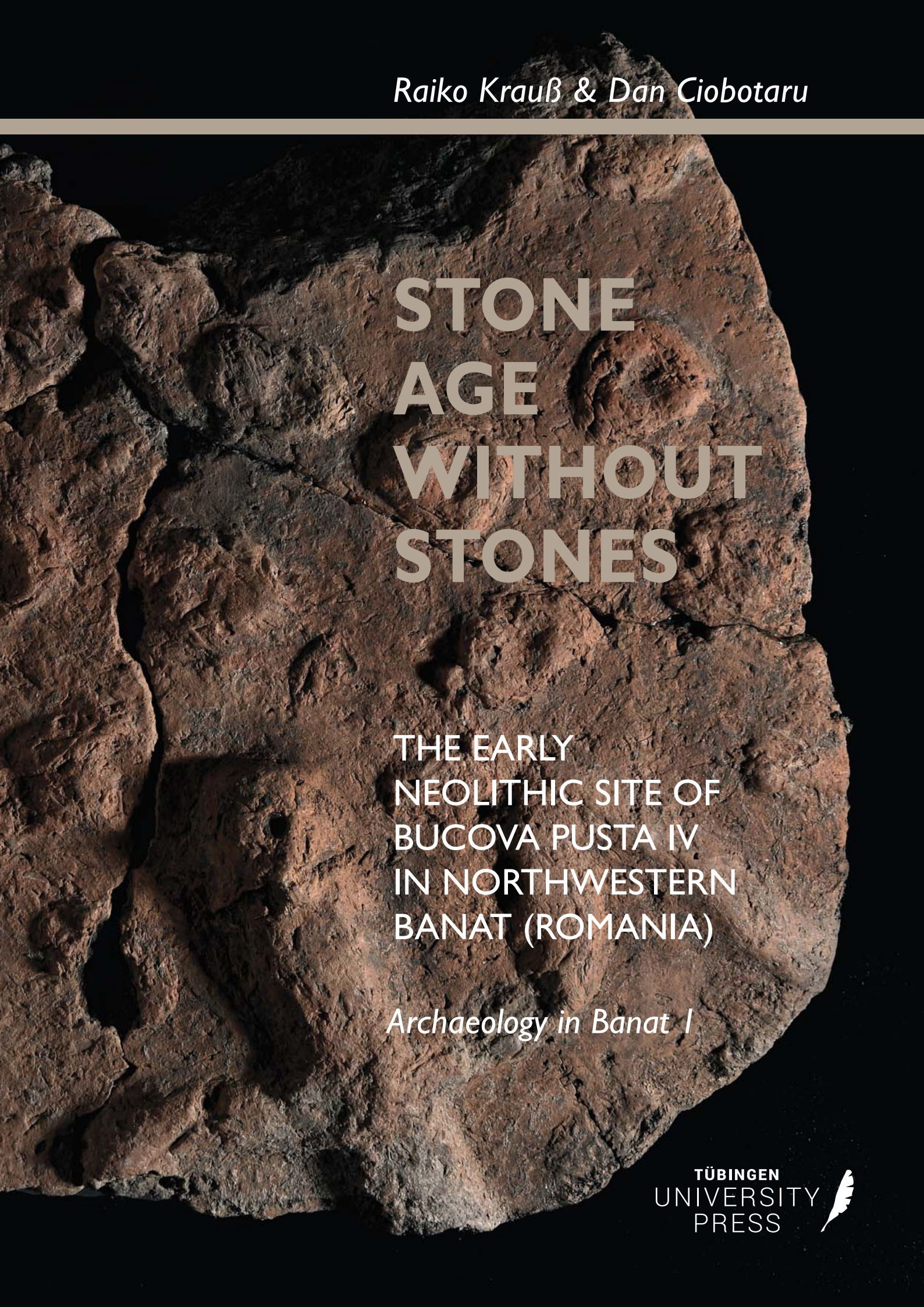




Raiko Krauß & Dan Ciobotaru

STONE AGE WITHOUT STONES

THE EARLY
NEOLITHIC SITE OF
BUCOVA PUSTA IV
IN NORTHWESTERN
BANAT (ROMANIA)

Archaeology in Banat I

TÜBINGEN
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PRESS



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northwestern Banat (Romania)

ARCHAEOLOGY IN BANAT I

Edited by
Raiko Krauß & Dan Ciobotaru

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The Early Neolithic site of Bucova Pusta IV in
northwestern Banat (Romania)

Raiko Krauß & Dan Ciobotaru

in collaboration with

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Cornelius Meyer, Bogdana Milić, Bastiaan Notebaert, Dana Pilz, Clemens Schmid,
György Sipos, Petru Urdea, Lea Valcov, Laura Winkelbach, Wim Wouters, Steve Zäuner,
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Preface

This monograph is the first volume in a new book series entitled “Archaeology in Banat”. This series is primarily intended for the publication of excavation results in monographic form. Although the trend in archaeology is increasingly shifting towards partial publication in articles in journals or online media, the monograph is still the best method of publishing all aspects of research into an excavation site in a compact and clear manner, with the necessary cross-references between the various contributions. However, this series is also open to various works of monographic scope or conference contributions with a narrower focus on the prehistory and early history of the Banat. At the same time, this series is intended to focus on the cultural history of the historical landscape of the Banat, which today is divided into the three countries of Romania, Serbia, and Hungary, in its entirety, and with reference to neighbouring regions in south-eastern Europe, thus transcending borders. The flat land between the rivers Mureş, Tisza, and Danube, with the Carpathian Mountains to the east, offered good conditions for human settlement, especially from the time of sedentism onwards. Fertile soils and numerous watercourses are the basis of an economy centred on agriculture and livestock farming - these two resources are abundant in Banat. However, the landscape has changed dramatically over the last three centuries due to human involvement. The land, which was once regularly flooded in spring after the snow melted in the Carpathians, was permanently drained as a result of regulatory intervention in the water system from the time of Austrian rule in the 18th century. The presumed vegetation cover of the landscape has also largely disappeared as a result of agricultural use. Many of the former smaller watercourses are still recognisable in satellite images, but are now covered by fields.

The landscape in the northern part of the Banat, where the field of Bucova Pusta is located, is characterised by an absolute lack of stones. Even the rivers in the flat landscape have such a low flow velocity that they can no longer transport pebbles, but rather possess a muddy subsoil. In times when stone artefacts played a major role, this shortage needed to be countered in some way. The stone artefacts from the Early Neolithic settlement of Bucova Pusta IV were made from raw materials hailing from far away, and some of them show traces of extreme use and secondary to tertiary re-use. Other objects, which elsewhere might have been made from simple stones, were moulded from clay and hardened in the fire. However, the lack of stones also confronts archaeological research with the methodological problem of the difficulty

of proving settlement in the times before the Neolithic. Stone artefacts are usually the only surviving evidence of settlement in the Palaeolithic and Mesolithic periods. We have chosen the main title of the book “Stone Age without Stones” to draw the reader’s attention to this specific phenomenon of archaeology in Banat.

The archaeology in Banat started in the second half of the 19th century with the foundation of the Society of History and Archaeology in Southern Hungary. Starting in 1893, the association conducted the first archaeological research projects in the Banat. This was also the time when enthusiasts such as Gyula Kisléghi Nagy began their collecting and undertook archaeological excavation in the westernmost part of the Banat. In the south of Banat, the scientific activity of Felix Milleker in collecting and documenting the archaeological heritage of the province had a consistent role in the fostering of interest in its archaeology. In the second part of the 20th century, the main archaeological issues which had preoccupied the founders of the Society almost a century before were still unsolved. Some of the prehistoric archaeological projects undertaken during this time are still not published. This new collection is dedicated to the new generation of researchers who have begun to cooperate internationally over the last decades. Their work and the results which they are generating from projects both old and new form the centrepiece of this new series, and of the present publication.

At this juncture, it is almost impossible to thank all those who have supported our work over the past years. Nevertheless, we would like to mention a few people and institutions without whom the very successful co-operation between the University of Tübingen and the National Museum of the Banat would not have been possible. The German Research Foundation generously supported our work with grants for the research projects “Investigations on the Early Neolithic Settlement on Bucova Pusta, Romanian Banat” (KR 2951/4-1), “Resources and the Formation of Inequality. Raw Materials and Communication Systems in Prehistoric Southeast Europe” (CRC 1070 “Resource Cultures”, sub-project A01) and “Chronological Studies on the Neolithisation Process along the Danube” (KR 2951/10-1) as well as through scholarships and personalised funding programmes within the framework of the Heisenberg Programme (KR 2951/8-1; KR 2951/12-1; KR 2951/14-1), and through the provision of vehicles. We greatly appreciated the hospitality of the Dudeștii Vechi community from the very beginning of our work, and have developed close friendships with many community representatives over the years.

