacian problem we propose to compare the site's basic typological data with two recently well-published Proto-Aurignacian site assemblages from Eastern and Western Europe: the Siuren I rock-shelter in Crimea (south of Eastern Europe) which provided two sets of data from the 1920s excavation – the lower layer (Hahn 1977) and the 1990s excavation Units H & G (Demidenko, Chabai 2012a; 2012b), and the Fumane Cave (north of the Apennine peninsula), Units A2 & a1 finds from the external part of the cave (Falcucci *et alii* 2020). The comparison (Table 1) confirms the model proposed above, i.e. the occurrence of several Early Aurignacian tool types at Krems-Hundssteig, while both the Crimean and Apennine sites do not contain any endscrapers on blades with Aurignacian-like retouch, endscrapers on Aurignacian strangled blades and Aurignacian strangled blades itself, and only have a single occurrence of blades with Aurignacian-like retouch. The latter occasional presence of blades with Aurignacian-like retouch in the Proto-Aurignacian assemblages can be interpreted as resulting from the intensity of use/re-use of some retouched blades at UP sites. It indeed finds an additional confirmation in many non-Aurignacian UP assemblages, like, for example, the case of Willendorf II site (Lower Austria) where some large blades with scalar retouch occur throughout the entire Gravettian sequence, i.e. layers 5–9 (Felgenhauer 1956–1959, Abb. 27, 2, 5; 31, 1; 33, 2, 4, 5-8; 35, 4–8; 39, 1, 3; 42, 7, 9, 12–14). It is therefore important here to define the Aurignacian-like retouch not only through the presence of a heavy scalar retouch but also through at least some clear blade edges covered by stepped retouch. The stepped retouch is generally associated only with the Early Aurignacian retouched blades, and in this case can be used as a "guide fossil" for this particular Aurignacian industry type. On the other hand, the presence of many (c. 2–3 times more) endscrapers on laterally/bilaterally retouched pieces at Krems-Hundssteig in comparison to the respective Siuren I and Fumane data might also demonstrate a particularity of the Krems-Hundssteig site. All other Krems-Hundssteig tool types generally coincide with the Siuren I and Fumane toolkit, within the range of some lithic variability cases that will be specially discussed for a summary of all the Carpathian Basin Proto-Aurignacian assemblages.

Thus, a rather long and detailed description of the Krems-Hundssteig lithics "rehabilitates" its Proto-Aurignacian status for most of the early last century artefact collection.

The Romanian Banat and the Româneşti-Dumbrăviţa I and II, Coşava I, and Tincova sites

The Romanian Banat is part of the entire Banat in the south-south-west of the Carpathian Basin. The Banat is now politically situated in south-western Romania, north-western Serbia and south-eastern Hungary. The geographical position of the Banat was recently very well characterized from the point of view of Prehistoric Archaeology:

"*In the north, it opens onto the Pannonian expanses, onto the tall loess ridges and steppes, an area rich in water resources and fertile land. In the east, the left -bank tributaries of the Tisa (Tisza) provided easy access to the rich Transylvanian hills which offered game hunting opportunities, but also precious mineral resources, copper, iron, gold and, especially, salt indispensable for a pastoral economy. In the south, the Morava river valley provided communication with the central-Balkan hinterland and, in some periods, the Danube tribes, as a result of pastoral movement or, rarely, plundering campaigns, reached as far as the prosperous Mediterranean world. Finally, in the west, the Sava and the Drava, two large right-bank tributaries of the Danube, enabled contact, varying in intensity, with the Alpine foothills which played an important role in the development of metallurgy in the Bronze and Iron ages*" (Tasić 2011, p. 11). More geomorphological details for the region can be found in the same book but in the chapter particularly dedicated to the Paleolithic (Bălтean 2011, p. 23–39).

All the above-mentioned Aurignacian sites in the Banat were discovered between 1958 and 1961 by I. Stratan, director of the local History Museum in Lugoj, and then excavated by him, and also by the professional Paleolithic archaeologists C. S. Nicolăescu-Plopşor and F. Mogoşanu between the late 1950s and early 1970s (see Bălтean 2011, p. 39). The main studies and publications of the sites and their materials were authored by Mogoşanu (1978; 1983). His analyses on the lithic assemblage artefact and the comparisons to the above-analyzed Krems-Hundssteig site finds have led many colleagues to include the Banat materials among the Proto-Aurignacian ones (Aurignacian with Dufour *lamelles*) assemblages of the Central Europe (e.g. Kozlowski 1965; Hahn 1977; Demidenko 2002; 2003; Demidenko, Otte 2000–2001; Demidenko, Noiret 2012).

Despite the significant similarity of the basic techno-typological features with the Proto-Aurignacian assemblages, there is an important thing to note on the microliths. Although they represent a small number of each tool-kit due to the absence of artefact bearing sediment dry/wet screening during the excavations, Româneşti-Dumbrăviţa II could be a very special locus with the presence of few retouched flakes, two atypical endscrapers, eight unretouched *lamelles* and 12 microliths for the entire lithic assemblage with not even a single reduction object from where *lamelles* could be struck off. The microliths are as follows: one bladelet with bilateral dorsal retouch (a fragmented Font-Yves / Krems point?), one Krems point on microblade with bilateral alternate retouch, nine Dufour *lamelles* on seven microblades and two bladelets with alternate retouch and one Dufour *lamelle* on microblade with ventral retouch (Fig. 4, 9–20) (Mogoșanu 1983, p. 230, Fig. 4, 11–18; Hahn 1977, p. 134 and Tafel 169, 17–28). This allows us to presume some functional differences between the Tincova, Coşava I, and Româneşti-Dumbrăviţa I sites, on the one hand, and Româneşti-Dumbrăviţa II site, on the other, where the latter locus could be a special task camp, a short-termed / ephemeral hunting station (?). It is additionally worth mentioning here the long ago proposed explanations for some artefact differences between Krems-Hundssteig and Tincova (the best known Banat site to the outer world in the 1960s and 1970s): *"... Tincova is relatively homogeneous – the result of one or two occupations – whereas Krems-Hundssteig consists of at least ten occupation units"* (Hahn 1977, p. 309).

First geochronological data for the Proto-Aurignacian assemblages of the Banat sites were based on some general geological considerations and pollen date, however, of a very late age, related to a period from "Herculane I Oscillation" (Tursac Interstadial in Western Europe) to "Herculane II Oscillation" (Laugerie Interstadial in Western Europe) (see Cârciumaru 1980, p. 190–200; 1993, p. 225), that is c. 23–18.8 ka uncal BP. This surprising chronology for the Proto-Aurignacian was sometimes accepted and the Banat sites have been even associated with the Aurignacian V (Kozlowski 1993, p. 285). One of us (Yu.D.) in his Proto-Aurignacian studies in the late 1990s–early 2010s never agreed with such late both geochronology and industrial attribution for the Banat sites, defending their Proto-Aurignacian industrial and chronological parameters (e.g. Demidenko 2002, p. 66; Demidenko, Noiret 2012, p. 348–349). Now, as it was noted above in the present article, thanks to the new 2010s investigations of the German and Romanian colleagues and their associates at the Banat Aurignacian sites, it is known, at least for Romaneşti-Dumbrăviţa I, that their absolute dates exceed 40 ka cal BP being in the chronological range of the European Proto-Aurignacian.

The best way to objectively evaluate lithic artefact data of the Banat Aurignacian sites is to structure their typological indicators through the already proposed model for the Krems-Hundssteig site. There are three separate data sets that can be used for such indicators' representation. Prior to the 2010s, German–Romanian Banat studies, the following (and incidentally), German and Romanian data sets also, were the most comprehensive ones (Hahn

1977; Bălţean 2011) and are used by us. Also, of course, the new 2010s field works and re-analyses of the previously excavated two site materials (Românești-Dumbrăviţa I and Coşava I) are involved (Sitlivy *et alii* 2012; 2014). However, these three data sets are not really in a good accord one to the other because of the following two basic reasons. First, the sites' artefacts are stored in four different institutions in Romania (M. Anghelinu pers. commun. to Yu.E. Demidenko, January 2021), and each artefact analysis has used one or the other collection sets. Secondly, different techno-typological approaches were also used during the artefact analyses. Finally, there are differences in understanding the Românești-Dumbrăviţa I stratigraphy. That is why each of the artefact data set should be additionally explained and compared.

Bălţean's (2011) study offers definitely clearer information than the one provided by Mogoşanu. The three sites tool data (Table 2) are similar one to the other by the following features.

	Romanești-Dumbrăviţa I, levels III-IV 2000s analysis data 6	Coşava I, levels I-II 2000s analysis data 6	Tincova 2000s analysis data 6	Romanești-Dumbrăviţa I levels II-III 1970 analysis data 7	Tincova 1970s analysis data 7
ENDSCRAPERS	***67 / 50.0%***	***69 / 68.3%***	***31 / 42.5%***	***38 / 48.7%***	***22 / 39.3%***
Carinated endscrapers & cores	32 / 47.8%	34 / 49.3%	10 / 32.3%	8 / 21.0%	3 / 13.6%
Shouldered / Nosed endscrapers	4 / 6.0%	6 / 8.7%	2 / 6.4%	1 / 2.6%	1 / 4.5%
Simple & flat endscrapers	28 / 41.8%	21 / 30.4%	15 / 48.4%	18 / 47.4%	8 / 36.4%
Endscrapers on laterally/ bilaterally retouched pieces	1 / 1.4%	5 / 7.3%	4 / 12.9%	11 / 29.0%	10 / 45.5%
Endscrapers on blades with Aurignacian-like retouch	2 / 3.0%	3 / 4.3%	0		0
Endscrapers on Aurignacian strangled blades	0	0	0		0
BURINS	***53 / 39.5%***	***15 / 14.8%***	***8 / 11.0%***	***27 /34.6%***	***13 / 23.2%***
Carinated	2 / 3.8%	0	1 / 12.5%	0	0
Dihedral	29 / 54.7%	13 / 86.7%	3 / 37.5%	7 / 25.9%	0
On truncation / transversal on lateral preparation	16 / 30.2%	0	2 / 25.0%	5 / 18.5%	4 / 30.8%
Angle / transverse on natural surface	6 / 11.3%	2 / 13.3%	2 / 25.0%	15 / 55.6%	9 / 69.2%
LAMELLES with a fine lateral / bilateral retouch	***8 / 6.0%***	***2 / 2.0%***	***22 / 30.1%***	***13 / 16.7%***	***18 / 32.1%***
Dufour, *lamelles* with alternate / alternating retouch				11 / 84.6%	6 / 33.3%
Dufour, *lamelles* wih ventral retouch				1 / 7.7%	0
Pseudo-Dufour, lamelles with lateral dorsal retouch				0	1 / 5.6%
Pseudo-Dufour, lamelles with bilateral dorsal retouch				1 / 7.7%	11 / 61.1%
FONT-YVES / KREMS POINTS with a fine retouch	***0***	***1 / 1.0%***	***3 / 4.1%***	***0***	***3 / 5.4%***
BLADES Strangled with Aurignacian-like retouch	***0***	***1 / 1.0%***	***0***	***0***	***0***
BLADES with Aurignacian-like retouch	***6 / 4.5%***	***13 / 12.9%***	***9 / 12.3%***	***0***	***0***
TOTAL	***134 / 100%***	***101 / 100%***	***73 / 100%***	***78 / 100%***	***56 / 100%***

Table 2. Banat Proto-Aurignacian indicative tool types according to 2000s and 1970s studies.

Endscrapers of Proto-Aurignacian character predominate, carinated endscraper-cores predominate over shouldered/nosed ones in 5–8 times, as well as over a rather minor quantity of endscrapers on laterally/bilaterally retouched pieces. A few endscrapers on blades with allegedly Aurignacian retouch mentioned at Românești-Dumbrăviţa I and Coşava I, but not at all at Tincova, are of dubious character from our point of view because none of the illustrated such pieces bears a stepped retouch while in fact the blades only show a well elaborated scalar retouch.

Burins are, however, different from the Proto-Aurignacian, as reflected by the dominance of the dihedral burins for all three sites' burin sets. Some issues with the dihedral burins should be mentioned here. First, no burin was illustrated by Mogoşanu and Băltean for Coşava I where of all 15 burins, 13 are dihedral. Secondly, of all eight Tincova burins, four were illustrated (Băltean 2011, Fig. 31, no. 7–10) but none of them are dihedral and, furthermore, two of them (Băltean 2011, Fig. 31, no. 7–8) are presented as dihedral but they are in fact angled ones. The latter situation might indicate some classification errors leading to an "artificial" over-representation of the dihedral burins at the Banat Proto-Aurignacian sites. The Romanian colleagues did not give the exact numbers of the various sub-types of the Dufour type microliths according to their retouch placement, although the presence of items with both alternate and dorsal retouch is obvious among the illustrated pieces. The Font-Yves/Krems points are noted through the presence of a few such pointed *lamelles* with a fine retouch at Coşava I and Tincova. Finally, there is still pending the question on the presence of *blades with Aurignacian-like retouch* at the Banat sites. In the tool-lists these blades do make a notable percentage but the same as with the above-discussed endscrapers on blades with allegedly Aurignacian retouch, there is only a single blade fragment, the blade's proximal part, with a stepped-like bilateral dorsal retouch among the Tincova lithics (Băltean 2011, Fig. 33a, 5). Regarding the strangled blades with Aurignacian-like retouch, one such piece only was identified among the Coşava I lithics (Băltean 2011, Fig. 15, no. 3). Accordingly, as the Romanian colleagues' retouched blade data do not allow us to indicate the presence of a series of real Aurignacian blades with one or two sub-types, we cannot firmly establish any Early Aurignacian typological features for the Banat Proto-Aurignacian assemblages. It also highlights the clear Proto-Aurignacian industrial status for the lithic material.

J. Hahn's (1977) data is worth analyzing because in his studies, carried out in the first half of 1970s he used the same typological criteria in studying the Aurignacian assemblages in both Central and Eastern Europe, including the already mentioned finds from Krems-Hundssteig and Siuren I. In light of this, Hahn's data on the Romanian Banat sites and their assemblages are of great importance for our studies. It is worth mentioning that Hahn's study was based upon only a part of the lithics excavated by Mogoşanu and it might explain why the Romanian colleagues did not pay much attention to his data. Materials from Românești-Dumbrăviţa I and Tincova were studied by Hahn in detail, while Coşava I lithics were only briefly described. This is why we re-calculated and structured the former two assemblage data in Table 2, and Coşava I data are only used for separate notes on some particular tool classes and types. The Românești-Dumbrăviţa I and Tincova tool classes and types are similar. Endscrapers demonstrate a minor presence of shouldered/nosed items in comparison to higher values of carinated pieces (c. 3–4.5% versus c. 29–45%) (Fig. 3, no. 2), significant percentages of both simple and flat specimens (c. 36–47%) (Fig. 3, no. 3–7) and examples of laterally/bilaterally retouched pieces (c. 29–45%) (Fig. 3, no. 8). Keeping in mind that Hahn had not recognized debitage pieces with Aurignacian retouch in his studies; it is worth looking at his illustrations of the two Banat sites' endscrapers and retouched pieces themselves because if such heavily retouched tools had occurred there, they would have definitely been illustrated by him. However, there is not a single such heavily retouched tool with a stepped retouch in the two discussed tool-kits, meaning the real absence of Aurignacian blades there (Fig. 4, no. 1–8). Burins, in his classification, differ from the Romanian colleagues' data. They, like other Proto-Aurignacian burins, demonstrate either absence (Tincova) or a subordinate position of dihedral items (c. 26%) for Românești-Dumbrăviţa I (Fig. 3, no. 12), while angle burins do predominate for the two burin sets (c. 55% and 69%) (Fig. 3, no. 9–11, 13). Such burin type data might indeed indicate some classification misunderstanding of the burin types from the part of the Romanian colleagues, c. 40–50 years ago. The microlith types and sub-types vary for the two tool-kits. On one hand, Românești-Dumbrăviţa I does not have any pointed *lamelles*, while Dufour *lamelles* with alternate retouch dominate massively (c. 85%) (Fig. 3, no. 15–17). On the other hand, the Tincova microlith set has some Font-Yves points; *lamelles* with a fine bilateral dorsal retouch dominate (c. 61%), whereas Dufour *lamelles* with alternate retouch account for a third of all retouched *lamelles* (c. 33%). The differences in microliths might be explained through differential use by humans at every site and also by different functions of the sites. All in all, the Hahn's Românești-Dumbrăviţa I and Tincova tool data do actually strengthen their Proto-Aurignacian attribution. Hahn's (1977) Coşava I tool data look similar to the data he collected for Românești-Dumbrăviţa I and Tincova. With respect to the Aurignacian blades and endscrapers on Aurignacian blades, a single Aurignacian strangled blade (Hahn 1977, Taf. 164, no. 13) was noted, the same piece that had also been mentioned and illustrated by Mogoşanu (1983, Fig. 5, no. 12) and Băltean (2011, Fig. 15, no. 3). So, there is more than one study that testifies to the presence of only a single Aurignacian blade for the three Banat Proto-Aurignacian sites.

