The earliest Aurignacian in Romania: New investigations at the open air site of Româneşti-Dumbrăviţa I (Banat)

Das früheste Aurignacien in Rumänien – Neue Untersuchungen an der Freilandfundstelle Româneşti-Dumbrăviţa I (Banat)

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Abstract - Previous archaeological research in the Banat area (South-western Romania) resulted in the definition of a chronologically late Krems-Dufour type Aurignacian, followed by the isolated find of several considerably old anatomically modern human (AMH) remains at Oase Cave, several decades later. The last find set the stage for new stratigraphic, chronological and archaeological reassessment of Banat Aurignacian settlements at Tincova, Coşava and Româneşti-Dumbrăviţa. This study presents the attribute analysis of the Aurignacian lithic assemblage at Româneşti-Dumbrăviţa I, involving both old and recently excavated collections. Alongside the more accurate identification of the main technological and typological features, pointing to a Protoaurignacian/Early Aurignacian assignation of the Early Upper Palaeolithic industry here, new chronological landmarks, much older than previously considered, became available. Preliminary thermoluminescence results point to an estimated age between 45 and 40 ka for the main accumulation in GH3 at Româneşti, thus indicating a possible contemporaneity of the Banat Aurignacian and the Oase AMH finds. A brief comparative outline of the Banat Aurignacian settlements is also provided, followed by and attempt at placing the local Aurignacian into the European Early Upper Palaeolithic landscape.

Zusammenfassung - *Bisherige Forschung zum Beginn des Jungpaläolithikums im Banat ergaben widersprüchliche Ergebnisse. Nachdem die von dort bekannt gewordenen Aurignacien-Freilandfundstellen Tincova, Coşava und Româneşti-Dumbrăviţa zunächst chronologisch an das Ende dieses Technokomplexes gestellt worden waren, wurde nach der Entdeckung der Überreste früher anatomisch moderner Menschen in der Oase-Höhle angenommen, es handele sich um ein Proto-Aurignacien. In dem vorliegenden Artikel werden diese Widersprüche anhand neuer Grabungen und erster absoluter Datierungen sowie einer detaillierten Analyse der Alt- und Neufunde an der Fundstation Româneşti-Dumbrăviţa aufgelöst. Demnach handelt es sich an diesem Fundplatz um eine Steingeräteindustrie, die sowohl Merkmale des Proto-Aurignacien als auch des klassischen Aurignacien aufweist. Erste Thermolumineszenz-Alter zwischen 45 kyr BP im Liegenden und 40 kyr BP im Hangenden deuten auf eine frühe Zeitstellung von Româneşti-Dumbrăviţa innerhalb des älteren Jungpaläolithikums und eine zeitliche Überschneidung mit den Menschenresten aus der Oase-Höhle. Vor diesem Hintergrund wird die Bedeutung des Banat im Rahmen der Ausbreitung des frühen modernen Menschen nach Europa diskutiert.*

Keywords - Banat region, Protoaurignacian, Stratigraphy, Absolute Dating, Technology, Lithic analysis
Banat Region, Protoaurignacien, Stratigraphie, Absolute Datierung, Technologie, Artefaktanalyse

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Introduction

The rich Romanian Palaeolithic record has been reflected in a number of comprehensive publications in recent decades (e.g. Chirica et al. 1996; Cârciumaru 1989, 1999; Păunescu 1989, 2000, 2001). Several other recent contributions, mostly devoted to a critical reassessment of published data, particularly focused on the Middle-to-Upper Palaeolithic transition and the onset of the Upper Palaeolithic (e.g. Riel-Salvatore et al. 2008; Noiret 2009; Barton et al. 2011; Anghelinu et al. 2012; Anghelinu & Niţă in press). Notwithstanding, the Southwestern Romania record (i.e. the historical region of Banat - Mogoşanu 1978) was for a long time overlooked by detailed studies (but see Hahn 1970, 1977) and rarely incorporated into the broader framework of the European Upper Palaeolithic (e.g. Kozlowski & Kozlowski 1975; Djindjian et al. 1999), remaining, at best, a subject of regional overviews (Păunescu 2001; Băltean 2011a, b).

The discovery of anatomically modern human remains (AMH) at Oase Cave (Trinkaus et al. 2003), as well as recent advances in Aurignacian studies (e.g. Bon 2002; Bordes 2002; Chiotti 1999; Lucas 2000; Le Brun-Ricalens et al. 2005, 2009; Nigst 2006; Nigst et al. 2008; Nigst & Haesaerts in press) prompted, however, a renewed interest in the Early Upper Palaeolithic in this region (Teyssandier 2003, 2007a, b, 2008; Teyssandier et al. 2010; Tsanova et al. in press; Zilhão 2006, 2007). The lack of material culture

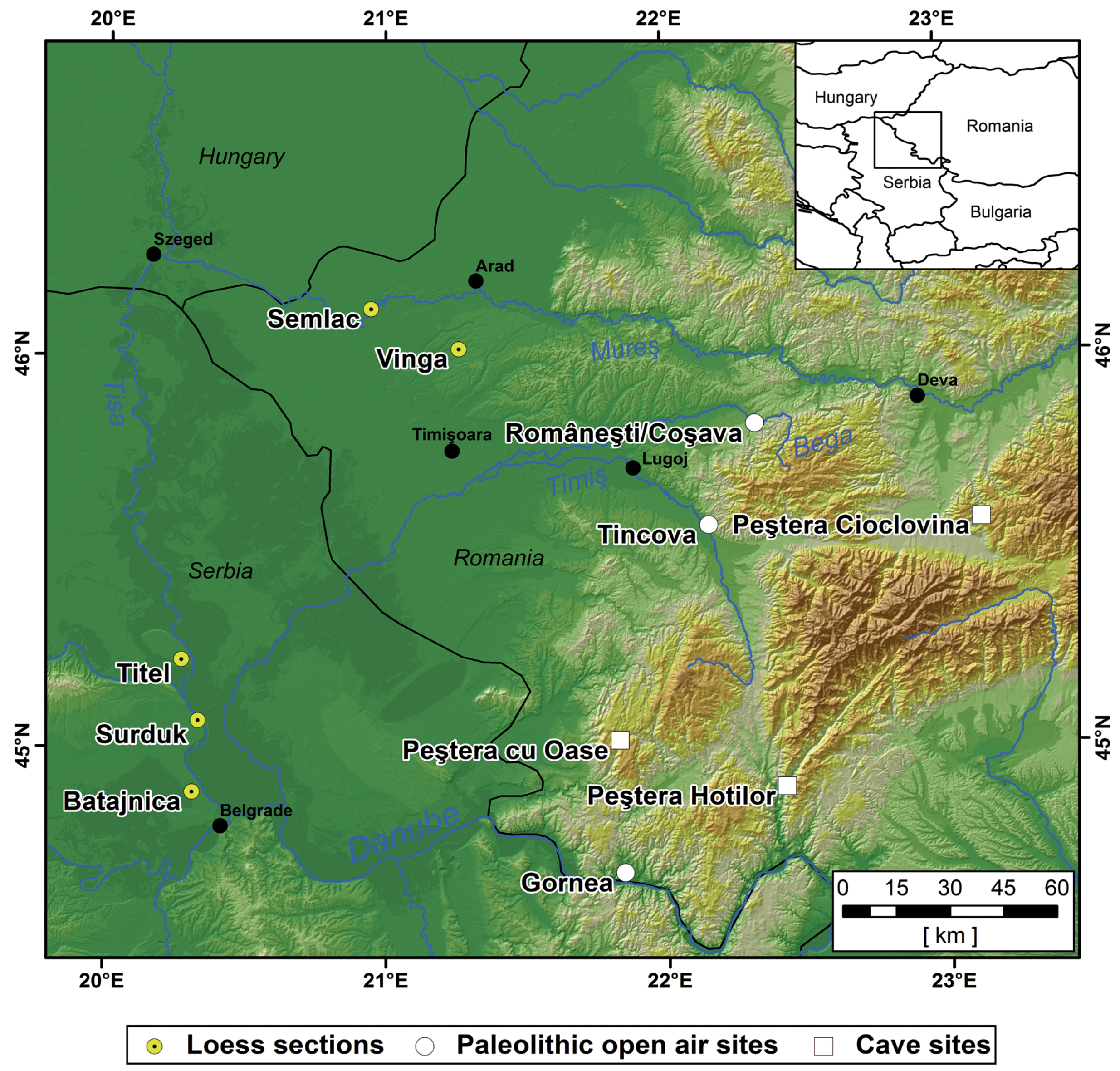

Fig. 1. Palaeolithic sites in Banat, south-western Romania and selected loess sections of the lowland (Projection: UTM 34 WGS 1984, Cartography: R. Löhrer).

***Abb. 1.** Paläolithische Fundstellen im Banat und ausgewählte Löss-Bereiche in den Niederungen (Projektion: UTM 34 WGS 1984, Kartierung: R. Löhrer).*

associated with the early-dated fossil remains at Oase focused attention initially towards the single-layered Aurignacian settlement at Tincova, located in the same region as Oase Cave. Reassigned to the Protoaurignacian, Tincova was rapidly included in the intense debate regarding the initial dispersal of AMH into Europe (Teyssandier 2003; Zilhão 2007; Tsanova et al. in press). The Aurignacian assemblages at Coşava and Româneşti-Dumbrăviţa in the northern part of this region were rarely invoked in recent studies, despite the fact that the industries of these sites had always been compared and presented together with Tincova as "classical" or Krems-Dufour type Aurignacian/culture (Mogoşanu 1972, 1978; Kozlowski & Kozlowski 1975; Hahn 1970, 1977; Demidenko 1999, 2000 - 2001; Demidenko & Otte 2000 - 2001; Demidenko & Noiret 2012).

In the light of a much needed re-evaluation of the Aurignacian in Romania (Anghelinu & Niţă in press), the importance of new, detailed reassessment of these sites appeared evident (Sitlivy et al. in press), all the more so since, challenging the lithic analogies connecting the Banat assemblages with the Krems-Dufour Aurignacian (see also Chirica et al. 1996), the original pollen-based geochronological estimations – Herculane/Tursac, for the single layer at Tincova and Herculane II/Laugerie, for the main concentration, layer III at Româneşti (Mogoşanu 1978; Cârciumaru 1989, 1999) – have indicated an unexpectedly young chronology. Clarifying this chronological status, considerably younger than any known Eurasian Aurignacian occurrence, has become crucial as well.

As a consequence, both Româneşti-Dumbrăviţa and Coşava were selected in 2009 for detailed stratigraphic, chronological and archaeological reevaluation, including excavation of new test pits, and TL, OSL, pollen, sedimentological and tephra sampling, correlated with the study of old and new archaeological collections. This article presents the first results of such recent research, focusing on both Mogoşanu's and newly excavated (2009 - 2010) lithic assemblages from Româneşti-Dumbrăviţa I, along with comparative reappraisal of regional technological and typological data.

Previous work

Româneşti (Timiş district) is located on the periphery of Poiana Ruscă Mountains, in the eastern part of the historical region of Banat. The Palaeolithic site of Româneşti (local toponym: Dumbrăviţa) is situated at the confluence of the Bega Mare and Bega Mica rivers, 4 km N from the site of Coşava, from which it is separated by the large Bega valley (Figs. 1 2). The settlement is situated in a rather short loess-like sequence (c. 3 m) on the 10 m river terrace (45°49'02.41" N, 22°19'15.12" E) and, based on lithic surface scatters, extends about 4 hectares.

Fig. 2. Româneşti-Dumbrăviţa I and II sites during field campaign in 2009-2010: 1 – view from the east; 2 – view from the north-west.

Abb. 2. *Die Fundstellen Româneşti-Dumbrăviţa I und II während der Ausgrabungen 2009-2010: 1 – Sicht von Westen; 2 – Sicht von Nordwesten.*

Mogoşanu's excavations

The history of investigations in Banat has been recently described in detail (e.g. Băltean 2011a, b), and will not be extensively discussed here. We focus mainly on the original stratigraphic subdivision and artifact descriptions (Mogoşanu 1972, 1978, 1983).

F. Mogoşanu excavated Româneşti-Dumbrăviţa I site in 1960 - 1964 and 1967 - 1972, over a large area of about 450 m² (Fig. 3). The stratigraphy was represented in one combined synthetic profile for adjacent zones Româneşti I and II (Mogoşanu 1978) (Fig. 4: 2, 3):

1) modern soil: 0-15 cm;

2) fine loess-like sediment with iron oxide: 15-35 cm;

3) intermediate yellow-reddish layer with brown "stains": 35-50 cm;

4) brown-reddish clay with prismatic structure, rich in iron oxide concretions, especially in the lower part: 50-110 cm;

5) fine, reddish clay with vertical greyish-bluish veins: 110-180 cm;

6) clay mixed with rolled pebbles and iron oxide: 180-200 cm;

7) clay mixed with fine pebbles: 200-250 cm;

8) compact horizon of iron oxide and rolled pebbles: 250-280 cm;

9) fine, reddish clay, mixed with pebbles: 280-320 cm.

From bottom to the top, six archaeological layers were identified in the upper part of the sequence at Româneşti I (Mogoşanu 1972, 1978, 1983):

- *Layer I* was present at a depth of about 115-105 cm from the modern surface at the upper limit of reddish clay and contained 48 quartzite/quartz artifacts;

- *Layer II* lied at the base of brown-reddish clay at a depth of 95-90 cm, documented as a thin layer (5 cm thick) across a small excavated area of 8 m² and contained rare artifacts, including, endscrapers, burins, blades with fine retouch, sidescraper and flakes;

- *Layer III* was found at a depth of about 86-70 cm in the same sediment, yielding a rich industry Aurignacian industry of more than 5000 artifacts, including 114 tools (end-scrapers, including carinated ones, predominate over burins, associated with eight Dufour bladelets and some retouched blades, comprising some typical Aurignacian forms);

- *Layer IV* was located in the upper part of brown-reddish clay, at a depth of 67-60 cm (20 m²). 61 tools, about 30 % of which are truncated pieces on blades and flakes, were recorded, with fewer endscrapers and Aurignacian blades and more burins, including burins on truncation;

- *Layer V* was found in a transitional zone between the same brown-reddish clay and the uppermost loess (at a depth of 50-40 cm), representing extended but clustered work-shops with an industry rich in knapping waste and only 38 tools, dominated by burins and with less common Aurignacian pieces.

- *Layer VI* is located in the uppermost loess (30-20 cm in depth from the modern soil) and attributed to the Epipalaeolithic (Mogoşanu 1978) or the Gravettian (Mogoşanu 1983; Chirica et al. 1996).

Thus, according to Mogoşanu, the Aurignacian (layers II, III, IV and V) was stratified between the "Quartzitic Mousterian" (layer I) and the Gravettian (layer VI).

As far as the horizontal distribution of artifacts is concerned, Mogoşanu published only very broad information in form of a schematic plan (Fig. 3). What can be said, apart from the scattered distribution of layer VI ("Gravettian/Epipalaeolithic"), with some

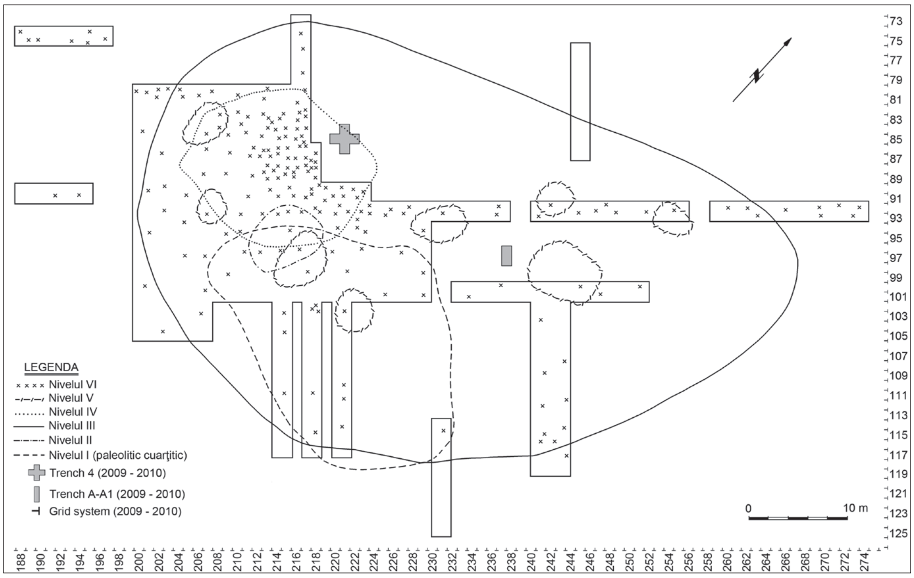

Fig. 3. Româneşti-Dumbrăviţa I site map: Mogoşanu's and 2009-10 excavations.

Abb. 3. *Româneşti-Dumbrăviţa I. Plan der Ausgrabungsflächen von Mogoşanu und der neueren Untersuchungen 2009-2010.*

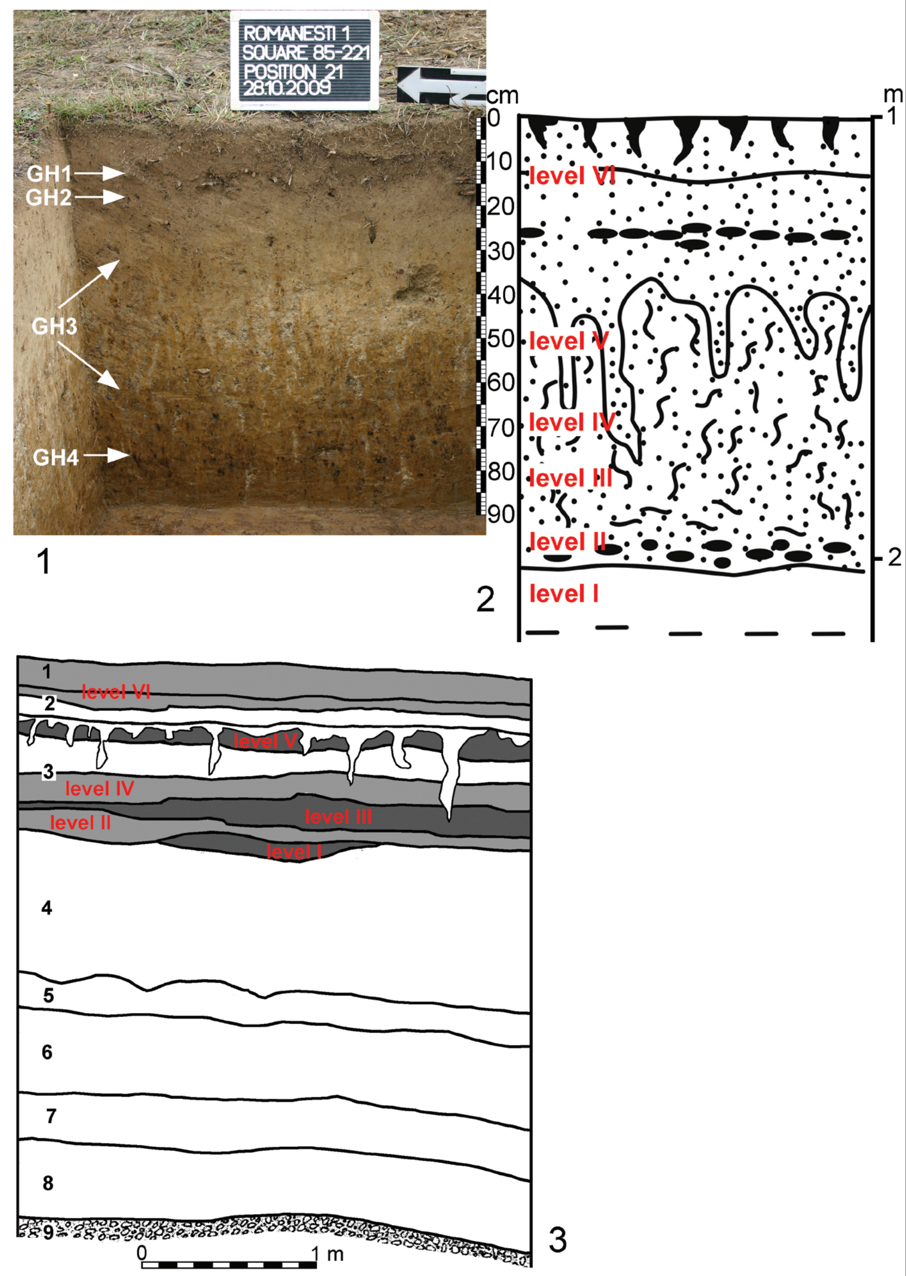

Fig. 4. Româneşti-Dumbrăviţa I, stratigraphic sections: 1 – 2009 field campaign; 2, 3 – Mogoşanu's excavations (after Mogoşanu 1978).

Abb. 4. *Româneşti-Dumbrăviţa I, Stratigraphie. 1 – Ausgrabung 2009 ; 2, 3 – Ausgrabungen durch Mogoşanu (nach Mogoşanu 1978).*

certainty is that only layer III was observed in almost all trenches. The widely spread occurrence of this layer corresponds to the absolute number of lithics. Layers I ("Mousterian") and IV ("Aurignacian") were found over comparably large, only partly intersecting areas in the southwestern part of his excavation, whereas layers V ("Aurignacian") was located in small, and at the same time distant, clusters. Layer II ("Aurignacian") was only recognized once almost in the centre of Mogoşanu´s main trench. With exception of layer V and II, the mapping is better to be understood as information about the presence and absence of layers rather than actual artifact concentrations in conventional sense. This is even more so as no structures, e.g. fire places, knapping areas, etc., are reported from Româneşti-Dumbrăviţa I. While both sites lack bone preservation, it should be noted that Româneşti-Dumbrăviţa II yielded small workshop clusters which appear to have been stratigraphically parallel to layer V of the main site. One workshop was specialized in Dufour production, associated with alternately retouched bladelets, retouched flakes, two endscrapers and several Krems points (Mogoşanu 1978).

History of interpretations

Despite many references to Româneşti I, interpretation of this site was quite limited and, apart from the hypothesized workshop function, focused on two related issues: chronology and cultural attribution.

The initial excavator, F. Mogoşanu, had rapidly noted the similarities between Tincova, Coşava layer I, Româneşti-Dumbrăviţa I layer III, and the UP collection at Krems-Hundssteig (Austria), a correlation which was subsequently confirmed by others (e.g. Kozlowski 1965; Hahn 1970, 1977; Demidenko 1999; Demidenko & Otte 2000 - 2001; Demidenko & Noiret 2012). Unfortunately, much like the eponymous site at Krems, the Banat Aurignacian assemblages, altogether lacking organic material, remained for decades undated. As a consequence, most interpretations relied on formal aspects of the published lithic collections.

Due to the inferred late geochronology, Mogoşanu saw the Banat Aurignacian as an echo of its Central European counterpart, postdating the emergence of the Gravettian technocomplex. To him, the Banat acted as a geographic refugium for late Aurignacians retreating from an "expanding" Gravettian (Mogoşanu 1978, 1983). Further references in the Romanian archaeological literature (Cârciumaru 1999; Păunescu 2001) only reiterated the Krems-Dufour analogy and generally acknowledged the late chronology of the phenomenon (but see Chirica et al. 1996).

More recent debates on the definition of the Aurignacian have usually exclusively included Tincova, attributed to the Protoaurignacian, Early Ahmarian or Kozarnikian (e.g. Teyssandier 2003; Tsanova et al. in press). Other reassessments of the Banat sites, including Tincova, Româneşti (layers II–III) and Coşava (layers I–II), however, point to the similarity between their lithic technology and the Protoaurignacian, tentatively pushing the chronology of Româneşti layer I and Tincova to the Hengelo-Arcy interstadial (Băltean 2011a, b). Hopefully, the arguments in the present contribution will help resolve such lingering taxonomical and chronological issues.

Outline of the present study

The present study focuses on the following issues:

1. re-evaluation of lithic assemblages excavated by Mogoşanu with regard to changed methodology (in classification, attribute analysis) and reconstruction of raw material reduction (technology);

2. re-assessment of the stratigraphical information by small scale test pits with special focus on vertical and horizontal artifact distribution using up to date excavation techniques (e.g. three-dimensional measurements);

3. elucidation of the frequency of small-scale artifacts by the application of wet sieving;

4. evaluation of the absolute age of the Aurignacian layers by using OSL- (on sediment samples) and TL- (on burned flint samples) dating methods;

5. clarification of the status and context of the assemblages in frames of the Early Upper Palaeolithic and the first dispersal of modern humans into Europe.

The following sections reflect the outline of the study and first present the main characteristics of the Aurignacian assemblages from Mogoşanu´s excavations layers II, III, IV and V. It will be followed by the presentation of our own field work, comparisons between the two data sets and, finally, a discussion in how far the results allow for a classification as Aurignacian or Protoaurignacian.

Results of the analysis of Mogoşanu's lithic assemblages

Methods and samples

The lithic analysis, designed to provide information on technology, typology and raw material exploitation, was based on attribute analysis of cores, laminar debitage and tools in the available old and newly excavated assemblages (for attributes see Tixier 1963; Hours 1974; Marks 1976; Demars & Laurent 1989; Inizan et al. 1995; Pelegrin 2000; Chabai & Demidenko 1998; Soriano et al. 2007; Le Brun-Ricalens et al. 2009; Sitlivy et al. 2009; Demidenko 2012; Sitlivy et al. in press). The subdivision of carinated pieces into cores and endscrapers was made *sensu* Yu. Demidenko: "In addition to its classical characteristics (Sonneville-Bordes & Perrot 1954: 332; Movius & Brooks 1971: 255), a carinated endscraper should always have in its typical form a front-edge scraper width greater than the length of lamellar (bladelets *sensu lato*) retouch facets which created this front-edge." (Demidenko 2012: 97).