First and foremost, the Union of Bulgarians in Banat (UBB), initially represented by its chairman Niculae Mircovici and the then-mayor and current chairman of the Union, Gheorghe Nacov, should be mentioned here. The local heritage museum of the municipality, managed by the UBB, became our excavation base over the years. The building and its grounds offer us accommodation, a leisure area with a sports field and an extensive outdoor area for the preparation of samples and the processing of finds, work rooms, and laboratories and, last but not least, the opportunity to adequately archive the finds and present a selection to a wider public in the exhibition. The polyglot Nacov was able to personally recount the fascinating history of the village and of the Banat Bulgarians in general to generations of students. He was always enthusiastic about our work, and personally contributed to the popularisation of our excavation results. When foreign guests came to visit Dudeștii Vechi, Nacov would show them

round also our excavation house. More than almost anyone else, the current representative of the Bulgarian minority in the Romanian parliament combines his political agenda with the historical roots of his village, in which archaeology occupies a prominent place.

It is thanks to Constantin Kalscov's tireless work that we know the topographical location of the vast majority of archaeological sites in the region. He is a monument conservator in the truest sense of the word, and is always on hand when a site is endangered by encroachment. He has become part of our international team, and has also contributed to this book as an author.

Our general thanks go to the friendly residents of Dudeștii Vechi, with many of whom we have been able to build close relationships over the years and have benefited from their help in a variety of ways. The acting mayor Bono Cucalan should be mentioned here by name, but the sentiment holds for the entire community.

Alexander Edmonds helped with the production of this book by making precise language corrections to the English text. Any remaining spelling mistakes are our own responsibility, as we also needed to make changes to the content ourselves before this text went to print. Anna Koch helped with the technical editing of the texts and took care of compiling the bibliography and implementing the citation rules of the Romano-Germanic Commission (RGK), which were applied there. Jonas Sprißler set the illustration plates and Sophie Anders extracted the plate descriptions from our finds database. Other helpers and contributors to this book are listed by name in the respective chapters. We would like to take this opportunity to thank them all!

In order to make this volume and the planned book series open access immediately after printing, we decided to utilise the possibilities offered by Tübingen University Press (TUP). This necessitated a double anonymised review process, which contributed to the further improvement of the manuscript. We would like to take this opportunity to thank the two anonymous reviewers and the editorial board of TUP. We would particularly like to thank Sandra Binder from TUP, who handled the communication with the printing house and the editorial board and introduced the final corrections to the manuscript.

Larissa Kurz did a marvellous job, which went far beyond her merely selective involvement in this project. She designed the entire layout of the book and typeset all the texts herself. As if that wasn't enough, most of the content-related work only took place during typesetting, which required numerous correction runs. We think the result is quite impressive and sets the standard for all further volumes which will hopefully appear in this new series.

Tübingen and Timișoara in February 2024,

Raiko Krauß & Dan Ciobotaru

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Chipped stones of Bucova Pusta IV

Bogdana Milić, Michael Brandl

Introduction

The title chosen for this book may appear somewhat misleading, as stone artefacts discussed here actually come from the Bucova Pusta IV site. However, compared to other Early Neolithic sites in south-east Europe, the number of these items is indeed very small. Among all other find categories, the number of stone artefacts is negligible, making it almost appropriate to describe this period on the site as a „Stone Age without stones.“ The excavation seasons of 2010, 2012, and 2013–2015 at the Bucova Pusta IV site yielded only 61 chipped stone artifacts. Despite this modest number, our paper aims to explore their context, providing insights into their role and significance for the site interregional connections. Furthermore, a few chipped stones were discovered during the surface survey around Bucova Pusta IV in 2014 and Kalcsov I (Fig. 1)¹. The Bucova Pusta IV assemblage was unevenly distributed in the archaeological contexts at the site, while

¹ The finds in the text and accompanying figures and tables are labelled after the site name, i.e. BP (for Bucova Pusta IV) or CAL (for Kalcsov I), context, which is related to the trench name, survey or surface, and the ID number of single artefact according to database entries, e.g. BP-R-I, CAL-I, BP-SURF-I, BP-SURV-I. Feature number is not included in the pieces' names.

Bucova Pusta IV / Find context (Trench)	Number of pieces	Excavation season
G	1	2013
G/H	1	2014
H	1	2013
I	1	2014
L	2	2014
L/K	1	2014
K	8	2014
M	2	2014
O	2	2014
O-P	1	2014
P	21	2015
Q	1	2015
R	5	2015
S	2	2015
T	3	2015
Addendum Trench A	2	2010
Addendum Trench B	4	2012
Surface finds	3	2015
Other contexts	Number of pieces	Find year
Kalcsov I survey (CAL)	4	2014–2015
Survey around Bucova Pusta IV	4	2014–2015

Total number of finds: 69

Tab. 1 Context of finds from Bucova Pusta IV, survey around the site and Kalcsov I used in the analyses.

Early Neolithic assemblage Main technological categories		Tools (modified blanks)
Cores	n=1 (4.76 %)	1 out of 2
Core prep./rejuv. elements	n=1 (4.76 %)	/
Blade products	n=12 (57.15 %)	8 out of 12
Flakes	n=5 (23.81 %)	3 out of 5
Debris	n=1 (4.76 %)	/
Hammerstones	n=1 (4.76 %)	/
Total	100 % (no=21)	57 % (no=12)
Disturbed assemblage Main technological categories		Tools (modified blanks)
Hammerstone on a core	n=1 (2.94 %)	/
Core	n=2 (5.88 %)	/
Core prep./rejuv. elements	n=5 (14.71 %)	1 out of 5
Blade products	n=14 (41.18 %)	9 out of 14
Flakes	n=11 (32.35 %)	6 out of 11
Debris	n=1 (2.94 %)	/
Total	100 % (no=34)	48.5 % (no=16)

Tab. 2 *Techno-typological features of the Bucova Pusta IV assemblage (excavations 2013–2015).*

the largest number of artefacts belongs to Trench P, and the rest is allocated as given in the table (Tab. 1). The total number of pieces is extremely low, although they were collected by hand – picking and sieving. Different features within the trenches contained chipped stone artefacts, and according to the assignment and interpretation of features, the material was found in relation with the Early Neolithic dwelling structures, pits, filling layers, ovens, and on the surface. A part of the material derives from the recent work connected to older trenches dug by Gyula Kisléghi Nagy in 1904, and from disturbed contexts, which evidenced later intrusions, or were impacted by ploughing activities.

Techno-typological features of the chipped stone assemblage (excavations 2013–2015)

The Early Neolithic assemblage retrieved from the pits, dwellings, and infills during

the excavations 2013–2015 is comprised of 21 chipped stone artefacts, which technologically belong to different categories, being divided into cores, core maintenance (preparation and rejuvenation related) elements, blade products (central blades), flakes, and debris. In addition, non-obsidian knappable material (quartz nodules, in particular) was also used for hammerstones. Artefacts discovered in disturbed or mixed contexts, which are still at least partially related to the Early Neolithic trenches, comprise other pieces, and were recorded in the same way (Tab. 2). The documentation of chipped stones follows the methodological approach addressed in Milić 2018; id. 2019, which was used by the author for the studies of the Neolithic material in Anatolia, the Aegean, and the Central Balkans (south Serbia).

Despite the low number of pieces recovered from the site, and, aside from the abundance

of central blades (aimed or targeted blade products with no traces of cortex/natural surface or core reduction maintenance) followed by flakes, the material also evidences cores and technical elements related to core preparation and rejuvenation alongside the minor debris. In total, seven obsidian pieces were documented at Bucova Pusta IV, two from the Early Neolithic features, and another five from disturbed excavation strata and the surface. The rest of the material is attributed to different non-obsidian knappable rock varieties, as given in more detail in the later sections of the text.

Blade products

Central blades are the most numerous in the assemblage, occupying 57 % and 40 % of the Early Neolithic and disturbed material respectively. Those from the secure Early Neolithic contexts are preserved as complete pieces and medial fragments, followed by a few distal and proximal sections. They are mainly detached from the unidirectional cores, with the exception of two pieces, which bear opposite directional negatives; these could be related to knapping of cores with two opposing platforms or “turned” (primarily unidirectional) cores, and cores knapped by direct percussion after being placed on an anvil. According to the regularity of edges, detachment stigmata and negatives on blades, soft direct and indirect percussion, pressure technique and anvil technology are attested. The length of blades ranges between 10–68 mm, and their sections are mainly trapezoidal; edges are parallel, and profiles are straight or slightly convex.

Disturbed and mixed contexts yielded blades which are more fragmented, and preserved mainly in their medial and proximal sections. Apart from one blade with negatives displaying two opposite

directions, the rest was knapped from the unidirectional cores. In this assemblage, there is a wider variety in blade regularity, with blades exhibiting parallel, convergent, and divergent sizes, and curved and straight profiles, while mostly showing trapezoidal sections. The lengths occur in ranges between 10–58 mm. Their production techniques are particularly noteworthy, especially concerning the large regular blades, which were most likely produced by indirect percussion or pressure flaking with the use of levers (for more details on recognition criteria for large blades, see Pelegrin 2006; id. 2012).

Flakes

Flakes from the Early Neolithic contexts are divided into thin cortical and non-cortical flakes, and elongated or blade-like-flakes. They are detached from the uni- and multidirectional cores and cores knapped on anvils, generally speaking in favour of reduction of medium-sized and small cores (flake sizes ranging between 7–15 mm). Disturbed layers display a wider range of flakes with sizes between 7–30 mm, and can be attributed to thin cortical and non-cortical flakes, short hinged flakes, and tiny flakes (under 11 mm). Negatives on the dorsal side of flakes attest to the knapping of anvil, opposed platform, and the multidirectional cores. In general, the blade and flake assemblage seems to derive from different core reduction strategies, which can suggest that there were two main aims of production of chipped stone tools at the site. However, the anvil knapping is a common feature for these two assemblages. Furthermore, the general lack of a more solid number of cores limits a full understanding of what might be differing core maintenance strategies, especially regarding mixed reduction of flakes and blades from a single sequence.