Having thus summarized the 1970s and 2000s, Romanian and German colleagues' data on the three Banat sites and their assemblages, it still remains the possibility for more studies at the sites. It was really hoped then that the newly organized joint German-Romanian project for their new investigations in the late 2000s would bring more chronological and artefact data with clearer interpretations (see Demidenko, Noiret 2012, p. 349). Till now, however, from our point of view, the results turned out to be mainly negative on the Coşava I and Românești-Dumbrăviţa I lithic artefacts, although the Last Glacial Interpleniglacial geochronology was firmly established and core reduction data were given with greater detail first time for the Banat sites (Sitlivy *et alii* 2012; 2014).

Many classification errors, in our view, and some problems during the new studies of the Coşava I and Românești-Dumbrăviţa I lithics (Fig. 5, no. 1–15) have led our colleagues to define the "Aurignacian 0.5" industry type, something in-between the Proto-Aurignacian and the Early Aurignacian (see some our considerations on the matter above) (Sitlivy *et alii* 2012; 2014). This is why in addition to arranging into two sections the new typological and then technological data for the two Banat lithic assemblages, we will explain our position on concrete classification errors and will show the values re-calculated by us into two sections. Later on, we will also discuss in more detail the proposed "Aurignacian 0.5" status.

Coşava I, levels I–II two tool data set can be seen in Table 3.

	Coşava I, levels I-II	Romanești-Dumbrăviţa I	Coşava I, levels I-II	Romanești-Dumbrăviţa I 1960-72
	2010s analysis data 8	1960-72 layers III-IV & 2009-10 GH3 9	2010s re-calculated data	III-IV & 2009-10 GH3 re-calculated
ENDSCRAPERS	***55 / 58.5%***	***24 / %***	***55 / 75.3%***	***24 / %***
Carinated endscrapers	5 / 9.1%	4 ?	5 / 9.1%	?
Shouldered / Nosed endscrapers	3 / 5.4%	?	2 / 3.6%	?
Simple & flat endscrapers	21 / 38.2%	20 ?	20 / 36.4%	6 ?
Endscrapers on laterally/ bilaterally retouched pieces	22 / 40.0%	?	28 / 50.9%	3 ?
Endscrapers on blades with Aurignacian-like retouch	4 / 7.3%	?	0	0
Endscrapers on Aurignacian strangled blades	0	0	0	0
BURINS	***11 / 11.7%***	***43 / %***	***11 / 15.1%***	***43 / %***
Carinated	4 / 36.4%	3 / 7.0%	0	0
Dihedral	0	5 / 11.6%	0	8 / 18.6%
On truncation / transversal on lateral preparation	1 / 9.1%	0	5 / 45.5%	7 / 16.3%
Angle / transverse on natural surface	6 / 54.5%	35 / 81.4%	6 / 54.5%	28 / 65.1%
LAMELLES with a fine lateral / bilateral retouch	***5 / 5.3%***	***90 / %***	***5 / 6.8%***	***90 / %***
Dufour, *lamelles* with alternate / alternating retouch	4 / 80%	51 / 56.7%	4 / 80%	51 / 56.7%
Dufour, *lamelles* wih ventral retouch	0	21 / 23.3%		21 / 23.3%
Pseudo-Dufour, lamelles with lateral dorsal retouch	0	7 / 7.8%		7 / 7.8%
Pseudo-Dufour, lamelles with bilateral dorsal retouch	1 / 20%	11 / 12.2%	1 / 20%	11 / 12.2%
FONT-YVES / KREMS POINTS with a fine retouch	***1 / 1.1%***	***3 / %***	***1 / 1.4%***	***3 / %***
BLADES with Aurignacian-like strangled retouch	***1 / 1.1%***	***0***	***1 / 1.4%***	***0***
BLADES ith Aurignacian-like retouch	***21 / 22.3%***	***13 / %***	***0***	***0***
TOTAL	**94 / *100%***	**173 / *100%***	***73 / 100%***	**160 / *100%***

Table 3. Banat Proto-Aurignacian indicative tool types, 2010s data and their re-calculated our versions.

Endscrapers (55 pieces). The original data is characterized by: a slight predominance of five carinated over three shouldered / nosed pieces where all of them together make 14.5%; a minor prevalence of still dominant 22 endscrapers on laterally / bilaterally retouched pieces (40.0%) over 21 simple and flat endscrapers (38.2%), and also some presence of four endscrapers on blades with Aurignacian-like retouch (7.3%). The re-calculated values for endscrapers are as follows: five carinated (9.1%), two shouldered / nosed (3.6%), 20 simple and flat (36.4%), 28 pieces on laterally/bilaterally retouched pieces (50.9%). The re-calculation has taken into account that a "carinated nosed endscraper" (Sitlivy *et alii* 2014, Fig. 8, no. 2) has no specially made side notches for a "nose" formation, it is just a carinated endscraper; a "carinated endscraper on bilaterally retouched blade" (Sitlivy *et alii* 2014, Fig. 8, no. 4) is in fact a simple endscraper on retouched blade; a "thick ogival endscraper" (Sitlivy *et alii* 2014, Fig. 8, no. 3) is a "fan-shaped endscraper" which was counted with endscrapers on laterally / bilaterally retouched pieces; of all four alleged endscrapers on Aurignacian blades none was illustrated, and knowing the way such pieces from the new excavations

at Românești-Dumbrăviţa I were analyzed (see below), there is no other reason than to name them as endscrapers on laterally / bilaterally retouched pieces. Here it is also worth noting that a number of endscrapers were additionally classified as thick ones (Sitlivy *et alii* 2014, Fig. 8, no. 3, 5) still being, however, in the range of simple, not carinated endscrapers, where we placed them for our re-calculation. As a result of the re-calculation, endscrapers on laterally / bilaterally retouched debitage pieces became the most numerous endscraper type, endscrapers on Aurignacian blades do not occur at all, and the number of shouldered / nosed endscrapers is really low.

Burins (10 pieces with 11 identifiable burin edges, because of the presence of a double burin). Original data can be structured as follows: angle / transverse on natural surface burins dominate (6/54.5%), carinated burins represent a moderate quantity (4/36.4%), and there is a single burin on truncation (1/9.1%). The representation of burin types appears strange as dihedral pieces allegedly absent, because carinated burins are actually a specific multifaceted variant of dihedral asymmetrical items and carinated and dihedral burins are always present together in assemblages. The classification of Coşava I carinated burins' is also peculiar. The following four burins were re-classified by us as follows: an "angle, on oblique truncation" is a burin on oblique truncation, a "carinated, transverse, double, on laterally retouched blade" (Sitlivy *et alii* 2014, Fig. 9, no. 3) is a double transverse on lateral retouch burin, 2 "carinated, transverse" (Sitlivy *et alii* 2014, Fig. 9, 1–2) are in fact 2 transverse on natural surface burins of angle type. Accordingly, there is no single carinated or dihedral burin at Coşava I and the exclusive presence of angle and on truncation burin types fits well into the well-known range of the Proto-Aurignacian burins.

Microliths with a fine retouch (6 pieces). These are four *lamelles* with bilateral alternate retouch (Hahn 1977, Fig. 164, no. 10; Sitlivy *et alii* 2014, Fig. 15, no. 1–3), one *lamelle* with bilateral dorsal retouch (Hahn 1977, Fig. 164, no. 3) and one Font-Yves point. Again, it is the most typical set of microliths for the Proto-Aurignacian.

Blades with Aurignacian retouch. These indicative tools are said to be of these types: "*retouched blades are significant in all Coşava assemblages and include Aurignacian types in all levels: with scalar lateral/bilateral retouch, some pointed (Fig. 10: 7, 8) and strangled items (Fig. 11: 6)*" (Sitlivy *et alii* 2014, p. 202). These Aurignacian blades account to 22 pieces in levels I–II and among them are only two pointed blades that were defined by previous colleagues as single strangled blades and which can be regarded by us as possibly (!) being true Aurignacian ones, although this should be confirmed by the presence of stepped retouch on their lateral edges. So, there is a single certain Aurignacian blade, i.e. a strangled blade among the many retouched blades in the Coşava I tool-kit.

All in all, the Coşava I, levels I-II tool-kits do correspond well to the Proto-Aurignacian tool characteristics, although it should be noted a significant percentage of both endscrapers on laterally / bilaterally retouched debitage pieces and retouched blades but no other Aurignacian industry type is present.

Românești-Dumbrăviţa I, layers III–IV & GH 3 respective two tool data set is provided in Table 3.

Endscrapers (24 pieces). In comparison to the above-represented Coşava I endscraper type data, Românești-Dumbrăviţa I 27 endscrapers were classified in the 2010s project through a "coarse" type-list with actual identification of four "carinated", eight "thick", one "double", 12 "simple", and two "unidentifiable" specimens. Moreover, the understanding of the endscraper classification is complicated by the description of the carinated endscrapers' retouch characteristics: "*sub-parallel/parallel retouch*" (Sitlivy *et alii* 2014, p. 101), while, by definition, any typical carinated endscraper should bear lamellar removal negatives on their working fronts/flaking surfaces, since they were mostly cores or endscraper-cores. So, according to our classification system, the endscraper list can be also represented as follows: four carinated and 20 simple/flat pieces, while one double and two unidentifiable pieces can be left aside. However, any shouldered/nosed, on laterally/bilaterally retouched debitage items, including any with Aurignacian retouch types (Fig. 5, no. 8–11) cannot be detected in either the special table or the following descriptions, although their presence was mentioned in the text (Sitlivy *et alii* 2012, p. 101–102, Fig. 20). Going through the illustrations of nine endscrapers (Sitlivy *et alii* 2012, Fig. 21–23), not taking into account two double and one endscraper-burin ones (Sitlivy *et alii* 2012, Figs. 21, no. 1; 22, no. 1, 4), from our point of view, we suggest the following types for nine pieces with some corrections of their published type identification: simple & flat endscrapers – 6, simple endscrapers on laterally/bilaterally retouched pieces – 2, fan-shaped endscrapers – 1, where the latter type's piece must be grouped with endscrapers on laterally/bilaterally retouched pieces following our basic classification. The newly recognized simple & flat endscrapers include three "*simple on blade*" items (Sitlivy *et alii* 2012, Figs. 22, no. 3; 23, no. 1, 5), one "*thick*" item (Sitlivy *et alii* 2012, Fig. 21, no. 2), one "*simple endscraper, on bilaterally retouched blade*" (Sitlivy *et alii* 2012, Fig. 23, no. 3), one "carinated endscraper, on blade" (Sitlivy *et alii* 2012, Fig. 23, no. 6). Two of our simple endscrapers on laterally / bilaterally retouched pieces are one "*thick shouldered, on Aurignacian laterally retouched blade*" (Sitlivy *et alii* 2012, Fig. 22, no. 2) and one "*endscraper, on Aurignacian laterally retouched blade*" (Sitlivy *et alii* 2012, Fig. 23, no. 2). The piece identified now as a single fan-shaped endscraper is a "thick, endscraper on Aurignacian bilaterally retouched blade" (Sitlivy *et alii* 2012, Fig. 23, no. 4). With so many unpaired endscraper classifications, we

can only add to our still uncertain on the published source data with many resulted question marks in Table 3, one more question regarding the presence of both carinated and shouldered/nosed endscrapers here, on one hand, and, on the other, no real occurrence of endscrapers on any Aurignacian blades, with an also unclear number of endscrapers on the laterally/bilaterally retouched debitage pieces. At the same time, it is still possible to say that the above-analyzed Romaneşti-Dumbrăviţa I endscrapers are within the typological frame of the Proto-Aurignacian endscrapers where most of bladelet/microblade reduction was realized on typologically recognized cores on nodules/chunks. They do not fall within our typologically defined endscrapers and these materials could represent a particular case (see below core data discussion).

Burins (42 pieces, excluding typologically unclear one "flat" and one "dihedral, on truncation" burins, but including three double burins, in total 43 typologically identifiable burin terminations). The original burin set is structured according to the identified types: carinated – 3/7.0% (Fig. 5, no. 13–15), dihedral – 5/11.6%, angle/transverse on natural surface – 35/81.4%. It is worth noting the absence of all burins on truncation/transversal on lateral preparation and the presence of some carinated burins. Thanks to some additional text explanations and seven burin illustrations (Sitlivy *et alii* 2012, Fig. 25, no. 1–7), our burin types' re-calculations can be viewed as follows: carinated – 0, dihedral – 8/18.6%, on truncation/transversal on lateral preparation – 7/16.3%, angle/transverse on natural surface – 28/65.1%. Accordingly, all three "carinated" examples were assigned solely to the dihedral burin type due to the absence of any burin verge with more than three definite burin spall negatives, which is strongly required by the carinated burin definition, "*being a dihedral asymmetric item with one multifaceted verge on which more than three bladelet sensu lato removal scars terminate either by a characteristic retouched notch (busked type sensu stricto) or the unretouched edge of a blank (carinated type sensu stricto)*" (Demidenko 2012c, p. 98). The particular Românești-Dumbrăviţa I "carinated" burins have maximum two burin spall/bladelet removal scars on one verge (Sitlivy *et alii* 2012, Fig. 25, no. 1–3); this is why many, for example, Gravettian assemblages with numerous dihedral burins would become "Aurignacoid-Gravettoid" ones by employing an erroneous manner of recognizing carinated burins. Also, burins on truncation/transversal on lateral preparation make a separate series of items. This is because five "angle, on truncation" burins (Sitlivy *et alii* 2012, Fig. 25, no. 4) and one "angle double, on truncation" burins with two on truncation edges have been re-classified by us into burins on truncation. In sum, burins on truncation / transversal on lateral preparation and angle/transverse on natural surface burins make together over 80% of all the Românești-Dumbrăviţa I burins and this is once again a good sample of Proto-Aurignacian burins.

Microliths with a fine retouch (93 pieces). There were 93 selected Dufour/pseudo-Dufour and pointed pieces on *lamelles* for the present study (Sitlivy *et alii* 2012, p. 105–106, 121; Figs. 28, 29, 37). These are 19 pieces from the 1960–1972 excavations layers III–IV and 74 pieces from the 2009–2010 excavations GH 3. During the most recent excavations were found two Font-Yves and one Krems points (Sitlivy *et alii* 2012, Fig. 37, no. 1–3). The 90 laterally/bilaterally retouched *lamelles* (Sitlivy *et alii* 2012, Figs. 29, 37) are as follows: Dufours with alternate retouch – 51/56.7%; Dufours with ventral retouch – 21/23.3%; pseudo-Dufours with bilateral dorsal retouch – 7/7.8%; pseudo-Dufours with lateral dorsal retouch – 11/12.3%. Such Românești-Dumbrăviţa I types and sub-types of the *lamelles* with a fine retouch resemble the data from Fumane Cave, Units A2 & A1 (Table 3), making again this Banat site artefact data of Proto-Aurignacian industrial affinity.

Blades with Aurignacian retouch. From the published data (Sitlivy *et alii* 2012, p. 104, 120) this tool type is represented by 13 pieces from both the 1960–1972 excavations layers III–IV (11 examples) and the 2009–2010 excavations GH 3 (two examples) (Fig. 5, no. 1–7). However, as it is the case with many before discussed alleged "Aurignacian blades", none of the pieces called as such (Sitlivy *et alii* 2012, Figs. 27, no. 1, 3–6; 36, no. 4, 6) bears stepped retouch, being characterized by only scalar retouch; these blades again testify to the somewhat elevated numerical level of the retouched blades for the Banat Proto-Aurignacian sites.

In sum, the data presented above about Românești-Dumbrăviţa I indicate tool types which correspond to the Proto-Aurignacian typological features, with the only really difference in a higher percentage of retouched blades and endscrapers on retouched blades and flakes.

The Banat Proto-Aurignacian basic core reduction data

Although some core and debitage characteristics on the 1950s–1970s artefacts from the Banat Proto-Aurignacian sites have been published, only the most recent Coşava I and Românești-Dumbrăviţa I 2010s studies present detailed data on the subject. Several core type definition mistakes occurred here, in our view. This is, first of all, related to the definition of "carinated cores". From the moment the carinated pieces were recognized as cores

instead of endscrapers and burins (e.g. Sasche-Kozlowska 1978), the basic feature of these cores is the presence of exclusively *lamelle* removal negatives on their flaking surfaces and no wider blade negatives. Accordingly, some carinated blade/bladelet cores defined for the Banat sites (three for Coşava I and four for Românești-Dumbrăviţa I – see Sitlivy *et alii* 2014, Fig. 6, no. 1–2; Table 2; Sitlivy *et alii* 2014, Figs. 7–9) should be included into "regular" blade/bladelet cores. Secondly, another proposed carinated core type, i.e. carinated flake / bladelet (five for Coşava I and two for Românești-Dumbrăviţa I – see Sitlivy *et alii* 2014: Table 2; Sitlivy *et alii* 2014, Fig. 7), should be also removed from the carinated cores' lists due to their technological uncertain status during bladelet core re-shaping processes, and included into bladelet "regular" cores. Thirdly, the classification of some cores as "bladelet/micro-blade" cores (Sitlivy *et alii* 2014, Table 2; Sitlivy *et alii* 2014, Fig. 7) does not seem to be a correct approach as still mostly bladelet removal negatives are visible on such cores, while some microblade scars can result from the occasional detachment during intensive bladelet reduction. Accordingly, the bladelet/micro-blade cores should be better called bladelet cores. At the same time, strictly speaking bladelet/microblade and microblade cores are possible to identify but these would be mostly so-called carinated core-tools, especially carinated burin-cores, with the strict technological accent on the microblade primary flaking processes. However, carinated burin-cores are totally missing among the Banat Proto-Aurignacian reduction objects and tools.