The analysis of old collections revealed biases in some artifact categories published in the past. For example, Mogoşanu's (1978) layer III contains more than 5000 artifacts, including 114 tools. The study sample of 2654 lithic artifacts differs from previously published data by (a) a larger tool-kit (161 *contra* 114), (b) lesser representation of endscrapers (18 *contra* 51, including 24 various carinated/core-like items) and (c) burins (17 *contra* 26), (d) more abundant Dufour bladelets (11 *contra* 8), (e) sidescrapers (7 *contra* 2) as well as retouched pieces on blades/flakes and broken tools. At present, 29 cores and 6 pre-forms have been recorded, above all carinated and narrow-faced types (often previously attributed to endscrapers and burins). On the other hand, the laminar debitage appears to be more representative: 719 blades, 168 bladelets (W is 7 - 12 mm; *sensu* Tixier 1974) and 7 micro-blades (W<7 mm *sensu* Amirkhanov 1986) *contra* 788 non-separated laminar products. Inconsistencies in frequencies and numbers of some artifact types between Mogoşanu´s published assemblages (Mogoşanu 1978: 80; Păunescu 2001: 188) and recently restudied material are due to the loss of some artifacts, illegible labels, incompleteness of former studies, differences in classification practices, or omitting of a certain number of broken tools and debitage products. Despite these biases, all main tool categories are present and generally reflect similar priorities in tool structure. Moreover, debitage, except "micro" artifacts, is abundant and informative for an application of a technological approach.

Raw material

Opal ("Banat flint") is the most common raw material used at Româneşti-Dumbrăviţa and neighboring sites. This rock is variable in quality (generally mediocre), homogeneity (often with inclusions) and colors (brownish, reddish and their combination). Large and medium-sized oblong well-rounded cobbles with alluvial cortex as well as nodules with fresh white cortex and non-cortical chunks of opal were used. Most of these (often of poor quality) are present in the Bega river gravels, on old uppermost eroded terraces and slopes in the vicinity of the excavated area. Nevertheless, the exact sources of good quality opal and other "exotic" rocks (e.g. "black" flint) remain unknown, but local and meso-local origins are likely. Flint, radiolarite, quartzite are present in much smaller quantities (<10 %). Chalcedony, jasper, quartz and obsidian occur sporadically or as isolated pieces. In addition, there are no significant changes within the Româneşti-Dumbrăviţa I Aurignacian-Gravettian

	Layer II			Layer III			Layer IV		
	n	%	% esse	n	%	% esse	n	%	% esse
Pre-forms	1	0.31	0.32	6	0.23	0.24	–	–	–
Cores	3	0.93	0.95	29	1.09	1.14	17	1.58	1.65
Flakes	165	51.08	52.22	1448	54.56	56.87	663	61.45	64.37
Blades	109	33.75	34.49	719	27.09	28.24	234	21.69	22.72
Bladelets	19	5.88	6.01	168	6.33	6.60	43	3.99	4.17
Micro-blades	2	0.62	0.63	7	0.26	0.27	3	0.28	0.29
Blank fragments	–	–	–	–	–	–	–	–	–
Tools	16	4.95	5.06	161	6.07	6.32	67	6.21	6.50
Tools/cores	–	–	–	1	0.04	0.04	–	–	–
Burin spalls	1	0.31	0.32	7	0.26	0.27	3	0.28	0.29
Debris	–	–	–	23	0.87	–	8	0.74	–
Chips	3	0.93	–	58	2.19	–	19	1.76	–
Chunks	4	1.24	–	27	1.02	–	22	2.04	–
TOTAL:	**323**	**100**	**100**	**2654**	**100**	**100**	**1079**	**100**	**100**
	Layer V			GH 3			GH 4		
	n	%	% esse	n	%	% esse	n	%	% esse
Pre-forms	1	0.13	0.14	2	0.03	0.08	–	–	–
Cores	22	2.87	3.06	19	0.25	0.71	–	–	–
Flakes	452	58.93	62.95	1136	15.14	42.74	24	17.02	52.17
Blades	162	21.12	22.56	260	3.46	9.78	5	3.55	10.87
Bladelets	38	4.95	5.29	471	6.28	17.72	5	3.55	10.87
Micro-blades	1	0.13	0.14	472	6.29	17.76	7	4.96	15.22
Blank fragments	–	–	–	40	0.53	1.50	–	–	–
Tools	41	5.35	5.71	169	2.25	6.36	3	2.13	6.52
Tool/Core	–	–	–	1	0.01	0.04	–	–	–
Burin spalls	1	0.13	0.14	88	1.17	3.31	2	1.42	4.35
Debris	–	–	–	389	5.18	–	4	2.84	–
Chips	24	3.13	–	4440	59.16	–	89	63.12	–
Chunks/Pebbles	25	3.26	–	18	0.24	–	2	1.42	–
TOTAL:	**767**	**100**	**100**	**7505**	**100**	**100**	**141**	**100**	**100**

Fig. 5. Româneşti-Dumbrăviţa I. Artifacts: Mogoşanu's (layers II-V) and 2009-2010 (GH3 and 4) excavations.

Abb. 5. *Româneşti-Dumbrăviţa I, Artefakthäufigkeiten. Ausgrabungen Mogoşanu (Schichten II-V) und Ausgrabungen 2009-2010 (Schichten GH3 und 4).*

	Layer II		Layer III		Layer IV		Layer V		GH3	
	n	%	n	%	n	%	n	%	n	%
DEBITAGE STRUCTURE										
Flakes	165	52.9	1448	57.9	663	65.4	452	65.0	1136	44.0
Tool on flakes	3	1.0	62	2.5	15	1.5	17	2.4	31	1.2
Blades	109	34.9	719	28.7	234	23.1	162	23.3	260	10.1
Tool on blades	12	3.8	81	3.2	45	4.4	22	3.2	47	1.8
Burin spall on blades	–	–	–	–	1	0.1	–	–	3	0.1
Bladelets	19	6.1	168	6.7	43	4.2	38	5.5	471	18.2
Tool on bladelets	1	0.3	15	0.6	5	0.5	2	0.3	19	0.7
Burin spall on bladelets	1	0.3	–	–	2	0.2	–	–	28	1.1
Micro-blades	2	0.6	7	0.3	3	0.3	1	0.1	472	18.3
Tool on micro-blades	–	–	3	0.1	2	0.2	–	–	57	2.2
Burin spall on micro-blades	–	–	–	–	–	–	1	0.1	57	2.2
TOTAL:	**312**	**100.0**	**2503**	**100.0**	**1013**	**100.0**	**695**	**100.0**	**2581**	**100.0**
LAMINAR STRUCTURE										
Blades	121	84.0	800	80.6	280	83.6	184	81.4	310	21.9
Bladelets	21	14.6	183	18.4	50	14.9	40	17.7	518	36.6
Micro-blades	2	1.4	10	1.0	5	1.5	2	0.9	586	41.4
TOTAL:	**144**	**100.0**	**993**	**100.0**	**335**	**100.0**	**226**	**100.0**	**1414**	**100.0**

Fig. 6. Româneşti-Dumbrăviţa I. Debitage and laminar structures: Mogoşanu's (layers II-V) and 2009-2010 (GH3) excavations.

Abb. 6. Româneşti-Dumbrăviţa I, Grundformhäufigkeiten. Ausgrabungen Mogoşanu (Schichten II-V), Ausgrabungen 2009-2010 (Schichten GH3 und 4).

sequence: opal remained the main raw material category used for knapping (about 85 - 95 %) (for details, see also Băltean 2011a, b).

General structure of Mogoşanu's layers II, III, IV and V

The general composition of all four Mogoşanu's assemblages remains nearly unchanged throughout the entire sequence, and is dominated by large debitage products: flakes (51.1 % to 61.4 %) and blades (21.1 % to 33.7 %). The frequency of bladelets (4.0 % to 6.3 %), tools (5.0 % to 6.2 %), and especially cores, is quite low (Fig. 5). The number of cores increases slightly from bottom to top (0.9 % to 2.9 %), also true for chunks, which become slightly more abundant toward the top of the sequence. Chips (<15 mm) and small debris/fragments (<25 mm) occur in small quantities due to different sieving practices. Consequently, micro-blades are nearly absent in all assemblages together with burin spalls, while burins are common in all layers. The tool/core ratio is moderate in the lowermost layers (5.3: 1 and 5.5: 1), progressively decreasing from 3.9: 1 to 1.8: 1. The blank-to-core ratio is high, showing significant core reduction; it also decreases from bottom to top (80.7: 1; 55.4: 1 and 29.6: 1 in layers III, IV and V correspondingly).

The debitage structure throughout the sequence shows the dominance of flakes (normally >60 % including tools on flakes) over blades, which are 1.8 times less common at the bottom and 2.5 times at the top, showing progressive decrease in laminar blanks (from 38.8 % to 26.5 %). The laminar structure reflects the stable and absolute dominance of blades (>80 %) over smaller laminar products: bladelets (from 14.6 % to 18.4 %) and micro-blades (never exceeding 1.5 %) (Fig. 6).

Despite quantitative differences between layers, cores and tools exhibit similar morphological, technological and typological patterns. In addition, the presence and absence of tool types is more or less identical throughout the sequence. The main tool categories comprise endscrapers, burins, retouched blades, retouched pieces on blades/flakes and non-geometric microliths. In the richest layer III, these tool types occur in similar frequencies, while in the overlying layers endscrapers and especially burins are more numerous than non-geometric microliths. The latter were recorded in all levels, but are more frequently in levels III and IV.

In sum, the assemblages from layers II, III, IV and V do not exhibit major changes. Consequently, the following section presents a comparative description of the main classes of lithics, whereas data for the separate assemblages is to be found in the cited tables.

Cores

Cores are rare although their frequency progressively increases towards the top of the sequence (to 3.1 %). These belong to three main groups: (a) blade/bladelet/micro-blade carinated cores, (b) blade/let/micro-blade "regular", i.e. prismatic, including burin-like cores, and (c) flake cores. Taking into consideration only identifiable cores, significant changes in their quantitative representation can be

	Layer II	Layer III	Layer IV	Layer V	GH 3
CARINATED BLADELET/MICRO-BLADE:					
unidirectional	–	2	–	–	2
bidirectional	1	1	–	–	–
orthogonal-adjacent	–	1	–	–	–
orthogonal-alternate	–	1	–	–	–
CARINATED BLADE/BLADELET:					
unidirectional	1	2	2	2	–
bidirectional	–	1	–	–	–
bidirectional-adjacent	–	1	–	–	–
CARINATED FLAKE/BLADELET:					
unidirectional	–	2	–	–	–
BLADE:					
unidirectional	–	–	–	2	1
unidirectional, narrow flaking surface	–	–	–	–	2
bidirectional	–	1	–	2	–
bidirectional-adjacent	–	–	1	–	–
BLADE/BLADELET:					
unidirectional	–	2	–	–	1
unidirectional, narrow flaking surface	–	2	1	–	–
multiridectional, narrow flaking surface	–	1	–	1	–
bidirectional, narrow flaking surface	–	1	–	–	1
bidirectional	–	2	–	1	–
BLADELET/MICRO-BLADE:					
unidirectional	–	2	–	–	–
unidirectional, narrow flaking surface	–	–	1	3	
orthogonal-adjacent, narrow flaking surface	–	–	–	1	1
bidirectional, narrow flaking surface, on flake	–	–	–	1	–
BLADE/BLADELET ON TOOL					
change orientation, narrow flaking surface, on scraper	–	–	–	–	1
unidirectional, narrow flaking surface, on scraper	–	–	–	–	1
bidirectional, narrow flaking surfaces, on scraper	–	1	–	2	–
FLAKE/BLADELET, sub-polyhedral	–	–	2	1	1
FLAKE:					
semi-polyhedral	–	–	–	1	–
discoidal	–	1	1	–	–
semi-discoidal	–	–	–	–	1
crossed, on scraper, Kombewa	–	–	–	–	1
orthogonal, trifacial	–	–	1	–	–
UNIDENTIFIABLE	1	6	4	2	4
TOTAL:	**3**	**30**	**13**	**19**	**17**

Fig. 7. *Româneşti-Dumbrăviţa I. Cores: Mogoşanu's (layers II-V) and 2009-2010 (GH3) excavations.*

Abb. 7. *Româneşti-Dumbrăviţa I, Häufigkeiten von Kernformen. Ausgrabungen Mogoşanu (Schichten II-V), Ausgrabungen 2009-2010 (Schichten GH3 und 4).*

observed. While in lowermost layer II only two carinated cores were recorded, in the overlying layer III these are nearly as frequent as "regular" laminar cores. The latter category becomes dominant towards the top (Fig. 7). The core reduction was usually aimed at laminar production. Pre-cores are rare and were documented in uppermost layers IV and V (4 and 3 items). Carinated cores occur in all layers with different frequencies showing variability in final products/reduction stages (blade/bladelet, flake/bladelet and bladelet/micro-blade), debitage direction, platform(s)/working surface(s) number and position

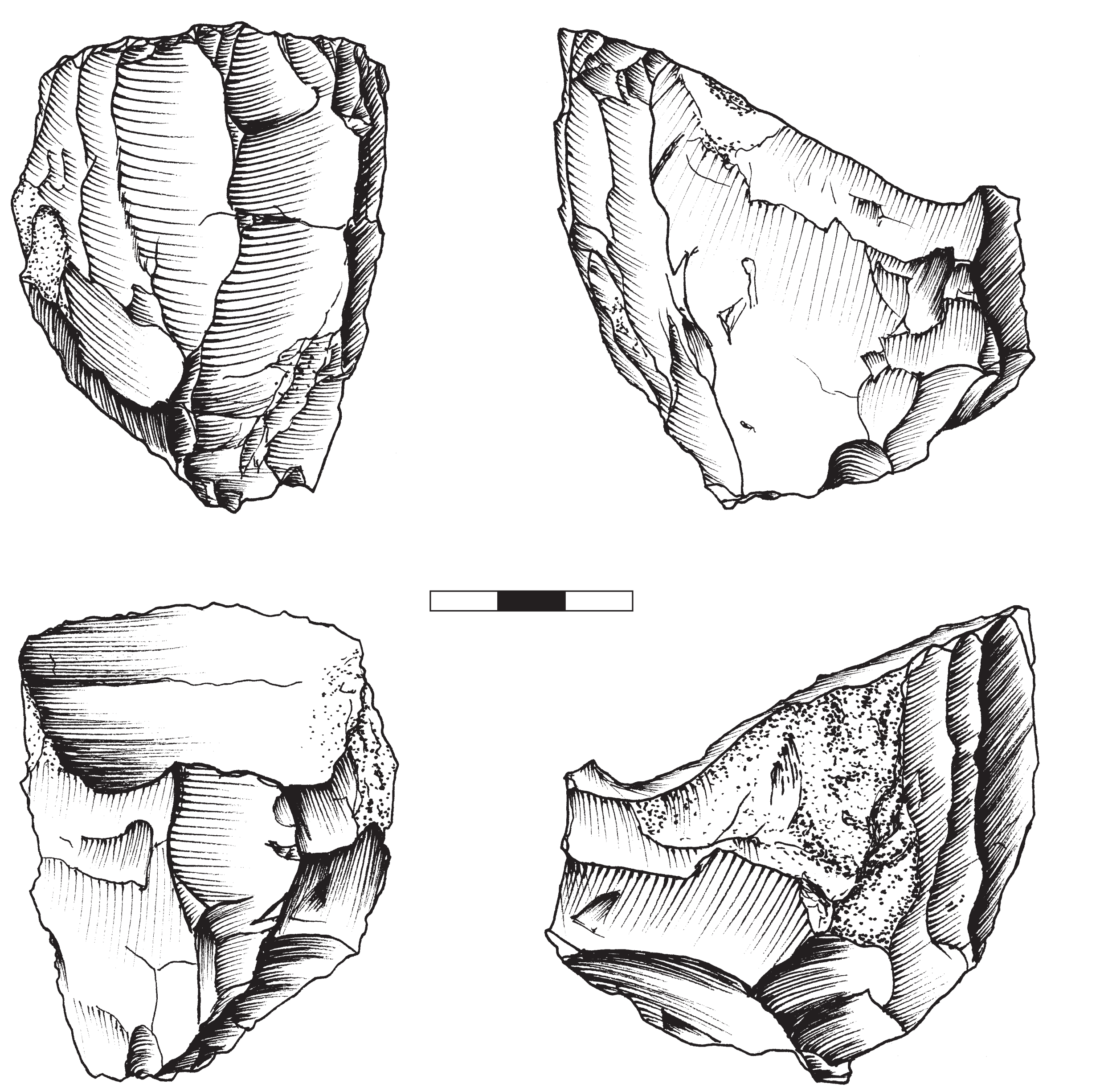

Fig. 8. Româneşti-Dumbrăviţa I, Mogoşanu 's excavations, layer III. Core: carinated blade/bladelet, unidirectional, narrow flaking surface, keeled.

Abb. 8. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III. Unidirektionaler gekielter Klingen-/Lamellenkern mit schmaler Abbaufläche.*

(e.g. unidirectional, bidirectional, orthogonal and their combination: adjacent – two opposed or 90° striking platforms where two flaking surfaces are adjacent, or alternate – where two flaking surfaces are opposite, isolated) (Figs. 8; 9; 10: 1, 2, 3). Carinated unidirectional blade/bladelet and bladelet/micro-blade cores are the most representative. They are generally made on massive flakes, but also on nodules, reflecting different reduction stages, mostly the full debitage and the initial stages, with corresponding rather large sizes. Striking platforms are usually plain (sometimes crudely faceted), with acute angles. Narrowing of core flanks by flake removals is common. "Regular" laminar cores comprise (a) prismatic and (b) narrow-faced with rectangular or triangular/keeled flaking surface(s) on the thin slice/edge of a core blank. Prismatic cores are quite diverse in regard to final products/reduction stages (blade, blade/bladelet, bladelet/micro-blade, flake/blade and flake/bladelet), debitage direction and platform(s)/working surface(s) placement. These cores were made on chunks, nodules and pebbles bearing some remnants of crests (Figs. 11: 1, 2, 3; 12: 1). Narrow-faced cores are represented by unidirectional on flakes (often "burin-like"), but also bidirectional, multidirectional and orthogonal-adjacent on flattish fragments/plaquettes (including recycling of tools) (Figs. 12: 2, 3; 13: 1). These cores show a rather advanced reduction stage

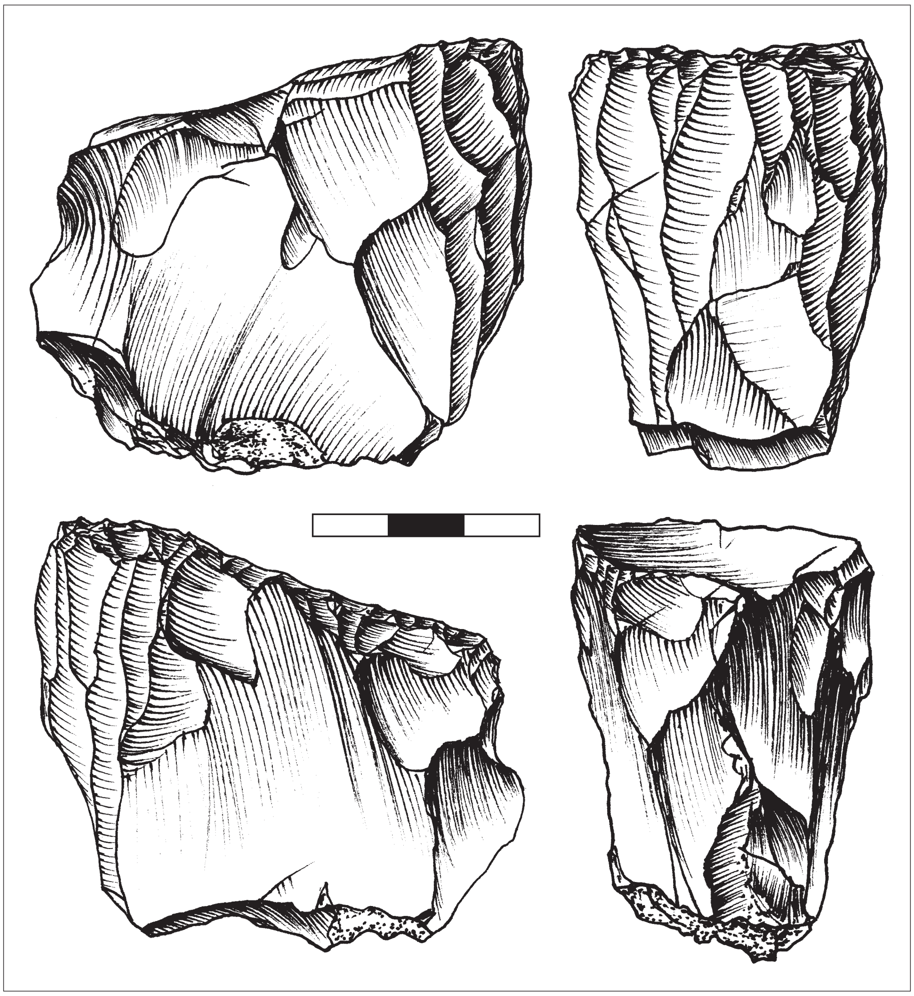

Fig. 9. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III. Core: carinated blade/bladelet, unidirectional, narrow flaking surface, keeled.

Abb. 9. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III. Unidirektionaler gekielter Klingen-/Lamellenkern mit schmaler Abbaufläche.*

(extension of narrow working surface to the wide side or several reduction zones) with or without crest remnants. Striking platforms are plain or crudely faceted; angles are almost acute. Flake cores are rare and include discoidal (Fig. 10: 2), semi-discoidal, orthogonal and Kombewa (4 pieces).

Laminar debitage

Quantitative analysis of laminar debitage is based on the layer III sample, which yielded by far the most numerous assemblage of the old collection. However, only minor differences throughout the sequence were recorded. Therefore, the debitage of layer III can be regarded as representative for all Aurignacian layers at Româneşti-Dumbrăviţa I. In layer III, blades are the second most common artifact class (after flakes) (n=719), but only 13.8 % (or 15.4 % including tools) of blades are complete. Bladelets are numerous (n=168), with more complete pieces (23.8 %, or 24.9 % including tools) and few micro-blades). The metrical data are as follows: (1) complete blade, max. size is 108.6, 41.6, 14.7 mm (an average of 34.8, 19.3, 5.6 mm); complete bladelet max. size is 52.7, 11.5, 2.8 mm (an average of 23.9, 10.2, 3.2 mm); complete micro-blade max. size – 30.5, 6.8, 1.6 mm (an average of 20.7, 6.4, 2.5 mm). Many removals are lacking cortex: flakes (78 %), blades (86.8 %) and bladelets/micro-blades (93.8 %). Among the primary flakes, cortical ones (>76 % of cortex) are quite rare (n=57, < 4 %), while there are only two such primary blades. Cortex position is typically lateral (>60 %). Only 11 bladelets/micro-blades have <25 % cortex. A unidirectional scar pattern is dominant for all laminar products: blades/tool-blades accounting for 66.7 % and bladelets/micro-blades for 70.5 %. The second most frequent blank scar pattern is convergent: 15.6 % and 16.5 % for blades and bladelets respectively. Other laminar dorsal scars are less common (about 5 - 6 %: crested, unidirectional-crossed) or rare (e.g., bidirectional). Blade shapes are mostly rectangular (up to 40 %), and trapezoidal (21.6 %); other shapes are rare (irregular – 13.4 %, ovoid – 10.3 %, triangular – 8 % and crescent

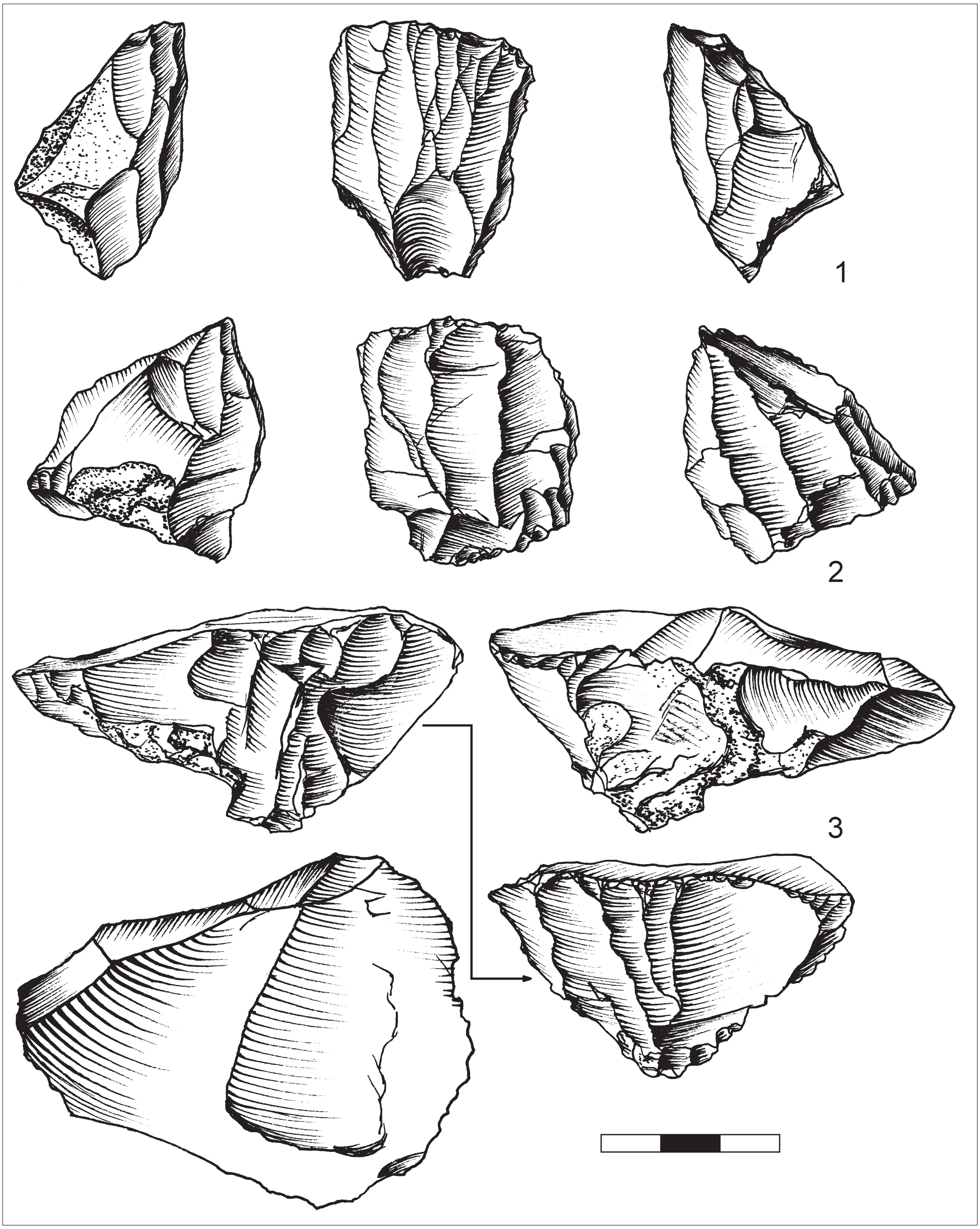

Fig. 10. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III. Carinated bladelet cores: 1, 2 – bidirectional, sub-cylindrical; 3 – unidirectional, sub-pyramidal.