Cores and core maintenance elements

A core on a blade (burin-like-core) found in an Early Neolithic feature represents the only core from a secure context, and is informative about the secondary use of primary blanks in an opportunistic manner for the final extraction of tiny blades or blade-like-flakes. Two cores from disturbed layers (surface finds made of obsidian and quartz) are related to the typical knapping of small specimens on an anvil. These pieces can possibly be connected with the Neolithic occupation, while, moreover, fitting to the common elements of the core reduction system known from the Early Neolithic settlements in the Banat, as well as at the other Starčevo sites, as already outlined by Ian Kuijt (1994, 90f., and references therein)².

In addition, a secondary use of a multidirectional flake core turned into hammerstone comes from a mixed layer. A quartz hammerstone fragment was also documented in the Early Neolithic trench in the context of a pottery concentration associated with Feature 6 in Trench R (for details on the context, consult the stratigraphy chapter).

Within the group of core maintenance elements, there is an Early Neolithic quartz preparation flake, which can suggest the occasional knapping of this raw material on site. Amongst other core preparation and rejuvenation pieces, there are two lateral (crested) blades in obsidian, an opening

flake, a debitage surface correction blade, and a surface rejuvenation blade documented in chert, which are related to the initial preparation of a core and reparations of the knapping directions during the main reduction sequence. Finally, two debris pieces are recorded in both contexts, which are associated with small knapping waste. It is presently clear that the assemblage does not contain exclusively ready-made products, which might be exchanged directly, but also other elements related to core reduction. However, the amounts of cores, maintenance elements, and debris are still very low for suggesting an on-site production of chipped stone artefacts, especially regarding regular blade products knapped from unidirectional cores. On the contrary, knapping of quartz, the anvil knapping of smaller cores or blanks, and the ad-hoc secondary modification of blanks can all be suggested to have been done locally.

Modified blanks – retouched and tools with macroscopically observed use scars

Within the chipped stone assemblage, the percentage of tools is quite high, taking 57 % in the secure Early Neolithic and 48.5 % in disturbed layers, demonstrating that half (or more) of the material produced was modified, likely in order to be used. This is an interesting pattern in contrast to other comparable assemblages (see e.g. Kuijt 1994, 87; Biagi 2011, 75; Šarić 2014; Horejs et al. 2019). Typological analyses of chipped stone tools demonstrate that central blades and non-cortical flakes were mostly used with or without retouch, with the exception of one opening fully cortical flake, which was additionally modified. This can suggest that there was a selection of blanks (primary products) for further modification. Tools distributed across the Early Neolithic features and fill layers demonstrate the presence of sickle blades, followed in number by end-scrapers made on

2 “Bipolar” knapping with the core set on an anvil where the direct striking by a hammerstone results in a simultaneous chipping from two different core sides, the top and the bottom which has contact with the anvil (see Crabtree 1972 for the original definition) should not be conflated here with bidirectional knapping, which represents removal of blanks from two different (opposed) platforms in a more controlled and organised manner.

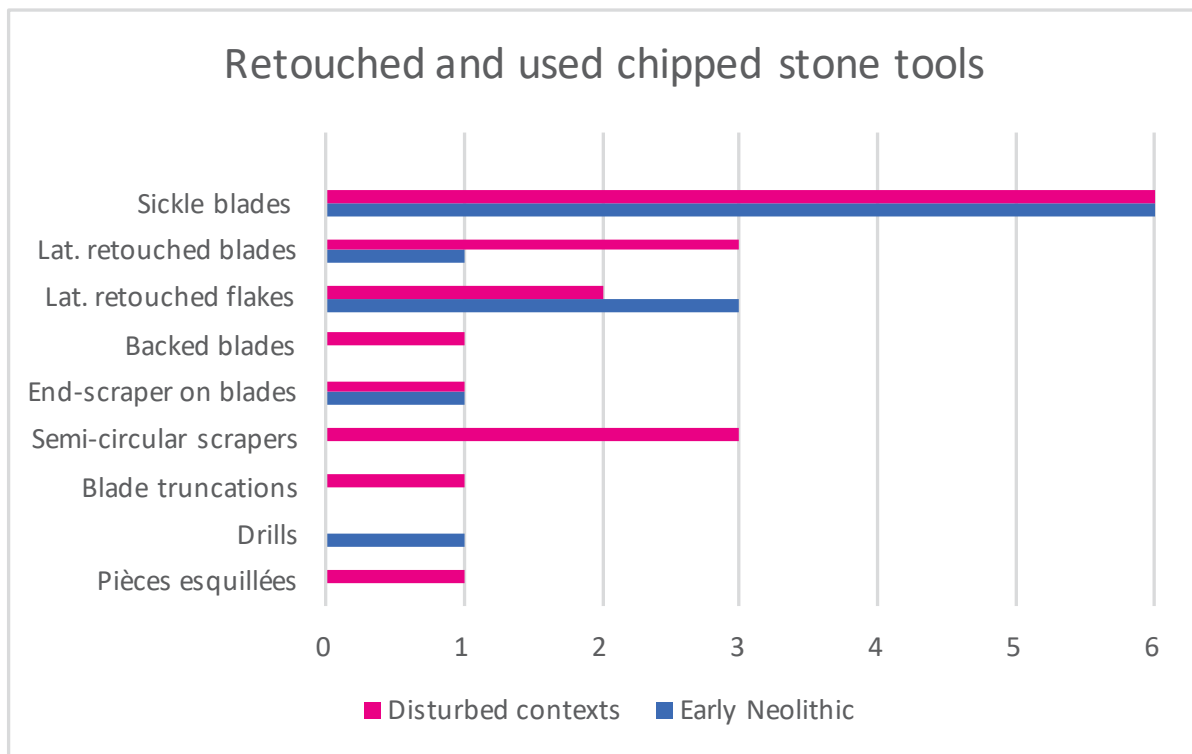


Fig. 1 Chipped stone typology (distribution of tool types in the Early Neolithic and disturbed contexts from the excavations 2013–2015).

blade blanks, and drills (Fig. 1; see Pl. 1 and 3 as well). The sickle elements are comprised of retouched or non-retouched blades (of which some have truncations), while specimens display the gloss which is both parallel and oblique to the edges of the blanks, possibly suggesting different hafting practices.

Tools recorded from disturbed layers evidence a similar typology, especially in the number of sickle elements which are based on retouched blades, followed in number by truncations and end-scrapers. However, there is a bigger variety of tool types in these contexts, which also include semi-circular scrapers made on flakes, a backed blade, and a pièce esquillée (a symmetrical splintered piece), which could technologically and typologically fit into the Early Neolithic group of finds (Fig. 1; see Pl. 2 and 4). Still, although a part of the retouched tools and tools with macroscopically observed scalar removals from disturbed contexts belongs to rather

uncharacteristic blanks (flakes and blades), a couple of the tools clearly demonstrate non-Early Neolithic features in terms of tool typology, and should therefore be counted among the mixed material. As already mentioned in one of the sections above, there are three large blades with retouched edges and a truncation (BP-K-7, BP-P-19, BP-P-20), which could be attributed to somewhat later chronological spans in regard to production technique, size, and retouch type. Moreover, a circular obsidian scraper also does not occur as a typical Early Neolithic tool (BP-M-1). Finally, a bilaterally retouched sickle insert (BP-K-3) can most likely be associated with the Bronze Age.

Addendum: Material from early excavations in 2010 and 2012

In the course of first excavations of the German-Romanian team in different parts of the mound, two trenches (A and B)

context	RM	prov	nat. surface	core	debitage unmodified				debitage modified			hammer-stone
					blade	flake	core prep. and rejuv.	debris	blade	flake	core prep. and rejuv.	
<i>Bucova Pusta IV_Early Neolithic</i>	„Balkan Flint“	NE Bulgaria or Romania	not preserved	1	1				5	1		
	chert	indet	not preserved						1	1		
	radiolarite	possibly Mecsek	not preserved						1			
	radiolarite	Transdanubia (Bakony Mts.)	not preserved						1			
	radiolarite	possibly Carpathian	not preserved	1								
	NLS	indet	residual / n.p.			1		1				
	obsidian	SE Slovakia (type C1)	not preserved	1						1		
	quartz	indet	gravel				1					1
	indet (burnt)	indet	not preserved							1		
<i>Bucova Pusta IV_Disturbed contexts</i>	"Balkan Flint"	NE Bulgaria or Romania	1 pc gravel		1	1	1		4			1
	"Central Banat Flint"	indet	not preserved							1		
	flint	Vollhynia	not preserved						1			
	chert	indet	gravel				1				1	
	high quality grey chert	indet	not preserved						1			
	chert	indet	not preserved		1	1			2			
	chert	indet burnt	not preserved		1	1						
	chert/spiculite	indet	not preserved		1							
	radiolarite (burnt)	most likely Bakony Mts.	not preserved							1		
	radiolarite	possibly Mecsek	not preserved							1		
	NLS	indet	gravel + residual			1		1	1	2		
	obsidian	SE Slovakia (type C1)	not preserved	1			2			1		
	quartz	indet	not preserved	1								
	indet (burnt)	indet	not preserved			1						
<i>Bucova Pusta IV_survey</i>	"Balkan Flint"	NE Bulgaria or Romania	not preserved						1			
	"Central Banat Flint"	indet	not preserved			1						
	radiolarite	possibly Mecsek	not preserved						1	1		
<i>CAL</i>	"Balkan Flint"	NE Bulgaria or Romania	not preserved							1		
	radiolarite	possibly Mecsek, 1 pc burnt	not preserved	1					1			
	NLS	possibly Mátra peri-volcanic silcrete	primary/residual						1			