With all the above-noted remarks on cores, it is still possible to make a special core type table (Table 4) with Coşava I and Românești-Dumbrăviţa I data, on one hand, and Siuren I and Fumane, on the other hand.

	Coşava I, levels I-II	Romanești-Dumbrăviţa I 1960-72	Siuren I,	Fumane, Units A2 & A1
	2010s re-calculated data	III-IV & 2009-10 GH3 re-calculated	1990s excavation Units H & G 2	external part of the cave 5
Blade Cores	*3 / 4.6%*	*5 / 10.9%*	*1 / 5%*	*3 / 4.8%*
Blade / Bladelet Cores	*15 / 23.1%*	*20 / 43.5%*	*4 / 20%*	*4 / 6.5%*
Bladelet "Regular" Cores	*20 / 30.8%*	*9 / 19.5%*	*3 / 15%*	*33 / 53.2%*
Bladelet "Carinated" Cores	*21 / 32.3%*	*7 / 15.2%*	*6 / 30%*	*14 / 22.6%*
Flake / Blade Cores	*0*	*0*	*5 / 25%*	*0*
Flake Cores	*6 / 9.2%*	*5 / 10.9%*	*1 / 5%*	*8 / 12.9%*
TOTAL	*65 / 100%*	*46 / 100%*	*20 / 100%*	*62 / 100%*

Table 4. Coşava I, Romanești-Dumbrăviţa I, Siuren I and Fumane Proto-Aurignacian basic core type data.

Understanding all inconsistences between the three classification approaches applied for core attributions (e.g. carinated and non-carinated cores, even bladelet *versus* blade/bladelet core identifications, etc.), grouping together all bladelet and blade/bladelet, and separately blade cores allows us to see yet common data for all these four core sets. Also, flake and flake/blade cores are considered here as mostly representing a "different reduction story" with getting both thick blanks for carinated cores/endscraper-cores and some large-sized debitage blanks for individual simple & flat endscrapers, burins, truncations, and retouched pieces. In sum, the four assemblages' cores do show enough similar bladelet-related indices: all bladelet and blade/bladelet cores are in a range between 65% and 86.2%, whereas blade cores vary between 4.6% and 10.9%. It is even possible that part of these blade cores were technologically just in the initial/preparatory stage bladelet cores. These pairs of values have the following implications. First of all, all sorts of bladelet core reduction processes were of much greater importance in comparison to the other core reduction processes. And it is in accord with the above-mentioned 20 years ago accent on the Proto-Aurignacian bladelet core data substantiated by Demidenko (Demidenko *et alii* 1998, p. 386–397; Demidenko 2002, p. 46–50, 65–66; Demidenko, Otte 2000–2001, p. 135–139, 144), confirmed by Falcucci (Falcucci *et alii* 2020). The very minor role of blade core reduction corresponds well to the dominance of bladelet reductions in all these assemblages, on one hand; on the other, blade core reduction is predominant for core-like pieces on chunks/nodules in Early Aurignacian, not mentioning here carinated endscraper-cores. Accordingly, not only the typological data but also the technological data indicate that the lithic assemblages from the Banat sites are well within the Proto-Aurignacian lithic standards.

Some conclusions on the Banat Proto-Aurignacian sites and their lithic artefacts

From the industrial-chronological point of view, before getting absolute dates around c. 41.000 cal BP for Românești-Dumbrăviţa I during the 2010s (Schmidt *et alii* 2013), Romanian archaeologists already made the following suggestion: "*we consider the Aurignacian horizons of the Tincova, Românești layer II–III and Coșava layer I–II similar to Proto-Aurignacian industries dated between 39–36 ka*" (Bălțean 2011, p. 73). The suggestion is in an accord with most previously expressed opinions on the industrial status of the Banat Aurignacian sites. However, as was constantly mentioned above, the new excavations and lab studies allowed the German–Romanian team to put forward a hypothesis suggesting that the Banat Proto-Aurignacian assemblages represent something in between the Proto-Aurignacian and Early Aurignacian, proposing even an "Aurignacian 0.5" affiliation, for underlying some mixture of the two Aurignacian industries (Sitlivy *et alii* 2012, p. 124–127).

The analysis above, centered on the Banat Aurignacian sites and their lithic assemblages, did not show any true Early Aurignacian techno-typological component, as well as the absence of the often claimed carinated burin-cores, characteristic for the later Aurignacian industry types. This example of Aurignacian studies with a number of errors in the recognition of various core and tool types indicates again and again a deficiency in good artefact analyses before proposing any new industrial subdivisions for the Aurignacian, as well as for some other UP techno-complexes. The "Aurignacian 0.5" industrial approach resembles the attempts to define for the Middle Paleolithic Micoquian, some "Para-Micoquian"/ "Charentoid Micoquian" industry types in Crimea, based upon, in our view, the erroneous classification of the actual lithic assemblages, that was criticized then (see the respective critique in Chabai *et alii* 2000).

There are two more subjects showing some other aspects on the investigations of the Romanian Banat Proto-Aurignacian sites.

Firstly, the Romanian Banat Proto-Aurignacian sites feature an interesting cultural stratigraphy within the region's UP record. There is only the Epigravettian overlapping the Proto-Aurignacian within the site's stratigraphy as it is a characteristic feature for not a single but all the Banat sites having Proto-Aurignacian and above only Epigravettian within their stratigraphic sequences. It means a sediment hiatus lacking all other possible Aurignacian industry types and the entire Gravettian industrial-chronological components as well. At the same time, there is still a good perspective for finding new Proto-Aurignacian sites in the region as the recently studied (re-deposited) open-air site of Temerești Dealu Vinii (Chu *et alii* 2019b) indicates, again yielding only Proto-Aurignacian and Epigravettian lithic artefacts.

Secondly, aside from the cluster of sites in the Romanian Banat, there is also a good potential to study the functional variability of the Proto-Aurignacian sites there. It was already noted the case with Românești-Dumbrăviţa II locus, being possibly a short-termed/ephemeral hunting station in contrast to the just "regular" sites and site-workshops such as Românești-Dumbrăviţa I, Coșava I, and Tincova. Furthermore, the sites are located on small river valleys, tributaries of the Danube River, with varying topographies (see Tasić, Draşovean 2011, Fig. 4–7) that might allow in future special research on the site functional variability using as an example the Proto-Aurignacian sites in the Ukrainian Transcarpathia and Eastern Slovakia (Demidenko *et alii* 2020).

Serbian Vojvodina Banat and the Crvenka-At site area

This area is geographically and geomorphologically similar to the above-discussed region the eastern counterpart of the Romanian Banat. The area with Aurignacian finds near Crvenka town was recognized since the end of 19th century (Mihailović 1992; Mihailović *et alii* 2011, p. 81–83). A series of surveys and small-size excavations were carried out there in the 1980s and in the 2010s (Radovanović 1986; Chu *et alii* 2014; 2016; Chu 2018). Aurignacian artefacts were scattered and collected at different loci over an area of 2 km^2. The latest efforts of the German-Serbian colleagues (Nett *et alii* 2021) allowed us not only to better understand site stratigraphies, UP finds horizons and their archaeological characteristics but also establish an absolute chronology for the complex of sites. Summing up the information, we have the following data. Excavation of trenches 3 and 5 at the At site lead to the recognition of two *in situ* Early UP levels with some lithics of Aurignacian character and a few ungulate bones (*Bos primigenius* and *Equus sp.*) poorly preserved and with collagen content too low for radiocarbon dating. The conducted OSL dating indicated that "*the sediments of the upper artefact level deposited at 35.3 ± 3.6 ka (2σ), while the lower level deposited between*

35.3 ± 3.6 ka (2σ) and 37.8 ± 4.2 ka (2σ)" with "*averaging all the modeled ages within the archeological context, gives an overall modeled average timing of 36.4 ± 2.8 ka (2σ)*" (Nett *et alii* 2021, p. 8). The sediment analyses also demonstrated that "*the find-bearing layers occur in sand dominated, in parts gravelly, deposits*" possibly "*related to fluvial deposition close to a river mouth draining into a paleolake in the Alibunar Depression*" (Nett *et alii* 2021, p. 12). Accordingly, Aurignacian humans did not only settle at low elevations in c. 86–87 m a.s.l. (Nett *et alii* 2021, p. 3) but particularly at a river delta near a lake, multiple times and on several places within a spatially large area.

The newly conducted high-resolution complex natural science research leaves, however, an open question regarding the homogeneous character of the recovered artefacts from both the archaeological levels with an average absolute data of 36.4 ± 2.8 ka (2σ) at the particular At site trenches excavated in 2014–2015, as well as for the Crvenka-At site complex in general. Surprisingly, the 2010s excavations data published in a series of articles do not provide any real information on the recovered lithic artefacts. There is no data on the quantity of recovered lithics in each lithological layer and/or archaeological level during the two field campaigns. There are only such artefact data for the 2014 research at two (?) trenches at the At I and At II loci.

"*...we were able to locate the archaeological levels within Layers 6 and 8 that resulted in 19 new archaeological artifacts. The artifacts found within Layer 6 were a maximum of 4 cm and were non-diagnostic to a particular archaeological industry, though there were a number of pieces identified as possible blade fragments*." And out of all the 19 pieces, in layer 8, stratigraphically the lowermost lithological horizon for the At loci, were "*three flint artifacts found in that layer, one was a nosed endscraper manufactured on a local flint nodule (Fig. 3)*" (Chu *et alii* 2014, p. 72). So, from the layer 8, yielding three pieces, it becomes understandable the occurrence of 16 uncharacteristic lithics in layer 6. The 2014 excavation stratigraphy was given only for the trench profile at At II locus (Chu *et alii* 2014, Tabl. 1 on p. 72) showing an archaeologically sterile 35 cm thick layer (7) between layers 6 and 8. As it was said for the At II stratigraphy, the same stratigraphy with two archaeological levels was established during the 1980s excavations. However, it was not specified the recovery of the 19 lithics artefacts either only for the At II or for both the At I and II.

The 2015 field work was carried out as follows: "*In 2015, eight test trenches were prepared at the edge of two preexisting sand extraction pits (At I and At II)*" (Nett *et alii* 2021, p. 3) with no mentioning of how these 8 trenches relate to the two (?) 2014 trenches. Furthermore, it was also said "*the first trench was excavated to locate the 1984 excavation trench by Radovanović (At II). Seven other trenches were excavated at the margins of an adjacent sand pit (At I) to clarify the sedimentary setting and to correlate the stratigraphy of At I and At II with the Crvenka locality*" and "*we focus on two of these trenches: trench 3 and 5. All finds and the excavation areas were piece-provenienced in a local coordinate system using both traditional analogue methods and a total station*" (Nett *et alii* 2021, p. 3–4). Thus, it follows that the 2015 trenches were only dug at the At II, whereas the two (?) 2014 trenches were excavated at both the At I and II. The 2015 recovered lithic artefacts at the At II are still poorly described with no numerical data and were characterized as follows.

"*The artifacts were found in a relative depth of ~1.90 and ~2.05 m in trench 3 and ~3.90 m and ~4.10 m in trench 5 (~83 m AMSL). Excavations uncovered early Upper Paleolithic Aurignacian lithic artifacts (usually placed around 43–35 ka), including several bladelet cores (e.g., thick endscrapers, nosed endscrapers), blades and endscrapers (Figure 3). Most or all of the blades come from single-platform cores and the high blade-to-flake ratio of the lithic assemblage made primarily from so-called Banat flint (Ciornei et al., in press) that is technologically consistent with the Aurignacian artifacts from the open air sites of the Romanian Banat (Anghelinu et al., 2012; Sitlivy et al., 2012; Sitlivy et al., 2014; Chu et al., 2016b; Chu et al., 2019)*" (Nett *et alii* 2021, p. 6).

From all the above-mentioned too short descriptions of lithics being certainly considered by the German-Serbian team as a single and homogeneous Aurignacian find complex some questions arise. 1. Lithic artefacts originating from more than one lithological layer with varying OSL dates (see Nett *et alii* 2021, Fig. 2) are strangely considered as only one and the same Aurignacian industrial unit. 2. The strange thing is that the previous 1980s field work at Crvenka-At site definitely showed at least two (!) main Aurignacian industrial units – "Typical Balkan Aurignacian" characteristic for layer IIa lithics at the At site with industrial comparisons to sites in the Balkans and "Aurignacian of Krems type" related to layer IIb at the Crvenka site with industrial similarities to Romanian Banat Aurignacian sites (Mihailović 1992, p. 49). Going through descriptions and illustrations of the two archaeological units (Mihailović 1992), the only way is to agree with D. Mihailović on the Aurignacian bipartite industrial subdivision. The so-called "Typical Aurignacian" is characterized by "*typical Aurignacian nosed endscrapers*" being "*the most common finds in layer IIa at At*"; "*Aurignacian blades and burins*" (Mihailović 1992, p. 49–50) with also a notable notion that "*there are few Middle Paleolithic elements and they are to be found only in Phase II*"; looking through the respective illustrations they seem to predominate, first of all side-scrapers, occurring in layers IIa at both the At and Crvenka sites

(Mihailović 1992, Tabl. XII–XIII, XXIII).These typological features are the most characteristic for Aurignacian II/Middle Aurignacian industry type with numerous shouldered/nosed endscraper-cores (e.g. Demidenko *et alii* 2017) for a Pan-European scale. The Crvenka-At Aurignacian II/Middle Aurignacian in the Carpathian Basin will be discussed by us later in a separate article. On the other hand, the "Aurignacian of Krems type" features the presence of "*carinated, core-like endscrapers, blades with a deep, semi-steeped notched retouch*" and "*because of the numerous stylistic and typological features which associate it closely with the Aurignacian material in the Romanian part of Banat (Coşava, Tincova, Romaneşti-Dumbrăviţa)*" (Mihailović 1992, p. 50). The typological descriptions are also supported by artefact illustrations for layer IIb at Crvenka site (Mihailović 1992, Tabl. V–IX). The newly received two OSL date sets also well correspond to the known Aurignacian II/Middle Aurignacian and Aurignacian 0/Proto-Aurignacian in Europe. Thus, all the data on the stratigraphy of lithological and archaeological layers, OSL dates and lithic artefacts features do unambiguously indicate not a single Aurignacian unit but two distinct Aurignacian units at the Crvenka-At site complex. The simple mention of the presence of shouldered / nosed endscraper-cores in the two units does not contradict to the two different roles of the tool-core type in the units and even morphological differences between the tool-core types there.

Thereafter, there is no sense to use an averaged OSL age for the two Aurignacian units. Furthermore, by not using the term "Proto-Aurignacian" after the new 2014–2015 field investigations and, at the same time, making permanent comparisons between the Crvenka-At artefacts and the Romanian Banat Proto-Aurignacian sites strongly demonstrates that the discussed Aurignacian find complex is again considered being something like "Aurignacian 0.5". The evident failure of using such an "intermediate approach" for the Banat Proto-Aurignacian connected to a number of artefact classification mistakes, as was shown above, does not again mean that other Cologne colleagues (first of all, W. Chu) should use that approach for the Crvenka-At, approach developed by the same team for the Banat materials. All the Crvenka-At "Aurignacian of Krems type" lithic data coincide with the above-analyzed respective Banat Proto-Aurignacian data: serial carinated/core-like endscraper-cores and retouched blades with no, however, sometimes the claimed presence of blades with Aurignacian retouch, as well as the occurrence of rare dihedral burins and no real carinated burin-cores with mostly finding of angle and on truncation / lateral retouch burins. The 8 artefacts from the 2015 excavation (see Chu *et alii* 2016, Fig. 6; Nett *et alii* 2021, Fig. 2) are typical Proto-Aurignacian indicative lithics: a thick shouldered endscraper-core (Fig. 6, no. 6), a Dufour sub-type large-sized *lamelle* with alternate retouch (Fig. 6, no. 1) and some retouched blades (Fig. 6, no. 3–4, 8).