Abb. 10. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III. Gekielte Lamellenkerne: 1, 2 – bidirektional, sub-zylindrisch; 3 – unidirektional, sub-pyramidal.*

6.8 %). Rectangular bladelets keep priority (up to 45 %), while triangular (14.6 %) and ovoid (14.6 %) shapes slightly increase. Debitage symmetry (on-axis) of laminar products is dominant (68.1 % of blades and 63.9 % of bladelets) over off-axis products, however the latter are still quite common. Blade/let profiles are twisted (37.1 %/37.7 %), curved (33.2 %/28.4 %) and flat (25.9 %/32.2 %). Twisted profiles increase in

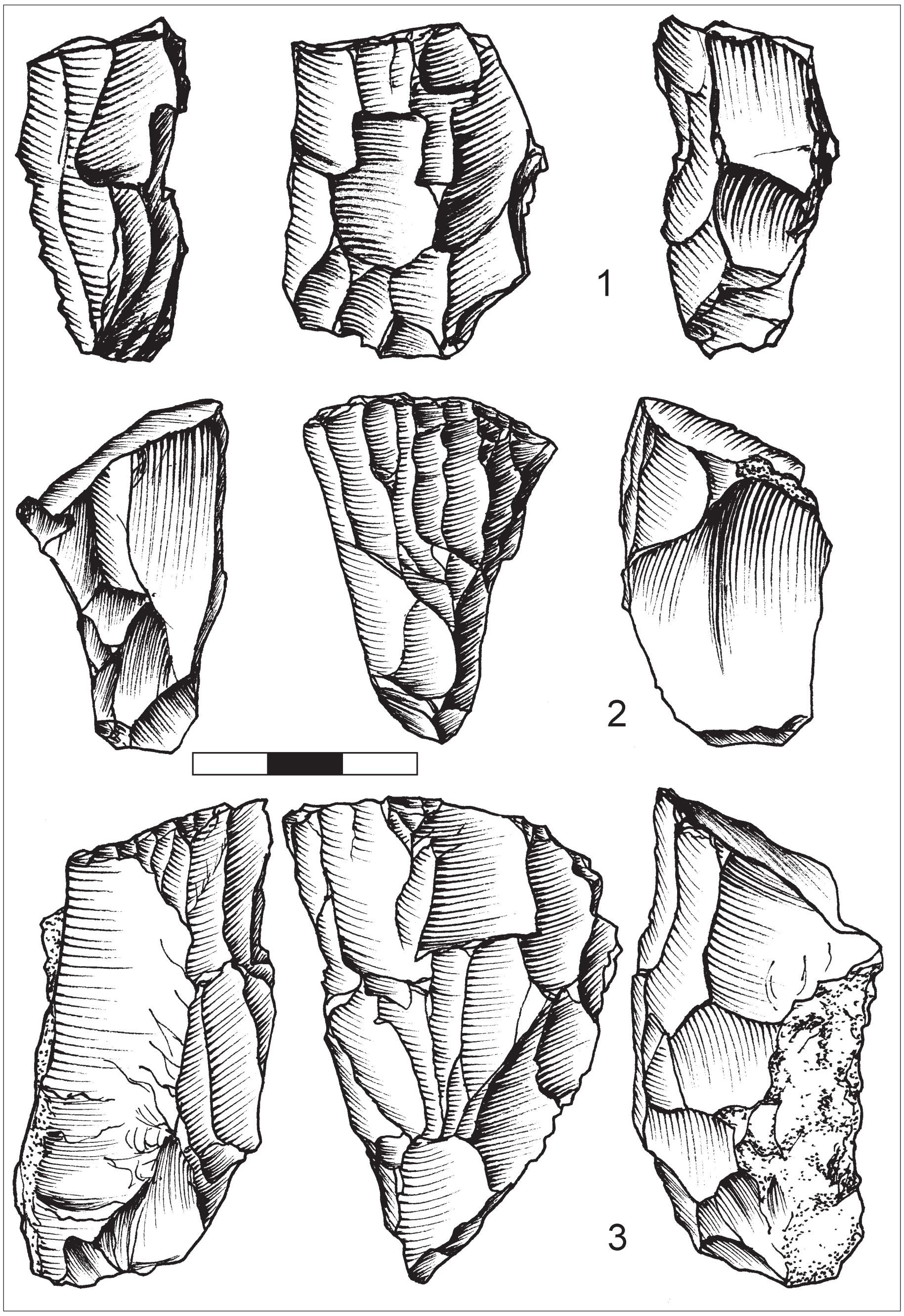

Fig. 11. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III. Blade/bladelet prismatic cores: 1 – bidirectional; 2, 3 – unidirectional, keeled.

Abb. 11. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III. Prismatische Kerne: 1 – bidirektional; 2, 3 – unidirektional, gekielt.*

overlying layer IV, while curved profiles decrease markedly (Fig. 14). Blade/let distal ends are mostly feathered (59.8 %/62.7 %), less blunt (20.5 %/14.5 %), hinged (13.7 %/21.7 %) and rarely overpassed (6 %/1.2 %). Blade cross-sections are principally trapezoidal (41.4 %) and triangular (31.3 %), followed by lateral steep (scalene) (18.5 %) and rare multiple (8.0 %) ones. On the other hand, triangular sections are more frequent (44.8 %) for bladelets, although trapezoidal (34.9 %) and lateral steep (16.1 %) sections are common. The abundance of triangular sections may also be explained by the frequent use of narrow-faced cores to obtain narrow laminar blanks. Laminar removals with lateral steep sections also maintain working convexity during debitage. With respect to platform preparation, single blow platforms are dominant. Plain butts are the most numerous among blades (68.4 %), followed by some dihedral and linear; other butts are rare (Fig. 15). Bladelets show a rise in linear (33.3 %) and punctiform (10.8 %) butts and a decrease in flat platforms (49 %). Blade butt lipping is common (including semi-lipped, which show the combination of butt lips and bulb of percussion on the blank's ventral surface), while bladelets show a decline

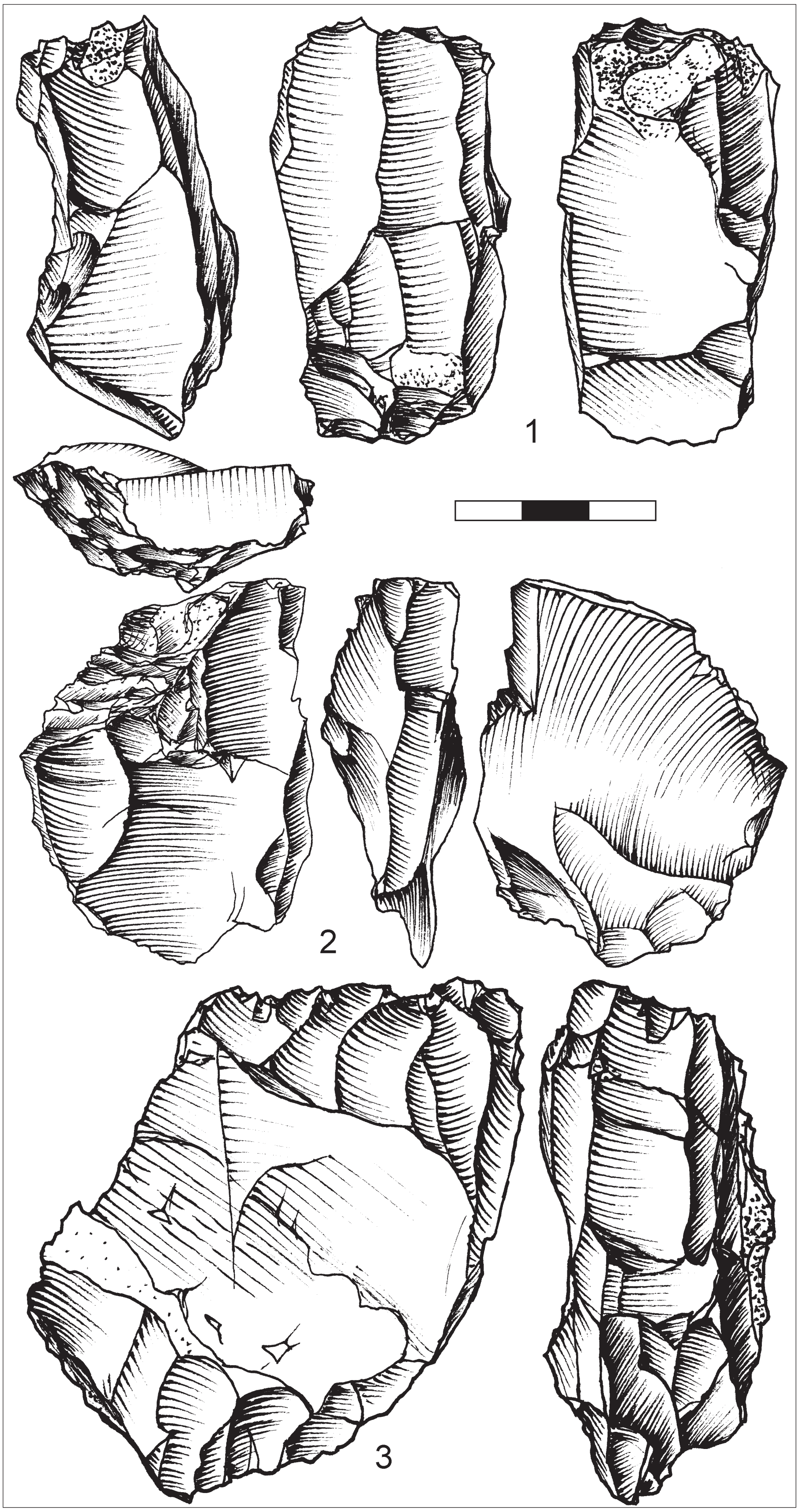

Fig. 12. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III (1, 3) and layer V (2). 1—blade core, bidirectional, sub-cylindrical; 2 – bladelet narrow flaking surface core, unidirectional, keeled; 3 – blade/bladelet narrow flaking surface core, unidirectional, keeled.

***Abb. 12.** Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III (1, 3) und Schicht V (2). 1 – Klingenkern, bidirektional, sub-zylindrisch; 2 – unidirektionaler gekielter Lamellenkern mit schmaler Abbaufläche; 3 – unidirektionaler gekielter Klingen-/Lamellenkern mit schmaler Abbaufläche.*

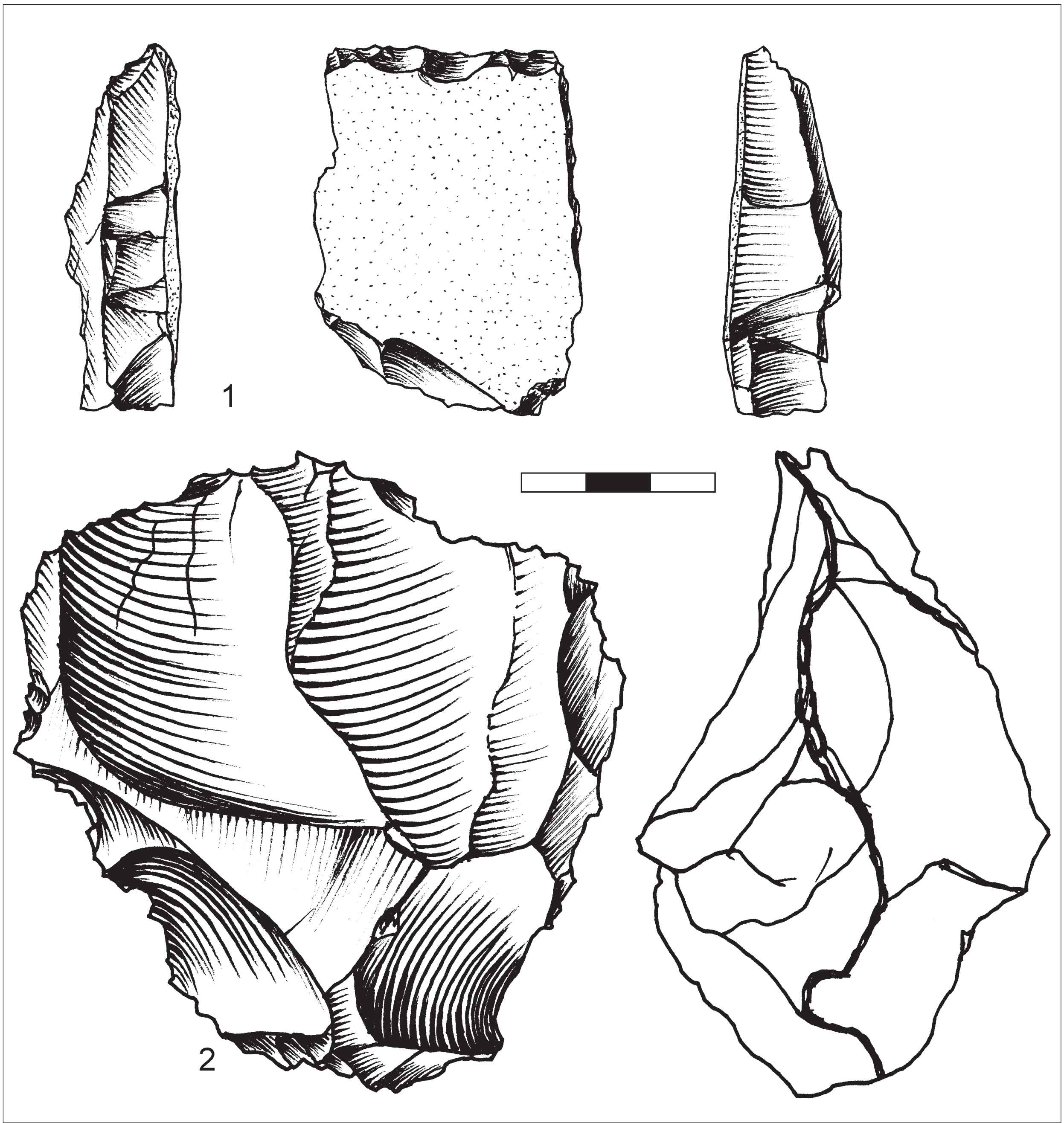

Fig. 13. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III. Cores: 1 – bladelet narrow flaking surface, unidirectional, made on scraper; 2 – discoidal.

Abb. 13. *Româneşti-Dumbrăviţa I, Ausgrabungen von Mogoşanu, Schicht III. Kerne: 1 – unidirektionaler Lamellenkern mit schmaler Abbaufläche an Schaber; 2 – diskoider Kern.*

in lipped butts with more unlipped butts (Fig. 16). As for bulbs, the diffused dominate over the developed ones for blades and bladelets; the bulb absence is common (Fig. 17). Split/shattered bulbs are rare. The domination of obtuse and inverted angles was recorded for both blades and bladelets, while right angles show the same low frequency (Fig. 18). The abrasion of the blade butt edges was frequent (53.2 % as well as butt reduction by faceting – up to 60 %), while this practice declines for bladelets (32.4 %). On the other hand, bladelet trimming of the overhang by faceting (small removals) was more common (51.5 %). Thus, two techniques were practiced to eliminate overhang on laminar cores as well as their combination.

Core maintenance products are frequent: in layer III these are represented by *débordant* flakes (69), crested flakes (29), crested blades (50), crested bladelets (10), tablet-flakes (29), tablet-blades (4), tablet-bladelets (1), core flank-flakes (56) and a flank-blade (1). Crested blades have one or two prepared slopes (6) with a central position on the core (5), sometimes partially prepared (4) or complete and include primary, secondary and neo-crests.

	Layer III				Layer IV			
	Blade		Bladelet		Blade		Bladelet/Micro-blade	
	n	%	n	%	n	%	n	%
convex	12	*1.7*	1	*0.5*	2	*0.8*	1	*2.0*
flat	181	*25.9*	59	*32.2*	69	*26.6*	15	*29.4*
incurvate	232	*33.2*	52	*28.4*	66	*25.5*	6	*11.8*
twisted	259	*37.1*	69	*37.7*	114	*44.0*	29	*56.9*
irregular	14	*2.0*	2	*1.1*	8	*3.1*	–	–
TOTAL:	**698**	***100.0***	**183**	***100.0***	**259**	***100.0***	**51**	***100.0***

	GH3, blade				GH3, bladelet			
	broken & complete		complete		broken & complete		complete	
	n	%	n	%	n	%	n	%
convex	2	*0.8*	1	*4.3*	4	*1.1*	4	*8.5*
flat	108	*43.7*	4	*17.4*	183	*49.3*	14	*29.8*
curved	42	*17.0*	7	*30.4*	43	*11.6*	3	*6.4*
twisted	94	*38.1*	11	*47.8*	139	*37.5*	25	*53.2*
irregular	1	*0.4*	–	–	2	*0.5*	1	*2.1*
TOTAL:	**247**	***100.0***	**23**	***100.0***	**371**	***100.0***	**47**	***100.0***

	GH3, micro-blade			
	broken & complete		complete	
	n	%	n	%
convex	1	*0.2*	1	*2.3*
flat	246	*56.3*	16	*37.2*
curved	41	*9.4*	9	*20.9*
twisted	148	*33.9*	17	*39.5*
irregular	1	*0.2*	–	–
TOTAL:	**437**	***100.0***	**43**	***100.0***

Fig. 14. Româneşti-Dumbrăviţa I. Laminar lateral profiles: Mogoşanu's (layers III-IV) and 2009-2010 (GH3) excavations.

Abb. 14. *Româneşti-Dumbrăviţa I, Klingenproduktion, Häufigkeiten der unterschiedenen Längsprofile. Ausgrabungen Mogoşanu (Schichten III-IV), Ausgrabungen 2009-2010 (GH3).*

	Layer III				Layer IV				GH3					
	Blade		Bladelet		Blade		Bladelet/ Micro-blade		Blade		Bladelet		Micro-blade	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
cortical	5	*1.4*	–	–	1	*0.8*	1	*4.5*	4	*3.7*	2	*1.0*	1	*0.6*
plain	242	*68.4*	50	*49.0*	81	*65.9*	11	*50.0*	67	*62.0*	102	*50.0*	44	*28.2*
plain-abraded	3	*0.8*	–	–	–	–	–	–	–	–	–	–	–	–
punctiform	15	*4.2*	11	*10.8*	5	*4.1*	1	*4.5*	6	*5.6*	9	*4.4*	16	*10.3*
linear	27	*7.6*	34	*33.3*	10	*8.1*	9	*40.9*	17	*15.7*	77	*37.7*	94	*60.3*
dihedral	35	*9.9*	4	*3.9*	16	*13.0*	–	–	10	*9.3*	11	*5.4*	1	*0.6*
crudely-faceted	13	*3.7*	2	*2.0*	6	*4.9*	–	–	4	*3.7*	2	*1.0*	–	–
fine faceted	9	*2.5*	1	*1.0*	4	*3.3*	–	–	–	–	–	–	–	–
spur	5	*1.4*	–	–	–	–	–	–	–	–	–	–	–	–
abraded	–	–	–	–	–	–	–	–	–	–	1	*0.5*	–	–
TOTAL:	**354**	***100.0***	**102**	***100.0***	**123**	***100.0***	**22**	***100.0***	**108**	***100.0***	**204**	***100.0***	**156**	***100.0***

Fig. 15. Româneşti-Dumbrăviţa I. Laminar butts: Mogoşanu's (layers III-IV) and 2009-2010 (GH3) excavations.

Abb. 15. *Româneşti-Dumbrăviţa I, Klingenproduktion, Häufigkeiten der unterschiedenen Formen der Schlagflächenreste. Ausgrabungen Mogoşanu (Schichten III-IV), Ausgrabungen 2009-2010 (GH3).*

	Layer III				Layer IV				GH3					
	Blade		Bladelet		Blade		Bladelet/ Micro-blade		Blade		Bladelet		Micro-blade	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
lipped	156	*43.1*	25	*23.1*	69	*55.6*	7	*29.2*	57	*51.8*	67	*32.7*	28	*17.6*
semi-lipped	125	*34.5*	40	*37.0*	33	*26.6*	7	*29.2*	25	*22.7*	101	*49.3*	82	*51.6*
unlipped	81	*22.4*	43	*39.8*	22	*17.7*	10	*41.7*	28	*25.5*	37	*18.0*	49	*30.8*
TOTAL:	**362**	***100.0***	**108**	***100.0***	**124**	***100.0***	**24**	***100.0***	**110**	***100.0***	**205**	***100.0***	**159**	***100.0***

Fig. 16. Româneşti-Dumbrăviţa I. Laminar butt lipping: Mogoşanu's (layers III-IV) and 2009-2010 (GH3) excavations.

Abb. 16. *Româneşti-Dumbrăviţa I, Klingenproduktion, Häufigkeiten der unterschiedenen Ausprägungen der Schlaglippen. Ausgrabungen Mogoşanu (Schichten III-IV), Ausgrabungen 2009-2010 (GH3).*

	Layer III				Layer IV				GH3					
	Blade		Bladelet		Blade		Bladelet/ Micro-blade		Blade		Bladelet		Micro-blade	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
developed	92	*25.3*	35	*31.8*	28	*22.2*	11	*44.0*	22	*19.6*	53	*24.9*	61	*38.4*
diffused	197	*54.3*	57	*51.8*	74	*58.7*	11	*44.0*	60	*53.6*	105	*49.3*	64	*40.3*
split/shattered	8	*2.2*	2	*1.8*	3	*2.4*	1	*4.0*	2	*1.8*	10	*4.7*	2	*1.3*
absent	66	*18.2*	16	*14.5*	21	*16.7*	2	*8.0*	28	*25.0*	45	*21.1*	32	*20.1*
TOTAL:	**363**	***100.0***	**110**	***100.0***	**126**	***100.0***	**25**	***100.0***	**112**	***100.0***	**213**	***100.0***	**159**	***100.0***

Fig. 17. Româneşti-Dumbrăviţa I. Laminar bulbs: Mogoşanu's (layers III-IV) and 2009-2010 (GH3) excavations.

Abb. 17. *Româneşti-Dumbrăviţa I, Klingenproduktion, Häufigkeiten der unterschiedenen Ausprägung der Bulben. Ausgrabungen Mogoşanu (Schichten III-IV), Ausgrabungen 2009-2010 (GH3).*

	Layer III				Layer IV				GH3					
	Blade		Bladelet		Blade		Bladelet/ Micro-blade		Blade		Bladelet		Micro-blade	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
inverted	67	*20.9*	8	*11.9*	14	*12.6*	–	–	21	*22.8*	15	*9.8*	4	*5.2*
obtuse	178	*55.5*	43	*64.2*	79	*71.2*	11	*61.1*	57	*62.0*	107	*69.9*	48	*62.3*
right	72	*22.4*	16	*23.9*	18	*16.2*	7	*38.9*	14	*15.2*	30	*19.6*	25	*32.5*
acute	4	*1.2*	–	–	–	–	–	–	–	–	1	*0.7*	–	–
TOTAL:	**321**	***100.0***	**67**	***100.0***	**111**	***100.0***	**18**	***100.0***	**92**	***100.0***	**153**	***100.0***	**77**	***100.0***

Fig. 18. Româneşti-Dumbrăviţa I. Laminar butt angles: Mogoşanu's (layers III-IV) and 2009-2010 (GH3) excavations.

Abb. 18. *Româneşti-Dumbrăviţa I, Klingenproduktion, klassierte Winkel zwischen Schlagfläche und Ventralfläche. Ausgrabungen Mogoşanu (Schichten III-IV), Ausgrabungen 2009-2010 (GH3).*

Secondary crested blades are frequent (26), often including lateral examples (13) from the sides of the core and some neo-crests (6) showing repeated core maintenance. Crested blades/lets were also selected for tool production, as well as some tablets and *débordant* flakes.

Tools

Tool manufacture in all Aurignacian layers of Româneşti-Dumbrăviţa I relied mostly on opal of various qualities (e.g. about 87 % of tool-blades, tool-bladelets in layers III and IV). Different types of flint occur sporadically, as well as quartzite. Isolated pieces were made on chalcedony, jasper, radiolarite (the last raw material being better represented in laminar debitage). Tools were made on both blades and flakes, more on blades, however without proportional changes towards the top of the sequence (Fig. 19). Tool-bladelets are present in small quantity, and their frequency declines throughout the sequence. Tool-micro-blades are rare. The scarcity of tools on bladelets and micro-blades can be explained by past excavation practices, considerably different from the present-day.