Tab. 3 *Raw materials according to technological elements (material from the excavations 2013–2015 and surveys).*

yielded two and four chipped stone artefacts respectively. In Features 13 and 16 of Trench A (excavated in 2010), a laterally retouched fragmented blade-like-flake in chert and an obsidian thick flake were found, and can be

attributed to the Early Neolithic layer (see more details and distribution of finds in the section with stratigraphy data). However, an Early Neolithic feature documented during the excavations in 2012 potentially affected

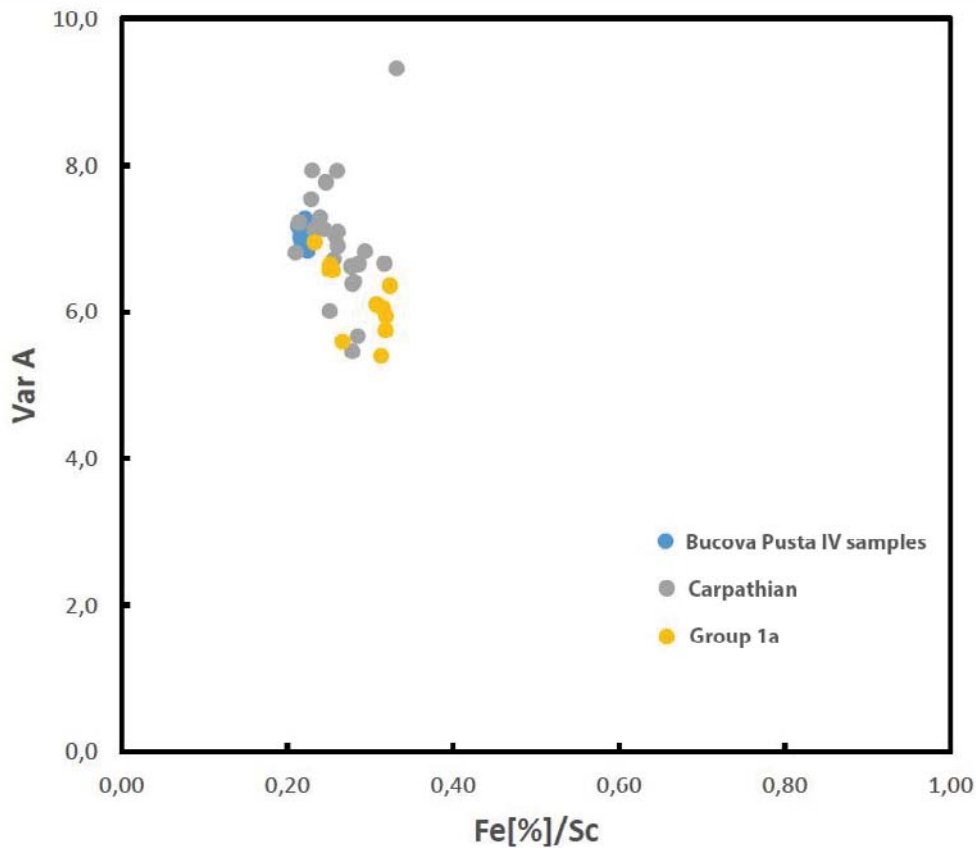


Fig. 2 Results of the Neutron Activation Analyses (NAA) made by E. Pernicka.

by recent agricultural activities must be taken with caution regarding the dating of finds. These comprise three chert artefacts (two elongated, regular flakes and a larger thick non-cortical flake), and one small obsidian flake (Pl. 6).

Material from the survey around Bucova Pusta IV and Kalcsov I

The surface survey in the vicinity of Bucova Pusta IV and the material gathered around Kalcsov I yielded eight prehistoric chipped stones. There are 4 blades, 3 flakes, and 1 anvil core in this collection, of which 6 pieces bear modification in the form of retouching. According to two pieces from the survey (Pl. 5), namely a denticulate, bifacial sickle element (BP-SURV-4), and a retouched “mini-adze” tool made of chert (BP-SURV-1), the

existence of a Bronze Age occupation in the vicinity of the site cannot be doubted.

On the other hand, artefacts from Kalcsov I do not display particular characteristic features (with blades and a flake) permitting a more detailed chronological determination of the material (see Pl. 7). However, an out-of-shape anvil core could well be related to the Early Neolithic, which chronologically accords with early pottery sherds recorded in the course of work on the site, although a test trench exclusively uncovering Iron Age structures did not present stratified data for earlier periods (see Chapter 4).

Method of raw material analysis

Lithic raw materials in the chipped stone tool assemblage of Bucova Pusta IV were

stereomicroscopically analysed using a Zeiss SteREO Discovery.V20 microscope with 40–150 times magnification, and coupled with an Axiocam 305 colour digital camera for optimal microphotographic documentation. Stereomicroscopy aims at the identification of characteristics such as the microstructure, i.e. size, shape, and spatial arrangement of the constitutive components, and particular inclusions and bioclasts. In the case of silicites (i.e. organically formed SiO_2 modifications such as chert and flint), this investigation primarily focuses on the detection of microfossil remains; however, non-fossils may also be representative of specific source environments. This type of analysis allows the identification of raw material sources or source regions by reconstructing individual facies under which particular stone raw materials were formed.

To illustrate the raw materials with identified and unidentified provenance, we provide microphotographs under standardised 40 times magnification and water immersion at unpolished rock surfaces, which can be used as a reference catalogue for comparison with other assemblages from this area.

Comparisons with materials from the Vienna Lithothec (VLI) at the Department of Prehistoric and Historical Archaeology at the University of Vienna and the in-house rock collection at the ÖAW allowed the determination of the origin of a series of lithic raw materials at BP; however, this was not possible for the entire assemblage (especially some chert varieties). The question regarding their provenance will be addressed in the course of further in-depth studies involving cooperation with local lithic specialists and geo-archaeological surveys.

Raw materials

The distribution of raw materials according to all elements of the *chaîne opératoire* of

chipped stone production at Bucova Pusta IV and Kalcsov I is provided in Tab. 3.

From an overall perspective, a characteristic yellow-honey-brown raw material of high quality oftentimes displaying white spots dominates the lithic (and specifically the Early Neolithic) assemblage from Bucova Pusta IV. This material is easily recognisable, and typically referred to as “Balkan Flint” (BF), although significant variability exists upon closer (and especially petrographic) examination. Sources of this kind of material(s) are known from the Moesian Platform and adjacent regions in Bulgaria and Romania from both Lower and Upper Cretaceous formations, with the best documented outcrops along the River Danube in the Pleven-Nikopol area (Biagi/Starnini 2013; Ciornei 2015; Crandell 2013; Gurova 2012a; id. 2016; Gurova et al. 2016; Gurova/Nachev 2008). Several authors have recognised the significance of BF as a marker of the Neolithisation in the Balkans and the Carpathian Basin, and its role in the subsequent maintenance of socio-economic contacts (e.g. Gurova 2012a; id. 2016; Gurova et al. 2016; Kaczanowska/Kozłowski 2008). The dominance of BF at Bucova Pusta IV indicates the strong involvement of its inhabitants in Neolithic networks active on a broader scale in the circum-Carpathian realm.

Two chipped stone tools (BP-K-3 and BP-SURV-2) are made from so-called „Central Banat Flint“ (CBF). This is a silicite (chert; also described as “biogenic jasper” from the Metaliferi Mts., see Crandell 2011, 71) of lower quality on account of frequently occurring fissures and cracks. It is typically yellowish-brown, sometimes with a green hue. The most characteristic features are dark brown to black veins and spots. The exact source regions of this type of material are still not systematically investigated; outcrops are, however, known

from Timiș and Hunedoara Counties in western Romania (Comșa 1971, 15; Biagi/Starnini 2013, 50; Starnini et al. 2012, 109; Biró et al. 2000). Both artefacts are clearly related to a later stage of prehistory, best corresponding to the Bronze Age (a bifacial sickle implement and a bifacial “mini-adze”).