All the above-mentioned data indicate the Proto-Aurignacian character of the stratigraphically lower Aurignacian finds horizon at the Crvenka-At site complex, around HE-4, c. 40.000 cal BP (37.8 ± 4.2 ka (2σ) in Serbian Vojvodina Banat.

The human settlement interpretation for Crvenka-At is also proposed to be viewed as an example of "*riparian landscape*" use with a strong suggestion "*that fluviolacustrine environments were exploited by early modern humans potentially even representing a favorable location in the landscape where vital aquatic food sources rich in micronutrients could be harvested*" that is "*in agreement with isotopic findings from the region's early Upper Paleolithic human record that have high δ15N values, suggesting higher consumption of freshwater foods compared to previous indigenous populations*" (Nett *et alii* 2021, p. 13). What strikes us is the strong accent placed on aquatic water food resource exploitation. We would suggest, however, not to exaggerate the "Proto-Aurignacian fishing abilities". First of all, not only Proto-Aurignacians but also Middle Aurignacians certainly occupied several times the discussed micro-area. Secondly, it should be not forgotten the couple of bones of *Bos primigenius* and *Equus sp.* at the At site present at the site during the 2015 excavation in trench 3, which rightly led our colleagues to acknowledge "*a general limnic/ fluvial woodland environment: Bos primigenius preferred floodplain habitats in river valleys, river deltas and bogs and the occurrence of Equus sp. suggests a grass-dominated habitat in proximity*" to the site (Nett *et alii* 2021, p. 13). As a result, the Proto-Aurignacians might have visited the micro-area mainly for hunting the above-noted herd ungulates and possibly just used some river and lake aquatic sources as minor food supplies for widening their diet quality at a time when nets/weir baskets, harpoons and fishing hooks were yet unknown during Early UP in Europe. Actually, such basic herd ungulate subsistence strategy persisted at least until the late phases of the Late UP in Europe, such was the case, for example, of the two well-studied Late Magdalenian open-air sites of Champréveyres and Monruz on the shores of Lake Neuchâtel in Switzerland, where harpoons had already been used for fishing (Müller 2004; 2008). Thirdly, the permanent association of the Oase Cave Early *Homo sapiens* having the above mentioned "*high δ15N values, suggesting higher consumption of freshwater foods compared to previous indigenous populations*" with the Proto-Aurignacian sites in the Romanian and Serbian Banat areas (e.g. Sitlivy *et alii* 2012; 2014; Nett *et alii* 2021) might not reflect the truth either, and instead, the Oase humans could be the right candidates for the Initial UP sites in Eastern Central Europe (see below).

Proto-Aurignacian sites in Ukrainian Transcarpathia (Berehove-Muzhievo site cluster) and Eastern Slovakia (Tibava site)

Berehove I (as the *in situ* Proto-Aurignacian site is known today) was initially, at the beginning of 20th century, a rocky quarry place where the presence of some lithic artefacts indicated a possible Stone Age occupation; later, in 1935, UP artefacts (a "rather primitive Aurignacian") were identified by Czech archaeologist J. Skutil in the rocky quarry's Quaternary sediments, and the site of Kishegy/Mala hora near Beregszász/Berehove town was announced as the first real Palaeolithic site of the Podkarpatská Rus in Czechoslovakia (Skutil 1938). However, no excavations were undertaken at the site in the 1930s. New work at the site took place in 1969 and 1971 during a systematic Palaeolithic research in the present day Ukrainian Transcarpathia (Soviet Union) by a Transcarpathian Palaeolithic Expedition team from Kyiv, headed by V. N. Gladilin. While Gladilin was mainly searching for Lower and Middle Palaeolithic sites in the region (the surveys successfully led to the discovery of the Korolovo site complex in 1974), the Kishegy/Mala hora site was excavated by a member of the Expedition team, S. V. Smirnov. During two field campaigns, the site was excavated over an area of ca. 240 m^2. Smirnov assigned the sites's lithic artefacts (a little less than 1100 pieces, but no faunal remains preserved as it was the case at other open-air Palaeolithic sites in the Transcarpathia) to the Aurignacian, suggesting that the lithic were *"no less developed than late phase of Eastern Slovakian Aurignacian"* (Smirnov 1974, p. 39). Thus, Berehove I and its artefacts were compared with the Aurignacian sites in the neighboring Slovakia, where after the intensive field research of L. Bánesz in the 1950s and 1960s were identified and excavated several Aurignacian sites, Barca I and II, Seňa I, Tibava and Kechnec (Bánesz 1960; 1961; 1968). Later on, in the 1970s and the early 1990s several surface find spots (Berehove II–VI and Muzhievo I) were discovered close to the Berehove I on various terraces and slopes of the Berehove shallow mountain area situated between the town of Berehove and the village of Muzhievo (Smirnov 1973; Tkachenko 1989; 2003). Consequently, lithic artefacts from both Berehove I (after 1971 were recovered very few, mainly resulting from the geological profile cleaning carried out during Soviet times) and some nearby surface loci (considered as being the remains of sites destroyed by natural processes) were usually discussed as belonging to the "Berehove Aurignacian culture" related to the Middle Aurignacian in Central Europe with the closest analogies to the above-noted Slovak sites, first of all, to Barca I and II (Tkachenko 1989; 2003).

Two important research events happened in the 21st century, when Transcarpathia became the westernmost part of the newly independent state of Ukraine after the collapse of the Soviet Union in 1991, and Berehove I got new industry-related-chronological data and new interpretations together with the discovery of new surface find loci.

First, new excavations were carried out by V. I. Usik (Kyiv) in 2006–2007 (c. 8 m^2) and then in 2010 and 2012 (c. 20 m^2). For now, the main body of the new Berehove I data was published after its 2000s excavations (Usik 2008). So far, the 2010s excavation data (Usik *et alii* 2013; 2014) have revealed that the Aurignacian artefact bearing level dates to the Last Glacial Interpleniglacial and was not chronologically later as thought before; some technological data is also available - *"bladelet/microblade production from specific cores, including double-platform cores and cores with narrow working surface"* and *"bladelet/microblade reduction was separated from unidirectional blade production"* (Usik et alii 2014, p. 228). As a result of the new fine excavations and with wet sieving used for the first time, the site's lithic assemblage was supplemented by a new artefact type, the Dufour sub-type *lamelles* with mostly alternate bilateral and ventral lateral retouch. Usik also conjoined and refitted some lithics, connecting artefacts from 1969, 1975, 1990 and 2006–2007 excavation blocks and profile cleanings, proving it was one and the same archaeological level for all excavated areas. Analyzing the Berehove I lithic assemblage, Usik also established its Proto-Aurignacian industrial affinity in contrast to the previously assumed Middle Aurignacian one.

The overall Berehove I lithic assemblage recovered between 1969 and 2007 (Usik 2008, Table 1 on p. 65) is now composed of 13.820 pieces, although 11.407 of them are chips under 15 mm, recovered after wet sieving during the 2006–2007 excavations. The core-like pieces consist of 23 items. The core classification is too general for any detailed description yet but indeed, aside from some bladelet carinated cores (Fig. 7, no. 1), bladelet reduction was also often performed from bladelet bidirectional and unidirectional narrow-flaked cores (Fig. 8, no. 1–4), rather unusual for the known Proto-Aurignacian core reduction processes. Debitage dates (1.818 pieces) are taken only after 2006–2007 excavations when wet sieving was carried out: flakes – 712/39.1%; blades – 232/12.8%; bladelets – 260/14.3%; microblades – 614/33.8%. While information of the blanks of all 109 recovered tools is not very detailed, Berehove I can be characterized by a typical Proto-Aurignacian dominance of *lamelles* within both the debitage pieces (48.1% of the bladelets and microblades) and the 2006–2007 tool sample in 96 pieces (57.3% microliths). At the same time, a significant share of the flakes resulted from the debitage probably indicates an intense on-site core re-

preparation and reduction. The total tool-kit, 109 pieces is "squeezed" for the purposes of the present article and is given in Table 5.

	Berehove I
	2000s analysis re-calculated data 10
ENDSCRAPERS	***7 / 9.7%***
Carinated endscrapers	1 / 14.3%
Shouldered / Nosed endscrapers	3 / 42.8%
Simple & flat endscrapers	1 / 14.3%
Endscrapers on laterally/ bilaterally retouched pieces	2 / 28.6%
Endscrapers on blades with Aurignacian-like retouch	0
Endscrapers on Aurignacian strangled blades	0
BURINS	***10 / 13.9%***
Carinated	1 / 10%
Dihedral	0
On truncation / transversal on lateral preparation	6 / 60%
Angle / transverse on natural surface	3 / 30%
LAMELLES with a fine lateral / bilateral retouch	***55 / 76.4%***
Dufour, *lamelles* with alternate / alternating retouch	42
Dufour, *lamelles* wih ventral retouch	/ 76.4%
Pseudo-Dufour, lamelles with lateral dorsal retouch	?
Pseudo-Dufour, lamelles with bilateral dorsal retouch	?
FONT-YVES / KREMS POINTS with a fine retouch	***0***
BLADES with Aurignacian-like strangled retouch	***0***
BLADES ith Aurignacian-like retouch	***0***
TOTAL	***72 / 100%***

Table 5. Berehove I Proto-Aurignacian indicative tool types

It has a "regular" Proto-Aurignacian burin set (10 pieces) with prevailing examples on truncation/transversal on lateral preparation (6), some angle/transverse on natural surface ones (3), no dihedral items and a single carinated piece, as well as a great dominance of Dufour sub-type *lamelles* with alternate bilateral (Fig. 7, no. 6–14) and ventral lateral retouch (42/76.4% with no exact quantity given separately for alternate and ventral pieces among the Dufour *lamelles* out of all 55 microliths), although other 13 microliths' retouch type and placement data were not published yet. Despite of some claimed blades with Aurignacian retouch present (Usik 2008, Fig. 8, no. 5–6) the particular pieces do not bear the typologically required stepped retouch. At the same time, the numerically small endscraper set (7 items) is enough specific in contrast to all other above-analysed Proto-Aurignacian assemblages with a prevalence of nosed endscraper-cores (3) over wide-fronted endscraper-cores (1) (Fig. 7, no. 2–5) with also the presence of only a single simple endscraper and two simple endscrapers on retouched blades. All in all, by all basic techno-typological parameters, the Berehove I lithic assemblage still fits well into the European Proto-Aurignacian as was already pointed out before (e.g. Demidenko, Noiret 2012, p. 349–350) with also peculiar *lamelle* reductions from both bladelet bidirectional and bladelet unidirectional narrow-flaked cores, as well as a great role of nosed endscraper-cores.

Secondly, a new study was conducted on the surface loci altogether with the respective Berehove I site data, in terms of their precise topographical location using GPS and elevations above sea level, and Tisza River valley, resulting in a map with all UP Berehove and Muzhievo site and find spot locations, the raw materials used for on-site and off-site lithic artefact production processes, the lithic artefact type presence/absence, and some Palaeolithic site settlement pattern data (Demidenko *et alii* 2020).

Regarding the raw materials used, it should be, first of all, noted that both the site and the surface find loci are situated within the Berehove shallow mountain area where local raw material types were rocks of volcanic origin which undergone metasomatic transformations (siliceous, opalised) tuffs, tuffites and rhyolites. In other words, the UP human visitors of the Berehove shallow mountain area were literally sitting on the local raw material outcrops while settling there. In addition, some pieces on flint, silicified sandstone, siliceous argillite, obsidian and hyalodacite mostly of Transcarpathian origin were also supplementary used.

Instead of the previous image, i.e.a group of Middle Aurignacian destroyed sites, the Berehove and Muzhievo surface find loci are seen actually as of Proto-Aurignacian character. They are now understood as representing a series of various and functionally different supply chain loci ("site-satellites") of the following types.

- *Raw material outcrops*, *Muzhievo 3–5*, with a few real artefacts indicating limited (just testing?) core reduction processes only at Muzhievo 3 and located at the highest elevations for all the known loci at Berehove shallow mountain area, 200–255 m a.s.l. and 88–143 above Tisza River valley.

- *Workshops, Muzhievo 2* (at 174 m a.s.l. and 62 m above Tisza River valley) and *Muzhievo 1* (at 141 m a.s.l. and 29 m above Tisza River valley). Muzhievo 2 represents a raw material outcrop sporadically visited by the Proto-Aurignacian people, such as the Muzhievo 3–5 loci, but with some intensive primary flaking processes showing the initial workshop characteristics clearly seen through the indicative presence of both wedge-shaped pre-cores!), representing the already well-known core reduction method at Berehove I site. On the other hand, Muzhievo 1 accounts not for rare human visits with some lithic treatment actions on mainly rock testing like at Muzhievo 2 and especially at Muzhievo 3–5, but really demonstrates primary flaking activities coming from a real workshop visible through the presence of several wedge-shaped pre-cores and some initial reduction cores, and associated with them core maintenance products (CMP), blades and flakes; some intensively flaked blade/bladelet and flake/bladelet bidirectional cores; some indications on carinated endscraper-core separate bladelet/microblade reduction. At the same time, the near-absence of tools and burnt lithics confirms a workshop character for the discussed locality. Also, Muzhievo 1 has a lower topographical position in comparison to the elevations of Muzhievo 2–5 loci. In sum, Muzhievo 1 locus was a workshop where some already tested raw material pieces and prepared pre-cores were brought from localities like Muzhievo 2–5 for further preparation and reduction, with also an "export" from the loci then of some wedge-shaped pre-cores, only initially flaked blade cores, several blades and bladelets themselves due to the intensive reduction of some blade/bladelet bidirectional cores, as well as of some carinated endscraper-cores and their performs.

- *A site-workshop Berehove II* (located at 174 m a.s.l. and 62 m above Tisza River valley). This is another locality where the Proto-Aurignacian humans were bringing some already tested material pieces, prepared pre-cores, especially including the wedge-shaped one (Fig. 9; 10, no. 1–2), and only initially flaked blade and blade/bladelet cores "primary workshops" like Muzhievo 1 and 2. The lithic pieces brought were more intensively treated both preparing more pre-cores and initial cores, and getting several "target products" like blades and bladelets. Accordingly, some of the pre-cores, cores and debitage pieces were already processed at Berehove II, including some tool preparation and probably on-site use and even rejuvenation. At the same time, the not really elaborate reduction of some cores might also indicate an "export" of some such reduction objects somewhere else. Furthermore, the occurrence of some flake cores at Berehove II allows us to suggest an on-site "targeted" primary production of thick flakes used then at the locality as debitage blanks for carinated and shouldered/nosed endscraper-core preparation/re-preparation and some reduction, as a thick nosed endscraper-core and lateral/fronto-lateral carinated endscraper-core maintenance flakes testify for. In addition, the presence of four flake cores and a single thick nosed endscraper-core also permits an "export supposition" or thick flakes transfer to other loci for carinated reduction. Finally, the presence of the heavily burnt lithics (eight items) on local raw materials indicates a fireplace/hearth functioning at Berehove II, not just a pure workshop feature. Thus, Berehove II locus, still combining some of the Muzhievo workshop features, also demonstrates some living stile character, adding here also the presence of 13 tools, and it considered as being a site-workshop, probably representing a sort of transshipment camp between workshops and a base camp.

Taking the loci's elevation data, Berehove II is comparable to Muzhievo 1 and 2 workshops, being, however, closer to Tisza River valley. Of great importance here is the topographic aspect, i.e. Muzievo and Berehove loci are situated on two different slopes of the Berehove shallow mountain area, with Muzhievo loci on southern slopes and Berehove loci on western slopes.

- *Special task-oriented loci*, *Berehove VI* (170 m a.s.l. and 58 m above Tisza River valley) and *Berehove VII* (140 m a.s.l. and 28 m above Tisza River valley). The two loci (Berehove VII being very recently discovered, in 2019, by B. Rácz), still situated at the local raw material outcrop area, do not testify, however, for any systematic "regular" pre-core preparation/core reduction processes, with core-like pieces at Berehove VI being absent and at Berehove VII being represented by a single flake/blade multi-platform core. At the same time, there are series of tools sensu strict and carinated pieces at the two loci (Fig. 8, no. 5–6). Such lithic artefact structures can only be associated with human activities at some special ephemeral camps where the Proto-Aurignacian people have been carrying out particular tasks, different from activities at a base camp, site-workshop and/or workshop.

In the context of the above-described different supply loci, Berehove I site is considered to be a base camp for the Proto-Aurignacian human groups inhabiting the Berehove shallow mountain area.

It is distinct by its topographic position, being at the lowest elevation (130 m a.s.l. and 18 m above the Tisza River valley) among all the Berehove and Muzhievo site-loci cluster with the easiest access to the Tisza River bed and its surrounding valley, the site's occupants having good hunting possibilities of various ungulate herds and some (just

some) possibilities for getting additional supplementary aquatic food resources. Furthermore, the site is located at a lower ridge area between the western (with Berehove loci) and southern (with Muzhievo loci) slopes of the shallow mountain area, also allowing the site's humans an easy access to the two slope areas' variable lithic sources.