Endscrapers in layer III were made on blades as well as on flakes, while in the uppermost layer V all seven tools were made only on flakes (Fig. 20). Carinated and thick endscrapers were usually made on massive flakes (Figs. 21: 1, 2; 22: 1), while simple ones mostly on (quite massive) blades (Figs. 22: 3; 23: 1, 3, 6). Both carinated (with sub-parallel/parallel retouch) and thick endscrapers (mostly with scalar modifications, including oval and shouldered ones) are frequent in layer III and IV. Only simple and thick endscrapers on flakes were recorded in uppermost layer V. Carinated (Fig. 23: 5) and thick endscrapers as

	Layer II		Layer III		Layer IV		Layer V		GH 3		GH 4
	n	% esse	n	% esse	n	% esse	n	% esse	n	% esse	n
Endscraper	1	8.3	18	12.2	7	12.3	7	20.0	2	1.4	–
Borer	–	–	1	0.7	–	–	–	–	–	–	–
Burin	2	16.7	17	11.5	10	17.5	12	34.3	15	10.6	–
Combined tool	1	8.3	1	0.7	–	–	1	2.9	–	–	–
Retouched blade	1	8.3	16	10.8	11	19.3	4	11.4	5	3.5	–
Retouched pieces on blade	2	16.7	24	16.2	7	12.3	4	11.4	16	11.3	–
Notched piece	1	8.3	9	6.1	3	5.3	1	2.9	4	2.8	–
Denticulated piece	–	–	3	2.0	–	–	–	–	–	–	–
Sidescraper	–	–	7	4.7	2	3.5	3	8.6	3	2.1	–
Retouched piece on flake	–	–	22	14.9	4	7.0	–	–	12	8.5	–
Truncated piece	3	25.0	5	3.4	3	5.3	–	–	2	1.4	–
Thinned piece	–	–	5	3.4	–	–	–	–	–	–	–
Pieces esquillées	–	–	1	0.7	3	5.3	1	2.9	3	2.1	–
Non-geometric microlith	1	8.3	19	12.8	7	12.3	2	5.7	80	56.3	3
Unidentifiable tool	4	–	13	–	10	–	6	–	27	–	–
TOTAL:	**16**	**100.0**	**161**	**100.0**	**67**	**100.0**	**41**	**100.0**	**169**	**100.0**	**3**
tools on blades	12	75.0	81	50.3	45	67.2	22	53.7	47	30.5	–
tools on bladelets	1	6.3	15	9.3	5	7.5	2	4.9	19	12.3	–
tools on micro-blades	–	–	3	1.9	2	3.0	–	–	57	37.0	3
tools on flakes	3	18.8	62	38.5	15	22.4	17	41.5	31	20.1	–
TOTAL:	**16**	**100.0**	**161**	**100.0**	**67**	**100.0**	**41**	**100.0**	**154**	**100.0**	**3**
Tools on Aurignacian blades	1		3		4		3		2		

Fig. 19. Româneşti-Dumbrăviţa I. Tool types: Mogoşanu's (layers II-V) and 2009-2010 (GH3 and 4) excavations.

Abb. 19. *Româneşti-Dumbrăviţa I, Häufigkeiten der Werkzeugklassen. Ausgrabungen Mogoşanu (Schichten II-V), Ausgrabungen 2009-2010 (GH3 und 4).*

	Layer II	Layer III	Layer IV	Layer V	GH 3
ENDSCRAPER ON BLADE:					
carinated	–	1	–	–	–
thick	–	–	1	–	–
double	–	1	–	–	–
simple	1	7	3	–	2
unidentifiable	–	1	–	–	–
ENDSCRAPER ON FLAKE:					
carinated	–	3	–	–	–
thick	–	5	2	3	–
simple	–	–	–	2	–
fan-shaped	–	–	–	1	–
divergent (ovoid)	–	–	–	1	–
unidentifiable	–	–	1	–	–
TOTAL:	**1**	**18**	**7**	**7**	**2**

Fig. 20. Româneşti-Dumbrăviţa I. Endscrapers: Mogoşanu's (layers II-V) and 2009-2010 (GH3) excavations.

Abb. 20. *Româneşti-Dumbrăviţa I, Häufigkeiten der Kratzer. Ausgrabungen Mogoşanu (Schichten II-V), Ausgrabungen 2009-2010 (GH3).*

well as simple ones show variability, including oval, shouldered, and double specimens on lateral/bilateral retouched blanks, including Aurignacian blades (Figs. 22: 2, 4; 23: 2, 4). Some were truncated.

Burins are numerically significant in all layers and highly variable throughout the sequence (Figs. 24; 25; 26: 1, 3, 6). These were produced more often on blades than on flakes. Angle burins on snap are the common type in all layers, as well as dihedral, with only rare occurrences of carinated, dihedral angle (angle on transverse burin facet), double, mixed and isolated busked types. Burins on retouched blades (lateral, bilateral and also Aurignacian) and various truncations are common. Transverse and flat burins are also observed. In one case (layer V), a double angle burin on snap was made on a retouched bladelet. The scarcity of burin spalls in all layers (12 in total) contrasts with the high frequency of burins.

Combined tools were documented in different layers: simple endscraper + angle burin on snap on blade (layer II), thick shouldered endscraper on retouched flake + transverse burin on snap (layer III) (Fig. 22: 1) and simple endscraper + straight truncation on retouched piece on blade (layer V) (see Hahn 1977, Plate 169: 8).

Retouched blades. For unknown reasons, the study sample of retouched blades and retouched pieces on

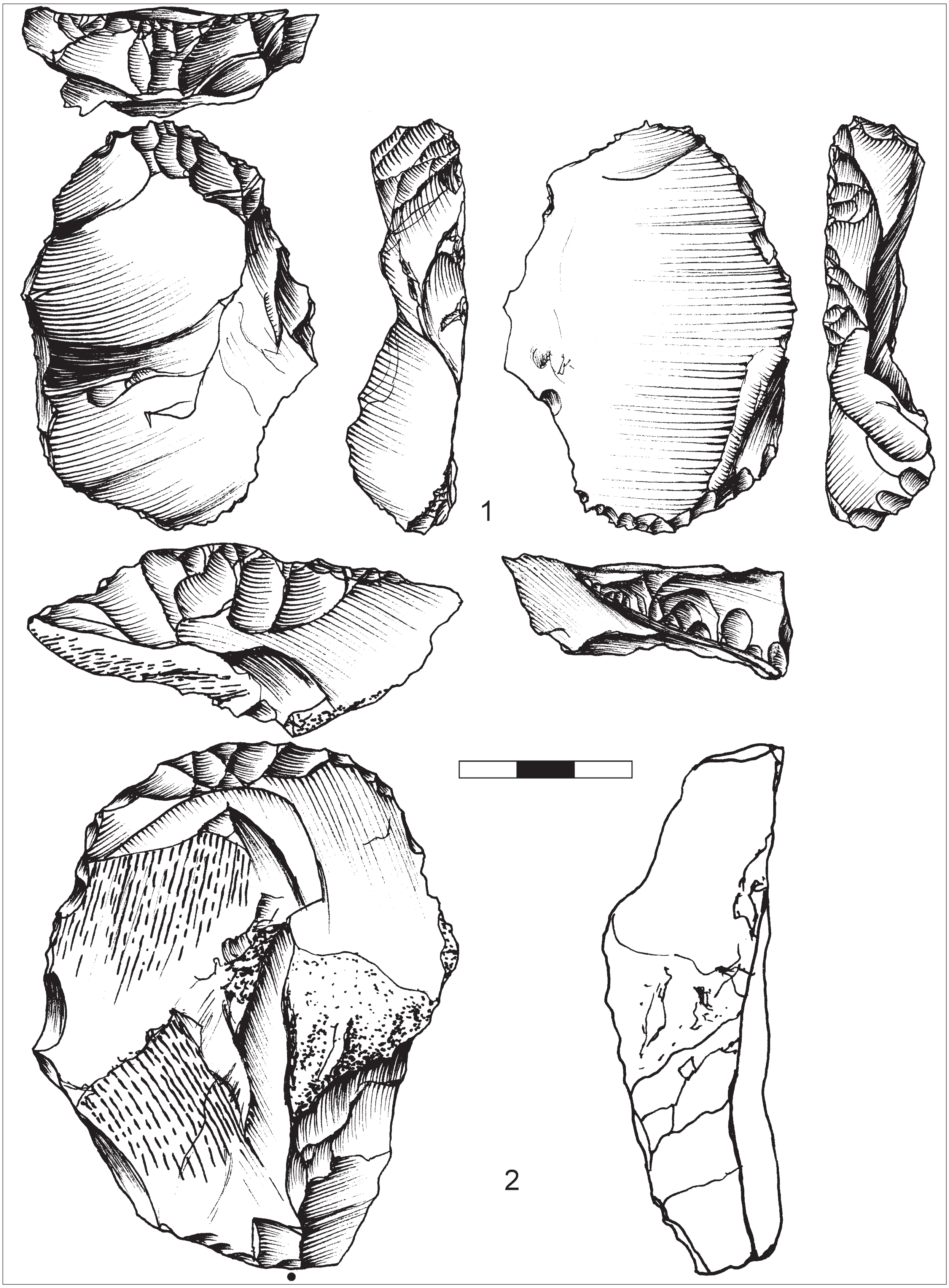

Fig. 21. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III. Endscrapers on flakes: 1 – thick, double alternate, ogival/shouldered; 2 – thick.

Abb. 21. *Româneşti-Dumbrăviţa I, Kratzer an Abschlägen. Ausgrabungen Mogoşanu, Schicht III: 1 – Doppelkratzer an massivem Abschlag: oval/ Nasenkratzer; 2 – massiv.*

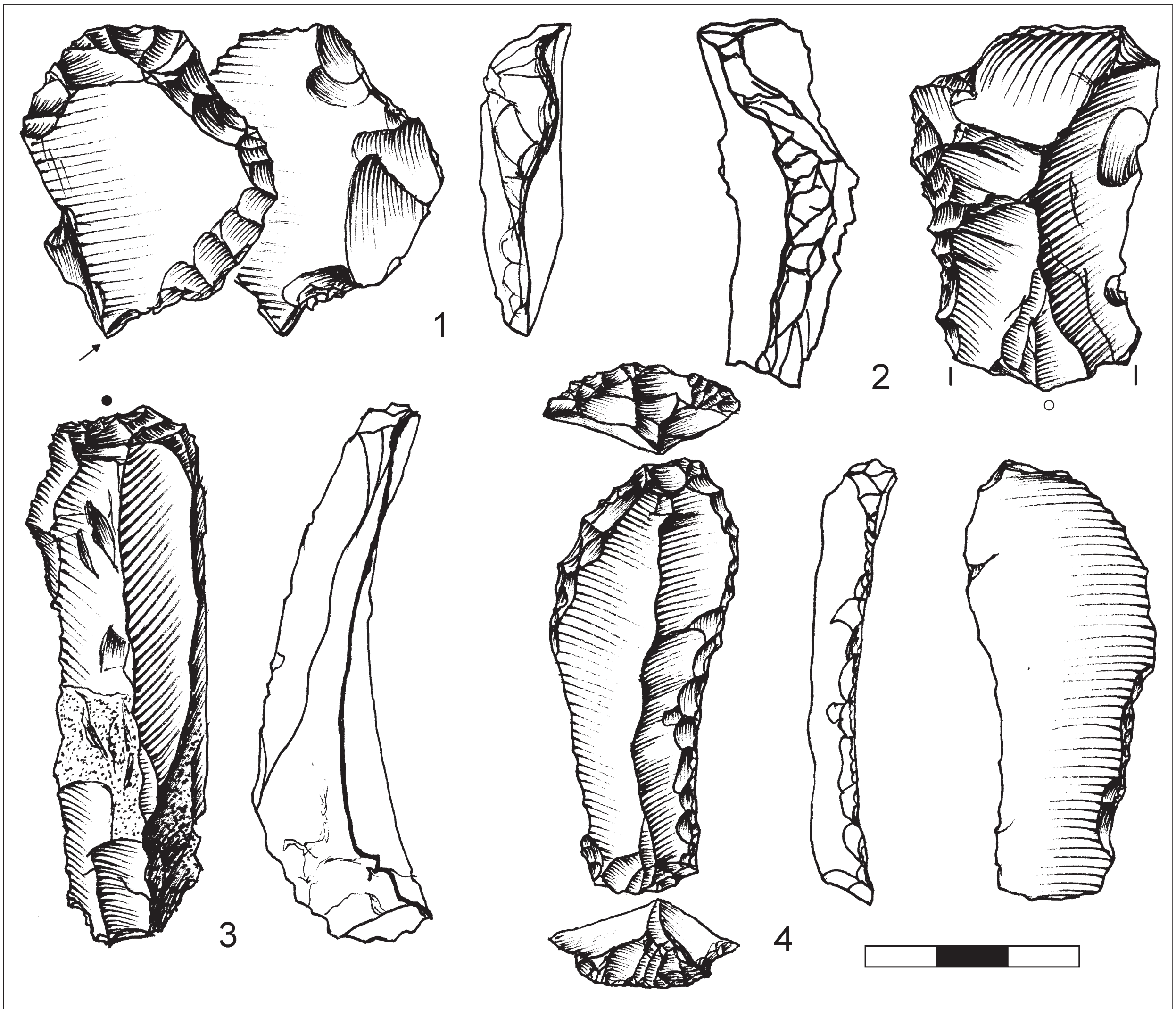

Fig. 22. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III (1, 3, 4) and layer IV (2). Endscrapers: 1 – thick, shouldered, on laterally retouched flake with transverse burin on snap; 2 – thick shouldered, on Aurignacian laterally retouched blade; 3 – simple on blade; 4 – double, on Aurignacian alternatively retouched blade.

Abb. 22. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu Schicht III (1, 3, 4) und Schicht IV (2). Kratzer: 1 – massiver Nasenkratzer an kantenretuschiertem Abschlag und Transversalstichel an Bruchkante am gegenüberliegenden Werkzeugende; 2 – massiver Nasenkratzer an Klinge mit Aurignacien-Retusche. 3 – einfach an Klinge; 4 – doppelt, an retuschierter Klinge.*

blades is much bigger in comparison with the previously published data. Regardless, retouched blades (with continuous, non-marginal, quite invasive scalar lateral/bilateral, convergent/pointed obverse, inverse and alternate mostly semi-steep retouch) are numerically significant (n=32), including Aurignacian types (n=11). These and other tool types made on Aurignacian blades occur in all layers (Fig. 27).

Retouched pieces on blades and on flakes with light, short discontinuous or partial retouch (while non-marginal) are common throughout the sequence (Fig. 19). Pieces on blades have usually obverse lateral semi-steep retouch.

Notched pieces are well represented in layer III (n=9), less in layer IV (3) and were made more often on blades than on flakes. The notches are often lateral, but can also be bilateral, proximal, distal and lateral/distal. The retouch (usually scalar, semi-steep and steep) is mostly obverse and rarely inverse. Notched Aurignacian bilateral (Fig. 27: 1) and lateral blades were documented in layers III and IV (Hahn 1977, Plate 169: 2).

Denticulated pieces on flakes were recorded only in layer III: distal, dorsal (2) and lateral dorsal (1).

Sidescrapers occur in all assemblages (except layer II) in comparable proportions and in small numbers (Fig. 19) and were produced on flakes by continuous steep, semi-steep and flat retouch. They are of two main types: lateral and transverse with convex or straight working edge, except for one angle (lateral/transverse) type. The retouch is mostly obverse, while ventral, alternate and bifacial retouch occurs episodically (Fig. 26: 4).

Truncated pieces appeared in all layers, except uppermost layer V. Two of these are distal on retouched blades, including Aurignacian retouch, and

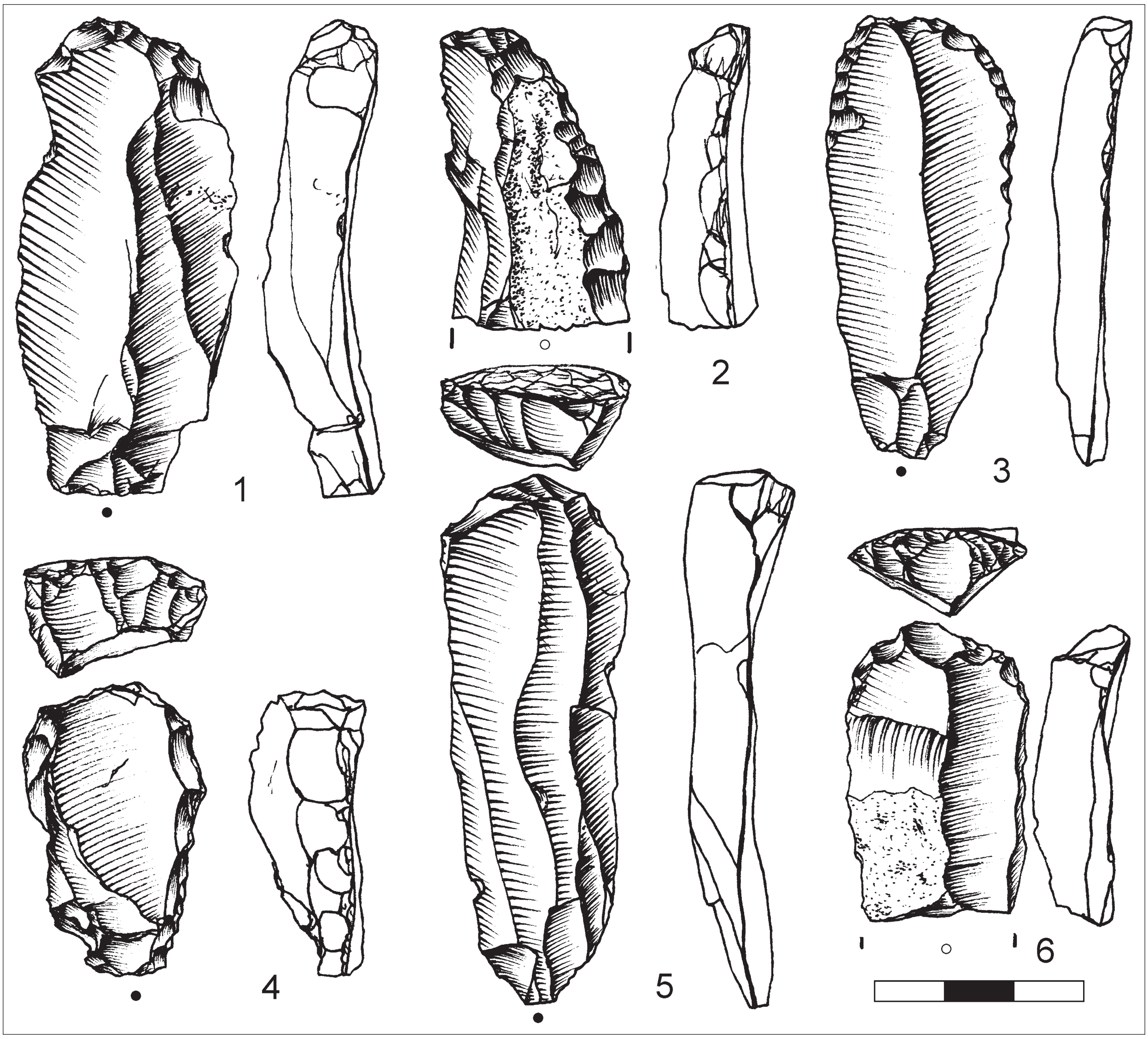

Fig. 23. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III: 1, 6 – simple endscraper, on blade; 2 – endscraper, on Aurignacian laterally retouched blade; 3 – simple endscraper, on bilaterally retouched blade; 4 – thick endscraper, on Aurignacian bilaterally retouched blade; 5 – carinated endscraper, on blade.

Abb. 23. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III: 1, 6 – einfacher Kratzer an Klinge; 2 – Kratzer an Klinge mit Aurignacien-Retusche; 3 – Kratzer an beidseitig retuschierter Klinge; 3 – massiver Kratzer an Klinge mit beidseitiger Aurignacien-Retusche; 5 – Kielkratzer an Klinge.*

one is proximal on blade (layer II), 3 are proximal straight and 2 are distal (layer III) (Fig. 26: 2, 5) and 2 are distal and 1 is proximal (layer IV) (Hahn 1977, Plates 169:3; 168:3). They were made on laterally/bilaterally retouched and non-retouched blades with oblique, straight and concave truncation (except one case on flake).

Thinned pieces (*sensu* Geneste 1985) occurred only in layer III and were produced on flakes (3) and blades (2). These are backed, lateral, proximal, and on snap by dorsal and ventral flat retouch.

Pieces esquillées (scaled tools *sensu* Marks 1976 or splintered pieces) on both flakes and blades, are rare and generally uncommon for the Banat Aurignacian.

Non-geometric microliths (*sensu* Hours 1974) were recorded in all layers, more frequently in layers III and IV (12.8 % or 19 and 7 in number). The 29 "micro-tools" were made on bladelets and only 5 on micro-blades. These are represented by: (a) Dufour bladelets/micro-blades (alternate or inverse fine/micro-scalar, semi-steep retouch), pseudo-Dufour bladelets/micro-blades (*idem* obverse lateral and bilateral retouch) (c) Font-Yves point (*idem* obverse lateral retouch) and (d) *varia* ("small-sized" modified bladelets: 2 lateral notches, lateral/proximal denticulate, proximal oblique truncation, burin and bladelet with invasive flat retouch – some of them with possible projectile impact traces) (Figs. 28; 29). In the most representative Dufour sample (layer III), modified lamellar blanks were mostly symmetrical (on-axis) with nearly equally represented flat (7), twisted (6) and curved (4) profiles. In terms of fragmentation mode and metrics, only 9 of

	Layer II	Layer III	Layer IV	Layer V	GH 3
BURIN ON BLADE:					
angle, on snap	–	6	5	6	5
angle, on butt	–	1	–	–	–
angle, on truncation	–	–	1	–	2
angle double ,on snap	–	–	1	–	–
angle double, on truncation	–	1	–	–	–
transverse	–	–	–	–	1
transverse, on natural truncation	–	1	–	–	–
dihedral	–	1	1	–	–
dihedral, on truncation	–	–	–	–	1
dihedral busqué	–	1	–	–	–
double mixed	–	1	–	2	–
carinated	–	1	–	–	–
BURIN ON FLAKE:					
flat	–	–	–	–	1
angle, on snap	1	1	1	2	2
angle busqué, on truncation	–	–	–	1	–
angle, on truncation	–	1	–	–	1
transverse	–	1	–	–	1
dihedral	–	1	–	–	1
carinated	–	–	1	1	–
multiple/bladelet core (?)	1	–	–	–	–
TOTAL:	**2**	**17**	**10**	**12**	**15**

Fig. 24. Româneşti-Dumbrăviţa I. Burins: Mogoşanu's (layers II-V) and 2009-2010 (GH3) excavations.

Abb. 24. *Româneşti-Dumbrăviţa I, Häufigkeiten der Stichelformen. Ausgrabungen Mogoşanu (Schichten II-V), Ausgrabungen 2009-2010 (GH3).*

29 microliths are complete: max. size is 59.5, 10.5, 5.5 mm; min. 18.7, 9.3, 2.9 mm; average 35.9, 9.9, 2.9 mm; average W is 9.6 mm and T is 2.8 mm. One ventral Dufour in layer III was made on a small proximally broken blade (>33.2, 13.6, 4.6 mm) by fine alternate semi-steep bilateral/distal retouch (Fig. 29: 11). Blanks of all non-geometrical microliths have unidirectional (17) and some convergent (5) dorsal scars and show mostly "on-axis" detachment (22). Twisted (14), flat (10) and curved (5) lateral profiles were recorded. Only 2 micro-notches and 1 Dufour (layers II, III and IV) show an "off-axis" pattern combined with twisted profiles. As for butts, these are usually plain and linear (Th< 2 mm), often lipped/semi-lipped, with diffused bulbs, obtuse internal butt angles and quite rare overhang reduction by small removal trimming (7) or abrasion (3).

Results of the 2009 - 2010 excavations

New excavations aimed at collecting samples for the dating program, coupled with comprehensive geological analyzes and a more accurate contextualization of the lithic assemblages from the preserved stratified part of the settlement. The new researches focused on the character of soils and sediments, palaeoenvironment and chronostratigraphy, state of preservation, and the actual content of the archeological remains. In comparison to the already large size of the area previously excavated, the new researches were much more restricted. Field work concentrated on well documented punctual survey trenches near to Mogoşanu's main trench where all of his layers were recorded to be present, albeit with different clustering. Pre-requisites for the selection of the spatial position of the surveys were therefore the localization of Mogoşanu´s trenches and the identification of a more or less horizontal position to secure preservation of sediments. The interdisciplinary field research at Româneşti-Dumbrăviţa I took place in 2009 - 2010. After the localization of numerous old trenches, a grid system was established and two test pits were excavated until the lowermost archaeological horizon (layer I according to Mogoşanu) was reached. One of these, Trench 4 to the West of the central part of the former main trench, opened a high-density cluster. The excavation methodology comprised 3D recording of all artifacts regardless of their size and wet sieving of sediments recovered from each quarter of 1 m^2. The new excavations, while small-scaled, provided numerous lithic remains, which complemented the old data, especially the microlithic component, generally lost during Mogoşanu´s investigation.