Obsidian artefacts from Bucova Pusta IV microscopically match the Carpathian I type typically associated with sources in south-eastern Slovakia. This obsidian type is typically shiny black, and can appear almost completely translucent in the case of very thin pieces (e.g. bladelets). By means of contrast, Carpathian II obsidian from north-eastern Hungary mostly displays a slightly greyish hue, and is non-translucent, while Carpathian III obsidian, which only occurs in the western extreme of Ukraine at Rokosovo, is characterised by a porous structure and macroscopically visible grains (Rácz 2018). Chemical Neutron Activation Analyses (NAA), made by Ernst Pernicka at the Curt-Engelhorn-Zentrum Archäometrie (CEZA) laboratory in Mannheim, Germany, demonstrate that the sampled assemblage comprised of seven obsidian artefacts (from the Early Neolithic and disturbed or survey contexts – see pieces on photographs), corresponds to the Carpathian I source region, therefore confirming the first microscopic observations (Fig. 2). This study compares the data on chemical characterisations of the Carpathian source areas made by Oddone et al. (1999).

Together with BF, obsidian is one of the most significant exogenous materials for Neolithic chipped stone production in the Carpathian region (Bačo et al. 2017; Biagi 2011, 71–72; Culicov et al. 2009; Milić 2014; Rosania et al. 2008; Szepesi et al. 2018).

An end-scraper on a blade made of Volhynian flint (BP-K-8), which represents

a long-distance import from the western Ukraine, is noteworthy. As suggested for sites in eastern Hungary (e.g. Maroslele-Pana, see Kaczanowska et al. 2011, 276–277, or Alsónyék-Bátaszék, see Szilágyi 2018), Volhynian flint is typically associated with the Late Neolithic/Chalcolithic and does not occur in Early or Middle Neolithic contexts.

Neogene lacustrine silicites (NLS; oftentimes termed “limnosilicites” or “limnoquartzites”, which is problematic – see Brandl/Hauzenberger 2018, 57 for a discussion on the terminology) are represented by a total of eight chipped stone artefacts. NLS are by-products of volcanic activities and visually highly diverse. Sources can consequently be found at various locations between western Hungary and the Tokaj Mountains, and along the entire intra-Carpathian volcanic arch comprising Slovakia and parts of west-central Romania (Biró 1986; Biró et al. 2000). Furthermore, this type of raw material can be found throughout Serbia (Miladinović et al. 2016). Blade CAL-4 could correspond to one particular subtype of NLS, the so-called Mátra peri volcanic silcrete (Szurdokpüspöki opalite, see Biró 1986).

Radiolarites within the assemblages are derived from three different source regions. Petrographically, most of this group corresponds best to Mecsek-type radiolarite (see e.g. Szilágyi 2018, 132). Two artefacts are made from Transdanubian (Bakony) radiolarite; however, one is heavily burnt (BP-H-1), and cannot therefore be unambiguously assigned. The one securely determined specimen (BP-T-3) is of the so-called “Hárskút” type (for a discussion related to the relevance of this sub-division of Bakony radiolarites, see Szilasi 2017). Based on its petrographic composition, BP-P-11 is most likely of Carpathian origin, i.e. from the Pieniny Klippen Zone (Brandl et al. 2014; Cheben/Cheben 2010). Of the presumed Mecsek radiolarites, BP-SURV-4 again most

likely represents a Bronze Age denticulated sickle element.

The provenance of other silicite (chert/flint) raw materials cannot presently be securely identified. Some of those pieces may be uncharacteristic (i.e. very small or burnt) BF (e.g. BP-Q-1; BP-R-5; BP-OP-1), and some derive from (most likely “local”) gravels, as indicated by natural surface remains (BP-P-1). One spiculitic chert, for which we cannot indicate potential geologic sources at present, was also recorded (BP-P-5).

The broad large blade BP-K-7 is a high-quality grey chert of unknown provenance, probably corresponding to the “grey/blue” flint described from Foeni (Kuijt 1994, 89).

Of three quartz artefacts in the assemblage, the two Early Neolithic pieces (one preparation flake and one hammer stone fragment) remain of a gravel surface, which indicates an origin of very likely close-by river sources. However, the exact provenance cannot be determined at present.

The material of the two pieces BP-R-3 and BP-P-9 was indeterminable due to the influence of intense fire

Chipped stone production and use in context – concluding remarks

The Early Neolithic chipped stone collection from Bucova Pusta IV represents a curious case in terms of the number of artefacts, considering that multiple excavation seasons were conducted on site. However, the paucity of chipped stones in the Early Neolithic context here is not unique, as similarly small assemblages (under 40 pieces) resulting from the scarcity in knappable raw materials were reported from comparable sites in the wider vicinity, such as Foeni-Salaş and Miercurea Sibiului-Petriş (Bácskay 1976; Kuijt 1994;

Biagi 2011). This pattern in the western Banat in Romania also seems to follow a culturally different outline when compared against the other two geographical regions within the Banat – the mountainous area in the east and southeast, and the Danube Gorges respectively (Draşovean 2007, 67f.). On the other hand, the small assemblages from the Romanian Banat limit our understanding of the variety of evidence in terms of production techniques and the components of lithic toolkits, therefore leaving very little room for comparisons with other well-known assemblages from contemporaneous chronological sequences, for instance those in the Danube Gorges region or northern and central Serbia.

In a similar way, internal changes and developments of chipped stone production involving the questions of cultural continuity and discontinuity through time cannot be explicitly framed as has been done for other sites, which exhibit clearer trends in production and use of chipped stone tools (e.g. Kozłowski/Kozłowski 1984, Šarić 2014; Bogosavljević Petrović/Starović 2016). Sites with low numbers of artefacts (including Bucova Pusta IV) clearly demonstrate that chipped stones supported domestic activities performed in everyday life, likely on a household level. They are mostly expressed in tools used in harvesting domestic cereals, and other cutting, drilling, and scraping implements, with many retouched tools most likely being hafted, based on the retouch types. The absence of geometric microliths in the assemblages with a low number of artefacts from the Romanian Banat should be also interpreted with caution, considering the ongoing debate about the role of geometrics in Early Neolithic horizons, in which Donja Branjevina and other sites from the Starčevo-Körös-Criş in Romania and Hungary likely demonstrate different cultural traditions (Šarić 2014, 176).

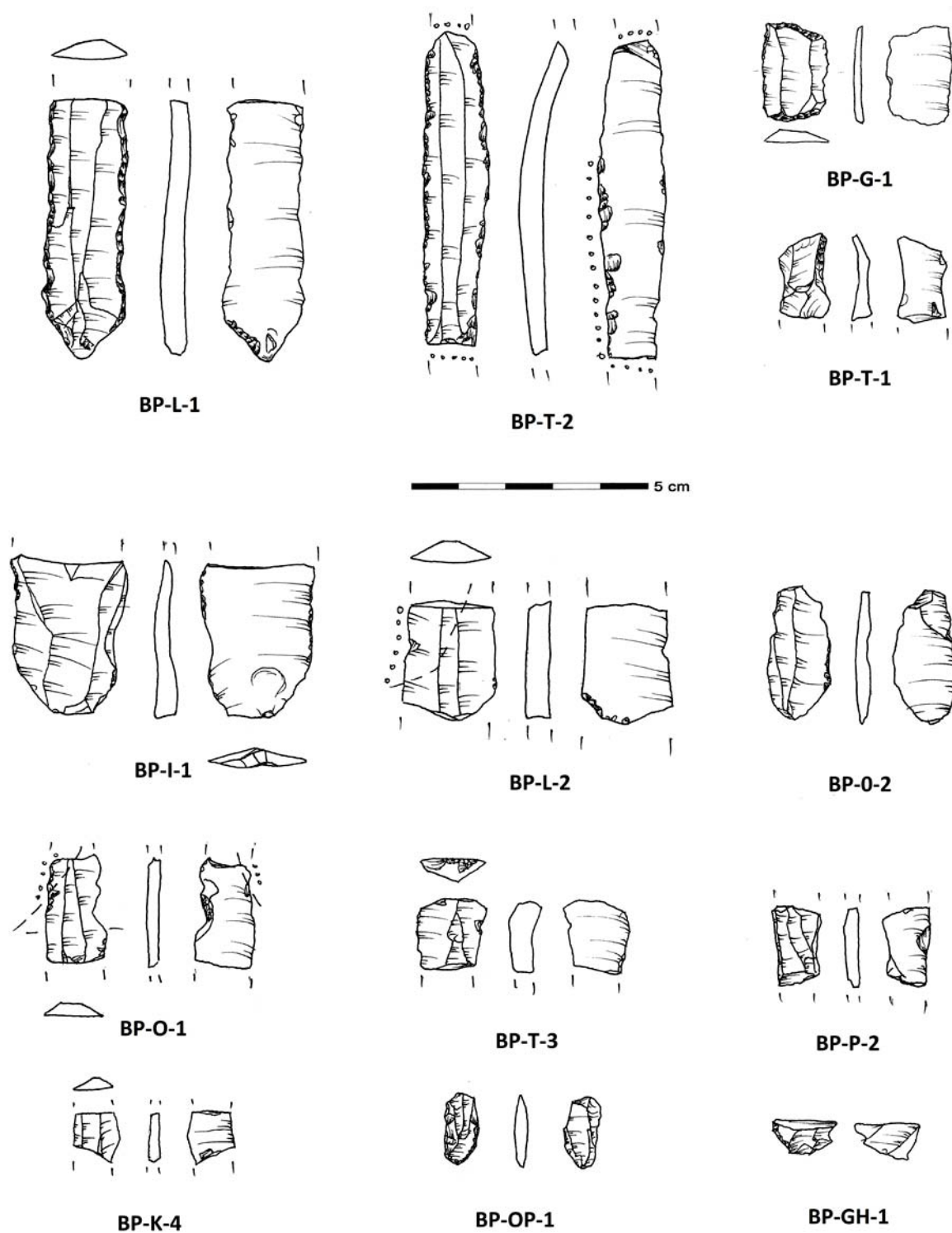
Techno-typological and raw material studies of the small Early Neolithic assemblage from Bucova Pusta IV mark an important step in understanding the behaviour of this agricultural community with no direct access to knappable materials. Two different core reduction systems can be outlined based on the intended or final products, and other technical elements available in the assemblages. The first, which is unlikely to be related to a local production, concerns blades which were produced from single-platform cores by percussion and pressure technique, and arrived at the site via exchange, for which particular raw material selection suggests the involvement of long-distance networks. “Balkan Flint” makes up a significant portion of the chipped stone assemblage in the Early Neolithic assemblage. The obsidian from south-eastern Slovakia (Type Carpathian 1) is also present here, albeit in small quantities. The exchanged products include bladelets and long blades which were used on site, and were occasionally additionally modified and secondarily reduced in the final exploitation of blanks for obtaining small specimens. The second reduction strategy concerns local production, which is related to knapping of quartz, most likely accessible to the community, and the knapping of smaller blanks (used secondarily) related to cores set on an anvil. The production of bladelets and small flakes coming from anvil knapping does not necessarily indicate low knapping skills, but could be related to an opportunistic means of raw material use. There are still open questions concerning the recycling of the material in this assemblage, and occasional introduction of larger cores for blade and flake production, which are currently linked to the existence of some core preparation and rejuvenation elements, although these