The following lithic artefact techno-typological data do distinguish Berehove I site from the Berehove and Muzhievo loci.

- Berehove I has more cores than pre-cores, same as Berehove II site-workshop, while Muzhievo 3's raw material outcrop and Muzhievo 1–2 workshops contain more pre-cores.

- Berehove I still has wedge-shaped items but only a few such pre-cores and, at the same time, several bladelet wedge-shaped cores, while the workshops and the site-workshop have mainly such type of pre-cores, some blade and blade/bladelet wedge-shaped cores (only known yet at Muzhievo 2) and no true bladelet wedge-shaped / narrow-flaked core.

- Regarding the carinated reduction technology that occurs at all the discussed localities, attested through the presence of carinated endscraper–cores *sensu lato* (both wide-fronted carinated *sensu stricto* and thick nosed/shouldered endscraper–cores) and no carinated burin-core technology, which is a feature of the Late/Evolved Aurignacian, Berehove I definitely has more of the "narrow variety" of the type (thick nosed/shouldered endscraper-cores), and when the carinated pieces occur at the workshops and the site-workshop, there are more common of the "wider variety" of the type, and the known special camps have either only "wider" (Berehove VI) or only "narrow" (Berehove VII) such reduction items.

- Berehove II site-workshop is the only locality with a series of flake cores.

- Berehove I site, Berehove II site-workshop and Muzhievo 1 workshop have various bidirectional cores being, however, not true bidirectional but a sort of double single-platform cores with just one flaking surface.

- The rather few number of blade and blade/bladelet cores at Berehove I does not correspond to the quantity of blades and blade-tool blanks at the base camp, so it is assumed that part of the blades and tools were brought from the site-workshop and the workshops to the base camp.

- Berehove I site yielded almost the entire Proto-Aurignacian tool set, while only some of these types are known for the Berehove site-workshop and the special camps, and they are completely absent at the workshops and raw material outcrops.

As a result of the new surface find loci and site study, we argue that a Proto-Aurignacian logistic/foraging/radiating settlement pattern is detectable at the Berehove shallow mountain area, in the Ukrainian Transcarpathia.

For some of the above-noted lithic peculiarities of the Berehove-Muzhievo site-loci cluster within the European Proto-Aurignacian, several explanations are suggested below.

The serial presence of bifacial wedge-shaped pre-cores and then blade, blade/bladelet and bladelet wedge-shaped/narrow-flaked cores is demonstrated by the presence of flakes of various size and shape, angular and rather flat natural fragments of local metasomatically transformed tuffs, tuffites and rhyolites, which were technologically necessary in order to make special pre-cores for subsequent systematical core reduction; the wedge-shaped core technology is best adjusted to the available and easily accessible raw material types at the localities discussed.

The unusual presence of bidirectional cores is again technologically connected to the peculiarities of the raw material reduction objects when items with good flaking qualities were intensively flaked apparently bidirectional manner, in fact being just double single-platform reduction.

Carinated endscraper-cores *sensu lato* (wide-fronted carinated endscraper-cores and narrow-fronted thick nosed/shouldered endscraper-cores) do variably occur. Most probably, the prevalence of the narrow-fronted endscraper-core type at the base camp should be understood through both the reduction in size of the wide-fronted carinated endscraper-cores brought to the site into then the more narrow thick nosed/shouldered endscraper-cores

and, most likely, better reduction control of the thick nosed/shouldered endscraper-cores during a long and continuous their primary flaking.

It is additionally worth noting the presence of several flake cores, technologically aiming at thick flake production, only at Berehove II site-workshop, which supports the flaking of blanks for carinated endscraper-cores *sensu lato* just at workshops. On the other hand, the absence of flake cores at Berehove I indicates an intensive bladelet/microblade reduction of the carinated endscraper-cores *sensu lato,* almost exclusively at the base camp; when brought there thick flakes had already been detached at the site-workshop.

All in all, it is the first case during the European Proto-Aurignacian when a complex settlement pattern with a base camp and sites-satellites is recognized as a closely located cluster of loci.

The new analysis of the Berehove-Muzhievo site-loci cluster did also lead to a new but still preliminary analysis of the Aurignacian sites in Eastern Slovakia, for a long time compared with Berehove I site. For now the Tibava lithic artefacts assemblage (coming from a site with no faunal preservation, like at Berehove I) excavated in 1956 by L. Bánesz (1960) appears to be in a good accordance with the Berehove-Muzhievo Proto-Aurignacian assemblages (Fig. 11, no. 1–16) (Demidenko et alii 2020, p. 213–215):

- it has a 'bladely' character but microliths, *lamelles* with a fine retouch, are poorly represented due to 1950s excavation techniques;

- blade/bladelet and bladelet core reductions are detected through the presence of respective cores and debitage pieces;

- the presence of a series of well-retouched but not Early Aurignacian-like blades with a stepped retouch;

- the availability of both bladelet carinated cores and carinated and thick nosed/shouldered endscraper-cores but no carinated burin-cores;

- the presence of wedge-shaped bifacial pre-cores, defined by us, and cores (Demidenko *ET alii* 2020, Fig. 13, no. 1–2).

There are also some other features that bring Berehove I and Tibava sites together. The site of Tibava is the nearest Slovak site to Berehove I, only c. 65 km as the crow flies and, the most importantly, Tibava is situated in the western part of Vihorlat-Gutin mountain range that runs from Eastern Slovakia through the Ukrainian Transcarpathia into northern Romania. Accordingly, Proto-Aurignacian human groups could have moved along the slopes of this mountain range in now three different countries. Moreover, the most dominant rock type used by the Proto-Aurignacian humans at Tibava site was brownish silicified sandstone of Ukrainian Transcarpathian origin (c. 37% of all lithic artefacts) and some other Transcarpathian rocks (black siliceous argillite, radiolarite, ungvaritem and even possibly Berehove metasomatically transformed tuffs, tuffites and rhyolites) were also supplementary used at the Slovak site. Thus, the raw material factor indeed connects the two Proto-Aurignacian sites of these two neighboring regions. Finally, the site of Tibava, in a terrace of 'Za Cintorínom' Hill (123 m a.s.l. and 7–8 m above the nearby Breznický stream) is the lowest Aurignacian site in Eastern Slovakia, and this again connects the Slovak and Transcarpathian sites.

Summing up the above-discussed date on the Proto-Aurignacian sites from the Ukrainian Transcarpathia and Eastern Slovakia, it becomes more and more evident the need for more field surveys in order to identify other Proto-Aurignacian sites in the Ukrainian Transcarpathia, eastern Slovakia, north-western Romania and north-eastern Hungary. Most likely, new surveys should be concentrated on low elevation lean terraces, generally not covered by Palaeolithic archaeologists, and the topographical settings similar to those of Berehove I, Tibava and Crvenka-At sites. Successful attempts might lead to the identification of a Proto-Aurignacian site network throughout the entire north-eastern part of the Carpathian Basin.

OTHER AREAS WITH POTENTIAL PRESENCE OF PROTO-AURIGNACIAN SITES IN THE CARPATHIAN BASIN

As was noted in the beginning of the present article, there is a certain number of sites and especially surface find loci with some Aurignacian-like lithic artefacts in the Carpathian Basin, and it is a hard task to identify some

assemblages that could be assigned to the Proto-Aurignacian. Below we present two sites (a surface find locus and a cave) in Hungary and Serbia which qualify as candidates.

Possible Proto-Aurignacian data in Hungary

No *in situ* Proto-Aurignacian site is yet known in Hungary, the country geographically constituting the heart of the Carpathian Basin. It is even a bit more striking due to the recognized Proto-Aurignacian sites in the Banat, and especially now in Eastern Slovakia and the Ukrainian Transcarpathia. The Slovak and Ukrainian cases are the most important here due to the geographical location of most of the known Early UP sites in Hungary, namely in northern Hungary, the neighboring region to Slovakia and Transcarpathia.

At the same time, as it appears, some Proto-Aurignacian perspectives in Hungary still come from northern Hungary and its Eger region, in the area confined to the southern foothills of the Bükk Mountains. Areas to the south of Eger have been intensely surveyed for Paleolithic sites, and some site excavations have been carried out during the last c. 50 years (e.g. Fodor 1984; Kozlowski, Mester 2003–2004; Mester, Kozlowski 2014). One of the found loci, Demjén-Hegyeskő-tető II, is located on the Hegyeskő Plateau on the eastern outskirts of the Demjén village, c. 7 km south-south-west from the town of Eger. The first Paleolithic artefacts at different localities on the plateau were discovered by László Fodor in the 1970s (Fodor 1984). Later on, more than 20 years ago, one of the present authors (S. Béres) also started to search for Paleolithic artefacts on the Hegyeskő Plateau, recording the exact provenience of each artefact concentration found. One of the loci discovered by S. Béres in 2000 (240 m a.s.l.) is situated c. 100 m north-west from the highest point of the Hegyeskő Plateau and was later mentioned in the Hungarian archaeological literature under the name of Demjén-Hegyeskő-tető II (Zandler 2012).

The lithic artefacts from here are quite few, only 88 pieces, despite the repeated visits at the find spot. Other than three items made from possible non-local western Ukrainian flints, all other specimens were produced on local raw materials, mostly limnosilicites and some radiolarian marls, radiolarites and silicified sandstones, whose outcrop places are located at a distance of 5–15km, which means they are not right near the site of Demjén-Hegyeskő-tető II. Classified by artefact categories, the lithic artefacts are four unworked pieces of raw material (4.5%), seven core-like pieces (8.0%), six core maintenance products (CMP) (6.8%), 21 debitage pieces (23.9%), 21 pieces with some secondary-like treatment (23.9%) and 29 debris pieces, six chunks, 17 chips and six uncharacteristic, too fragmented débitage pieces (32.9%). The lithics show mostly on-site core reduction processes. The seven cores are all bladelet ones, five complete (Fig. 12, no. 1–4) and two fragmentary. Two wide-fronted carinated endscraper-cores (Fig. 12, no. 5–6) add to the "regular" cores. The predominance of flakes (13/61.9%) should not obscure the presence of five blades, two bladelets and a microblade artefact. The occurrence of both crested pieces and core tablets among the CMP sample indeed indicate an on-site intensive primary reduction processes. Still preliminary, the analysis of the tool sample (excluding the two endscraper-cores), has revealed the presence of a burin on truncation and an unifacial point on blade, plus a number of various items with some retouch which could be in fact a pseudo-retouch damage; these latter pieces should be re-analyzed. It is also worth noting the absence of any bifacial and/or backed pieces at the locus and of any other indicative lithics to suggest a non-Aurignacian industrial component presence at the loci. At the same time, a hypothesis on the Proto-Aurignacian character of the Demjén-Hegyeskő-tető II lithics cannot be refuted; moreover, the locus' position at 240m a.s.l., well within the range of 200–300 m a.s.l. known for the Romanian Banat Proto-Aurignacian sites.

All in all, the above-discussed Demjén-Hegyeskő-tető II locus and its surrounding area should be explored again in order to find more lithics.

More possible Proto-Aurignacian data in Serbia

In 2012 T. Dogandžić initiated a survey along the valley of Resava River, a tributary to the Velika Morava River (Central Serbia) where she discovered a number of caves and rock-shelters. The field work in the area included Dogandžić's excavations at Orlovača Cave (400 m a.s.l.) where a few interesting pieces have been found: a bladelet carinated core and a few Dufour sub-type *lamelles* with alternate retouch; they were found in level 3 superimposing level 4, MP (Dogandžić *et alii* 2014, p. 88–92; Dogandžić, pers. com. to Yu. D. December of 2013; September of 2019). The publication of the Orlovača Cave is in preparation yet. Accordingly, it is hoped to have more data on the site and its finds in the near future. The area with the cave is regarded by our Serbian colleagues as being of significant

importance, taking into consideration the geographic position of the Velika Morava River that "*runs in a roughly south-to-north direction, connecting, via the Danube and Tisa River valleys, the Hungarian Pannonian Plain* (the present article's Carpathian Basin) *in the north with northern Greece in the south, via the Vardar River valley in Macedonia*", thus suggesting the river valley as a dispersal route for both large mammals and human groups in the Pleistocene (Forsten, Dimitrijević 2003, p. 55).

As a result, it is possible that Orlovača Cave harbors the Proto-Aurignacian occupations in the southernmost area of the Carpathian Basin, on a "natural road" from the Balkans into the Carpathian Basin; this might indicate not only basic penetration of the Proto-Aurignacian humans into Europe from the east through the Danube River Corridor but also that some of their groups moved south via Velika Morava River Valley.

THE PROTO-AURIGNACIAN IN THE CARPATHIAN BASIN AND ITS HUMAN MAKERS

The above-discussed Carpathian Basin Proto-Aurignacian open-air sites either do not have any preserved organic remains (sites in the Romanian Banat, Ukrainian Transcarpathia and Eastern Slovakia), have few poorly preserved animal bones (Crvenka-At site in the Serbian Banat), or have mixed faunal remains originating from various Aurignacian and Gravettian occupations (Krems-Hundssteig site in Lower Austria). Therefore, it is not a great surprise to have no human remains in the Basin's Proto-Aurignacian sites. However, after the discovery of *Homo sapiens* remains directly dated to c. 40-39 ka cal BP but with no any archaeological context in Oase Cave (the Romanian Banat) in the first half of 2000s (e.g. Trinkaus *et alii* 2003), it became the general point of view then that the Oase *Homo sapiens* were the likely makers of the European Proto-Aurignacian and/or Early Aurignacian (Hublin 2013, p. 234) and also the makers of the Banat Proto-Aurignacian lithic assemblages (e.g. Sitlivy *et alii* 2012, p. 86–87; 2014, p. 194; Nett *et alii* 2021, p. 3, 13). New analyses, comprising new ^{14}C ages, *Homo sapiens* anthropological and ancient DNA analysis, particularly the new ones from Bacho Kiro Cave are of great importance in discussing the possible associations of the Oase *Homo sapiens* and the Carpathian Basin Proto-Aurignacian. The radiocarbon dates for Bacho Kiro Initial UP layer I (the 1970s excavation, layer 11) of c. 47–43 ka cal BP age, obtained on both anthropogenetically modified animal bones and human remains (Fewlass *et alii* 2020) make the Bacho Kiro *Homo sapiens* "*the oldest European Upper Palaeolithic hominins recovered to date*" (Hublin *et alii* 2020, p. 300). At the same time, the ancient DNA analyses of both the Bacho Kiro and Oase *Homo sapiens* (Fu *et alii* 2015; Hublin *et alii* 2020; Hajdinjak *et alii* 2021; T. Tsanova pers. commun. with Yu. D., March 2021) do show more Neanderthal ancestry for the Romanian cave humans, a fact that might indicate that "*the direct date of Peștera cu Oase—which was obtained before recent improvements in pretreatment techniques—is an underestimate*" (Hublin *et alii* 2020, p. 302). With such a scenario when also "*Neanderthals and modern humans would have had little or no overlap in the Central Balkans*" (Alex *et alii* 2019, p. 276), Oase Cave *Homo sapiens* can be associated with the Initial UP. The suggestion was already supported by the ancient DNA data where "*Ust'-Ishim* and *Oase1* ... do not show any distinctive affinity to later Europeans" (Fu *et alii* 2016, p. 204), while Aurignacian humans had genomic connections with them. In the light of this, it is worth remembering the hypothesis proposed ten years ago yet that the Oase humans "*could even have been makers of the mysterious Bohunician industry*" (Stringer 2011, p. 92), the Central European Initial UP. Here it should be kept in mind that the Bohunician is the Initial UP with true Levallois points within bidirectional core reduction processes, while the Bacho Kiro variant of the Initial UP did not have true Levallois points, but similar to the Bohunician had bidirectional core reduction, like, for example, the Initial UP assemblages in the Altai and Mongolia (Demidenko 2013). This is why there is a possibility of different "genetic fates" for Oase (Bohunician?) and Bacho Kiro *Homo sapiens* where the latter humans "*contributed to later populations with Asian ancestry*" but "*disappeared in western Eurasia without leaving a detectable genetic contribution to later populations*" (Hajdinjak *et alii* 2021, p. 257).

All in all, thanks to the new Bacho Kiro Cave investigations, now there is much more data to connect the Oase *Homo sapiens* with the Initial UP in Eastern Central Europe than with the region's Proto-Aurignacian. If this is the case, then Proto-Aurignacian in the Carpathian Basin still waits for finding its own *Homo sapiens*, such as the *Homo sapiens* remains (two deciduous incisors) discovered at the Proto-Aurignacian sites of Riparo Bombrini and Fumane in northern Italy (see Benazzi *et alii* 2015).

CONCLUDING REMARKS

The present review of all possible Proto-Aurignacian sites and their artefact assemblages in the Carpathian Basin, as well as the additional data (e.g. probable *Homo sapiens*, industrial variability, topography, settlement pattern), allow us to draw certain conclusions and make some suggestions.