Stratigraphy

In general, the sedimentary cover at Româneşti is comparably thin and artifacts are buried close to the surface, which both complicates geo-archaeological analysis. The combination of different methods of sedimentology, geochemistry and luminescence dating nevertheless showed that all findings above the lowermost layer I ("Quartzitic industry") belong to the last glacial cycle (for details see Kels et al. subm.). When compared to the original description of sediments by Mogoşanu (1978), it can be said that during re-excavation the same main geological features were detected (Fig. 4: 1). However, it turned out that the upper part of the sequence, including most of the archaeological layers, is dominated by the surface soil, here a Stagnic Albeluvisol. This soil developed under moderate climate and temporary soil wetness and is quite common on comparable sediments in flat or dell positions of the Banat foothills (Ianoş 2002; Mavrocordat 1971). The soil can be subdivided into two general horizons below the humic horizon, which has been further subdivided into a plough-horizon (Fig. 4: 1 - GH 1) and a humic horizon below (Fig. 4: 1 - GH 2): a bleached, light brown to grey (albic) horizon (Fig. 4: 1 - GH 3), followed by a brownish to reddish, weakly clay illuviated horizon below (Fig. 4: 1 - GH 4), which is more or less rich on

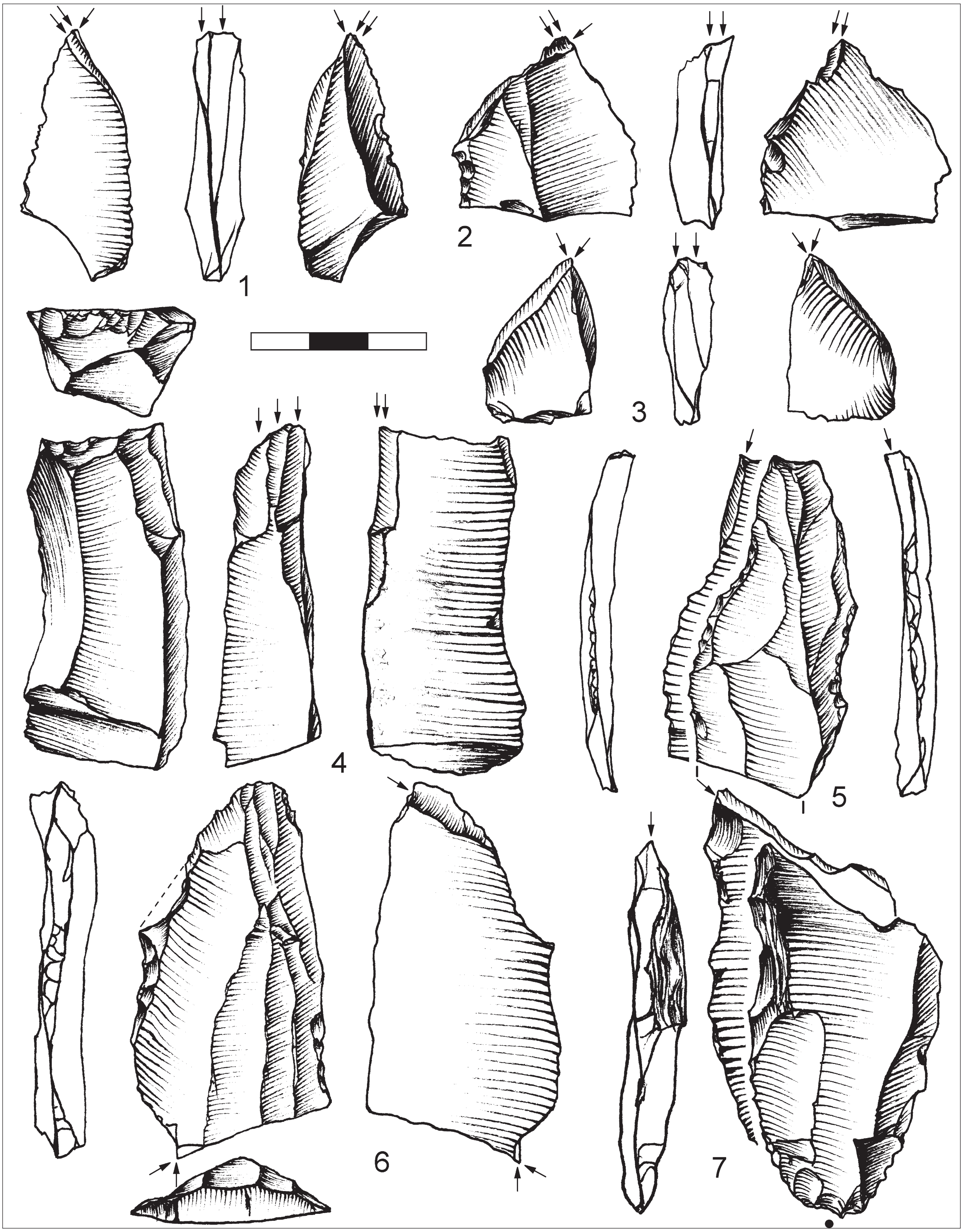

Fig. 25. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III (1, 2, 6, 7) and layer IV (3, 4, 5). Burins: 1 – carinated, dihedral, multifaceted; 2 – busked, dihedral, with lateral notch; 3 – carinated, dihedral; 4 – angle, on straight truncation; 5 – angle, on snap, on bilaterally retouched blade; 6 – double mixed, dihedral asymmetric/transverse, on bilaterally retouched blade; 7 – transverse, on natural truncation – crest.

Abb. 25. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III (1, 2, 6, 7) und Schicht IV (3, 4, 5). Stichel: 1 – Kielstichel; 2 – Bogenstichel; 3 – Kielstichel; 4 – Stichel an Endretusche; 5 – Stichel an Bruch an retuschierter Klinge; 6 – Doppelstichel: Mehrschlagstichel/Transversalstichel an retuschierter Klinge; 7 – Stichel an Bruch.*

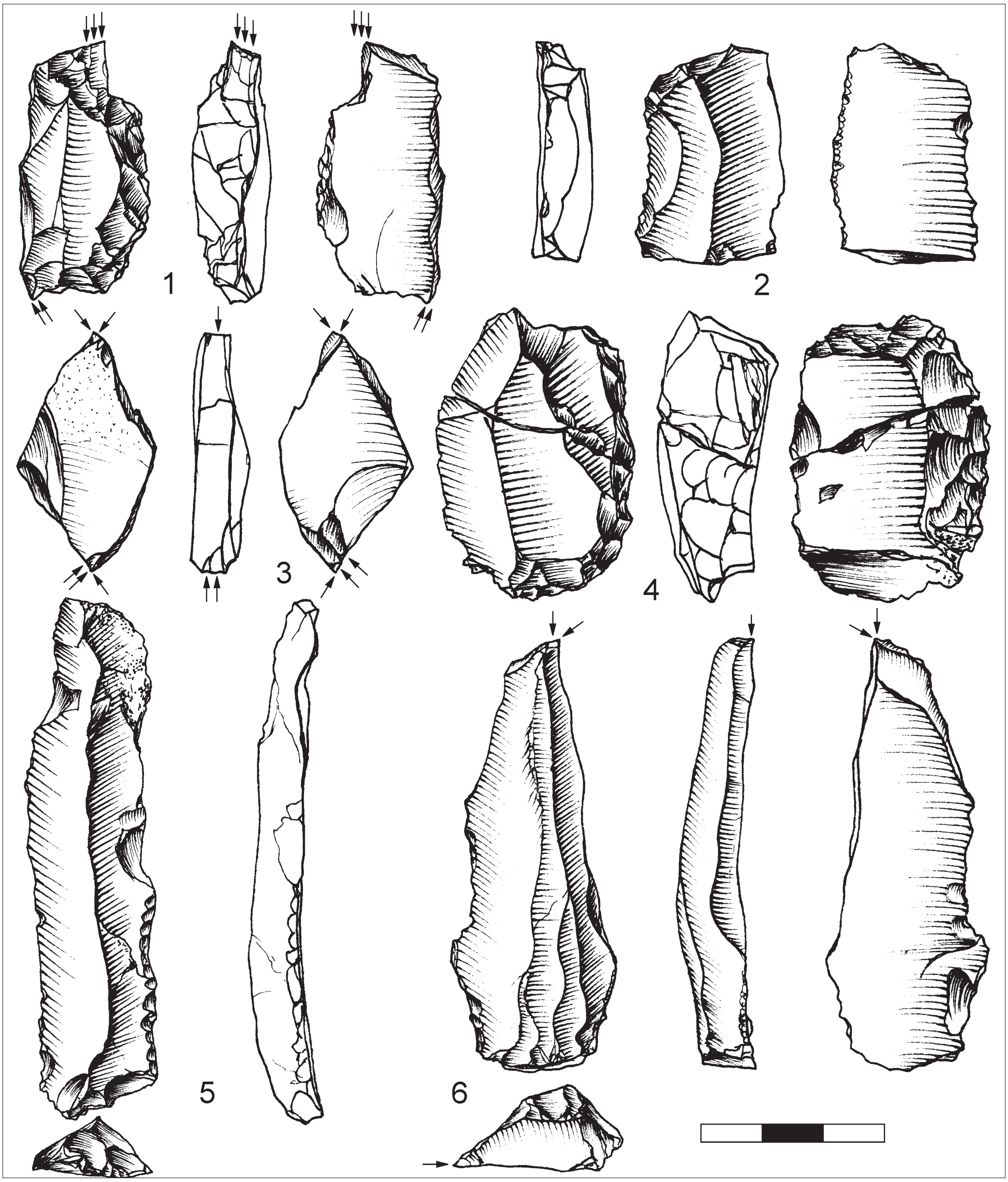

Fig. 26. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III (2, 4, 5) and layer V (1, 3, 6): 1 – double opposed burin, on snap/truncation, on laterally retouched Aurignacian blade; 2 – truncated piece, on laterally inversely retouched blade; 3 – burin carinated, double opposed; 4 – scraper, double-convex, alternate; 5 – truncated piece, on laterally obversely retouched blade; 6 – double mixed burin, transverse/dihedral asymmetric, on laterally retouched blade

Abb. 26. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III (2, 4, 5) und Schicht V (1, 3, 6): Doppelstichel an Bruch/an Endretusche an Aurginacien-Klinge; 2 – Endretusche an lateral ventral retuschierter Klinge; 3 – Kielstichel/Kielstichel; 4 – Doppelschaber: konvex/konvex, alternierend; 5 – Endretusche an retuschierter Klinge; 6 – kantenretuschierter Doppelstichel: Transversalstichel, asymmetrischer Mehrschlagstichel.*

Fig. 27. Româneşti-Dumbrăviţa I, Mogoşanu's excavations, layer III (1, 3, 6), layer IV (2, 4) and layer V (5). Blades: 1, 4, 5, 6 – Aurignacian blades, bilaterally retouched; 2 – bilaterally retouched blade; 3 – Aurignacian blade, laterally retouched.

Abb. 27. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III (1, 3, 6), Schicht IV (2, 4) und Schicht 5 (5). Klingen: 1, 4, 5, 6 – Aurignacien-Klingen, bilateral retuschiert; 2 – bilateral retuschierte Klinge; 3 – Aurignacien-Klinge.*

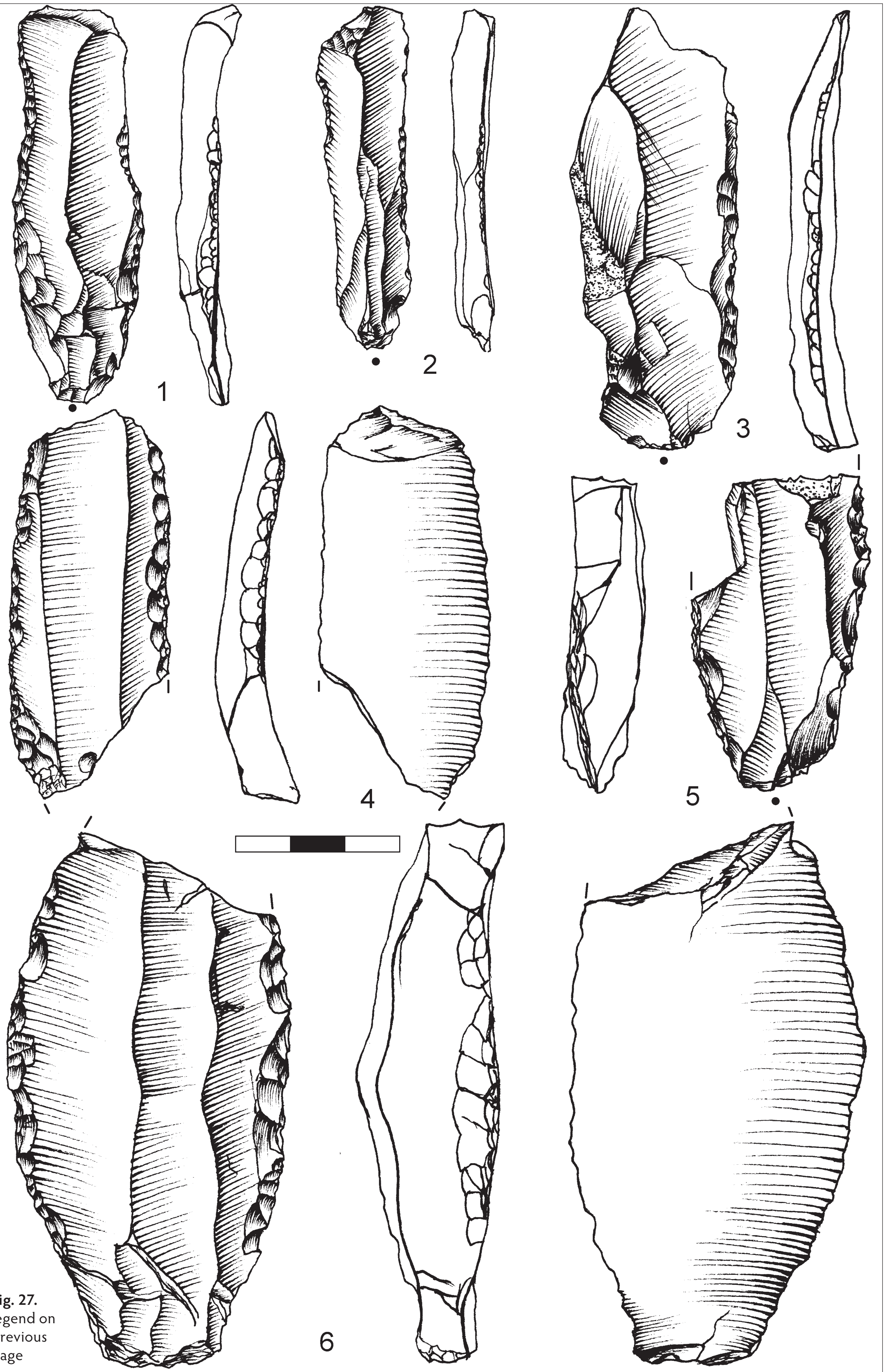

Fig. 27. legend on previous page

	Layer II	Layer III	Layer IV	Layer V	GH 3
Font-Yves point, lateral, dorsal, on micro-blade	–	–	–	–	2
Font-Yves point, lateral, dorsal, on bladelet	–	–	–	1	–
Font-Yves point, bilateral, dorsal, on blade	–	–	–	–	1
Font-Yves point, bilateral, dorsal, on bladelet	–	–	–	–	1
Krems point, alternate, on blade	–	–	–	–	1
Krems point, lateral, ventral, on bladelet	–	–	–	–	1
Dufour alternate, on blade	–	–	–	–	1
Dufour alternate, on bladelet	–	4	1*	–	5
Dufour alternate, on micro-blade	–	3	–	–	38
Dufour lateral, ventral, on blade	–	–	–	–	1
Dufour lateral, ventral, on blade with distal inverse retouch	–	1	–	–	–
Dufour lateral, ventral, on bladelet/distal oblique truncation	–	1	–	–	–
Dufour lateral, ventral on bladelet	1	2	–	–	5
Dufour lateral, ventral on micro-blade	–	–	–	–	14
Pseudo-Dufour, bilateral, on bladelet	–	–	–	–	5
Pseudo-Dufour, bilateral, on micro-blade	–	–	1	–	1
Pseudo-Dufour, lateral, on bladelet	–	6	1	–	1
Pseudo-Dufour, lateral, on bladelet/proximal truncation	–	–	–	–	1
Pseudo-Dufour, lateral, dorsal, on micro-blade	–	–	1	–	2
Notch, lateral, dorsal, on bladelet	–	1	1	–	–
Denticulate, lateral/proximal, dorsal, on bladelet	–	1	–	–	–
Truncated bladelet, proximal, oblique, dorsal	–	–	1	–	–
Bladelet with lateral, dorsal, flat invasive retouch	–	–	1	–	–
Burin double on snap, on retouchet bladelet	–	–	–	1*	–
TOTAL:	**1**	**19**	**7**	**2**	**80**
* with projectile impact					

Fig. 28. Româneşti-Dumbrăviţa I. Non-geometric Microliths: Mogoşanu's (layers II-V) and 2009-2010 (GH3) excavations.

Abb. 28. *Româneşti-Dumbrăviţa I. Häufigkeiten der fein retuschierten Lamellen. Ausgrabungen Mogoşanu (Schichten II-V), Ausgrabungen 2009-2010 (GH3).*

iron and manganese spots and concretions. In its lower part, unearthed in an additional geological trench and not visible in Fig. 4, GH 4 becomes more gleyic. From the bleached horizon, albeluvic tonguing interfingers into the brownish horizon. It is important to point out the soil formation has reached deep below the recent surface and overprinted the sediments of Mogoşanu Aurignacian layers. Therefore, sedimentological changes recorded by previous fieldwork seem less relevant for the understanding of their formation process. Our field studies and the analytics show a much more complex differentiation and development of sediments and soils. One of the major, yet preliminary results is that the surface soil shows a polygenetic development, overprinting pre-weathered sediment belonging to former horizons not visible in the field. The latter horizons may represent weak soil developments (of interstadial character?) whose relation to the Aurignacian artifacts in GH 3 is - at the momentary stage of investigation - not clear cut.

Artifact distribution

Aurignacian assemblages originate from two trenches (Fig. 3: trenches 4 and A, 2009/2010; 7 m^2). Both show the same stratigraphical sequence described above, with Geological Horizon 3 (GH3) being quantitatively much more important. Whereas a total of 7505 lithics comes from GH3, artifacts from the underlying GH4 do not differ from the GH3 industry, but are much less abundant an therefore only described very briefly: 3 Dufours on micro-blades (Fig. 24: 5, 32), 2 burin spalls, 5 blades, 5 bladelets, 7 microblades, 24 flakes, 1 chunk, 1 pebble and waste (89 chips, 4 small fragments <25 mm). The uppermost GH2 and GH1 contain a quite abundant Epigravettian industry, sometimes mixed with pottery fragments of different periods.

Only Trench 4 allows for an admittedly restricted hypothesis about horizontal and vertical distributions of finds in the different GHs. While GH3 is – at least in this part of the open air site - a high density zone, the

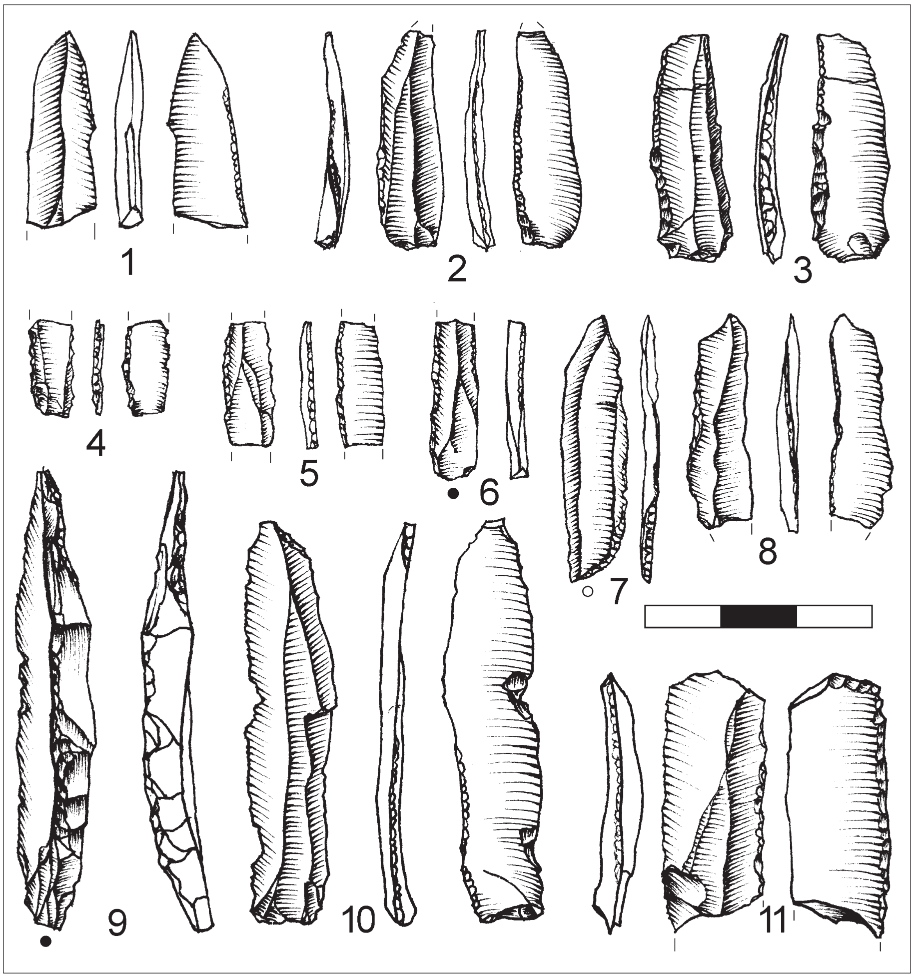

Fig. 29. Româneşti-Dumbrăviţa I, Mogosanu's excavations, layer III (2, 3, 4, 5, 8, 10, 11), layer IV (1, 7) and layer V (9). Non-geometrical microliths: 1 – Dufour, on inversely retouched bladelet; 2, 3, 8, 10 – Dufour, on alternatively retouched bladelets; 11 – Dufour, on alternatively retouched blade; 4, 5 – Dufour, on alternatively retouched micro-blades; 6- pseudo-Dufour, on obversely bilateral retouched micro-blade; 9 – Font-Yves point, on laterally retouched crested bladelet; 7 – bladelet with oblique proximal truncation.

Abb. 29. *Româneşti-Dumbrăviţa I, Ausgrabungen Mogoşanu, Schicht III (2, 3, 4, 5, 8, 10, 11) Schicht IV (1, 7) und Schicht V (9). Fein retuschierte Lamellen: 1 – Dufour, ventral retuschiert an Lamelle; 2, 3, 8, 10 – Dufour, an alternierend retuschierten Mikroklingen; 11 – Dufour, an alternierend retuschierter Klinge; 4, 5 – Dufour, an alternierend retuschierter Mikroklinge; 6 – Pseudo-Dufour, an beidseitig dorsal retuschierter Mikro-Klinge; 9 – Font-Yves Spitze, an Lamellen mit Kernkante, 7 – Lamelle mit proximaler Endretusche.*

uppermost GH1 and GH2 evidence a low density zone with some concentrations. The lowermost GH4 contains only isolated lithics. While the excavated trench is too small (5 m^2) to securely assess the horizontal distribution, it can still be said that the lithic material was dispersed equally across the entire excavated area, leaving some small round spaces without stone items. Burnt artifacts are common, forming several clusters, e.g. one in square 85/220, which delivered the highest amount of burnt material (38 pieces, including samples for TL dating). Cores were found mostly in the central part (10 out of 19), while tools, including microliths, were dispersed more equally (max. 58 and 24 pieces respectively in southern square 85/220).

As for the vertical distribution, characteristic meaningful artifacts were documented in the most concentrated part of GH3. Microliths, including Dufours, occurred in the middle of GH3 (47 out of 80), disappearing progressively toward the top and the bottom of the sequence. Cores (of all types) also occurred in the most concentrated spits of GH3, as well as in higher positions of this geological unit. No carinated pieces were recorded in the lowermost or in the uppermost part of the sequence. Twisted and rectilinear bladelets display the same trend, occurring together with the same frequency mostly in the central part of GH3. Skewed (off-axis) bladelets appear in equally small numbers at both ends of the sequence, being more frequent in the middle part. Thus these attributes do not show any significant technological changes across this succession. The

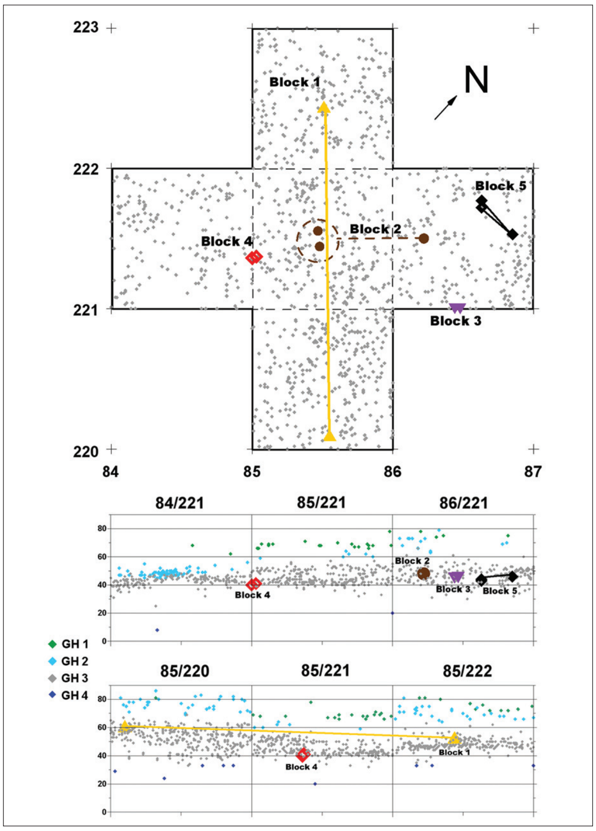

Fig. 30. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3: horizontal and vertical distributions of artifacts with refitted blocks (1-5).

Abb. 30. *Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, Artefakte aus GH 3: Horizontale Verteilung, Profilprojektionen und Zusammenpassungen (1-5).*

presence of many chips alongside the large items, the vertical and horizontal distribution of finds (Fig. 30), as well as the number of refitted artifacts within GH3 (Figs. 31 & 32), confirm that there was little geological or hydrological sorting of the material.

Trench A yielded similar assemblages, but in much less quantity (periphery/low density area).