are especially related to the group of artefacts from disturbed contexts.

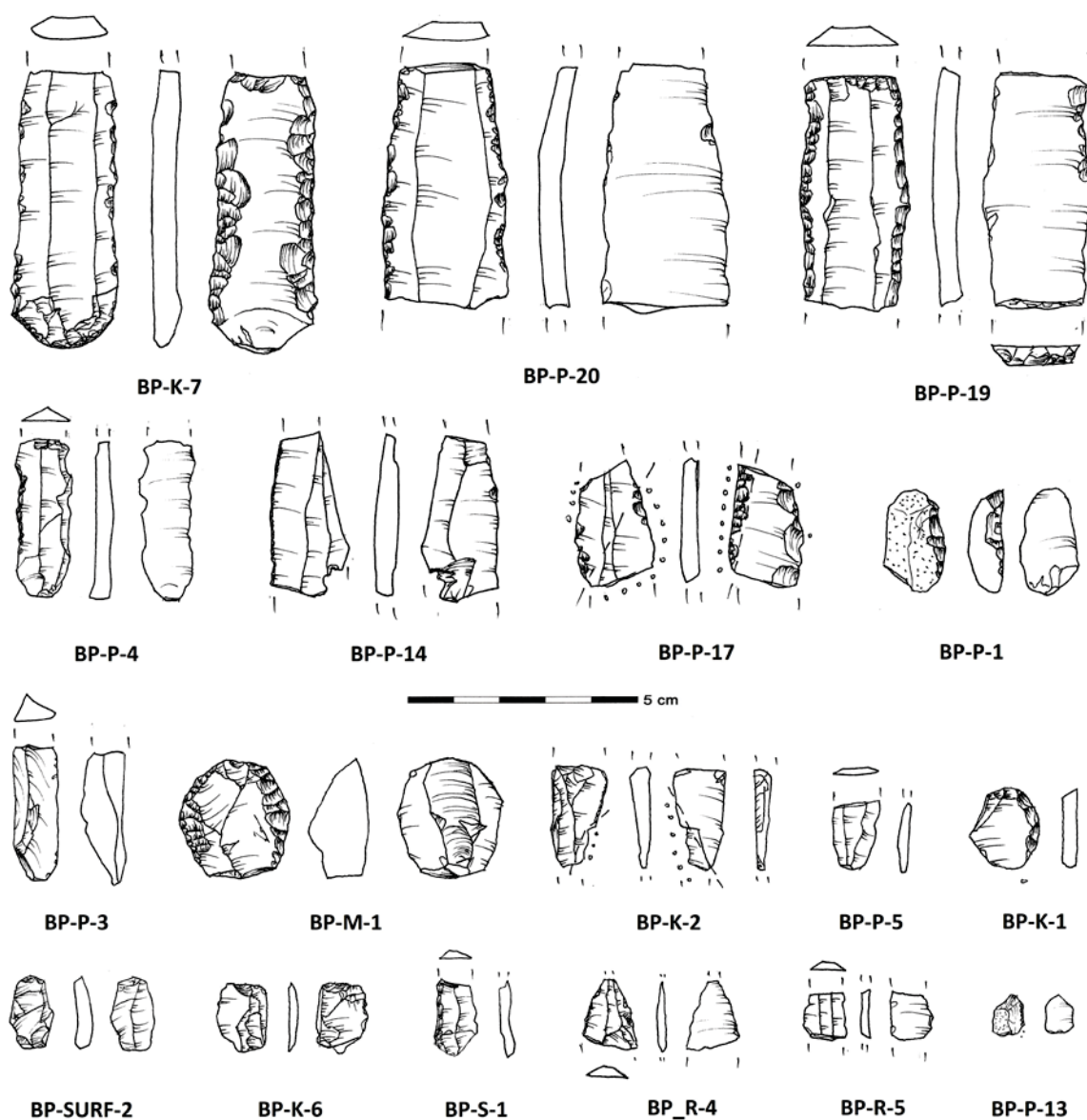
A larger diversity of lithic raw materials is present from these disturbed contexts. Although from a raw material and techno-typological perspective, a good part of these finds corresponds to cores, blanks, and tool types recognised in the secure Early Neolithic layers, later intrusions are doubtless present. There are some chipped stone tools indicating post-Neolithic activities at and around Bucova Pusta IV. These are Bronze Age sickle elements, retouched in a different (bifacial) fashion, and large blades demonstrating a skilled production which could be related to either the later Neolithic and/or Chalcolithic periods. Future investigations should focus on tracing the full scope of these, also including the later prehistoric periods at this unquestionably important site, so as to better understand the diachronic developments of early farming communities in the Banat region.

Acknowledgements

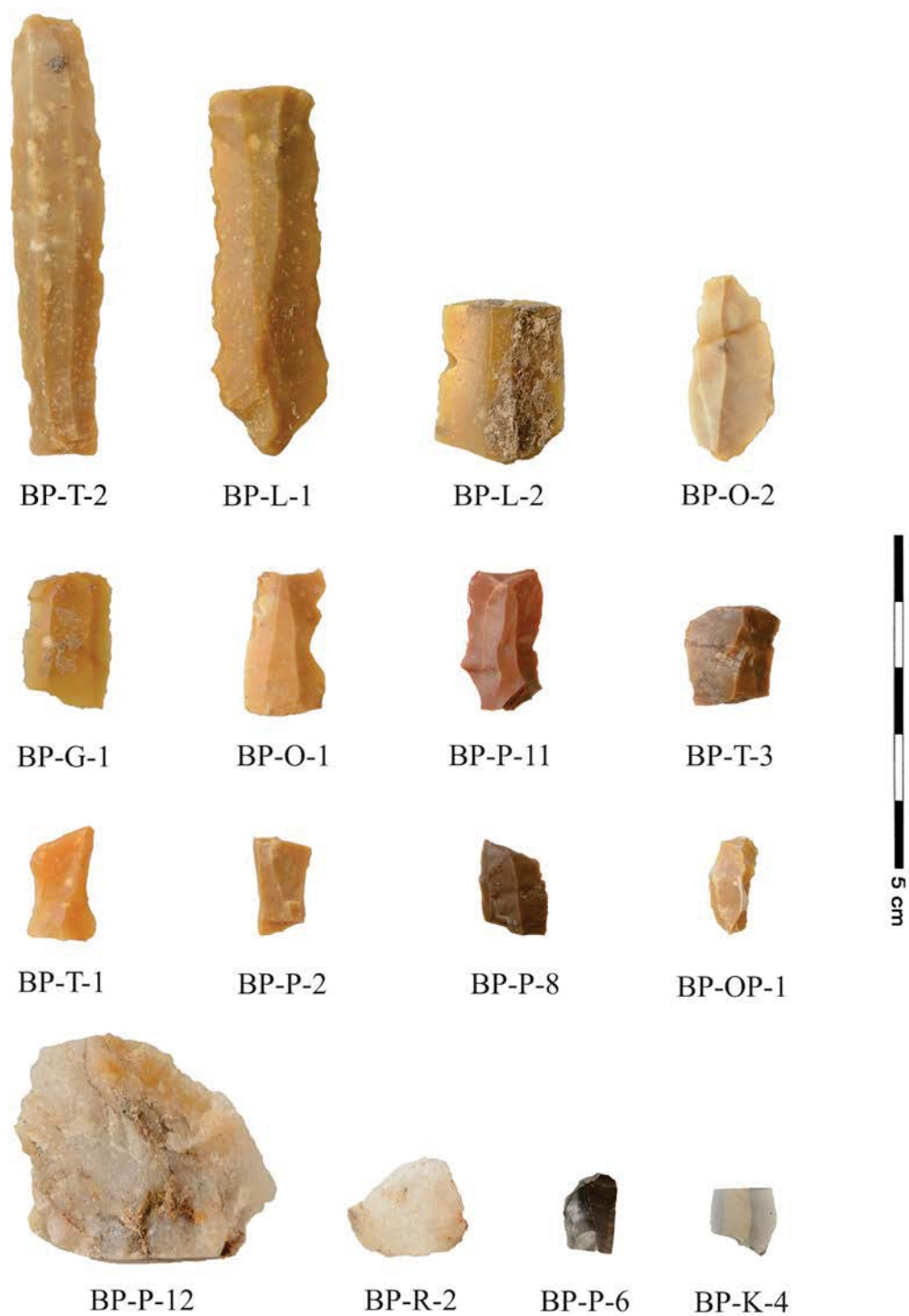
The study of chipped stone assemblage is the result of collaboration between the projects of Raiko Krauß (Tübingen) and Barbara Horejs (Vienna). Our analyses were carried out within the scope of the NEOTECH project – “Neolithic technological trajectories in the Balkans”, financed by the Austrian Science Fund (FWF) (Project P32096), which we would like to acknowledge here. We are deeply grateful to Ernst Pernicka for sharing his results of the Neutron Activation Analyses made for the provenance of obsidian artefacts. We also wish to thank our colleagues Christoph Schwall and Mario Börner for their kind help with initial setting for the taking photos of finds.