The Proto-Aurignacian industrial definition given at the beginning of the article is certainly valuable within all its technological and typological aspects. At the same time, there is some variability for the particular Aurignacian industry, remaining within its already recognized frames. The model developed for the Aquitaine Basin (south-western France) at the beginning of this century on the Proto-Aurignacian points out the existence of a single and continuous blade and later bladelet core reduction sequence, but stressing that "*bladelets can be produced separately (using small cores, or obtained along the edges of big flakes)*" (Bon 2006, p. 139). The latter notion, as it was already shown by one of the present authors (Yu. D.) in the late 1990s and early this century for the Siuren I rock-shelter materials (Crimea) in Eastern Europe, becomes valuable including now the Carpathian Basin sites where the presence of both blade/bladelet and separate bladelet core reductions was noted. At the same time, the separate bladelet reduction is attested by the presence of both various bladelet cores on chunks/nodules and carinated/shouldered/nosed endscraper-cores on thick flakes/a few raw material splinters while longer bladelets/microblades (c. 3–5 cm long) were mostly detached from the former reduction objects and shorter bladelets/microblades (c. 1–3 cm long) were mainly removed from the latter reduction objects. As it appears, when the used raw material pieces were of regular shape and high flaking quality, the endscraper-cores were basically of the wide-fronted carinated type, while in the cases with no regularity of raw material types' shapes and poor flaking quality, such as the Berehove-Muzhievo site-loci cluster in the Ukrainian Transcarpathia, additional one or two side notches for a better control of *lamelle* reductions were produced more often on the endscraper-cores of typologically-looking shouldered/nosed type. Furthermore, the serial occurrence of various wedge-shaped/narrow-flaked cores and bidirectional cores in the Transcarpathian site-loci cluster are also connected to such factors. Accordingly, some influence of the raw material type on Aurignacian endscraper-core typological variability and on some other types of cores is observed. It is also worth noting here that Proto-Aurignacian shouldered/nosed endscraper-cores are different from the chronologically later Aurignacian II/Middle Aurignacian shouldered/nosed endscraper-cores by their greater thickness for reduction of rather long *lamelles* (with length over 1 cm), while there is an actual impossibility to subdivide the Aurignacian II/Middle Aurignacian shouldered/nosed endscraper-cores into flat and thick examples due to overall low thickness (hardly exceeding 1cm) of their narrow flaking surfaces/working edges. Besides, various shares of different blade/bladelet and strictly speaking bladelet cores depend not upon a "cultural" influence, like, for example, the different Aurignacian industry types' features, but also on site function and the natural environment, which may be leading to some lithic artefact variability. At the same time, the fallacy of the postulated "Aurignacian 0.5", together with numerous misidentifications in core and tool type classifications, is also well seen through the absence of serial large-sized blade cores for intensive blade flaking in the Banat Proto-Aurignacian assemblages that is so typical for the Aurignacian I/Early Aurignacian. The latter Early Aurignacian/Aurignacian I blade core reduction strategy has been only recently traced for the Krems-Hundssteig type site (Shidrang *et alii* 2016) among all the Carpathian Basin Proto-Aurignacian sites and their lithic assemblages.

Coming to the Carpathian Basin Proto-Aurignacian tool-kits, the same site subdivision can be observed with Krems-Hundssteig, on the one hand, and all other sites, on the other. The Lower Austrian site yielded serial blades with Aurignacian-like heavy scalar and stepped retouch, Aurignacian strangled blades with (again) heavy scalar and stepped retouch, endscrapers on blades with the Aurignacian-like retouch and endscrapers on the Aurignacian strangled blades being almost exclusively present among the Early Aurignacian/Aurignacian I tools (e.g. Sonneville-Bordes 1960, Tabl. I, V–VI, IX–XIV; Figs. 11, 38, 42, 67). The Early Aurignacian/Aurignacian I tiny and rare, usually no longer than 1cm microliths, cannot be expected to be recognized among the Krems-Hundssteig assemblage, keeping in mind that the lithics were collected more than 100 years ago by construction workers. On the other hand, all the rest of the Carpathian Basin Proto-Aurignacian sites and find-spots usually lack these four Early Aurignacian / Aurignacian I tool types. The exceptions are the single occurrence of blades with Aurignacian-like retouch in some tool-kits, the presence of the only one Aurignacian strangled blade in Coşava I for all other sites' tool-kits, whereas no endscraper on the two types of Aurignacian blades has yet been recognized. All other typologically indicative tool types in these tool-kits are of Proto-Aurignacian character and, first of all, microliths, followed by the subordinate position of dihedral burins and either single or absent carinated burin-cores. The only other feature that deserves some attention is the availability of serial, both simple / flat endscrapers on well-retouched blades and the well-retouched blades themselves in the Banat sites, although such retouched blades can be easily found in any industry of

the Aurignacian and Gravettian. Accordingly, these retouched blades should be better understood through some "subjective" human activities at the sites when there were often needed retouched and several time rejuvenated blades.

Thus, the Carpathian Basin Proto-Aurignacian techno-typological data fit well into Proto-Aurignacian records in the Aquitaine Basin. The most recent short definition can be cited here (Dinnis *et alii* 2019, p. 31): *"- Production of modified, (relatively) long (2–4 cm) microblades/bladelets with straight or only slightly curved profiles. Retouch is usually inverse/alternate (Dufour bladelets, Dufour subtype), or direct bilateral (ie, Krems points). – Bladelet core types: production from blade cores or from independent bladelet cores; burin–cores sometimes used, but busqué burins absent; carinated scrapers rare or absent. – Aurignacian retouch rare or absent."*

It also means that some of the above mentioned (recent) attempts which state that "*the Aquitaine sequence represents only a regional pole*" (Falcucci *et alii* 2020, p. 128) for Aurignacian industrial-chronological sequence studies in Europe, and that it does not hold truth for other European territories, are in disagreement with the conclusions of this article. The "Aquitaine model" actually works well for a large region in the heart of Europe, the Carpathian Basin and its Proto-Aurignacian sites. Accordingly, not making mistakes with artefact classifications and then wrongly interpreting them, but finding some real industrial variability can make actually better and more vivid the classic French scheme.

All in all, some deviation in core and tool type proportions within the Carpathian Basin Proto-Aurignacian assemblages call for more studies of the industry's techno-typological variability as some industrial differences have been very likely caused by differences in site use by the Proto-Aurignacian *Homo sapiens*. One such study has already been done for the Berehove-Muzhievo site-loci cluster in the Ukrainian Transcarpathia (Demidenko *et alii* 2020). The next group of sites in line for such studies is in the Banat. Here it is also worth noting that we realize and propose to do such studies separately for each particular Aurignacian industry type. Accordingly, the recent attempt (Hauck *et alii* 2018) of a similar study is interesting but cannot be acknowledged as really successful due to the grouping together of sites and their data related to all possible Aurignacian industry types and even some sites with an uncertain Aurignacian status. At the same time, some of the study's criteria (Hauck *et alii* 2018, Fig. 6) are worth keeping in mind for further research.

Finally, it is needed to tackle the question of identifying more Proto-Aurignacian sites in the Carpathian Basin. As the studies at the Berehove-Muzhievo site-loci cluster, Tibava and Crvenka-At sites have definitely shown, a search for new *in situ* sites is necessary on the low elevation terraces of the Ukrainian Transcarpathia, Eastern Slovakia, North-Eastern Hungary, and, finally, in north-western Romania where Maria Bitiri conducted intensive pioneering Paleolithic investigations as early as the 1960s.

ACKNOWLEDGEMENTS

We are grateful to many friends and colleagues for discussions and some help, including L. Anderson, M. Anghelinu, R. Dinnis, T. Dogandžić, A. Falcucci, M. Händel, D. Mihailović, W. Müller, U. Simon, Ch. Stringer, G. Trnka, and T. Tsanova. At the same time, we alone are responsible for the ideas, views and shortcomings expressed in the article.

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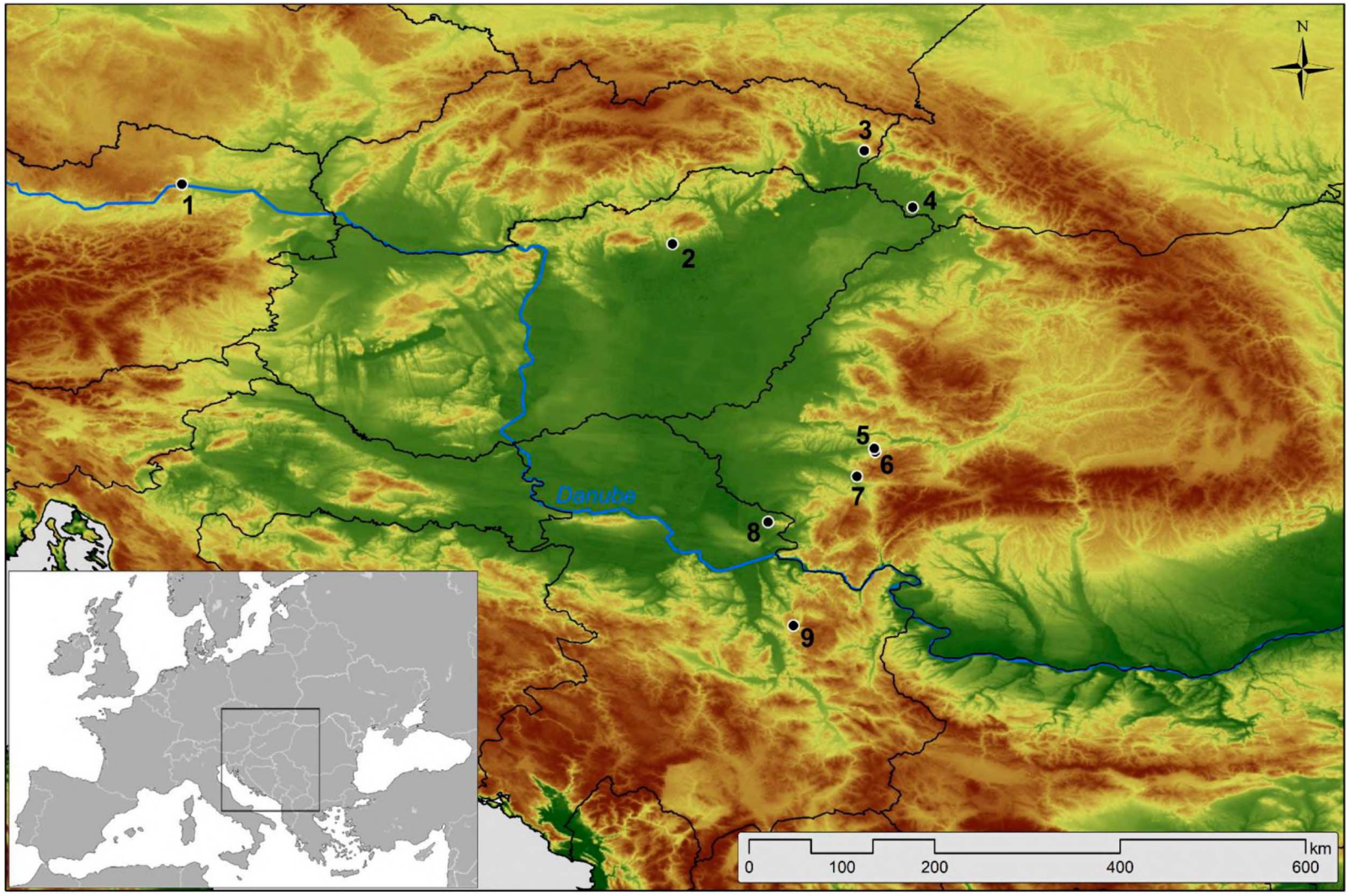

Figure 1. 1: Map of key sites mentioned in the text. Krems-Hundssteig, 2: Demjén-Hegyeskő-tető II, 3: Tibava, 4: Berehove-Muzhievo, 5: Coşava I, 6: Românești-Dumbrăvița I and II, 7: Tincova, 8: Crvenka-At, 9: Orlovača cave.

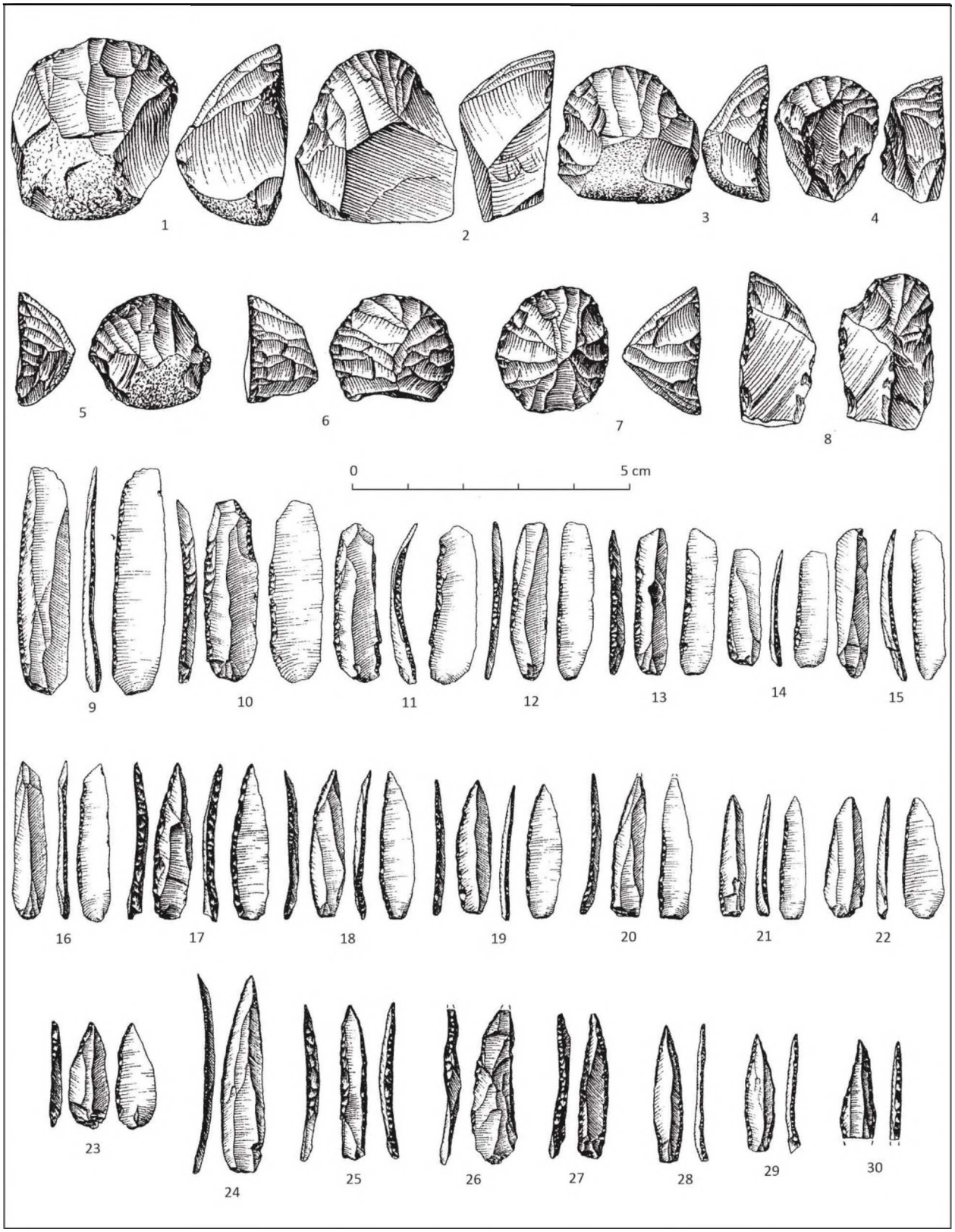

Figure 2. Krems-Hundssteig site Proto-Aurignacian lithic artefacts 1–30 (modified after Laplace 1970). 1 – bladelet "carinated" core; 2–7 – various carinated endscraper-cores; 8 – shouldered endscraper-core; 9–14 – Dufour *lamelles* with alternate retouch; 15–16 – Dufour *lamelles* with ventral retouch; 17–23 – Krems points with alternate retouch; 24–30 – Font-Yves points with bilateral dorsal retouch.