Absolute dating

OSL-dates

Luminescence dating was applied at the site Româneşti I in order to establish a chronology of the sedimentation processes. Luminescence measurements followed single-aliquot regenerative dose protocols analyzing the postIRIR$_{290°C}$ signal of potassium-rich feldspars extracted from bulk sediments (for technical details and discussion see Thiel et al. 2011; Buylaert et al. 2012; Fig. 33). Annual dose rates were calculated from the radionuclide contents determined by high-resolution gamma-ray spectrometry of bulk sediments. Dose attenuation by soil moisture and contribution of cosmic dose according to the sampling depth was accounted for. The lowermost OSL sample proved to be difficult to date by luminescence. The postIRIR$_{290°C}$ signal was already close to saturation and hence not suitable for dating (for more details see Kels et al. subm.). The IRSL$_{50°C}$ age of the lowermost sample of about 57.9 ± 5.4 ka provides only a minimum age for deposition of the sediments, because it is not corrected for any impact of anomalous fading of the signal. Connected to this layer is the layer of the lowermost "Quartzitic industry" (layer I, belonging to the lower part of GH 4), which is separated from the Aurignacian layers. Thus, the lowermost "Quartzitic industry" might not be younger than ~58 ka, but could be considerably older. Here, luminescence dating is unable to provide more accurate results.

Although parts of the profile show fine discordances, the Aurignacian assemblages from GH 3 most likely date to MIS 3, with luminescence ages of 45.1 ± 4.9 ka and 35.5 ± 3.9 ka from the middle part of this section (Fig. 33). Some of the findings could be connected to the buried weak soil in the middle part of the reference profile, which was not obvious in the field, but detected by multi-elemental analysis. Beneath this palaeosol of interglacial character we detected three layers of fossil root channels, which could belong to former palaeosurfaces, too.

Toward the top of the profile from the lower part of the sediments of GH 2 and connected to the bleached horizon a luminescence age of 19.2 ± 2.3 ka dates loess sedimentation into the Upper Pleniglacial (MIS 2). This fits to the archaeological layer initially attributed to the Gravettian, which can now be conventionally reassigned to a post-LGM Epigravettian. With these results, a first chronology of the sedimentary development at the Banat foothills was possible, offering first correlations to loess sections of the Romanian and Serbian Banat (Fig. 1) and giving new insights into the palaeoecology in different altitudes of the region (for further details see Kels et al. subm.).

TL-dates

The excavations yielded 12 heated artifacts from GH2 (1 piece) and GH3 for thermoluminescence (TL) dating. Due to early onset of dose saturation and scarcity of sample material (small size of artifacts), single-aliquot regenerative-dose (SAR) protocols were employed for palaeodose estimation in combination with or instead of conventionally used multiple-aliquot additive-dose (MAAD) techniques. Analysis of glow curves and dose response behavior during SAR measurements allowed us to distinguish two types of samples which possibly also reflect different mineralogical composition and thus different raw material sources. Dose recovery tests and internal checks for the quality of the dose estimates led to the discard of data from one type of samples. The reduced data set gives the following preliminary dates of the last heating event.

The only sample from GH2 yielded a SAR age of 15.2 ± 1.3 ka and a MAAD age of 16.1 ± 1.5 ka, thus falling into the Epigravettian. However, since this age estimate is based on one sample only, care must be

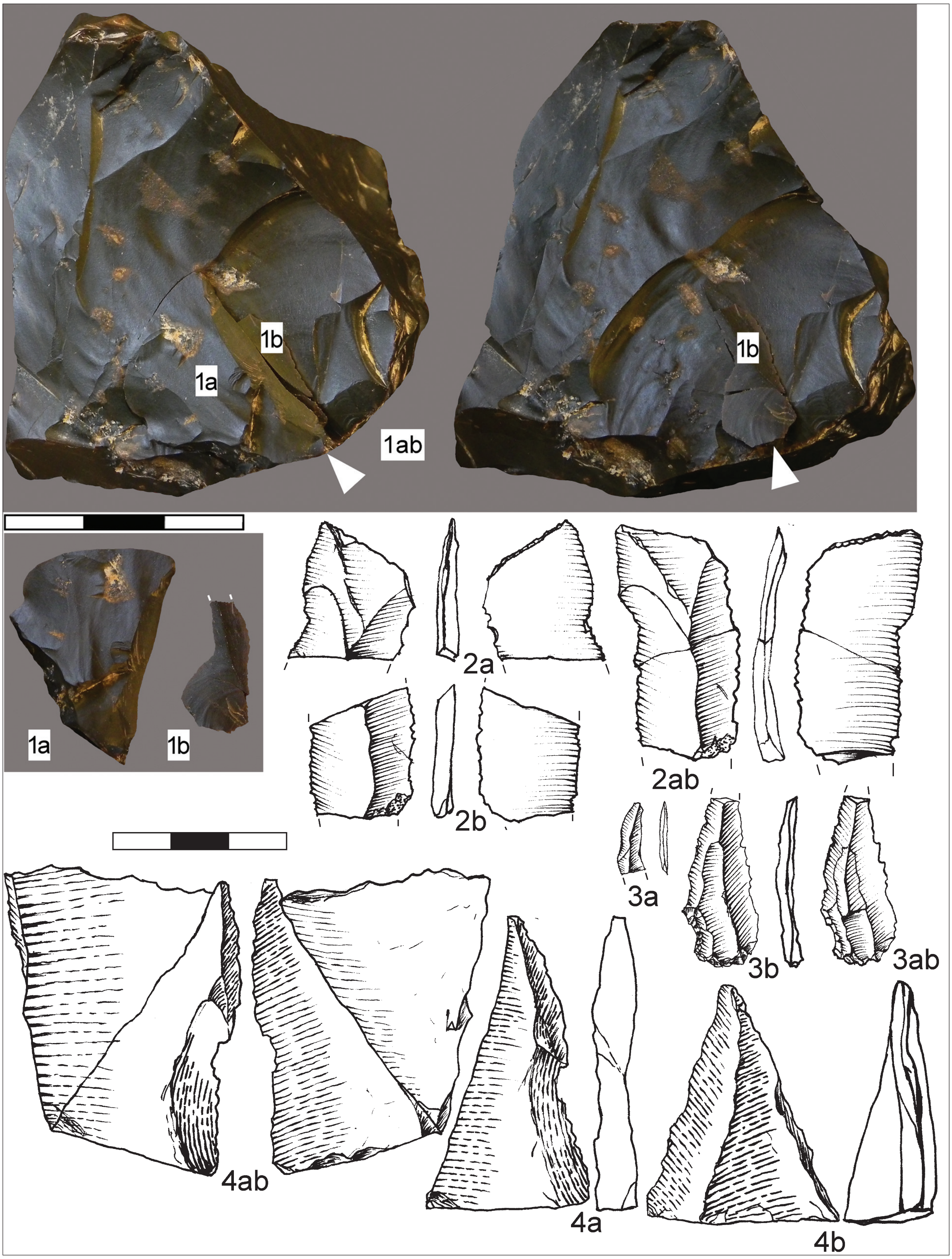

Fig. 31. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3: 1ab, 1a, 1b – core and refitted debitage (block 2); 2a, 2b, 2ab – conjoining of broken retouched piece on blade (block 4); 3a, 3b, 3ab – refitted micro-blade with notched piece on blade (block 3); 4ab, 4a, 4b – conjoining of broken crested flake (block 5).

***Abb. 31.** Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, GH 3: 1ab, 1a, 1b – Kern mit aufeinandergepassten Artefakten des Kernabbaus (block 2); 2a, 2b, 2ab – Aneinanderpassung eines gebrochenen retuschierten Stücks an Klinge (block 4); 3a, 3b, 3ab – Aufeinanderpassung einer Mikro-Klinge mit gekerbtem Stück auf eine Klinge (block 3); 4ab, 4a, 4b – Aneinanderpassung eines gebrochenen Abschlags mit Kernkante (block 5).*

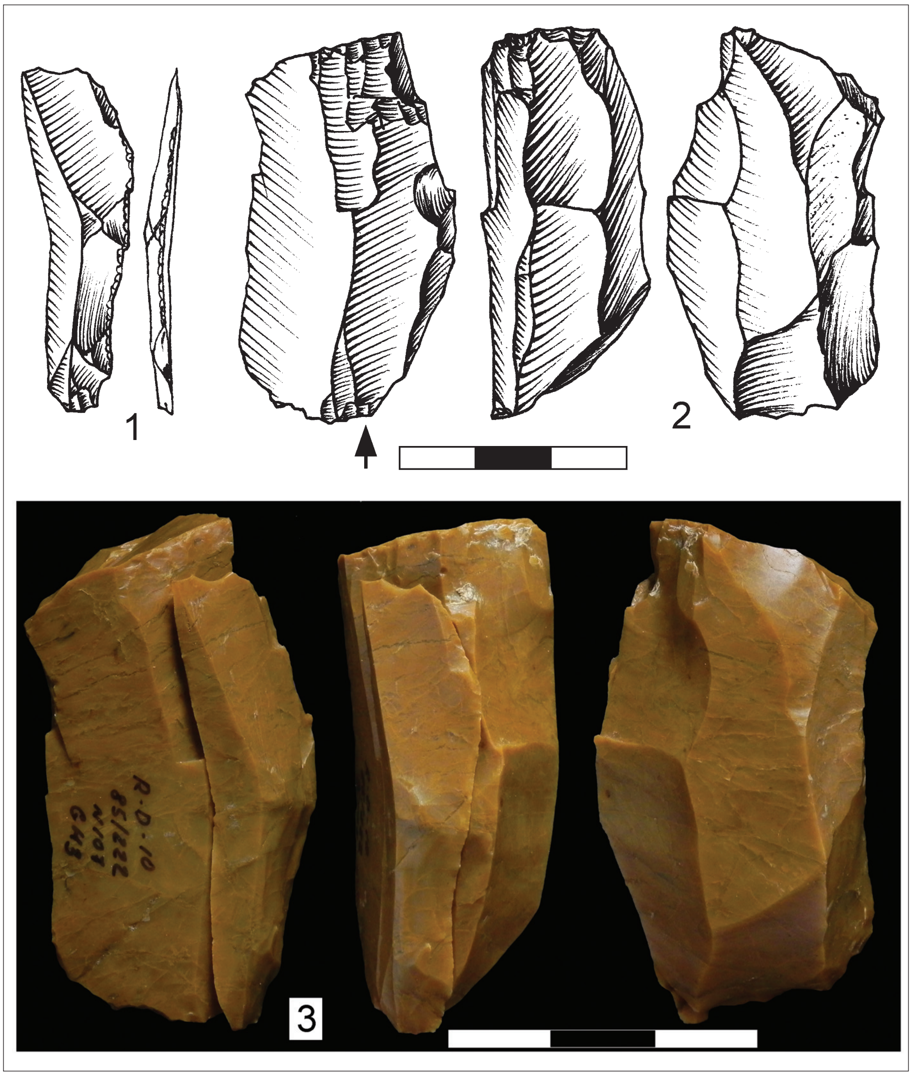

Fig. 32. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3: 1 – retouched piece on blade; 2 – blade/bladelet core, bidirectional, narrow flaking surface; 3 – refitting of the same core and blade (block 1).

Abb. 32. *Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, GH 3: 1 – retuschierte Klinge; 2 – bidirektional Klingen-/Lamellenkern mit schmaler Abbaufläche; 3 – Aufeinanderpassung desselben Kerns und der Klinge (block 1).*

taken when assessing its significance. Furthermore, the TL results indicate that the last heating of artifacts from GH3 most probably occurred between 40.0 ± 1.4 ka (SAR error-weighted mean) and 45.0 ± 1.5 ka (MAAD error-weighted mean), while the younger age clearly represents a minimum age, as discussed in detail in Schmidt et al. (subm.). All single ages contributing to these data are listed in Figure 33.

Analysis of the GH3 lithic assemblage (2009 - 2010)

Raw material

The new excavations show a raw material composition similar to Mogoşanu's assemblages in both raw material types and frequency (i.e. opal dominance). Additionally, an "exotic" black flint of very good quality appeared in Trench 4. A heavily reduced core on that flint, to which one micro-blade and one flake was refitted (Fig. 31: 1ab, 1a, 1b), as well as some isolated debitage products and Dufours were found.

General structure of the lithic assemblage

Chips are the dominant artifact category in the new assemblage (59.2 %), followed by a much lower frequency of flakes (15.1 %). Curiously, micro-blades and bladelets occur in the same number (472 and 471) and proportion (6.3 %), while blades are nearly twice as less frequent (Fig. 5). Small debris (<25 mm) are more representative than chunks and pebbles (5.2 % *contra* 0.2 %). The same disproportion is true for tools (2.3 %) and cores (0.3 %). Pre-forms/tested blocks are nearly absent (2 pieces). Burin spalls are abundant (88 items or 1.2 %) in comparison with the corresponding tools. The tool/core ratio is quite high (8.8: 1), as is the blank to core ratio (125: 1), reflecting very high productivity.

Flakes (45.2 % including tools-on-flakes) dominate

Sample	Layer	Protocol	Temperature interval [°C]	Age [ka]
Rom17	GH2	MAAD, silex, 100-200 µm	270-380	16.1 ± 1.5
		SAR, silex, 100-200 µm	300-350	15.2 ± 1.3
Rom35	GH3	MAAD, silex, 100-200 µm	230-250	47.7 ± 3.6
		MAAD, silex, 100-200 µm	300-375	45.6 ± 1.9
		SAR, silex, 100-200 µm	270-310	42.3 ± 3.2
		SAR, silex, 100-200 µm	340-400	37.9 ± 3.7
Rom72	GH3	MAAD, silex, 100-200 µm	325-410	41.7 ± 3.0
		SAR, silex, 100-200 µm	350-400	41.0 ± 3.6
Rom116	GH3	SAR, silex, 100-200 µm	350-410	37.6 ± 3.2
Rom239	GH3	SAR, silex, 100-200 µm	340-400	39.2 ± 3.2
Rom346	GH3	SAR, silex, 100-200 µm	340-390	41.8 ± 3.5
Rom1-3	lower part of GH4	SAR-pIRIR290, K-rich feldspars, 63-100 µm		close to saturation
		SAR-IR50, K-rich feldspars, 100-200 µm		>>57.9 ± 5.4
Rom1-4a	GH3	SAR-pIRIR290, K-rich feldspars, 63-100 µm		45.1 ± 4.9
Rom1-4b	GH3	SAR-pIRIR290, K-rich feldspars, 63-100 µm		35.5 ± 3.9
Rom1-5	lower part of GH2	SAR-pIRIR290, K-rich feldspars, 63-100 µm		19.2 ± 2.3

Fig. 33. IRSL (feldspar) and preliminary TL (silex) ages. Individual TL dates were used for calculation of the error-weighted mean ages; discarded data (e.g. statistical outliers) are not shown. For some samples, two ages were generated by separate evaluation of single TL peaks passing the plateau test. The term MAAD stands for the multiple-aliquot additive-dose protocol and SAR for the single-aliquot regenerative-dose protocol. Dated materials and respective grain size ranges are also given; all ages are shown with their 1 sigma uncertainty. For further details on measurements, see main text, Schmidt et al. (subm.) and Kels et al. (subm.).

Fig. 33. *IRSL- (Feldspat) und vorläufige TL (Silex)-Alter. Aus den gezeigten TL-Daten wurden die fehlergewichteten Mittelwerte berechnet; verworfene Daten (z.B. statistische Ausreißer) sind nicht enthalten. Für einige Proben wurden zwei Alter berechnet, indem TL-Peaks, die den Plateautest bestanden haben, getrennt ausgewertet wurden. MAAD steht für das multiple-aliquot additive-dose-Protokoll und SAR für das single-aliquot regenerative-dose-Protokoll. Datierte Materialien und zugehörige Korngrößenfraktionen sind ebenfalls vermerkt; alle Alter sind mit 1 sigma Standardabweichung angegeben. Zu weiteren Einzelheiten der Messungen siehe Haupttext, Schmidt et al. (eingereicht) und Kels et al. (eingereicht).*

the *debitage structure* over micro-blades and bladelets (22.7 % and 20.1 % correspondingly), while blades are nearly twice as less frequent (Fig. 6). Nevertheless, the laminar orientation of GH3 industry is evident, since all laminar removals (54.8 %, including tools on laminar blanks and burin spalls) dominate over flakes and tool-flakes (45.2 %). Laminar structure shows a clear priority for small blank production, while blades appeared to be less important. Moreover, micro-blades were the most desired blanks for modifications – 57 tools on micro-blades.

Cores

A total of 19 cores were found, showing a very low frequency in the whole assemblage. Identifiable cores (13 items) have been subdivided into the following categories: pre-cores (2), carinated (2), prismatic (4), narrow-faced (5) and flake cores (2) (Fig. 7). Both pre-cores are on quartz and sandstone pebbles with several unidirectional scars. Carinated cores are unidirectional, with bladelet/micro-blade scars. The first core is on chunk with a wide sub-pyramidal working surface (Fig. 34: 2). The second core-on-flake has a working surface on hinged end and a platform on the *débordant* side (Fig. 34: 4). Prismatic cores comprise 1 blade unidirectional sub-cylindrical, 1 blade/let unidirectional core on flake, 1 bladelet orthogonal-adjacent (with wide and narrow working surfaces) core on flake (Fig. 34: 3) and 1 exhausted core (Fig. 31: 1ab). Striking platforms are flat. A single crest remnant was recorded. All of these cores show advanced reduction or exhaustion. Narrow-faced core-on-flakes (5 items) are represented by 3 unidirectional (Fig. 34: 1), 1 bidirectional (Fig. 32: 2, 3) and 1 core with changed orientation (Fig. 34: 5). Three cores are initial, and two cores are almost exhausted. Two cases of scraper recycling were recorded. Striking platforms are usually crudely prepared. The angles (between platform and flaking surface) are acute. Narrow unprepared working surfaces have a

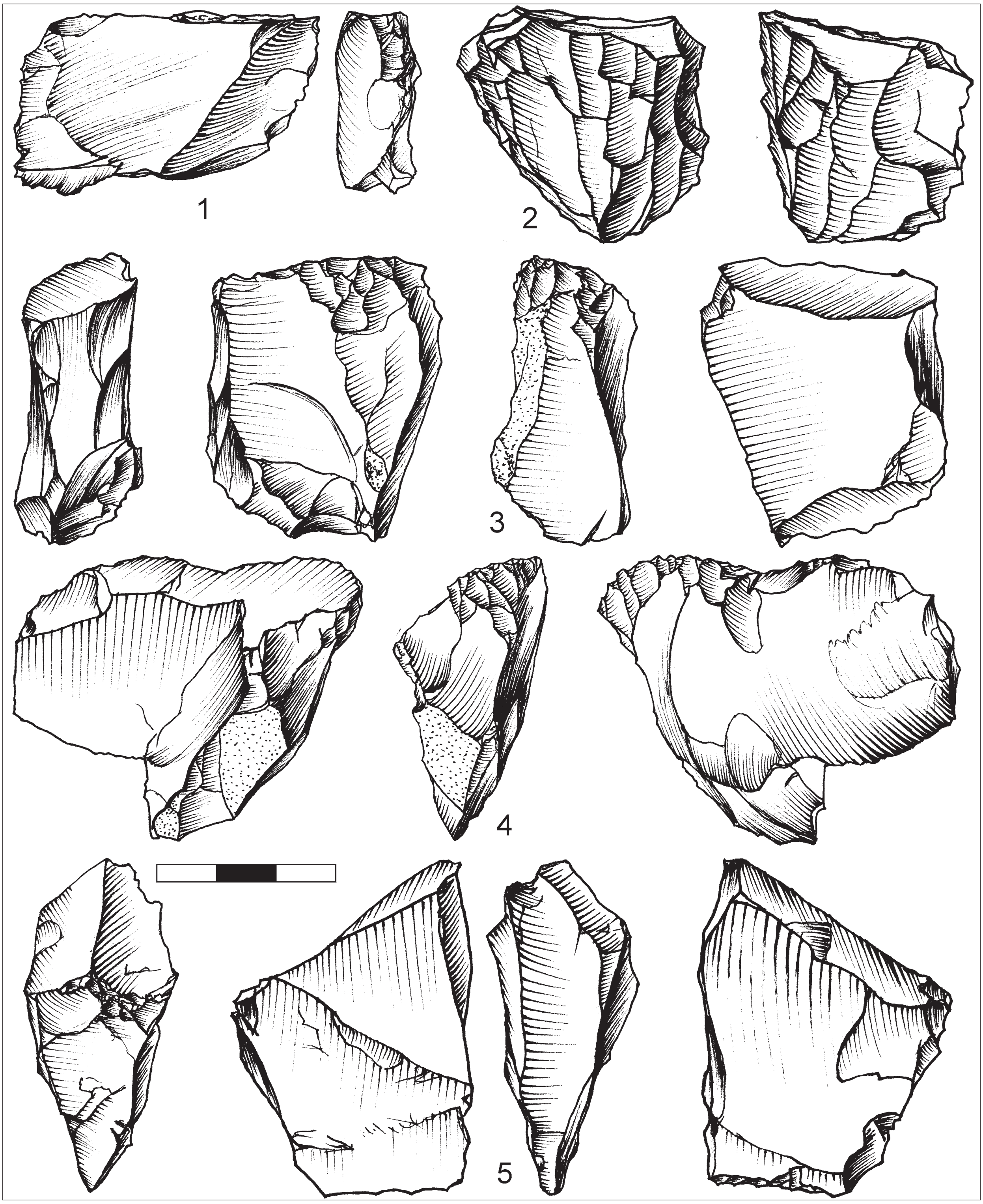

Fig. 34. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3: 1 – blade core, unidirectional, narrow flaking surface, made on flake; 2 – bladelet carinated core, unidirectional, sub-pyramidal; 3 – bladelet core, orthogonal-adjacent, made on flake; 4 –bladelet carinated core, unidirectional, made on flake; 5 – bladelet core, change orientation, narrow flaking surface, made on scraper.

Abb. 34. *Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, GH 3: 1 – unidirektionaler Klingenkern mit schmaler Abbaufläche an Abschlag; 2 – Gekielter unidirektionaler Lamellenkern, sub-pyramidal; 3 – Lamellenkern an Abschlag; 4 – Gekielter unidirektionaler Lamellenkern an Abschlag; 5 – Lamellenkern mit schmaler Abbaufläche an Schaber, mit einem Wechsel von Schlag- und Abbaufläche.*

triangular shape, sometimes extending to the ventral or dorsal sides. The two flake cores include a semi-discoidal and one on a lateral side-scraper (recycling) with crossed scars, belonging to the Kombewa type.

Laminar debitage

Laminar products are abundant (1414), although complete items are rare: blades (6.5 %), bladelets (9.6 %), and micro-blades (8.1 %). The tools show a lesser

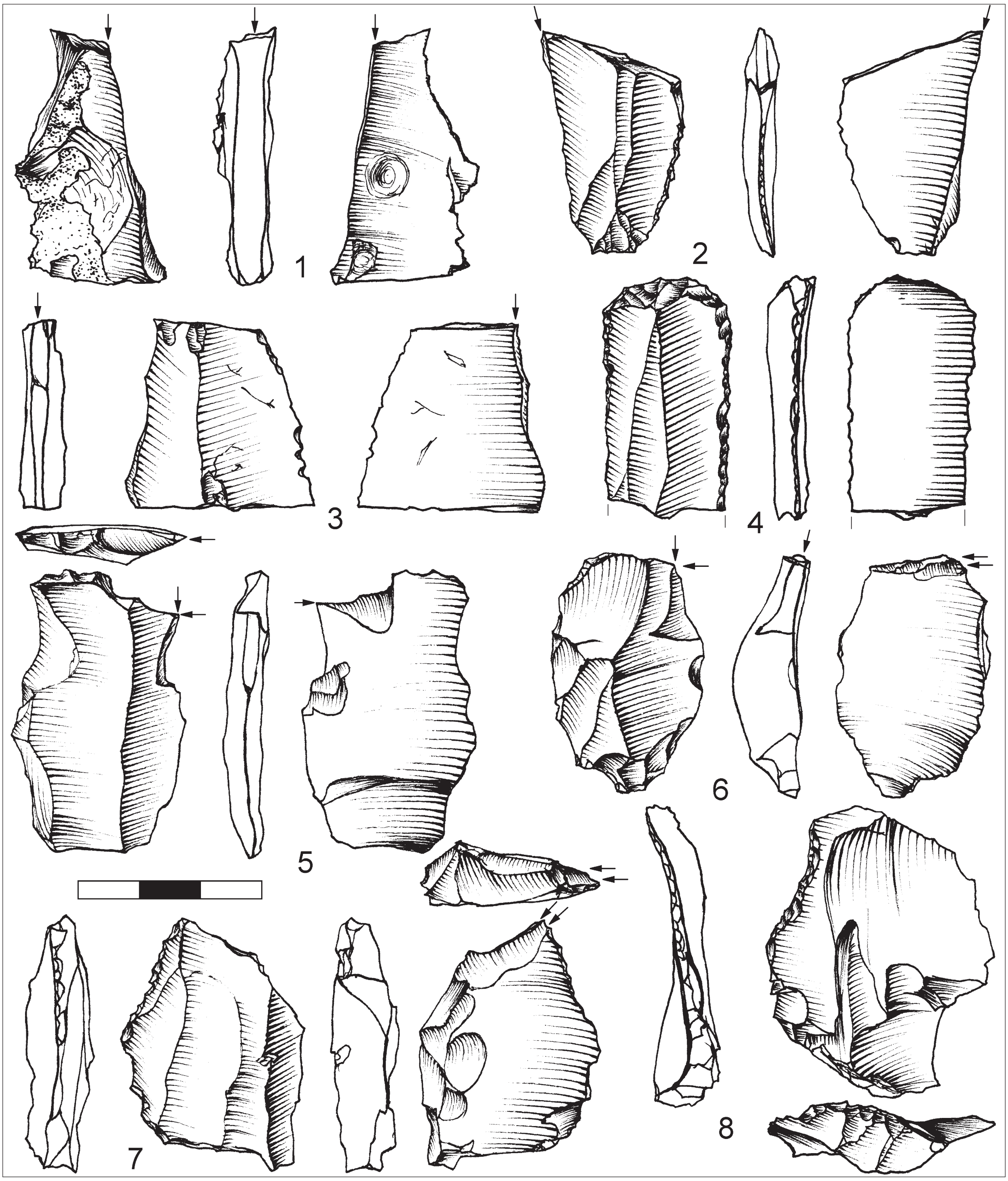

Fig. 35. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3: 1, 3 – angle burin, on snap, on blade; 2 – angle burin, on snap, on laterally obversely retouched blade; 4 – endscraper, on bilaterally obversely retouched blade; 5 – dihedral angle burin, on distal convex truncation, on blade; 6 – dihedral angle burin, 7 – transverse burin, on retouched blade; 8 – sidescraper, on core-tablet.