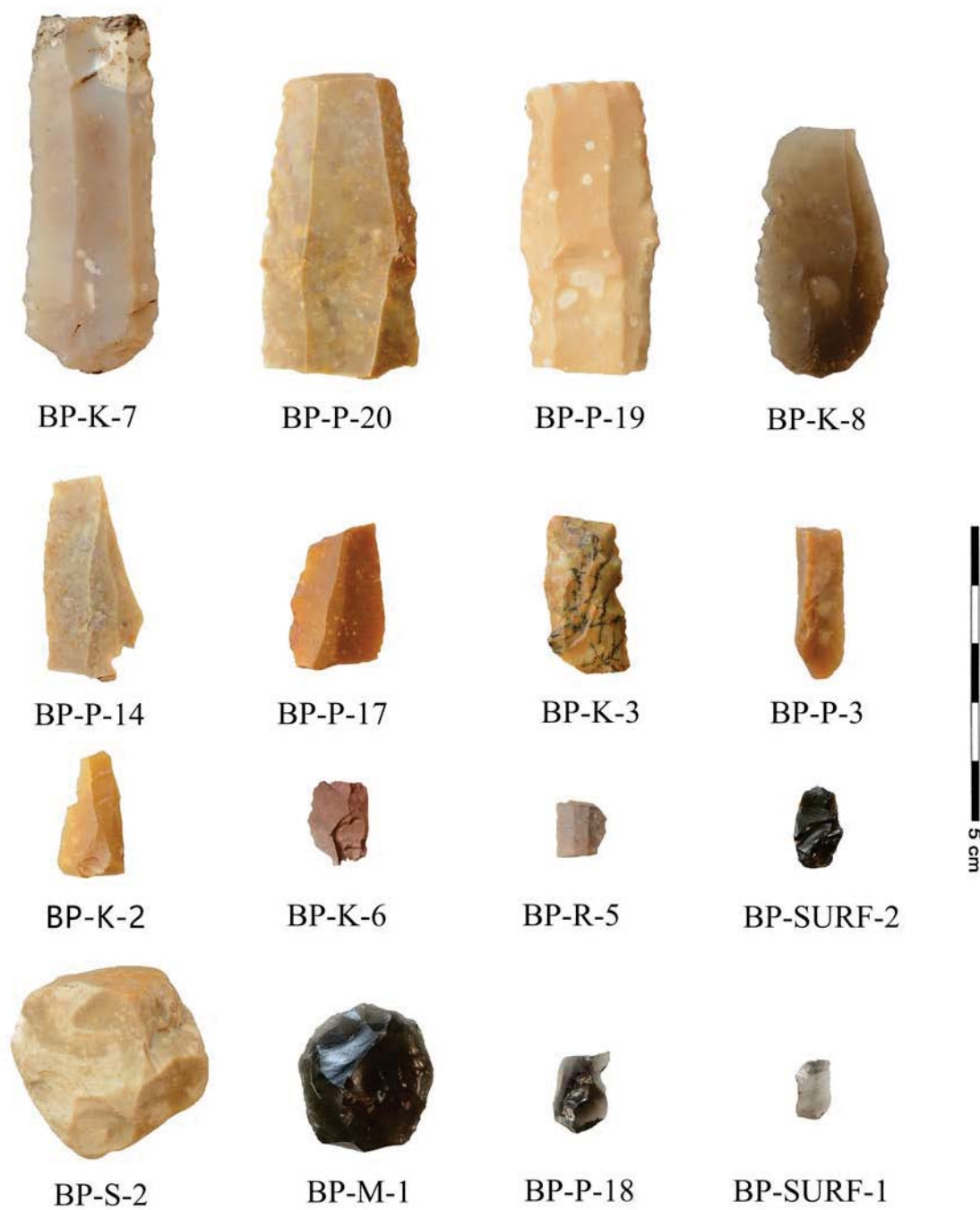
Pl. 1 Chipped stones from the Early Neolithic contexts at Bucova Pusta IV (drawings: B. Milić).



Pl. 2 Chipped stones from disturbed contexts at Bucova Pusta IV (drawings: B. Milić).



Pl. 3 Chipped stones from the Early Neolithic levels of Bucova Pusta IV (photos: B. Milić).



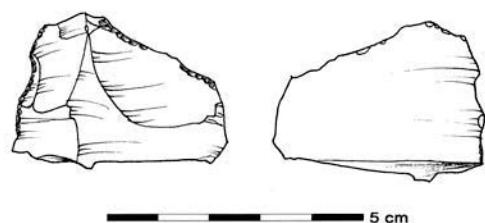
Pl. 4 Chipped stones from disturbed contexts of Bucova Pusta IV (photos: B. Milić).



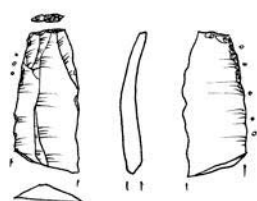
Pl. 5 Chipped stones from the survey around Bucova Pusta IV (photos: B. Milić).



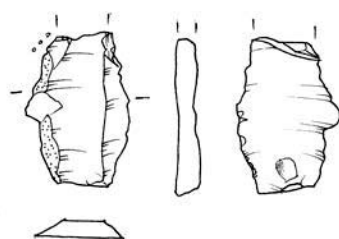
Pl. 6 Finds from Trench B of the site excavation in 2012 (photo: Bucova Pusta IV archive with modification).



CAL-1



CAL-2



CAL-4



Pl. 7 The selection of chipped stone tools (retouched flake and two sickle blades) from the surface finds of the Kalcsov I survey (drawings & photos: B. Milić).

APPENDIX: Microphotographs of the chipped stone assemblage (Photos: M. Brandl)

Microphotographs were produced under standardised 40 times magnification and water immersion at unpolished rock surfaces using a Zeiss SteREO Discovery.V20 microscope coupled with an Axiocam 305 colour digital camera.

Bucova Pusta IV – Early Neolithic

“Balkan Flint”



BP-I-1

“Balkan Flint”



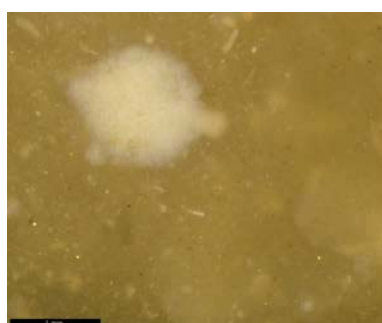
BP-L-2

“Balkan Flint”



BP-O-1

“Balkan Flint”



BP-T-1

Radiolarite (Carpathian)



BP-O-1

Radiolarite (Transdanubian - Bakony)



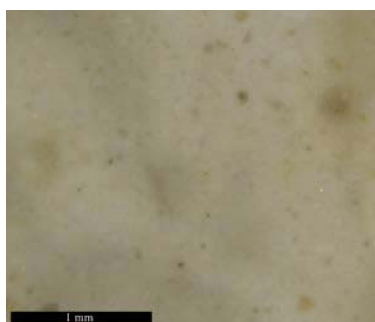
BP-T-1

Neogene Lacustrine Silicite (NLS)