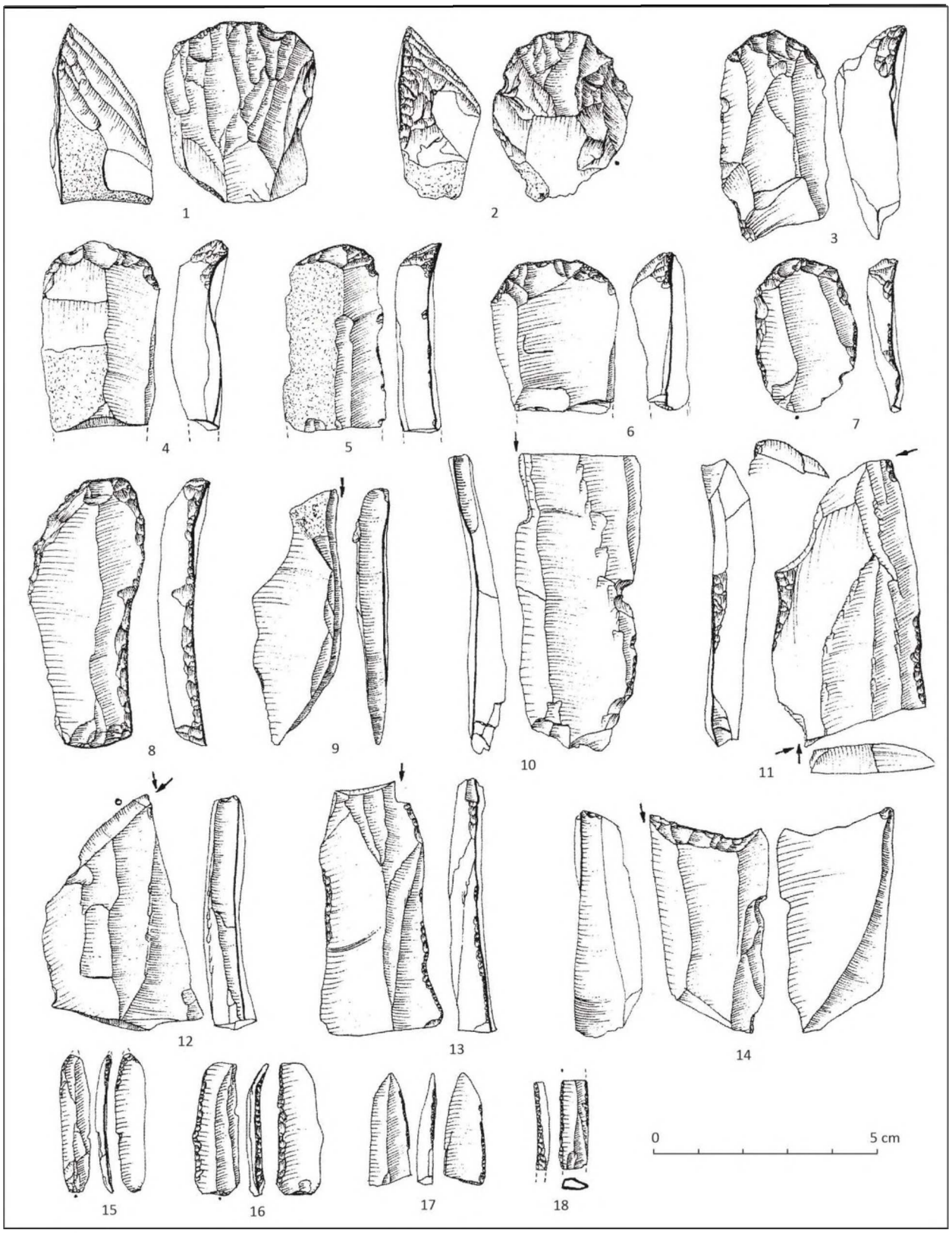

Figure 3. Românești-Dumbrăvița I site, layers II-III Proto-Aurignacian lithic artefacts 1–18 (modified after Hahn 1977). 1 – bladelet "carinated" core; 2 – carinated endscraper-core; 3–7 – simple flat endscrapers; 8 – double simple endscraper on a retouched blade; 9–10, 13 – angle burins; 11 – double transverse on natural surface burin; 12 – dihedral asymmetrical burin; 14 – burin on concave truncation; 15–17 – Dufour *lamelles* with alternate retouch; 18 – pseudo-Dufour *lamelle* with bilateral dorsal retouch.

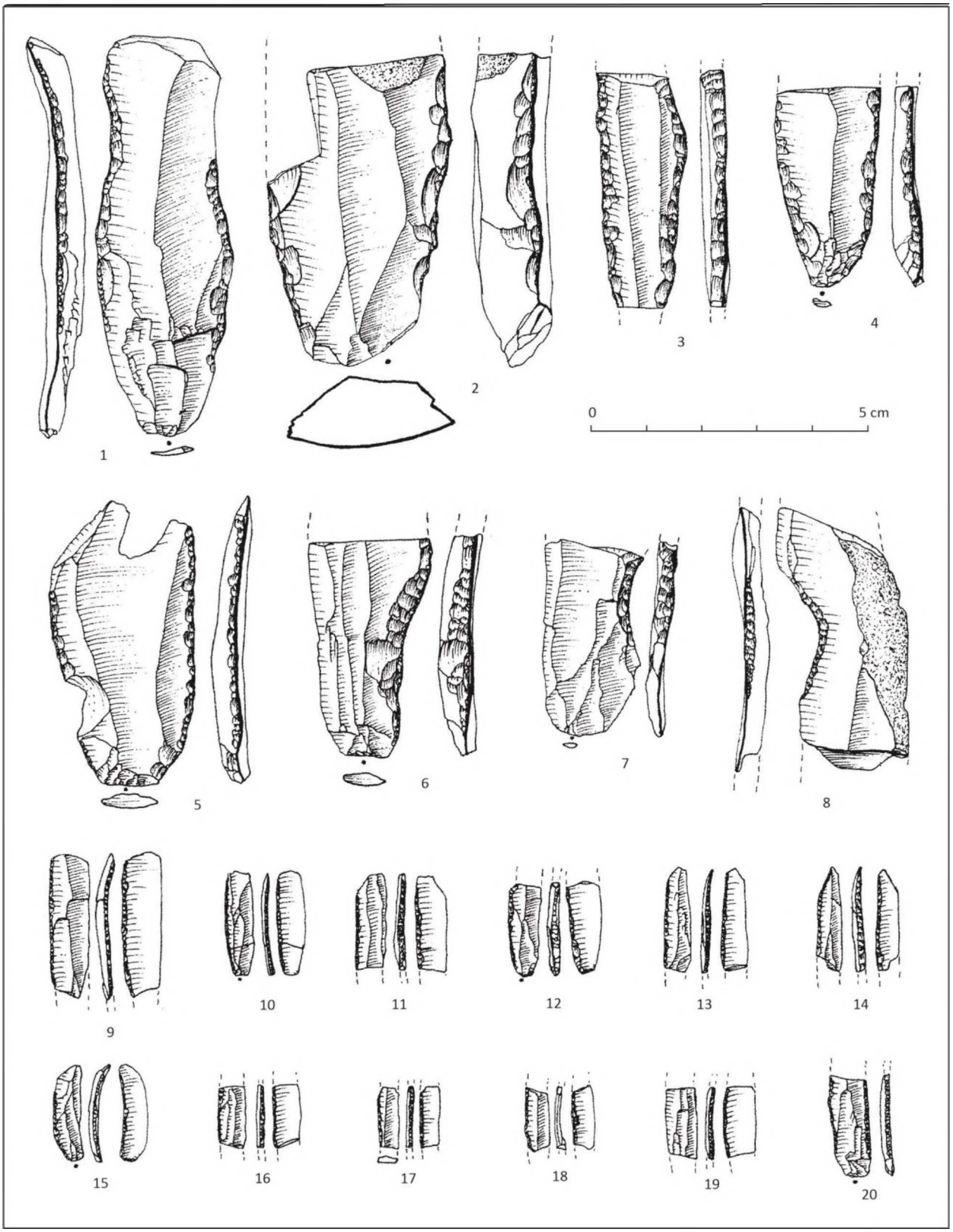

Figure 4. Românești-Dumbrăviţa I site, layers II–III Proto-Aurignacian lithic artefacts 1–8 (modified after Hahn 1977). 1–8 – various retouched blades; Românești-Dumbrăviţa II site Proto-Aurignacian lithic microliths 9–20 (modified after Hahn 1977). 9–18 – Dufour *lamelles* with alternate retouch; 19 – Dufour *lamelle* with ventral retouch; 20 – pseudo-Dufour *lamelle* with bilateral dorsal retouch.

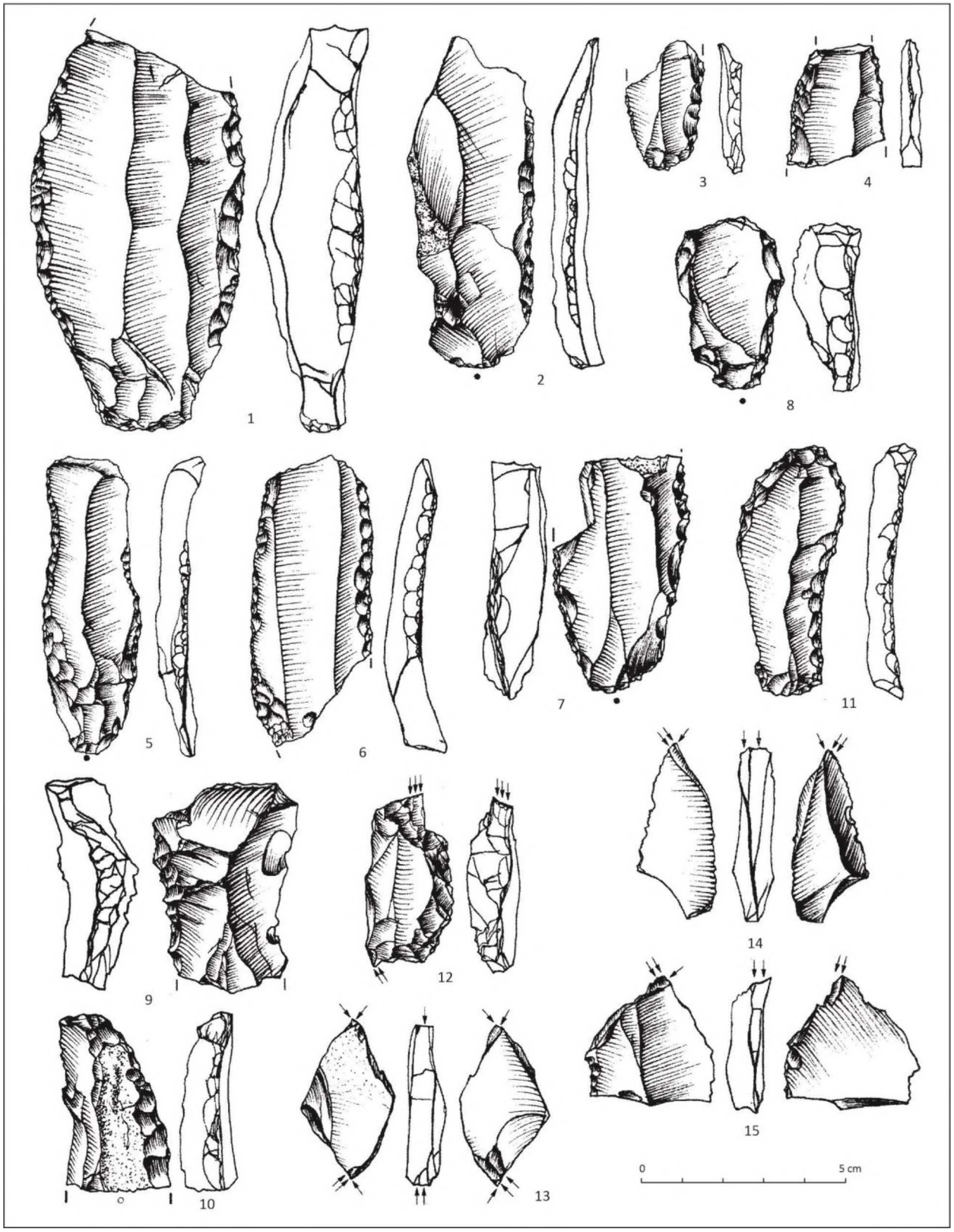

Figure. 5. Romåneşti-Dumbråviţa I site, layers III–V, GHIII Proto-Aurignacian lithic artefacts 1–15 (modified after Sitlivy et alii 2012). 1–7 – various retouched blades allegedly said to be "Aurignacian blades"; 8–11 – various simple flat endscrapers allegedly said to be "endscrapers on Aurignacian blades"; 12 – a double burin allegedly said to be "a double burin on an Aurignacian blade"; 13–15 – various dihedral burins allegedly said to be "carinated burins".

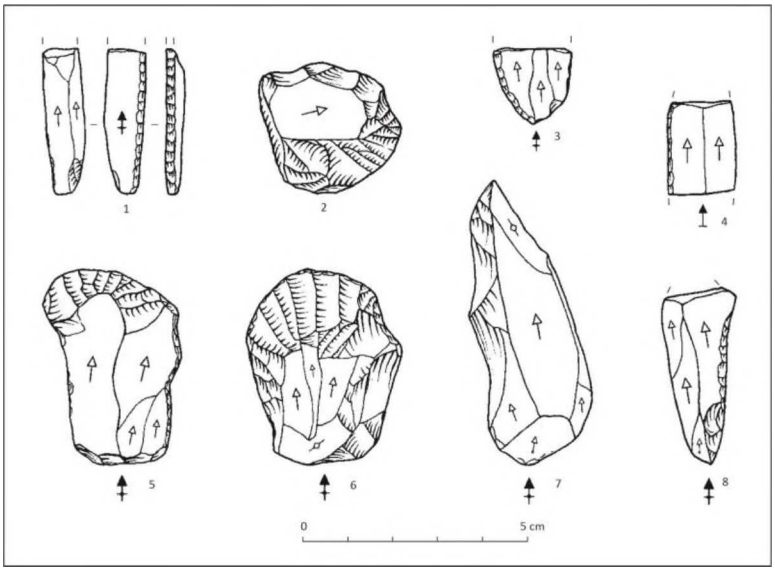

Figure 6. Crvenka-At site complex. 1–8 – Proto-Aurignacian lithic artefacts (modified after Chu 2018).

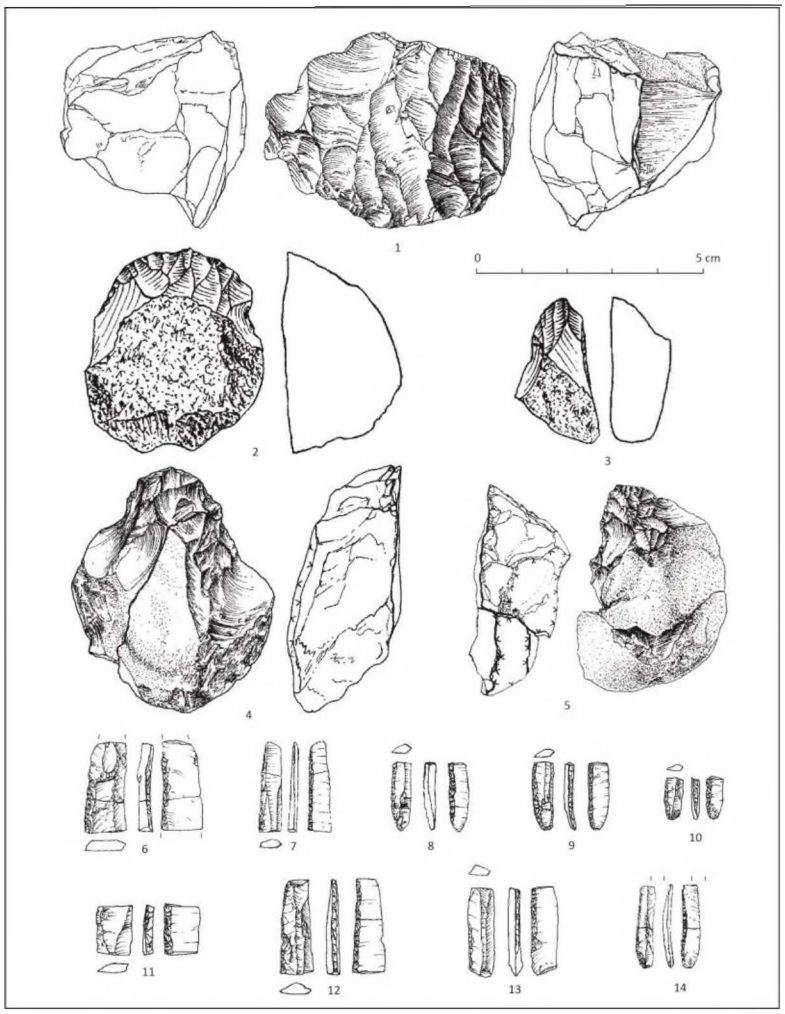

Figure 7. Berehove I site. Proto-Aurignacian lithic artefacts 1–14 (modified after Usik 2008). 1 – bladelet 'carinated' double-platform core; 2 – carinated endscraper–core; 3–5 – thick nosed/shouldered endscraper – cores; 6–14 – Dufour *lamelles* with alternate retouch.