Abb. 35. *Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, GH 3: 1, 3 – Stichel an Bruch; 2 – Stichel an Bruch an Klinge mit dorsaler Kantenretusche; 4 – kantenretuschierter Kratzer an Klinge; 5-6 – Mehrschlagstichel; 7 – Transversalstichel an retuschierter Klinge; 8 Schaber an Kernscheibe.*

degree of fragmentation: complete tool-blades (12.8 %), tool-bladelets (10.5 %) and tool-micro-blades (8.8 %). The metrical data are as follows: (1) blade max. size is 78.7, 37.6, 18.7 mm and average of 17 complete blades is 44.1, 17.6, 7.0 mm; bladelet max. size is 45.3, 11.9, 9.6 mm; average of 45 complete bladelets is 24.8, 9.5, 3.1 mm; micro-blade max. size is 21.1, 6.9, 3.9 and average of 38 complete micro-blades is 13.1, 4.9, 1.5 mm.

Flakes with different proportions of cortex (29.5 %), dominate over blades (11.7 %); bladelets and micro-blades with cortical surfaces are the least

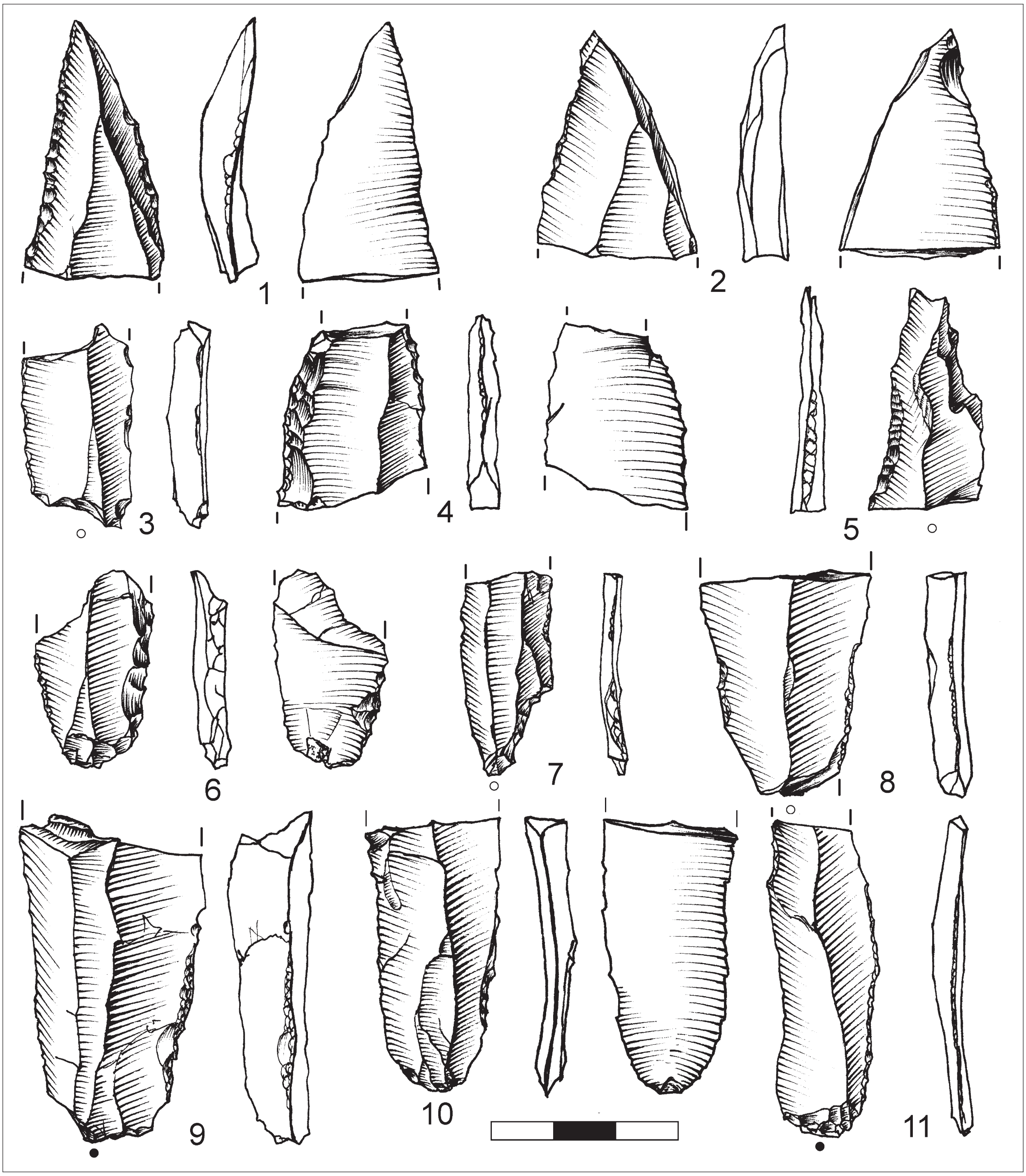

Fig. 36. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3: 1 – pointed blade, bilateral, dorsal; 2 – alternatively retouched piece on blade; 3, 7 – proximally truncated blades; 4, 6 – Aurignacian blades; 5 – notch on blade, lateral, dorsal; 8, 9, 10 – retouched pieces on blade; 11 – retouched blade, bilateral, dorsal.

Abb. 36. *Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, GH 3: 1 – Spitze an bilateral retuschierter Klinge; 2 – alternierend retuschierte Klinge; 3, 7 – Klinge mit proximaler Endretusche; 4, 6 – Aurignacien-Klingen; 5 – gekerbtes Stück an Klinge; 8, 9, 10 – retuschierte Klingen; 11 – bilateral retuschierte Klinge.*

frequent (about 3 %). Cortical flakes (>76 % of cortex) account for 30 items (5.2 %), while primary blades comprise three pieces and only a single bladelet. Laminar products with unidirectional dorsal scars are the most representative: blades (75.2 %), bladelets (74.4 %) and micro-blades (81.4 %), following by convergent (10.6 %, 13.8 % and 14.4 % respectively); other patterns are rare.

Blade shapes are mostly rectangular (46.7 %), more rarely trapezoidal (16.7 %), irregular (12.5 %) and triangular (10.4 %). Bladelets with rectangular shape dominate (51 %) over triangular (13 %) and trapezoidal (12.7 %). The micro-blades are usually rectangular (52.5 %), while triangular (20.7 %) and crescent

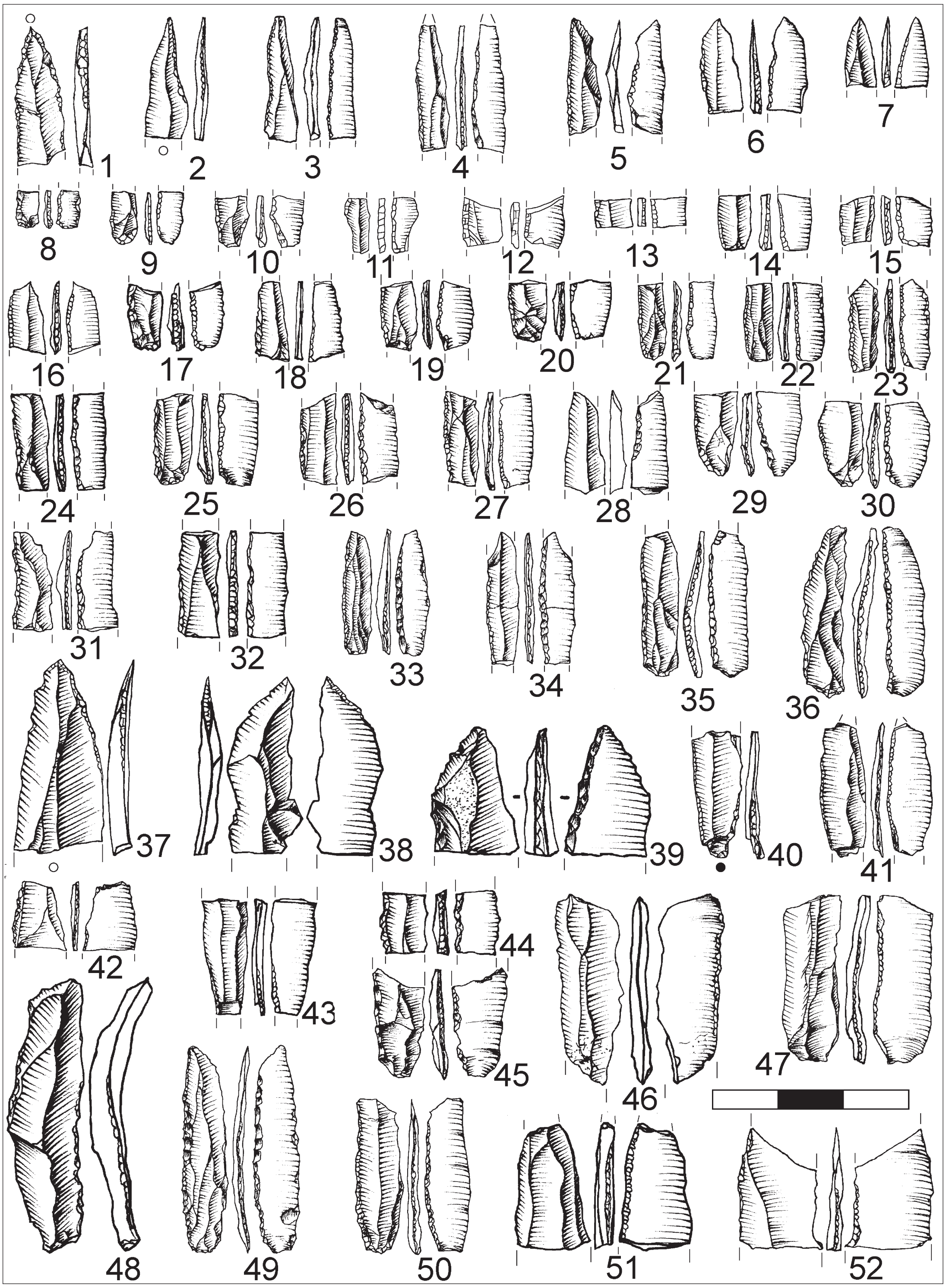

Fig. 37. Româneşti-Dumbrăviţa I, 2009-2010 field campaigns, GH3 and GH4 (5, 32). Non-geometric microliths: 1 – Font-Yves point, on bilaterally retouched micro-blade; 2 – Font-Yves point, on laterally retouched micro-blade; 3 – Krems point, on alternatively retouched micro-blade; 4-6, 8-27, 29-36, 41 – Dufour, on alternatively retouched micro-blades; 7, 28 – Dufour, on inversely retouched micro-blade; 37 – Font-Yves point, on laterally retouched blade; 38 – Krems point, on inversely retouched bladelet; 39 – Krems point, on alternatively retouched blade; 40, 48 – pseudo-Dufour, on bilaterally obversely retouched bladelet; 42-45, 49, 50 – Dufour, on alternatively retouched bladelet; 46, 47, 51 – Dufour, on inversely retouched bladelet; 52 – Dufour, on alternatively retouched blade.

Abb. 37. *Româneşti-Dumbrăviţa I, Ausgrabungen 2009-2010, GH 3: fein retuschierte Lamellen: 1 – Font-Yves Spitze an beidseitig retuschierter Mikroklinge; 2 – Font-Yves Spitze an beidseitig retuschierter Mikroklinge; 3 – Krems-Spitze an alternierend retuschierter Mikroklinge; 4-6, 8.27, 29-36, 41 – Dufour, an alternierend retuschierter Mikroklinge; 7, 28 – Dufour, an invers retuschierter Mikroklinge; 37 – Font-Yves Spitze an kantenretuschierter Klinge; 38 – Kremser Spitze an ventral retuschierter Lamelle; 39 – Kremser Spitze, an alternierend retuschierter Klinge; 40, 48 – Pseudo-Dufour, an bilateral retuschierter Lamelle; 42-45, 49, 50 – Dufour, an alternierend retuschierter Lamelle; 46,47,51 – Dufour, an ventral retuschierter Lamelle; 52 – Dufour, an alternierend retuschierter Klinge.*

(11.6 %) shapes are less frequent. The debitage symmetry of laminar products shows some variation within three main groups throughout size ranges. The blades show a near-balanced frequency of on-axis/off-axis products (56.2 %/43.8 %), while smaller removals became more symmetrical, i.e. on-axis bladelets (67.9 %) and especially on-axis micro-blades (74.9 %). Blade/let and micro-blade profiles are similarly twisted (38.1 %/37.5 % and 33.9 %), showing a progressive decline of curved profiles through the laminar categories (17 %/11.6 % and 9.4 %). On the other hand, flat profiles increase with the diminishing of laminar parameters (Fig. 14). It is worth mentioning that the complete laminar products show different profile frequencies, expressed particularly in higher twisting rates (Fig. 14). However, data based on intact products do not confirm the domination of one particular profile type.

As for the distal ends, they become more feathered from bigger to smaller laminar removals: 53.3 % (blades), 66.4 % (bladelets) and 75.6 % (micro-blades). Consequently, hinged fractures slightly decline from about 21 % (blade/lets) to 16 % (micro-blades), as well as blunt distal parts. Overpassed removals are rare, occurring mostly among blades (9) and flakes (12). Interestingly, triangular cross-sections of all laminar removals are more frequent than trapezoidal cross-sections. Lateral steep cross-sections progressively decline from blades (14.9 %) to micro-blades (6.4 %); multiple sections are rare and display a similar trend. This trend fits well with the common presence of narrow-faced cores and burins.

Figure 15 shows the dominance of single blow platforms of laminar products as well as the decline in flat platforms in favor of lineal throughout the laminar size groups. As for butt lipping (which is always high), the highest frequency of lipped and semi-lipped platforms was documented for bladelets (Fig. 16). The analysis of laminar products also revealed (a) a decline in lipped butts from blades to micro-blades and *vice versa,* and (b) an increase in semi-lipped butts from the smallest to the biggest laminar products. Diffused bulbs dominate among all laminar removals (max. 53.6 % for blades). However, this attribute shows a gradual decrease from blades to micro-blades (min. 40.3 %), while the frequency of developed bulbs increases. Bulb absence is considerable for all removals (c. 20 % - 25 %); the split/shattered pattern occurs sporadically (Fig. 17). Obtuse interior flaking angles dominate with similar frequency for all laminar products, while the frequency of right angles doubled for micro-blades in comparison with blades (Fig. 18). As for overhang reduction, abrasion and faceting were applied separately with similar intensity (>60 %) for both blades and bladelets. On the other hand, these techniques were used independently in nearly the same lower proportions for micro-blades. Moreover, mutual application of both techniques was often attested, mostly for blades (48.2 %) and bladelets (38.4 %) and much less so for micro-blades (16.6 %). Thus, cores designated for obtaining bigger laminar products were generally more often restored (as for overhangs) in comparison with the "micro" items.

Core Maintenance Products include 60 pieces: *débordant*/rejuvenation flakes (8), crested flakes (8), crested blades (11), crested bladelets (5), crested micro-blades (1), tablet-flakes (18), tablet-blades (1), and core flank-flakes (8). Crested removals are not very common, but represent all variations; lateral crests are dominant.

Tools

Tool production in GH3 was based mainly on opal (90.7 %), especially for the tools on flakes and on blades (up to 96 - 97 %), while several micro-blade tools were made of flint (8 pieces). Tools (n=169) were made on different kinds of blanks, as follows: micro-blades (37 %), blades (30.5 %), flakes (20.1 %) and bladelets (12.3 %) (15 cases of unidentifiable tool blank type). The toolkit is dominated by non-geometric microliths (56.3 %). Burins and retouched pieces on blades and on flakes are present in considerably lower percentages. Other tools are rare (Fig. 19).

Endscrapers include only two simple types on retouched blades (Figs. 20; 35: 4).

Burins (n=15) were made on blades (9) and flakes (6). These are angle burins on snap (7), including 2 on truncation, as well as dihedral (2), transverse (2 – one on truncation), flat (3) and unidentifiable (1). In four cases, the blanks were laterally (usually dorsally) retouched (Figs. 24; 35: 1-3, 5-7). Carinated burins are absent. In addition, 88 burin spalls were recorded. These are on blades (3), bladelets (28) and micro-blades (57); 19 have retouch/truncated remnants.

Retouched blades are rare (n=5), but also diverse, including pointed (1), laterally retouched (2) and two Aurignacian blade fragments (Fig. 36: 1, 4, 6, 11).

Retouched pieces on blades and on flakes with light short discontinuous or partial semi-steep retouch (while non-marginal) are common (16 and 12 items of each). These pieces on blades usually have lateral obverse retouch, rarely bilateral, alternate and alternating (Fig. 36: 2, 8-10). Retouched pieces on flakes often exhibit lateral obverse, but also inverse retouch.

Lateral notched pieces (n=4) are all on blades (Fig. 36: 5), with scalar, fine or marginal semi-steep and steep obverse retouch (1 case of alternating/double notch).

Sidescrapers (n=3) were produced on flakes and a flake-tablet (Fig. 35: 8) by continuous scalar semi-steep retouch and fall into the lateral (straight and concave) and transverse convex varieties.

Truncated pieces (n=2) are proximal, on retouched blades, with straight oblique and concave truncations (Fig. 36: 3, 7).

Pièces esquillées (n=3) are on flakes (2) and one on blade and have unidirectional scalar flat bifacial negatives (2); one piece is broken.

Non-geometric microliths are abundant (n=80) and represent more than half of the toolkit (Figs. 19; 28; 37). These micro-tools were often made on micro-blades (57), more rarely on bladelets (19), but also on small blades (4); curious cases of 2 Dufours, Font-Yves and Krems points on blades (Fig. 37: 37, 39, 52) with width between 12.6 - 13.7 mm. Fragmentation is very high: only 7 tools are complete (6 Dufours and 1 pseudo-Dufour). The sizes of complete pieces are as follows: max. 40.5, 11.2, 4.2 mm; min. 15.4, 6.5, 1.5 mm and average 25.2, 7.0, 2.1 mm. Average metrics of all microliths is >13.8, 6.7, 1.7 mm. Non-geometric microliths contain (a) Font-Yves points on blade/let and micro-blades (4), Krems points on blade/lets (2), Dufours on blade/let/micro-blade (64) and pseudo-Dufours on bladelet/micro-blade (10). The dominant type is represented by the Dufour with alternate retouch on micro-blades (=38 pieces), followed by pieces with lateral ventral retouch on micro-blades (14); both the Dufour and the laterally retouched type are less numerous when using bladelets as blanks. Half of the pseudo-Dufours were attributed to the bilateral dorsal type on bladelets, but some could belong to the Font-Yves points (7 pieces lack the distal parts). The selected blanks have unidirectional (63) and convergent (12) dorsal patterns. "On-axis" lamellar detachment is the usual trend (56), while "off-axis" removals are much less common (15). Flat lateral profiles dominate (38) over twisted (20) and curved (9); the association of twisting and "off-axis" detachments is rare (5). As for the butts, these are usually linear (19) and flat (7), with a slight difference between types, often semi-lipped/lipped (15/5), and also unlipped (7). Bulbs are mostly weak: diffused (20) and absent (2), with only few developed (5). Obtuse flaking angles, including 2 inverted, dominate over right angles (15 *contra* 6). The overhang was often reduced by abrasion (17 items) and trimming (18 items); in 11 cases both techniques were documented. Dufour retouch shows the classical trend, i.e. continuous fine/micro-scalar, semi-steep alternate with direct on the left edge and inverse on the right; sometimes accompanied by abrasion of working edges.

Unidentifiable tools are abundant (n=28).

Comparative outline

The archaeological sequences

The excavation area of 2009 - 10 is situated near the main (i.e. largest) trench of Mogoşanu's excavations (Fig. 3). From an optimistic reading of his mapping of the horizontal distribution of artifacts, which for several reasons is known to be schematic, one would have expected to find at least his Aurignacian layers III and IV as well as his Gravettian layer VI represented in the recently excavated sequence (Fig. 4: 1). However, this was not the case. While we found equivalents of his layer VI in two geological horizons (GH 1 and GH 2), the overwhelming part of the Aurignacian finds were located within the same geological layer GH 3. From a sedimentological point of view, as well as in terms of the depth of finds, Aurignacian artifacts from the lowermost geological horizon of our excavation, GH 4, are clearly separated from the materials above; they thus likely represent Mogoşanu's Layer II. In this Layer II 2 carinated cores (Fig. 7), 1 Dufour on bladelet (Fig. 28), as well as 12 various UP tool types similar to the uppermost Aurignacian assemblages (Fig. 19) were recorded.

In contrast to this clear distinction, no subdivisions of GH 3 were possible; there were no structures (e.g. fireplaces) or other indicators for original surfaces (e.g. banded sooty sediments, patches of hematite, etc.). Even more so, profile projections of the artifacts recovered from GH 3 show a more or less continuous vertical distribution with an overall thickness that varies between 20 cm and 5 cm (Fig. 30). Finally, available refits within GH 3 provide another empirical argument for the notion that no archaeological horizons could have been distinguished in the field. This raises the question about the integrity of Mogoşanu's distinction. We see four possible explanations for the obvious differences – GH 3 with its continuous vertical distribution *contra* Mogoşanu's Layers V, IV and III – between the sequences observed during the two excavations:

1) Although schematic, Mogoşanu's plan of the horizontal distribution clearly informs on the different spatial characters of his layers. Whereas he found layer III in all of his trenches, all other layers are patchy and cluster in more or less small areas. This especially accounts for his Layer V and, at the same time, means that any expectation to find all of Mogoşanu's layers within the same profile would tend to be false. Following this view, it might well be possible that *only Mogoşanu's layer III is represented in GH3*. This corresponds more or less to the vertical spread of finds of approximately 20 cm according to our measurements and Mogoşanu's description. However, as already mentioned, Mogoşanu's labeling of the lithics does not confirm such a distinct vertical distribution and speaks more for continuity in larger parts of the (middle section of the) sequence.

2) Perhaps, at least part of the stratigraphic separation of layers III to V described by Mogoşanu existed in other parts of the site. Due to a reduced sequence, *our sections gave a compressed palimpsest.*

3) Our sequence is representative for the entire site, and *archaeological finds from GH3 display a palimpsest that also Mogoşanu found*, but – for some reason or another – divided into three (then: artificial) layers. It is well known that post-depositional processes, combined with a low sedimentation rate, hinder the identification of several, originally distinct episodes of human presence. Among others, (perma-) frost structures (as perhaps indicated by the empty rounded areas in the recent excavation), rootlets as well as repeated and intense human or animal activities open possibilities to explain the genesis of a stratigraphic palimpsest of occurrences originally separated in time. The fact that the find-depth inscribed on the lithics does not show much (if any) vertical clustering supports this hypothesis.

4) Theoretically, it is not excluded that the GH3 assemblage from 2009 - 10 represents events of human occupation unrelated to those documented in Mogoşanu's excavations. However, the proximity of our trenches to those of Mogoşanu makes this notion highly improbable.

To conclude, the newly excavated Aurignacian assemblages occur continuously through GH3 showing no sterile, but variable, vertical artifact density, clearly suggesting repeated occupations and/or palimpsest. The labeling of some artifacts in the old collection confirms such continuity in vertical find spread and often does not fit to the strict distribution frame adopted in previous publications. For example, a number of artifacts (n=211) labeled with continuous "z" (depth from modern surface) between layers IV and V, supposedly sterile for 10 cm, had to be assigned to intermediate "unit" IV/V and not included in our analysis.

At the same time, Epigravettian *fossiles directeurs* were not found in GH3, giving the impression of insignificant mixture of the two technocomplexes. Similar to Mogoşanu`s stratigraphic record, the Aurignacian assemblages were found in different depth of GH3 and the upper part of GH4, sandwiched by the less abundant Epigravettian at the top and an industry with isolated, mostly quartz artifacts at the base of the sequence (Middle Palaeolithic?). The lack of inclination in the overall horizontal distribution of artifacts (Fig. 30) appears to indicate their primary position, as do the conjoining broken artifacts and technological refitting (Figs. 31, 32).

In sum, GH3 securely corresponds to Mogoşanu´s layer III. If it also included finds from his layer IV, which formed a nearby spatial cluster, depends on the reliability of his schematic plan (Fig. 3). Layer V with its patchy distribution is less probable represented in our trenches. Stratigraphic reasoning leads us to the assumption that the upper part of GH4 corresponds to Mogoşanu´s layer II.

The lithic assemblages

Observations made on the new sample of 7505 artifacts from GH3 (trenches 4 and A, 2009 - 2010, 7 m^2) and on the 2654 items of Mogoşanu's richest layer III, as well as uppermost layers IV and V, allow us to point out some differences, notwithstanding their common features.