BP-P-7

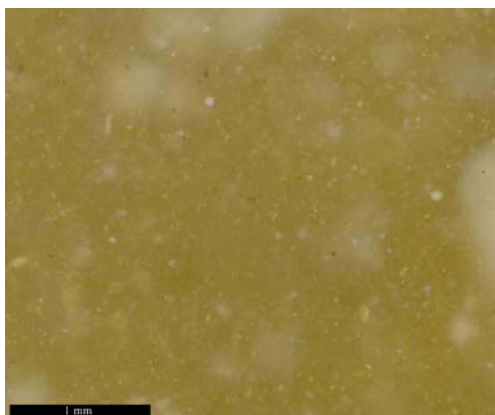
Chert, indeterminate



BP-O-2

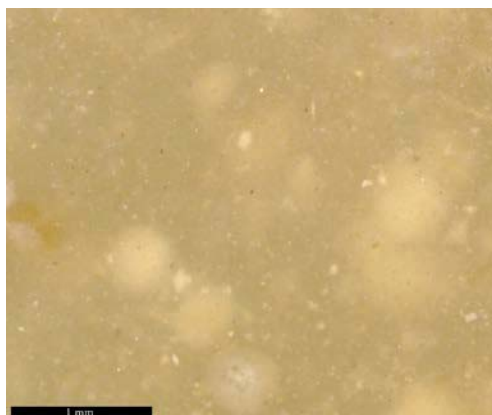
Bucova Pusta IV – Disturbed contexts

“Balkan Flint”



BP-K-2

“Balkan Flint”



BP-P-17

“Balkan Flint”



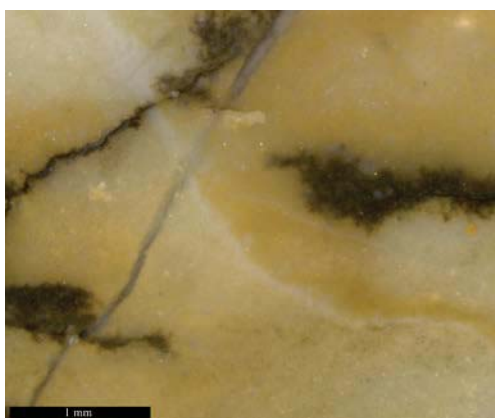
BP-P-19

“Balkan Flint”



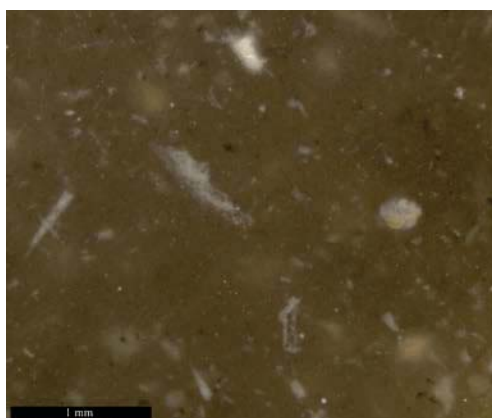
BP-S-2

“Central Banat Flint”



BP-K-3

Volhynian flint



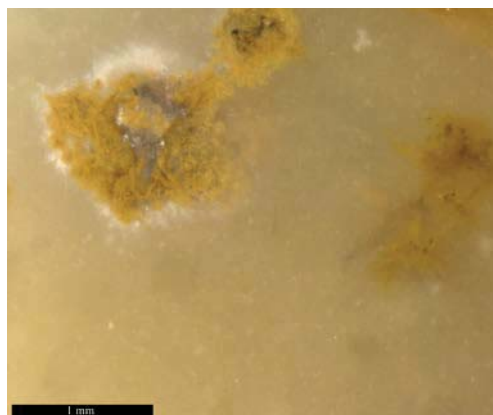
BP-K-8

Neogene Lacustrine Silicite (NLS)



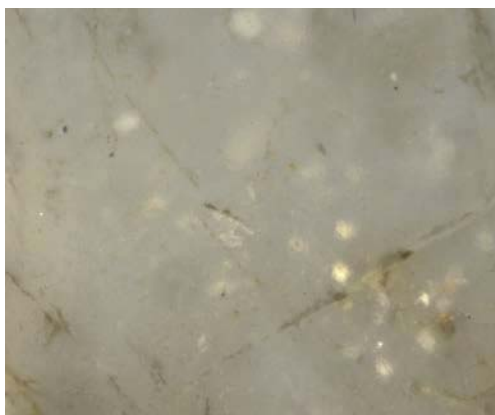
BP-K-1

Neogene Lacustrine Silicite (NLS)



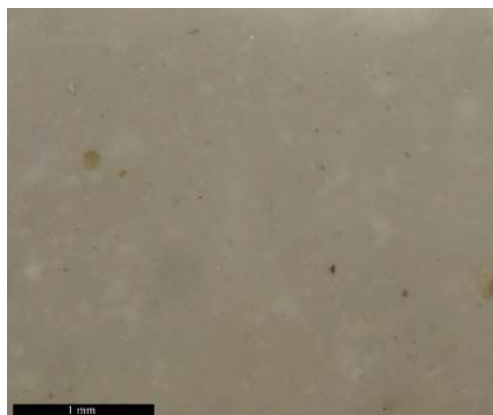
BP-R-1

Neogene Lacustrine Silicite (NLS)



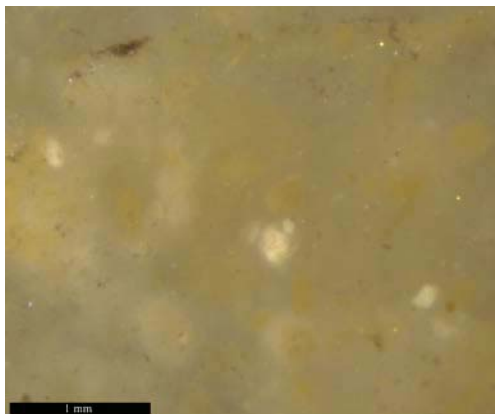
BP-P-15

High quality grey chert



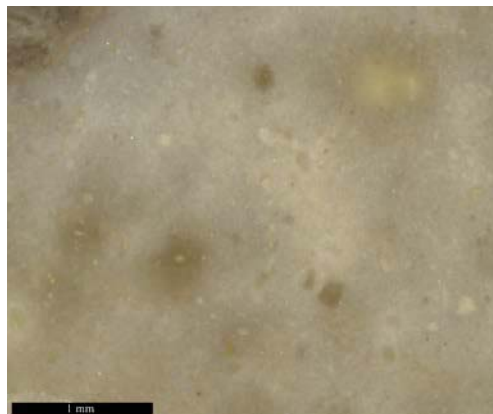
BP-K-7

Chert, indeterminable



BP-P-1

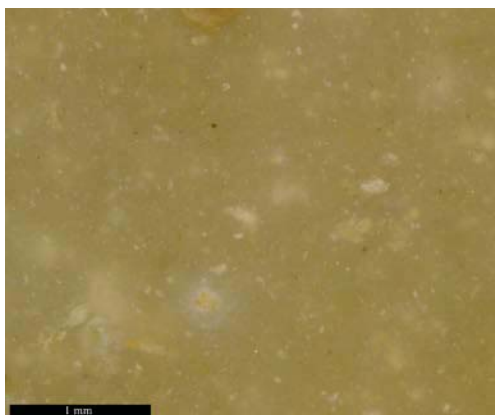
Chert, indeterminable



BP-P-4

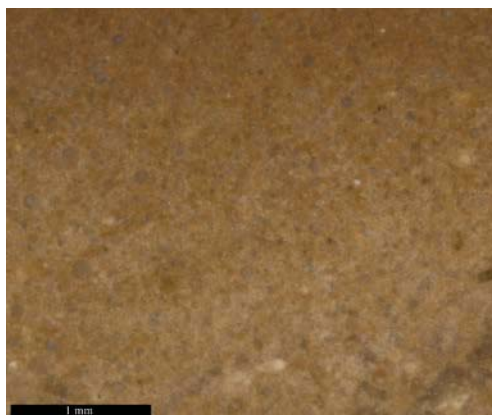
Kalcsov I

“Balkan Flint”



CAL-1

Radiolarite (possibly Mecsek)



CAL-2

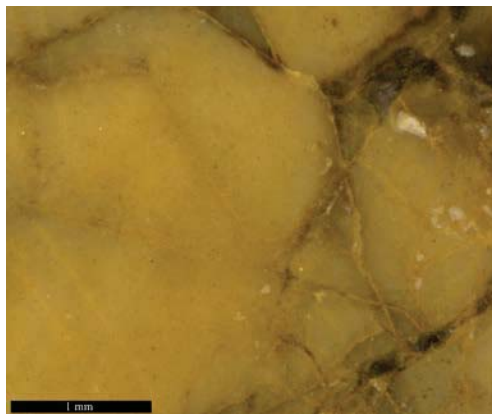
Survey material around Bucova Pusta IV

Radiolarite (possibly Mecsek)



BP-SURV-1

“Central Banat Flint”



BP-SURV-2

Archaeology in Banat I

Stone Age without Stones. The Early Neolithic site of Bucova Pusta IV in northwestern Banat (Romania)

This volume deals with the results of the excavations from 2010 to 2015 at the Early Neolithic settlement of Bucova Pusta IV near Sânnicolau Mare, in northern Banat. After the end of the Early Neolithic settlement, a large burial mound was erected at this site in the early 3rd millennium BC, the main burial of which was also documented during the excavations. The site was subsequently inhabited once again during the transition from the Late Bronze Age to the Early Iron Age. In medieval times, the site served as a burial ground for a nomadic equestrian population. The flat landscape of northern Banat is characterised by numerous watercourses. This is why the utilisation of aquatic resources played an important role in the Neolithic period. Another special feature is the lack of natural stones, which is reflected in the special character of the Early Neolithic finds.



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