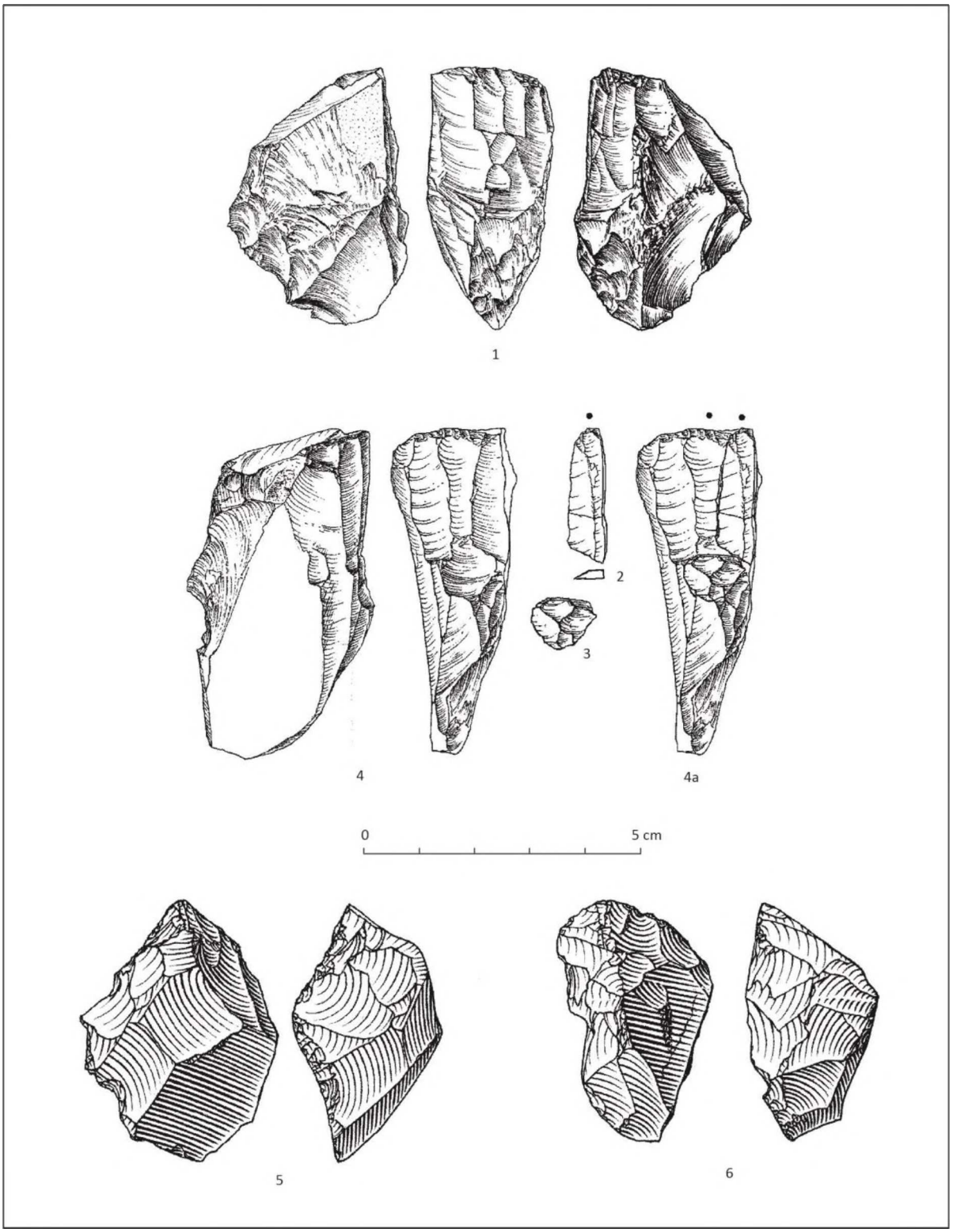

Figure 8. Berehove I site. Proto-Aurignacian lithic artefacts 1–4 (modified after Usik 2008). 1 – bladelet single-platform unidirectional wedge-shaped core; 2–4 – bladelet single-platform unidirectional wedge-shaped core and refitted to it bladelets; Berehove VII special task camp. 5–6 – Berehove VII special camp. Proto-Aurignacian lithic artefacts 5–6 (modified after Demidenko et alii 2020). 5–6 – thick shouldered endscraper-cores.

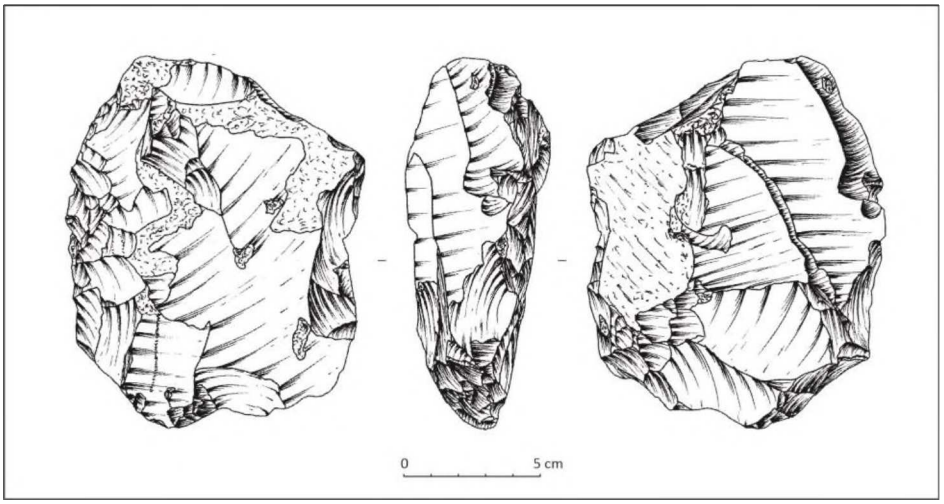

Figure 9. Berehove II site-workshop. Proto-Aurignacian lithic artefact. Wedge-shaped pre-core (modified after Demidenko *et alii* 2020).

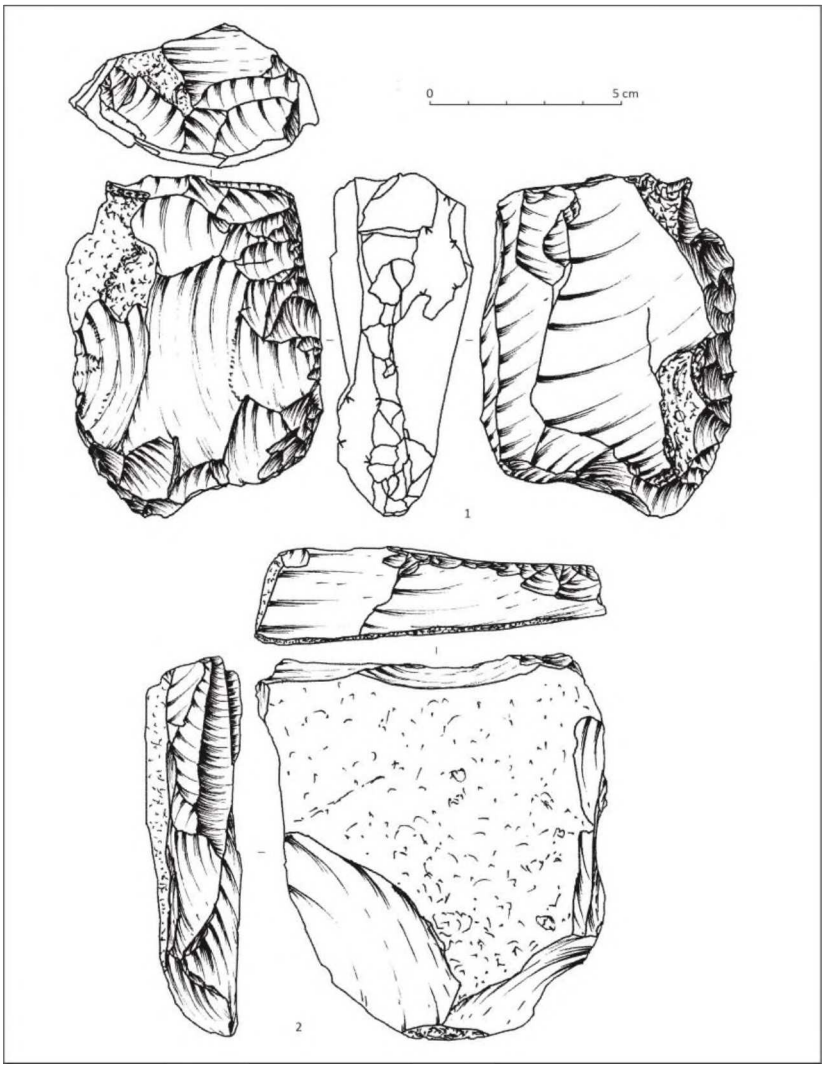

Figure 10. Berehove II site-workshop. Proto-Aurignacian lithic artefacts. 1 – 2 – Wedge-shaped pre-cores (modified after Demidenko *et alii* 2020).

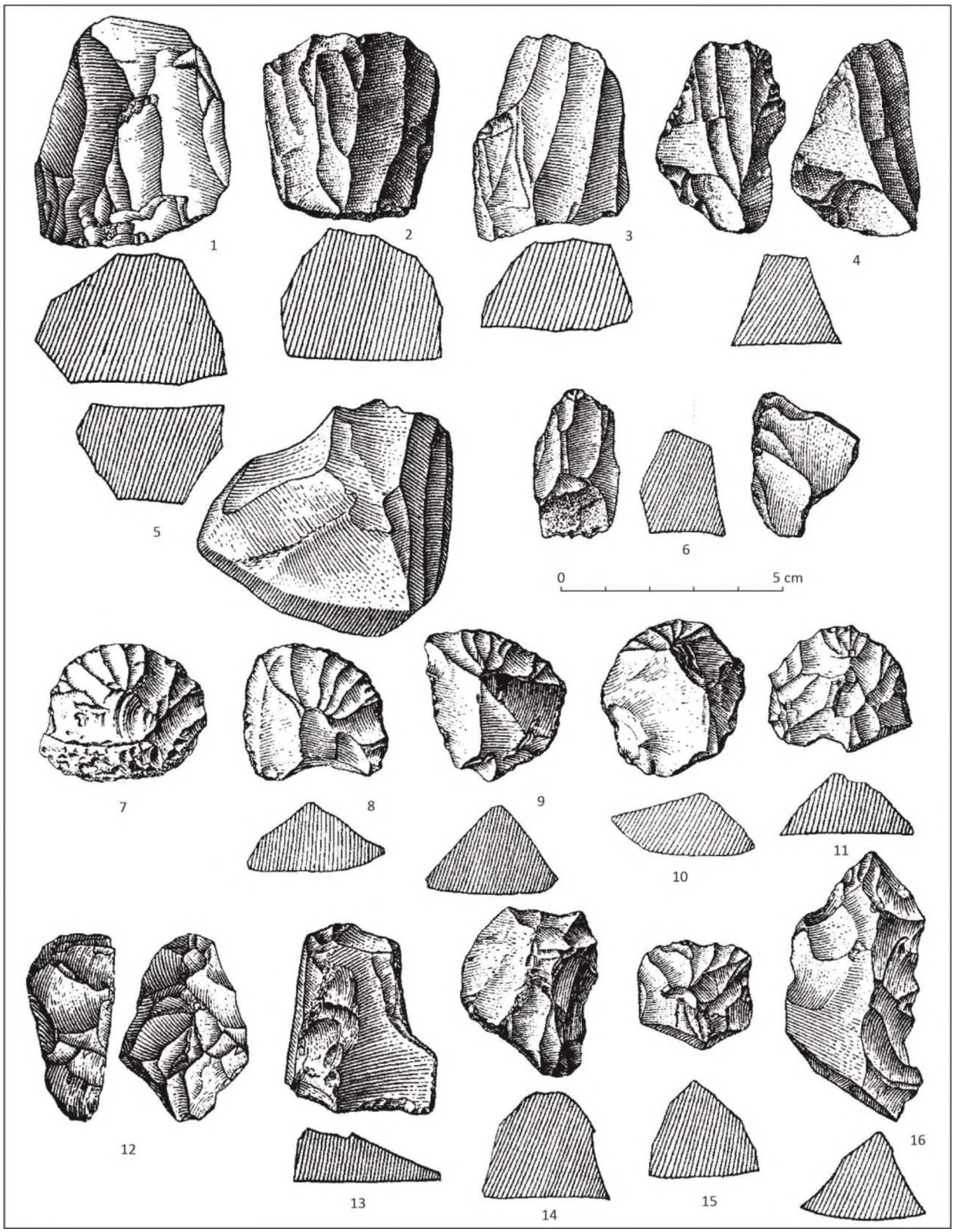

Figure 11. Tibava site. Proto-Aurignacian lithic artefacts 1–16 (modified after Bánesz 1960). 1–6 – bladelet "carinated" cores; 7–16 – carinated and thick nosed/shouldered endscraper-cores.

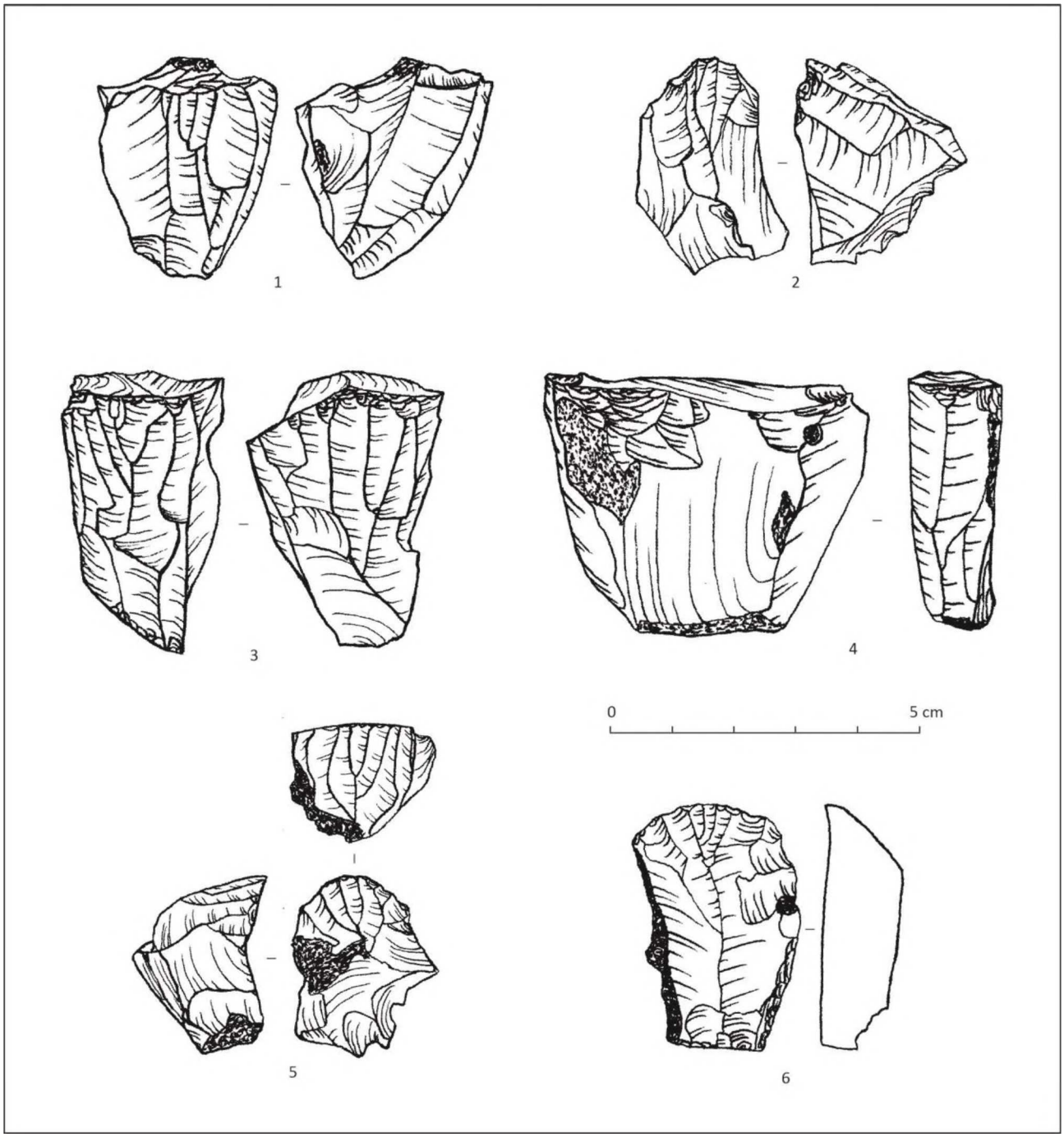

Figure 12. Demjén-Hegyeskő-tető II loci. Proto-Aurignacian lithic artefacts 1–6. 1–4 – bladelet cores; 5–6 – carinated endscraper-cores.

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