The general structure of the recently recovered assemblage from geological horizon (GH) 3 differ markedly from the old record by the dominance of small-sized artifacts, especially chips (59.2 % *contra* 2.2 - 3.1 %), bladelets and micro-blades (35.5 % *contra* 6.9 %, maximum rate in layer III) and burin spalls. In essential counts (without chips and debris), flakes in GH3 are less representative when compared to old collections (42.7 % *contra* ~60 %) and especially blades, which are about 2 - 3 times fewer. On the other hand, small lamellar blanks (micro-blades and bladelets) increase considerably in GH3 (about 3 - 4 times more) and become equal in relative frequency (17.8/17.7 %) and number (472/471 items). While the general structure of the new assemblage appears different from Mogoşanu´s collections (mostly due to different sieving practices), changes in proportions of tools, cores or chunks are almost negligible. The *debitage structure*, however, changed considerably. The similar prevalence of both flakes and small laminar products over blades is characteristic of GH3, while in the old collections flakes dominate over blades (the second common artifact category) and over all laminar products together. Finally, the most striking reversed changes are reflected in the *laminar structure*. Blades in the old collections represent >80 %, the rest are bladelets/micro blades), while this is the opposite in GH3. These changes were also observed when examining modified blank types: tools on flakes and on blades in old collections are more frequent, while in GH3 tools on micro-blades are the most common.

The recently recovered *cores* correspond to the main categories studied from previous extended excavations: carinated, prismatic, narrow-faced, and flake cores. Carinated cores are much less representative; however, biases in the excavated areas (7 m^2 *contra* 450 m^2) might provide a possible explanation.

In general, *laminar debitage* in the old and new sample are very similar with only a few differences recorded in laminar attributes. For example, blade and bladelet/micro-blade lateral profiles in GH3 appeared "straighter" when compared to old collections, while the twisted pattern remains common with the same value (see the striking resemblance between the twisted pattern in layer III and GH3 – Fig. 14). In sum, all studied collections shows a three-fold composition of lateral profiles, i.e. straight/curved/twisted, which are present in significant values. However, layer III shows the predominance of twisted blade/let profiles over curved or flat with a further increase in the twisted pattern in overlying layer IV. In contrast, the new GH3 assemblage exhibits the opposite trend, where flat profiles for all laminar categories always dominate over twisted and especially curved ones. This fact might be linked to the function of the excavated cluster and the debitage practice employed here, where the potential background for high twisted pattern was limited (only 2 carinated pieces). Another pattern is visible for all samples: with the "microlithisation" of laminar products, their lateral profiles become straighter (the highest rate was documented for micro-blades in GH3 - 56.3 %). The rare data for complete laminar products (Fig. 14) confirm this pattern, but also show an overestimation of flat profile frequency and also a non-estimation of twisted patterns. Thus, the results obtained for some attributes based on significantly fragmented laminar products should be treated with some caution. A slight difference occurs for bladelet lipping: old collections contain about twice as many bladelets with unlipped butts than in GH3, but this is not the case for blades and micro-blades. The same is true for bladelet butt zone abrasion. This manner was twice as frequent in GH3 and the opposite trend occurs in layers III and IV. Other laminar products are similar in with respect to this attribute.

The presence/absence of the main *tool types* is comparable for both samples, except for some rare items (borers, combined tools, denticulate and thinned pieces), which were not found during the new excavations. Striking changes are seen in the frequency of tool types, particularly the dominance of non-geometric microliths, especially Dufours on micro-blades, over other tools in GH3. While "small" toolkits are generally comparable, only one point (Font-Yves type) was documented in Mogoşanu's uppermost layer V. In GH3, this type together with the Krems variety accounts for 6 pieces. Also, burins (a common tool category for all Româneşti assemblages) are accompanied by abundant burin spalls, proving "on-site" production and recurrent utilization of these tools in the newly excavated cluster. On the other hand, GH3 industry lacks carinated, double and mixed burins. Concerning endscrapers, two simple endscrapers differ strongly from the representative old collections, which contain carinated, thick and double varieties, sometimes made on Aurignacian blades. Nevertheless, Aurignacian retouch was documented in all samples.

Synthesis: lithic technology and techniques of the Early Aurignacian at Româneşti-Dumbrăviţa I

Tested blocks and unworked nodules with fresh cortex (as raw material reserve) are rare or absent in these assemblages. However, the overall composition of the study samples (the dominance of large knapping products in the old collection and of small blanks and waste in the new assemblage, cores in different reduction stages, and various debitage products with or without cortex, core maintenance pieces and blanks) suggests on-site reduction of many opal cores. Moreover, the presence of cortical removals (mostly flakes with >50 - 100 % cortex, including fresh initial cover) and their ratio to cores on nodules/chunks/pebbles (4.6 for layers III, IV and 5.5 for GH3) evidences transport of some nodules to the site for further exploitation from the very beginning of the reduction process. This includes cortex removal, crest preparation, maintenance of debitage by neo-crests and often platform rejuvenation by flake-tablets. Reduction sequences were advanced and often successful as suggested by the rarity of initial cores/pre-cores, very high blank to core ratio (80.7: 1 in layer III and 125: 1 in GH3), and reflected very high productivity. Thus, long reduction sequences for prismatic, carinated and even narrow-faced cores-on-flakes (e.g. burin-like with change orientation) were common practice at this site. Quartz and quartzite were selected from on-site or neighboring river gravels for mostly short reduction sequences producing flakes and sometimes blades. Good quality rocks are scarce in the immediate surroundings and seem to have been transported to the site in a finished state (radiolarite tools) or as already preformed cores for further reduction (exhausted flake/bladelet sub-polyhedral core from black flint). This "exotic" core was exhausted at the site, as confirmed by refitting. Thus, different on-site knapping activities (pre-shaping and especially laminar production) as well as tool manufacture/re-sharpening (abundant burins and burin spalls), were common.

Cores and blanks from both old and new assemblages reflect several co-existing but unequally represented reduction systems throughout the sequence: (a) occasional flake and (b) dominant laminar/lamellar production. The non-exhausted character of flake cores (discoidal, orthogonal, and polyhedral) and presence of characteristic removals confirm the practice of deliberate flake production. Although flakes are the dominant debitage category, their production was marginal, unsystematic or limited (based on the rarity and reduction state of related cores). Most flakes were obtained during initial/terminal reduction stages or failed knapping (due to the often mediocre quality of opal) of blade cores. It appears that some massive primary flakes were brought onto the site (as at Coşava, see Sitlivy et al. in press), however, many carinated cores were made on nodules, chunks and pebbles (thus, fewer large massive flakes were used/needed). The narrow-faced cores may have been reduced from the on-site "flake stock".

Blade, bladelet and micro-blade production exhibits three co-existing independent systems based on reduction of (1) prismatic, (2) narrow-faced cores (including burin-like) and (3) carinated pieces (cores and tools). Continuity in all these reduction systems is confirmed by the blade/let scars on the working surfaces of prismatic, narrow-faced and carinated cores (i.e., mixed blade/bladelet, bladelet/micro-blade).

Prismatic cores were reduced by using uni- and bidirectional unprepared and prepared partially turned debitage applied to nodules/chunks/pebbles and flakes. The first method is based on direct exploitation of single and opposed double platform cores with extension onto the narrow sides as flaking surfaces (sub-cylindrical, triangular/keeled and sub-pyramidal cores). Cores were unprepared and, together with series of primary and secondary removals with high triangular and lateral steep cross-sections, document direct exploitation following natural convexities/ridges of the initial non-cortical chunk. The second approach differs by core pre-forming/shaping (before and during reduction) through the creation of a crest (lateral, often partial, one-sloped and rarely central/frontal two-sloped). The scarcity of cortical blades and cortical butts in comparison with primary flakes shows that many laminar cores were prepared by short removals prior to blade production. Core maintenance was achieved by additional lateral crests, re-preparation (neo-crests), narrowing, back flattening, and systematic platform rejuvenation by large flake-tablets (partial or total), platform edge abrasion and trimming by short elongated removals. Striking platforms are usually acute, plain single-blow and crudely-faceted. Such reduction results in blades, bladelets and micro-blades. Exhausted cores are represented by blade/let/flake polyhedral cores.

Narrow-faced cores were reduced longitudinally by means of uni- and bidirectional unprepared/prepared debitage (with/without crest installation) applied on the thin parts/edges of flattish chunks/nodules/plaquettes and flakes (burin-like pattern). Flaking surfaces were installed on distal or lateral edges, with platforms correspondingly on lateral or distal/proximal parts of the initial blank and reduction went backwards through the narrow edge/slice (*recul frontal*). Debitage could also extend onto the wide sides, dorsal or ventral surfaces or rotated in several directions, resulting in change in orientation or multidirectional narrow cores. Final products are mid-sized, small blades and/or bladelets variable in shape (commonly rectangular), with prevailed "on-axis" detachment pattern, with more frequent flat lateral profile.

Carinated cores were reduced in (a) unidirectional, (b) bidirectional and (c) orthogonal manners (parallel, less convergent exploitation of massive flakes or chunks/nodules). Unidirectional transversal exploitation of a massive flake began with the flat, thick part using the ventral face (endscraper pattern), which differs from the longitudinal exploitation of flakes (burin pattern) resulting in narrow-faced cores. For carinated reduction on chunks/nodules, two options should be taken into consideration: (a) transversal reduction of the thick part of a naturally flattish block (endscraper pattern) and (b) longitudinal reduction of the thick part or continuous exploitation of a voluminous block, resulting in wide-fronted (short with sub-pyramidal shape or as *nucléus en "sabot de cheval"*) or narrow-fronted cores with considerable thickness (Th > L, according to technological orientation, see Le Brun-Ricalens 2005: 56, Fig. 16). With the progressing debitage and on final stages of core reduction another tendency was observed – the preparation of additional platforms, platform re-orientation and combination of flaking surfaces placed in different planes resulted in (a) bidirectional (common flaking surface), bidirectional-adjacent (two flaking surfaces placed adjacently) or (b) wide-fronted orthogonal cores. The first generation of laminar products often yielded some blades and, as reduction progressed, bladelets and micro-blades were removed. Lateral/bilateral narrowing of the core sides by means of ordinary flakes and rejuvenation removals (core flanks) is typical. Platforms of carinated cores are commonly plain but also crudely-faceted (the result of rejuvenation by partial tablets).

Hard stone hammer percussion was normally used at the beginning of laminar reduction (core preparation) and for maintenance of exploitation (platform rejuvenation, restoring of working surface by core flank removals) or, more rarely, in flake core reduction (discoidal, polyhedral). Some core maintenance removals have pronounced bulbs (double) or even cone stigmata for repeated and/or very strong blows (e.g. in GH3 cortical flakes with unlipped and developed bulbs comprise about 60 %). On the other hand, other flakes (including cortical) with wide thick butts, and weak bulbs associated with lips indicate the use of soft percussion. Laminar detachment commonly started with the creation of a wide striking platform (single-blow cores) or without any preparation, using naturally flat surfaces on non-cortical chunks or flake ventral faces. Careful platform maintenance (elimination of overhang by abrasion and/or trimming by small elongated removals) and platform restoration by flake-tablets (partial or complete) were documented. Blanks commonly have abraded and/or trimmed proximal/dorsal parts and plain/linear butts. During production stages striking blows were directed mostly close to the edge of the core platform (marginal percussion), which resulted in thin flat butts of final products (e.g. in GH3, average butt Th of flakes is 3.4 mm and 2.7 mm for blades). These laminar products (including many flakes) clearly have weak/absent bulbs often combined with butt lipping and obtuse/inverted or right (less common) interior platform angles. Seemingly, soft stone and organic tools (indicated by the invisibility of impact points) were used. Curiously, not a single hammer stone was recorded in Româneşti among the 10 quartz, quartzite and sandstone pebbles.

Discussion: Româneşti-Dumbrăviţa I in the context of the earliest Aurignacian industries

The compact Româneşti I Upper Palaeolithic sequence seemingly shows repeated, recurrent occupations and/or a palimpsest rather than a sequence with clear cut boundaries. No sterile layers were documented during the new excavations, which is in agreement with the often observed continuity in vertical artifact distribution based on artifact labels from the old collections. The study of Româneşti I does not show any visible contamination of the uppermost Aurignacian by the overlying Epigravettian. Although the infiltration of artifacts from above along the rootlets or through later anthropic activity was possible, Epigravettian "type fossils" were not mixed with Aurignacian tools. Characteristic backed blades/bladelets occurred only in uppermost GH2 and GH1.

Our observations confirm the original Aurignacian attribution of layers II, III, IV and V at Româneşti I proposed by F. Mogoşanu long ago. The newly recovered samples from GH3 and GH4 fit well to this technocomplex. Technologically, the industry is characterized by prevalent blade/bladelet/micro-blade production based on independent (long continuous or short) commonly unidirectional (but also bi-/multidirectional) reduction of different cores: carinated (wide-/narrow-fronted; rare nosed-like), prismatic (partly turned, sub-pyramidal, keeled), narrow-faced (including burin-like cores-on-flakes and recycled core-on-tools) and occasional Middle Palaeolithic cores (discoid, polyhedral, Kombewa). The use of direct soft hammer percussion for laminar production is well-documented. The laminar blanks include mid-sized blades, quite long and narrow bladelets and tiny micro-blades with straight/curved/twisted profiles, common rectangular shape and debitage symmetry (especially lamellar products). These blanks, as well as flakes, were modified into various tools with different frequencies. The toolkit comprises "Aurignacian *fossiles directeurs*" (carinated and thick ogival, shouldered endscrapers, rare carinated burins, Aurignacian blades/retouch on some tools on blades and a "micro arsenal" – Dufour sub-type bladelets and some Font-Yves/Krems points), common UP types (simple endscrapers, abundant angle burins on snap, often on truncations, dihedral burins, semi-steep retouched blades and retouched/notched pieces on blades, and truncated pieces on different blanks), as well as a rare MP component (sidescrapers on flakes/tablets).

The Banat Aurignacian from Tincova, Coşava and Româneşti has been a constant subject for typological comparisons, evoking a number of similarities at a European scale (see references above). The general typological structure of these assemblages suggested a direct connection to the Central and Eastern European Krems type Aurignacian. In addition to Krems-Hundssteig, which provided a single conventional date of c. 35 ka uncalBP (40.7 ka calBP – Hahn 1977; Zilhão 2011; but see also Wild et al. 2008), other similar assemblages in Central and Eastern Europe were also assigned to this group: Siuren I rock shelter, Units H and G (e.g. Demidenko et al. 1998; Demidenko 2000 - 2001; Demidenko & Otte 2000 - 2001; Demidenko & Noiret 2012) and Beregovo I (Usik 2008). However, recent advances in the chrono-technological subdivision of the Aurignacian (for references, see Introduction) render the straight-forward interpretation of the Banat assemblages less clear.

In the last decade, Tincova was seen as a new candidate for joining the Protoaurignacian on the basis of the dominance of continuous blade core reduction sequences, which resulted in blades (first generation of blanks) and then elongated bladelets with a straight profile (second generation), modified into Font-Yves/Krems points and Dufour sub-type bladelets. The Protoaurignacian attribution for Tincova was reinforced by the alleged rarity of carinated scrapers/cores and of typical Aurignacian retouch (Teyssandier 2003; Zilhão 2006; Teyssandier et al. 2010; Tsanova et al. in press). Partially due to the selective publishing and illustration in previous works, Româneşti and Coşava collections were generally ignored.

However, following the same perspective, the newly excavated cluster in GH3 at Româneşti I, which displays more "archaic" features than Tincova or other Banat assemblages, represents a better candidate for a Protoaurignacian assignment. These features are quite visible, for instance, in the core structure: dominance of prismatic and bladelet narrow-faced/burin-like core-on-flakes (e.g. similar to bladelet technology at Kozarnika, layer VII – Tsanova 2006; Sirakov et al. 2007), higher frequency of bladelet rectilinear profiles and especially the abundance of Dufour sub-type bladelets with alternate retouch placement. Aurignacian blades are also rare in Româneşti GH3. As for pointed bladelets (Font-Yves and Krems), these appeared in all Banat industries in small quantity and different layers, including uppermost ones (e.g. Coşava, layer III). The microliths and bladelet/micro-blade (rather than blade) production thus suggest a Protoaurignacian pattern for all Banat assemblages. On the other hand, three dissociated schemes of blade/bladelet/micro-blade production were observed, resulting in (a) prismatic, (b) carinated and (c) narrow-faced/burin-like cores. However, within each scheme, sequential reduction from blades to bladelets/micro blades occurred. In this respect, Româneşti contrasts with both the Protoaurignacian sequential and the classical Aurignacian dissociated schemas. The result of such production is an abundant straight/twisted/curved bladelet debitage which provided the basis for the "microlithic" toolkit (>50 %) dominated by the Dufour subtype. To a lesser extent (<20 %), a Dufour-based toolkit (often pseudo-Dufour) was recovered at Tincova and Coşava, in uppermost layer III (Sitlivy et al, in press).

While the general Aurignacian background of the Banat industries is indisputable, their accurate placement in the broader Aurignacian landscape is less straightforward, on both methodological and empirical grounds. It is worth mentioning that on a wider scale the key type fossil (i.e. the Dufour subtype bladelet) occurs in very different chronological and cultural contexts (e.g. Le Brun-Ricalens 2005: 53,

Fig. 14; Zilhão 2011: 349, Fig. 25: 14): Protoaurignacian (long, straight obtained from prismatic or pyramidal cores and flake slices/edges), Early Aurignacian I (small/mid-sized, straight with rectilinear and curved profile, mostly obtained from carinated or nosed pieces), and late Aurignacian III-IV (mid-sized, elongated, straight Dufours issued from core-burins). In Banat, the changes documented across the studied assemblages (e.g. increasing of twisting pattern), did not result in the production of the Roc-de-Combe subtype (short off-axis/skewed to the right twisted bladelets from carinated/nosed or busked core-burins) either in Româneşti or in Coşava. Neighboring Româneşti II yielded a compact area with numerous retouched bladelets/micro-blades including Dufour, rare Font-Yves/Krems points and few non-modified bladelets (Mogoşanu 1978). Despite their high stratigraphic position and parameters (shorter than those from other industries), these laminar products appeared rather "non-twisted" and seemingly "archaic" (i.e. Protoaurignacian). Still, depending strictly on the five-phase stylistically-based succession currently developed for Western Europe is perhaps unproductive for an accurate estimation of the regional variability of the Aurignacian in South-Eastern Europe. To be sure, having a general Aurignacian background, the Banat assemblages show a certain degree of technological and typological variability, which might be due either to (a) *chronological* and/or (b) *functional* impact, both possibly affected by time-averaging effects in the accumulation of the archeological record. If one gives weight to the first interpretation, despite the currently unequal chronological support, Româneşti I with TL dates (c. 40 - 45 ka) for GH3 (Schmidt et al. subm.) fits in calibrated radiocarbon terms into the acknowledged chronological range of the Protoaurignacian/Early Aurignacian across Europe (Zilhão 2006; Higham 2011; Higham et al. in press), and might indeed represent an initial phase of the Aurignacian technocomplex. However, evidence of certain specialization, variable activities and clustering of lithic remains in the context of a larger settlement were already recorded by F. Mogoşanu (Româneşti I, II), and also during the new excavations at Româneşti I. The general structure and typological ranges of Tincova, Româneşti I, and Coşava assemblages clearly point to inter-site functional differences as well. Unfortunately, the settlements' state of preservation (e.g. lack of faunal/seasonality data) hinders a deeper functional assessment.

To this state of knowledge, suffice it to say that, as noted throughout our studies, the Banat assemblages, especially Româneşti I, feature a combination of Proto- and Early Aurignacian traits. This trend was recently observed in different regions of Europe: e.g. the "mixed" look of the lithic assemblage C 4c4 at Isturitz, sandwiched between Proto- and Early Aurignacian industries and dated to 37 180 ± 420 uncalBP (Normand & Turq 2005; Szmidt et al. 2010a), or the dissociated bladelet production system in Fumane, layers A2, A3 (Broglio et al. 2005) with new radiocarbon ages of c. 35.5 ka BP or 41.8 and 40.8 ka calBP (Higham et al. 2009; Higham 2011). Further "uncommon" associations, like the split-base points and Protoaurignacian lithics were also reported in Trou de la Mère Clochette (Szmidt et al. 2010b). Such finds, much like the newly obtained chronology of the Early Aurignacian at Geissenklösterle (Higham et al. in press), seriously threaten the clear-cut techno-typological and chronological distinction between the Proto- and the Early Aurignacian. At minimum, they dismiss the geographic segregation defended by some scholars (e.g. Mellars 2006).

In addition, new radiocarbon ages of some key sites in Southern, South-eastern and Central Europe evidence not only a greater antiquity than previously thought, but also show that quasi-contemporaneous industries may be quite different. For example, at Franchthi Cave, the lithic assemblages with the CI tephra (corroborated by new ages of 35 ka BP or 40 - 39 ka calBP) appear totally "non-Protoaurignacian" and fully Early Aurignacian/Aurignacian 1 (Douka et al. 2011). At the same time, the new chronology at Riparo Mochi frames the Protoaurignacian/Aurignacian with Dufour bladelets or the Aurignacian with retouched bladelets from unit G (lowermost cuts) between 37 and 36 ka BP (Douka et al. 2012). Generally, the lithic artifacts from unit G as a whole are characterized by abundant retouched bladelets, numerous burins (often on truncation), and endscrapers, as well as bladelet production associated with small cores, crests, and tablets (Kuhn & Stiner 1998; Douka et al. 2012). The scarcity of Aurignacian *fossiles directeurs* (heavily edge-retouched blades, carinated and nosed endscrapers) even raised hesitations concerning the linkage between this industry and the Aurignacian (Kuhn & Bietti 2000). This record, which contrasts, for instance, with the contemporaneous Protoaurignacian industry of Fumane, actually containing representative carinated cores (Broglio et al. 2005), points once more towards functional or situational factors (e.g. Kuhn & Bietti 2000). Finally, recent researches at one of the key sites in the Danube valley - Willendorf II/layer 3 - show a similar trend. About 500 unpublished lithic artifacts were attributed to the Early Aurignacian and dated to around 39 ka - 38 ka BP (uncal). The toolkit evokes the Early Aurignacian technology of southern Germany (e.g., Geissenklösterle, AH III) and Aurignacian I in France, and differs from the Protoaurignacian of Spain and Italy (Nigst 2006; Nigst & Haesaerts in press).

To present knowledge, inner functional variability and/or a currently underreported Aurignacian stylistic manifestation might be equally responsible for these mixed features that we also noted in Banat. It is obviously premature to postulate the latter (i.e. an intermediary chrono-cultural unit, whatever the label used – for the sake of argument, we would propose

Aurignacian 0.5). It is worth noting, however, that if real, this phenomenon displays a comparably vast dispersal across Europe, partially matching both the Protoaurignacian and the Early Aurignacian (see also Douka et al. 2011); moreover, its chronological range appears statistically indistinguishable from them as well.

Conclusions

The low visibility of the Banat Aurignacian in the European literature had long been motivated by **1)** the lack of in-depth study and partial publication of the lithic collections and **2)** the absence of an absolute chronology coupled with unusually young geochronological estimations, occasionally reaching the beginning of the Tardiglacial (Mogoşanu 1978; Cârciumaru 1999). Previous archeological and palynological arguments alone proved insufficient for establishing a comprehensive regional chronology, as the age of the same assemblages fluctuated from c. 37 ka uncalBP to c. 18 ka uncalBP.

The contradiction between the interpretation of the lithic collections and previous chronological estimates resulted in new small-scale excavations at Româneşti-Dumbrăviţa I (2009 - 2010 campaigns), coupled with comprehensive sedimentological, tephra, optically stimulated luminescence (OSL), and thermoluminescence (TL) sampling. A full re-evaluation of the assemblages was attempted in order to allow both more detailed inter-site comparisons and better correlation with other European Aurignacian assemblages. The new excavations, albeit small, provided abundant material, which complemented old data and particularly the microlithic record, generally lost during Mogoşanu´s excavations.

Confirming, but also shading the initial Aurignacian definition, our reappraisal underscores the importance of the Banat Palaeolithic record for the topic of early AMH dispersal into Europe. The unexpectedly old dates of c. 45 - 40 ka BP for the Aurignacian industry at Româneşti I (GH3) highlight the complexity and industrial variability of this technocomplex in its initial phases. Unfortunately, the lack of a better regional dating record and the absence of any middle UP succession in Banat, as well as the fluctuation in defining the industrial variability, still leave the door open for speculation regarding the regional evolution of the Aurignacian technocomplex.

The issue is certainly wide-ranging. Observations made on lithic collections across Europe show the vulnerability of the narrow archaeological definitions of the Proto/Early Aurignacian, leaving their pan-continental application open to debate. They are certainly aggravated by the severe, decade-long underestimation trend of the radiocarbon ages (Higham 2011). To current knowledge, however, at least on geographic and chronological grounds, the Banat settlements seem to occupy an intermediate position between the Balkans (e.g. layer VII of Kozarnika c. 39 - 36 ka uncalBP) and some comparable Central European (e.g. Krems-Hundssteig, c. 35 ka uncalBP/40.7 ka calBP) occurrences (Protoaurignacian *sensu lato*). Further refining the chronological and taxonomic status of these industries should prove crucial for the key scenarios related to the Aurignacian penetration towards Western Europe.

Last but not least, the documented chronology fits well to the wide-scaled Eurasian scenario of AMH dispersal. More or less explicitly, given their geographic proximity, the Protoaurignacian at Tincova was seen as the likely cultural proxy for the Oase AMH finds (e.g. Teyssandier 2003; Zilhão 2006; Băltean 2011a, b). Although still based on a work in progress, the large series of common features linking Româneşti, Coşava and Tincova strongly suggests that this inference may hold true for the entire Banat record. The recent chronology of Româneşti – contemporaneous or slightly older than the Oase fossils at c. 35 ka uncalBP/40.7 ka calBP – marks a new spot on the map of Early Aurignacian dispersal and strengthens its hypothetical association to AMH. The early timing of this fully UP industry, lacking any connection to the local Middle Palaeolithic, reinforces the impression of allogeny for the Aurignacian technological package in this European area and underscores the key role the northern and southern Balkan sidelines of the Danube played for the onset of European Upper Palaeolithic.

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